The BEHAVIORAL ECONOMICS GUIDE 2024

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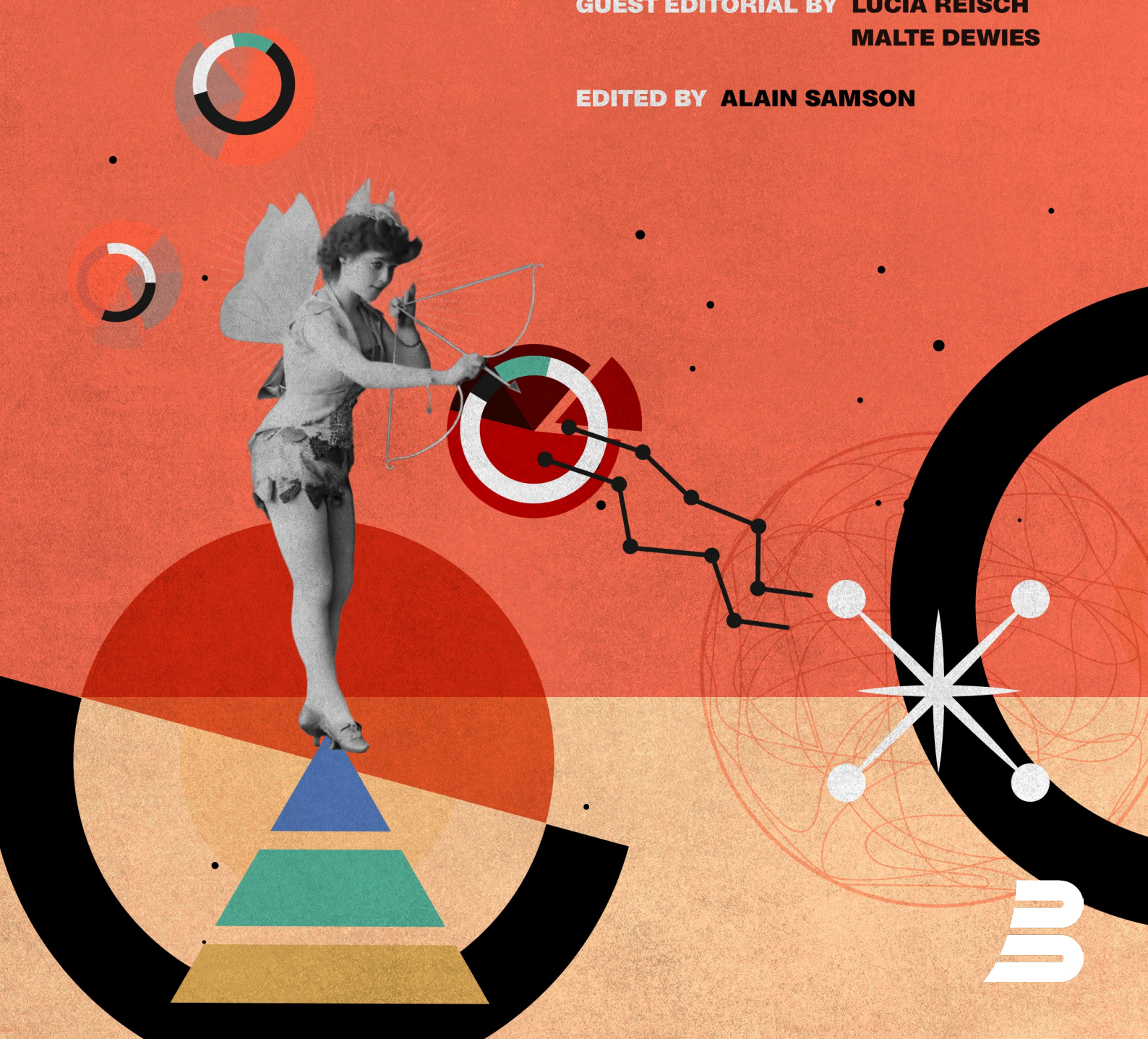

The Behavioral Economics Guide 2024
ISSN 2398-2020

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Published on www.behavioraleconomics.com by Behavioral Science Solutions Ltd

Suggested citation:

Samson, A. (Ed.)(2024). *The Behavioral Economics Guide 2024*.
https://www.behavioraleconomics.com/be-guide/.

Suggested citation for individual chapters/articles:
[Author(s)] (2024). [Chapter/Article Title]. In A. Samson (Ed.), *The Behavioral Economics Guide 2024* (pp. nnn-nnn). https://www.behavioraleconomics.com/be-guide/.

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Acknowledgements

The editor would like to thank Matthias Sutter for writing the introduction to this edition, as well as Lucia Reisch and Malte Dewies for their guest editorial.

We are grateful for the support received from AHA! Behavioral Design, Behavioral Research Hub, Behavioral Science Group, Dectech, Final Mile, Momentum Investments, Neovantas, Strategy& Middle East, as well as Durham University, Evidentia University, The Chicago School, London School of Economics and Political Science, University of Pennsylvania, University of San Francisco, and University of Warwick.

Many thanks also go to Andrew Gates and Alexandra Strick for their editorial help, Isabel Mariño for her cover design, as well as Hayat Askar, Rojhat Avsar, Gary Belsky, Thomas Bowden-Green, Will Delavan, Darcie Dixon, Milos Graonic, Mohamad Hjeij, Tim Houlihan, Elizabeth Krauter, Kármen Kovács, Wilfred Manuela Jr., Piper Oren, Peita Pacey, Elise Potier, Katrina Steyn, Mirjam van Tiel, Danilo Verboom, and Luciana Zardetto Pavan for their valuable feedback.

INTRODUCTION

A Behavioral Economics Guide for Your Workplace

MATTHIAS SUTTER

Max Planck Institute for Research on Collective Goods

Behavioral economics is about studying patterns of human behavior. As such, it constitutes a genuine social science, often using insights from neighboring disciplines such as psychology. Its empirical approach, which contrasts with the formalized and abstract models of the outgoing previous century, has uncovered various, often surprising, insights into human behavior—many of which relate to behavior in everyday professional life. In this year's introduction to the Behavioral Economics Guide, we ask what behavioral economics can contribute to a better understanding of human behavior in the workplace.

From starting a career to reaching the top as CEO of a company, business is about dealing with people, thereby making it essential to understand human behavior. It starts when you apply for a position and interview for it. To add a personal note: when I was younger, I thought my surname, starting with an "s", would be a disadvantage because queues are often formed alphabetically, including frequently the order of interviews for a job. I thought being early in a sequence would be an advantage and help make a good impression on the hiring committee. Yet, my own experience and research by Ginsburgh and van Ours (2003) on how the order of performing in musical competitions influences the outcome has changed my mind. The later in the game, the better a candidate's chances.

It seems that this is related to psychology, notably human decision-making. Early candidates rarely get the best possible grades, as there might still be a better one to come, so jurors leave room for top grades. Later interviewees are less affected by this, which increases their chances of getting a position. Consequently, if given the choice, it might not be a bad idea to ask for a later interview.

The Surprising Side-Effects of Employee Referral Programs

Naturally, there are also many other factors that help in finding a good job, not least having a good social network. The latter is particularly useful because most firms have implemented employee referral programs to fill their vacancies. At first sight, such programs are about getting new hires into the company, which usually works very well. Referred people are those with denser networks, and hiring them pays off for companies, as they are on average better educated, perform better, and are hired more quickly, thus reducing recruitment costs.

Nevertheless, such employee referral programs also have a hitherto completely overlooked side effect, as Guido Friebel from Frankfurt University and his colleagues have recently shown (see Friebel et al., 2023). Introducing employee referral programs not only attracts good people to a company, but it also improves the workplace satisfaction of employees who are already working for the company. Friebel et al. reveal this effect in a randomized controlled trial in a Baltic supermarket chain. The chain suffered from a very high turnover, mainly of their cashiers, who were paid the minimum wage. The authors introduced an employee referral program across a random selection of some of the more than 200 stores of the supermarket chain. If a referred person got a job, and the referring person stayed with the company for at least five months, the latter of the two received a bonus that accounted for up to about 40% of their monthly wage.

First, the chain noticed that, indeed, referred individuals were more quickly hired and stayed with the company longer. However, very few positions (less than 5% of all vacancies) were filled as a result of recommendations. Nonetheless, as it turned out,

the program had an unexpected side-effect, in that its introduction increased the average tenure of those employees already present in the company when the program started. The effect amounted to about 15% longer tenure in shops running the scheme.

The reason for this positive effect was identified in extensive employee surveys. In the shops utilizing the program, employees had a stronger feeling that they were valued by the company, and they appreciated that they had a say in hiring new personnel. They also had a more positive attitude to the supermarket chain in general, and their job satisfaction increased considerably. Thus, the program had positive side-effects, as it changed the relationship between the employer and employees. This improvement helps meet one of the major challenges in the current labor market, namely that it is not only difficult to get good people, but it is even more so in terms of holding on to current employees.

Why Leadership Is So Important

Another factor in attracting and then keeping good people is related to leadership. Again, it's the personal relationship that matters a lot. A recent study by Hoffman and Tadelis (2021) illustrates this fact very nicely. The researchers received access to a large high-tech company to evaluate managers in relation to their leadership skills. The company asked their employees, numbering more than 10,000, at regular intervals about various aspects of their workplace. An assessment of the respective supervisors' leadership qualities constituted a key part of the interviews. On a scale ranging from "Strongly disagree" to "Strongly agree," employees were requested to state their degree of agreement with each of the following six questions, asking whether managers (1) communicated clearly what work performance they expected; (2) offered regular coaching and tips on how somebody could improve their performance; (3) actively promoted an employee's career; (4) involved other people in important decisions; (5) created a positive mood within the team; and (6) were people employees could trust.

It turned out that the responses to these questions were indicative of several important outcome measures in the company. In particular, the better the score based on the previous six questions, (i) the higher the workplace satisfaction of employees; (ii) the longer employees stayed in the company (turnover fell by about 10 percent); and (iii) the less likely an employee's departure was judged as "regrettable" (instead of "good") for the company. The latter finding is particularly interesting, as it adds an important qualification as to how the separation between a company and an employee can be viewed. In the case of some employees, their loss would clearly be considered detrimental to the company, while for others the company might benefit from the separation.

Fluctuation, respectively turnover, is not a bad thing in itself, as it helps to facilitate better matches between employers and employees. Yet, for a company it is important to keep its best people, and to do so, it is important that they have good leaders with relatively high scores on the six questions mentioned above. Actually, good leadership—or people management skills more generally—even pays off for the leaders themselves, as Hoffman and Tadelis demonstrate. Leaders with higher scores get larger pay increases; in other words, it pays to take care of others, to promote and help them. This is something that traditional economics would have had a hard time acknowledging. Behavioral economics has changed that and provides sound evidence for why understanding human behavior and its patterns helps in a professional career and running a business.

Exploring the Impact of Fairness

The previous example has already addressed an important aspect of behavioral economics research from its inception, which is the insight that people care for more than just themselves. In other words, most people care for others (albeit within certain limits) and show what is usually referred to as "social preferences". One of these preferences is trust (a person's confidence in the honesty, dependability, and competence of another person), as seen, for example, in question (6) above. Another such preference is fairness, which means that people have a desire to be treated in a just and equitable way. It is true that what is fair often has a very egocentric touch, but more generally it can be understood as the notion that the interests of both sides in an interaction should be taken into account.

Interestingly, fairness is not only important when a person is involved in an interaction, but it also matters

when observing how others are treated. This can even have important consequences for companies, as I investigated in a joint project with Matthias Heinz and other coauthors (Heinz et al., 2020). We started our project with the trivial observation that a person who is treated unfairly should not increase their motivation or productivity. The evidence clearly supports this expectation. But what happens to their productivity if an employer treats another worker unfairly? Does an unaffected worker care?

To research these questions, we rented a call center and hired 195 employees to conduct a telephone survey in two separate shifts. Overall, our organization was very employee-friendly: we paid a generous hourly wage, offered flexible work times, ensured a pleasant work atmosphere, and gave full discretion to workers in terms of how they performed their job. Individual performance was measured by keeping track of the number of calls they made during a shift. To identify the effect of unfair employer behavior on the performance of unaffected workers, we implemented three treatments.

In the "no-layoff" treatment, our staff numbers remained unchanged for the second shift; in the "quasi-layoff" treatment, we reduced our staff by 20 percent between shifts and told the remaining workers that fewer staff were present for the second shift due to cost reasons; in the "layoff" treatment, we reduced our staff by 20 percent and communicated the layoff through the following message to the remaining workers: *"The reason for this [the staff size reduction] is that we decided to lay off some of your colleagues. This allows us to reduce our costs. The selection of laid off workers has been random."*

To keep the remaining workers' prospects constant (for the only remaining shift), we made it very explicit that there would be no future employment possibilities in our organization. Moreover, we paid the wage upon arrival for each shift. Thus, workers in the "layoff" treatment knew at the beginning of the second shift that the layoffs of their co-workers would not have any consequences for them.

We found that the layoff announcement decreased the remaining workers' performance by 12 percent, mainly seen in later starts to their working day, taking longer breaks, and finishing earlier. We also found evidence that the layoff announcement lowered the quality of their output. In contrast, there was no significant difference in performance between our "no-layoff" and "quasi-layoff" treatments. Thus, the reduction in staff numbers per se had no effect on performance, while the unfair layoff of others did have an influence.

After the field experiment, we conducted a number of surveys with our workers. Overall, workers in all treatments were quite satisfied with their salary, management's behavior towards them personally, and the atmosphere in the call center. However, the remaining workers in the "layoff" treatment group were significantly less satisfied with management's behavior towards their colleagues than the workers in the other treatments. We also asked our workers from the "layoff" treatment which parts of the layoff announcement they considered as anti-social. Their answers indicated that they saw the layoffs per se and the random selection of workers as particularly unfair.

To back up our interpretation of the data further, we conducted a prediction experiment with 43 professional human resource managers from medium-sized and large companies in Germany. We explained to them the nature of our call center setting and our treatment variation. Then we asked them to predict any changes in workplace performance between the first and second shift for all three treatments. It turned out that the HR managers' predictions were remarkably accurate on aggregate. They predicted that performance in the "layoff" treatment group would drop significantly between the first and second shift, while it would drop only slightly in the other treatments. Moreover, a large majority of the HR managers mentioned fairness concerns as the main reason for the reduction in performance. These results demonstrate that HR managers anticipate the detrimental effects of unfair employer behavior on the productivity of unaffected workers.

Our results imply that unfair behavior towards workers can be costly for employers, even if the workers who are directly affected are no longer with the firm. This is important for any organization that has to accommodate economic shocks by reducing labor costs. To reduce or mitigate the costs of supposedly unfair acts, organizations can apply a number of HR practices: the avoidance of layoffs through alternative HR practices (e.g., using natural fluctuations in the workforce to reduce staff numbers); the provision of severance pay or outplacement services; shifting the

blame to interim managers or business consultants; or the separation of profitable and unprofitable business units, with subsequent downsizing of the latter. These approaches may help employers to maintain a productive relationship with their workforce.

No Mission—No Motivation?

Besides the quality of the relationship between employers and employees, the mission of a particular task also matters a great deal for productivity. This might sound trivial, as practically all companies have mission statements nowadays, and if they all do, one might expect it to be important. Yet, first, it is possible that some missions don't match actual behavior. For instance, as a long-time commuter by train, I always felt it was ironic that Deutsche Bahn liked to boast that as a leading global mobility service provider, it placed great value on comfort and punctuality. Given the permanent decrease in punctuality over the previous 15 years or so, this mission was certainly not a credible one. Second, however, it is also intriguingly difficult to measure the effects when the mission of a task matches an employee's preferences.

For this reason, I am a fan of a brilliant design devised by Jeffrey Carpenter and Erick Gong (2016), investigating whether an employee's approval of their company's mission actually affects productivity. Two months prior to the presidential election in the United States in 2012, the researchers asked students about their political attitude and their opinion on Barack Obama, the Democratic incumbent, and Mitt Romney, the Republican challenger. The students were requested to answer questions about whose positions in the election campaign seemed more attractive to them, whom they would vote for, and whether they were registered voters of one of the parties.

A few weeks before the election, the students were offered a job for a brief period. They were asked to send letters supporting one of the two candidates to voters in Ohio, a highly contested state in that year. Who was to write and send a letter, and on behalf of which candidate, was randomly assigned, which meant that some worked for the candidate they supported while others were asked to campaign for the candidate they rejected. Accordingly, some were able to identify with their "employer," while others had opposing views.

Paying a fixed wage to participants, Carpenter and Gong were able to show that work performance was almost twice as great if a study participant was allowed to work for their preferred candidate, i.e., approved of the candidate's (political) mission, compared to a mismatch-situation in which the study participant had to send out letters for the candidate they rejected. Higher productivity included working faster and making fewer mistakes.

Next, Carpenter and Gong asked whether motivation could be "bought" to a certain extent if employees didn't agree with the goals of the candidate for whom they had to send letters out to voters. When paying for performance, i.e. paying more for more letters sent out, it turned out that students who worked for "their" candidate increased their output only marginally when getting extra money. Identification with the candidate's goals was obviously sufficient motivation to work hard.

The situation was quite different, however, with students who had to work for the candidate they rejected. Given extra money for better performance, their output increased significantly. The difference between them and the group of students who agreed with their candidate declined by about 50 percent compared with the condition with fixed pay. Therefore, financial incentives could at least reduce, albeit not completely remove, the discrepancy between the goals and attitudes of employees and companies. These findings show once more just how important personnel selection is—a topic with which we started this essay—because it pays off if employees can identify with a company's mission.

Digging Deeper: More Topics to Explore

In my recent book *Behavioral Economics for Leaders* (Sutter, 2023), I address many other questions with the methods of behavioral economics. Among them are "Why do taller people get a higher salary?", "Why do women request salary raises less frequently than men?", "Why can working from home be bad for your career?", "What effects do affirmative action programs have?", and "Why can salary transparency backfire?". Some of the answers to these questions

may sound weird or irrational at first sight, but they are based on patterns of human behavior that behavioral economics has uncovered in its mission to promote a better understanding of what motivates people and how they navigate the workplace.

I am sure that in the coming years we will learn more and more about why fairness, trust, good leadership, and equal opportunities for men and women are so important for workplace climates and professional success, for both employers and employees. Behavioral economics has already contributed a great deal to these questions, as this essay has hopefully been able to illustrate, but there are many more exciting insights to come and to share in future editions of the Behavioral Economics Guide.

THE AUTHOR

Matthias Sutter is director at the Max Planck Institute for Research on Collective Goods in Bonn, Germany, and professor of experimental and behavioral economics at the universities of Cologne and Innsbruck. His work focuses on the economic decision-making of children and teenagers, on team decision-making, on field experiments on credence goods markets, and recently on randomized controlled trials in companies. He has published his work in all top-5 economics journals (i.e., in *Quarterly Journal of Economics*, *Econometrica*, *Journal of Political Economy*, *American Economic Review*, and *Review of Economic Studies*), as well as in general outlets such as *Science, Nature Communications* or *PNAS*. In 2023, he published a popular science book about how behavioral economics can be applied to professional life, titled *Behavioral Economics for Leaders: Research-Based Insights on the Weird, Irrational, and Wonderful Ways Humans Navigate the Workplace*, published by Wiley.

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EDITORIAL

Behavioural Economics and Policy: New Horizons

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In this Editorial, we argue that behavioural economics, policy research and practice are currently in a good place. We substantiate this claim by looking at the field from academic, public policy, and business perspectives, carving out what we think is promising. We also list the challenges with which the field currently has to deal, before closing with hot topics and future research opportunities.

The Best Moment (So Far)

Looking back at the past two decades of Behavioural Economics and Policy research, we claim that now is the best moment thus far – an auspicious and promising place to be. Even more so, we expect the field to grow and strengthen in the future, branching out to collaborate with other disciplines and making way for the broader inclusion of "behavioural insights" in problem-solving. This bold claim is informed by an academic and a policy perspective as well as by the growing interest of businesses and organisations.

An Academic Perspective

Through an *academic* lens, behavioural economics has been accepted within both economics and the social sciences. The early – sometimes fierce – debates between seemingly adversarial conceptions of neoclassical and behavioural economics have cooled down, and what Richard Thaler proclaimed almost a decade ago (2016) has now arguably come true: behavioural economics has become mainstream. Efforts can now be directed to new research frontiers and real-world problems that urgently need solutions. These range from socially acceptable interventions to promote healthy behaviours and pandemic prevention, boosting financial literacy and retirement planning, empowering citizens with digital sovereignty to safely navigate in the digital world, through to behavioural approaches strengthening democracy and moving towards markets that provide welfare within planetary boundaries, ultimately harnessing *nudging for good*.

From an institutional viewpoint, academia has achieved three conditions necessary for behavioural economics to flourish. First is a vibrant interdisciplinary community of researchers that goes far beyond economics, psychology, and policy and now includes a wide range of disciplines such as neuroscience, design and urban planning, machine learning, as well as studying and applying "behavioural insights". Several associations, including the International Behavioural Public Policy Association (IBPPA), the Behavioral Science & Policy Association (BSPA) and the Society of the Advancement of Behavioural Economics (SABE), founded in 1982, serve as hubs, convening and engaging this community. Specifically, all three associations organise lively annual conferences. At the El-Erian Institute of Behavioural Economics and Policy, we were honoured to host the third International Behavioural Public Policy Conference (IBPPC) at Cambridge in June. The conference sparked an impressive level of interest, reflected in a high number of high-quality submissions showcasing excellent policy-relevant research from around the world.

Second, several field-specific journals now attract and publish research on behavioural insights. Some of these outlets have been around for many decades, such as the *Journal of Economic Behavior and Organization* (1980), the *Journal of Economic Psychology* (1981) and

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the SABE-linked predecessors to the current *Journal of Behavioral Economics for Policy*. In addition, more recent journals, such as *Behavioral Science & Policy* (2015) and *Behavioural Public Policy* (2017), have opened up new platforms for discussion and opportunities to publish.

Third, faculty positions and chairs continue to emerge, thus providing fertile conditions for ambitious research programmes. Moreover, multiple dedicated research centres and institutes have been established over the last few years, including at world-leading institutions, such as the Daniel Kahneman and Anne Treisman Center for Behavioral Science & Public Policy at Princeton University. Funding is also available for early-career researchers; notably, the United Kingdom Research and Innovation programme recently invested over £17 million to expand national behavioural research capacity and address societal challenges by financing nationwide research and doctoral training. This is also good news for education and training of a new generation. Behavioural insights are currently included in many undergraduate programmes in economics and psychology, as well as some public policy programmes. Students wanting to dive in deeper can specialise in behavioural economics and policy as postgraduates. A range of behavioural economics and behavioural public policy programmes is available, particularly in the UK and the US, but also, for instance, in India, Abu Dhabi, and Singapore. In addition, several summer and winter schools are available for early-career researchers.

A Policy Perspective

From a *policy* perspective, behavioural insights are widely accepted and established as a legitimate lens and toolkit for various challenges. In much of policy practice today, using the behavioural lens is about to move from "innovation" to "consolidation" (Soman et al., 2023). Behavioural insights are often applied by default to comprehend, address, and successfully tackle policy challenges – as reflected in the many organisations worldwide using behavioural insights in some capacity, for instance by employing dedicated behavioural units or conducting sludge audits (Sunstein, 2022) to reduce and avoid unnecessary administrative burdens. Successful role models and robust knowledge of which processes and methods help policymakers apply behavioural insights are available (OECD, 2024; WHO, 2022) and can be utilised as other organisations join. Regarding the Sustainable Development Goals, the UN Behavioural Science Group plays an important role in spreading behavioural skills and knowledge across various policy issues and countries. The network now has about 5,000 members from more than 70 UN entities and 150 countries worldwide, as well as several thousand non-UN members from academia, civil society, NGOs, among others. Similarly, organisations such as the Behavioural Insights Team (BIT) are consulting policymakers on a global scale.

During the last few years, behavioural insights informed the first lines of defence during the global pandemic, helping to slow the spread of COVID-19 by encouraging people to adopt behaviours such as wearing masks, keeping a distance, and getting vaccinated. Although geographies differed in how behavioural insights were used, it is affirming that influential recommendations for the pandemic (van Bavel et al., 2020) were, in general, found to be robust and useful (Ruggeri et al., 2024). Behavioural insights continue to demonstrate their usefulness in other domains, too; for instance, deterrence messages sent to firms in the Dominican Republic increased tax revenue by $184 million (0.22% of GDP; Holz et al., 2023) by complementing a tax enforcement reform, thus highlighting the potential of behavioural interventions when combined with other policy measures (Alt et al., 2024; Stern, 2020).

A Business Perspective

While a behavioural approach is nothing new to marketing and communication, *businesses and organisations* are increasingly interested in behavioural insights to optimise internal organisational conduct and decision-making, help employees save for retirement age (Thaler & Benartzi, 2004), debias hiring processes, increase productivity and creativity, avoid groupthink, and nudge employees to make more environmentally friendly decisions (Decrinis et al., 2023). This is evidenced by a growing market of consultancies and units that offer insights and custom-made behavioural solutions such as capacity-building, intervention development, and more. Diverse clients, including businesses, governments and NGOs, employ such consultancies, sometimes overseen by in-house behavioural experts, for

task-oriented projects and long-term collaborations. In addition, we observe an increasing demand for executive education whereby decision-makers learn how to apply behavioural insights strategically for their organisations.

With the advent of unprecedented and seemingly unlimited opportunities and threats brought by recent innovations in generative artificial intelligence, organisations have been forced to react and develop strategies and policies on how to use and benefit from these new challenges in an economically viable – yet ethical and sustainable – way. Behavioural phenomena, such as predicting buying decisions, sit at the core of many new models. It is therefore not surprising that international organisations, multinational companies, and all Big Four consultancies today retain dedicated behavioural innovation units. The challenge for firms is complex and goes beyond staying within current regulatory handrails; it involves using behaviourally informed digital tools that are accepted and embraced by internal and external stakeholders. While digital nudging has been around (and has been criticised for its intrusive and manipulative force as dark patterns) for a long time, the level of dynamic and personalised targeting based on the most precise data predicting decisions in seconds is unknown, fascinating, and scary – all at the same time. We come back to this point later, stressing the need for ethical guardrails to be developed.

Current Challenges

While we hope to have highlighted that this is the best moment for behavioural economics thus far, important challenges need to be confronted to maintain the current momentum. Let us focus herein on three such tasks.

First, the *replication crisis* is a fundamental concern for empirical social sciences in general, including behavioural economics, as it poses a significant risk to the field's future impact and credibility. Those involved in research must ensure they employ validated research designs and rigorous methods (for recommendations in this regard, see Munafò et al., 2017). While we applaud the commitment of some journals to publish only pre-registered results (Nosek et al., 2018), we believe that this may be an overreaction, additionally disadvantaging other forms of insight and evidence creation. As an academic discipline, we need to strike an appropriate balance between careful replication and discovery-oriented research. As Carl Sagan said, "Absence of evidence is not evidence of absence". Another lesson to be learned is that behavioural scientists can practice humility better and be cautious not to express overconfidence in their findings (Hallsworth, 2023) – as demonstrated by research showing that experts regularly fail to predict the effect of interventions (Milkman et al., 2022). Additionally, policymakers were recently found to overestimate the effect of financial incentives on vaccinations (Jilke et al., 2024) measured in a field experiment. Robust methods and a humble attitude will help to maintain and strengthen trust in behavioural science.

Second, we can do a better job at acknowledging the *heterogeneity* of targets and contexts in empirical studies. We need to collect, evaluate, and report information on individuals, groups, and contexts to comprehend human behaviour fully and achieve internally and externally valid results. Yang and colleagues, from Behavioural Economics in Action at Rotman (2023), mapped relevant contextual dimensions, namely intervention design features, environmental factors, and features of the target population. Interventions tend to be more effective when taking into account contextual variation and individual differences ('context matters'). As an illustration, a recent study augmented defaults successfully by adding information about heterogeneity, highlighting that specific groups likely benefit from ignoring the default (Desiraju & Dietvorst, 2023). Similarly, in the health context, communicating the concept of herd immunity was found to be effective in individualistic cultures but not collectivist cultures which, by default, have a stronger concern for the prosocial aspects of vaccinations (Betsch et al., 2017). Dedicated conferences emerge to help catalogue, integrate, and communicate evidence from specific domains and make sense of heterogeneity. For example, the 2024 What Works Climate Solutions Summit in Berlin created an excellent environment to discuss the evidence of behavioural (and other) interventions for the climate and the environment. Moreover, it is worthwhile exploring the potential of artificial intelligence for selecting, classifying and coding empirical studies to build databases and

models that reflect the real world's heterogeneity. For instance, the YNOT Research Institute of Queens' College Cambridge and the El-Erian Institute of Behavioural Economics and Policy were successful in training a large language model to predict the effect of behavioural interventions based on short descriptions of context and target groups.

Third, as the field grows, the *specialisation of knowledge and skills* is progressing. For many, it has become an insurmountable challenge to keep up with articles covering the entire breadth of behavioural economics, and researchers tend to focus on specific areas. Also, in practice, tasks are increasingly being separated; for instance, there are specialised consultants for the development of interventions, specific behavioural or policy domains, and training knowledge and skills. Furthermore, research and practice have evolved separately and are less driven by the same group of first-generation pioneers, which consequently poses a challenge for those working in practice to develop their skills and keep up with the latest evidence. It also challenges researchers to engage with the field, learn from practice, and attend to questions relevant from a practice perspective. Annual conferences like the IBPPC, attended by practitioners and scientists, help build and maintain crucial links within the community. However, one significant barrier to a fruitful exchange is a lack of common understanding and shared terminology. Based on a large Delphi study and many interviews with experts, we (Dewies & Reisch, 2024) are developing an integrative classification of behavioural interventions to help overcome this challenge and avoid the dilution of behavioural insights terms and practice. The consulting industry has reacted to increasing specialisation by adding filters and "quality signalling," such as membership in associations like the Global Association of Applied Behavioural Scientists.

In the USA, a recent landmark report of the National Academies of Sciences, Engineering and Medicine (2023) emphasises the need for closer collaboration between behavioural economists and policymakers. It recommends that "government units should consider adopting the example of the Office of Evaluation Sciences, in the General Services Administration, to support and fund in-house capabilities for integrating behavioral specialists into policy development", using temporary research appointments and consulting organisations to provide expertise and assistance to state and local government entities that cannot afford permanent in-house staff. Regarding academic research, the report recommends "University leaders [to] ensure that training in the principles of behavioral economics and critical thinking about their translation and application to policy making is a core component of training for students pursuing degrees in public administration".

Hot Topics and Research Opportunities

Acknowledging the challenges ahead, we also see exciting opportunities. New voices enrich and extend behavioural insights as a *scientific* field. This includes efforts to deepen the understanding of core issues in behavioural public policy, such as human agency (e.g., Dold & Lewis, 2023), as well as the advancement of methods. An important innovative method is the "megastudy," which allows researchers to evaluate simultaneously the effects of many different interventions in the same setting (Milkman et al., 2021). Generally, the field seems to have become more open to contributions from various disciplines and theory pluralism; in fact, the social and behavioural sciences are stronger together than as individual disciplines. Defending disciplinary boundaries seems to be a stubborn instinct when steering behaviour effectively often requires a team effort (Dewies et al., 2022); thus, integrative attempts to bridge and dissolve disciplinary boundaries can be advantageous. In this regard, therefore, researchers may benefit from the rich experience of practitioners accustomed to working in interdisciplinary and problem-focused teams.

Analyses and interventions from behavioural economics are linked to the micro, meso, and macro levels of societal challenges. Typically, interventions on one level are inseparable from changes on other levels, too (Brownstein et al., 2022). Think about green energy defaults (Liebe et al., 2021) that shift individual demand and influence production; or mandated disclosures designed to improve market functioning (Halpern et al., 2024). Yet, it is encouraging that on the macro level there seems to be growing acknowledgement that human behaviour change needs to be part of solutions. Several landmark reports, such as the "Sixth Intergovernmental Panel on Climate Change IPCC Report" (Creutzig et al., 2022) and the

"Dasgupta Review on the Economics of Biodiversity" (2021), emphasise the key role of behavioural factors such as social norms. Technological solutions and economic incentives are necessary but insufficient in achieving required lifestyle changes (Newell et al., 2021). Behavioural insights are already mobilised to steer behaviour as part of such deep transitions (Park et al., 2023). Additionally, the White House recently shared a Blueprint for the Use of Social and Behavioral Science to Advance Evidence-Based Policymaking (National Science and Technology Council, 2024). This gives those working in policy the mandate and encouragement to employ behavioural insights ambitiously. Adopting a "behavioural lens" alongside other lenses can enable a more profound and meaningful analysis of problems, as well as better solutions for today's most pressing challenges.

The field constantly renews, expands, and applies behavioural economics to new areas and questions. Below we suggest a dozen candidates for promising research and application – some new and some long-established, albeit still under-researched and underestimated:

1. Sustainability and climate change: This is quite literally a hot topic with disastrous consequences for many. There is a broad worldwide consensus for enhanced climate action (Andre et al., 2024), but large-scale behaviour change is still lagging. We now have a solid evidence base of behavioural interventions in energy use (e.g., Andor & Fels, 2018), for example, but we need more evidence covering other domains, too.

2. Consumer protection and policy: One of the earliest applications of behavioural insights (Lissowska, 2022), this topic is surging again, since consumer markets are going online and the challenges of digital influence are massive, such as dark patterns, misinformation, and "buy now, pay later" schemes. There is potential for developing behaviourally-informed remedies, like smart disclosures (Bar-Gill, 2023).

3. The food system: What ends up on our plates, and how it is produced, threatens the world's climate, biodiversity, and national health and productivity (National Food Strategy, 2021). At the El-Erian Institute of Behavioural Economics and Policy, we are engaged in several research and change efforts to encourage sustainable and healthy diets (CamEATS Zero; Lohmann et al., 2024). We have also developed the outlines of a behavioural food policy (Reisch, 2021).

4. Artificial intelligence: Large language models like ChatGPT are already being used to predict and understand behaviour and build digital personas. With its unmatched potential, we are likely to have only scratched the surface of what artificial intelligence can mean for our field. Research is thus urgently needed to ensure it has positive effects on how we do research, publish, teach, and design policies and interventions.

5. International conflicts and security issues: Sadly, peacekeeping and reconciliation have become hugely important in the last couple of years. International conflicts also place a tremendous burden on the social and ecological environment and hamper economic thriving. Behavioural approaches such as curated (online and in-person) citizen forums, in which understanding and perspective-taking is promoted (Muradova, 2021), have been successfully tested.

6. Applied behavioural science ethics: The rich and intensive debate on the ethicality, legitimacy, and public acceptability of applying behavioural policy tools to influence human beings has become even more critical in light of the rise of generative artificial intelligence, robotics, and autonomous decision-making in practically all walks of life. The behavioural sciences have to agree on self-imposed boundaries and limits on the use of artificial intelligence in research and practice – an uphill battle considering the speed of change in what is possible and available.

7. Macroeconomic level: Recent economic developments and challenges, such as inflation, productivity, unemployment, and economic boom and bust, have an underlying behavioural dimension. Economic psychology, behavioural finance, political economy, and consumer research and policy have acknowledged this for decades. We believe there is much to gain for our field by being open and interested in this research before aiming to "reinvent the wheel".

8. Nudging organisational behaviour: Management is increasingly using nudges to steer green employee behaviour (Decrinis et al., 2023) and make organisations more productive and efficient. In addition, organisational contexts offer a broad range of outcomes relatively underexplored by behavioural insights, such

as teamwork, groupthink, organisational citizenship behaviour, and diversity.

9. Sludge reduction and behavioural audits: Governments are currently experimenting with avenues to embed behavioural insights structurally into policy through the review of practices and policies from a behavioural point of view. Two approaches seem particularly promising in this regard. First, so-called "sludge audits" (Sunstein, 2022) help identify and reduce unnecessary administrative burdens and friction for citizens accessing public services. Reducing sludge automatically reduces costs and increases welfare. Second, the Dutch government recently introduced the "capacity to act test" to evaluate ex-ante the behavioural assumptions of new and planned policies (Keizer et al., 2019).

10. Intercultural and internationally comparative studies: Behavioural insights are applied and embedded into institutions differently across geographies and organisations, but there is very little research identifying the institutional arrangements, strategies, and policy factors for successful implementation. Also, there is little research on how cognitive biases and heuristics differ in different cultures (Henrich et al., 2001). The time therefore seems ripe to take stock of and benefit from the lessons learned in various contexts.

11. Theory development: Behavioural insights is a rich empirical field, but better theories are needed to address replication and scaling challenges effectively (Camerer, 2020; Eronen & Bringmann, 2021; Oberauer & Lewandowsky, 2019). A recent example can be seen in Malmendier's (2024) pitch to extend the explanation of human decision-making to biological mechanisms in the form of bodily representations of lived experience.

12. Behavioural insights as a process: Often, the solution that gets implemented is the easiest to implement given pre-existing arrangements, rather than the most effective one (DellaVigna et al., 2024; Dewies et al., 2023). Findings like these cause researchers and practitioners to focus on implementation challenges and how behavioural insights can complement existing measures.

Conclusion

As we embarked on drafting this Editorial in Spring 2024, we were met with the news of Daniel Kahneman's passing. The outpouring of warm obituaries and admiring commentaries from friends and colleagues worldwide was a testament to the profound impact of his work on our field, Behavioural Economics and Policy. Kahneman, a pioneer among social scientists, championed a novel approach to economics, one that was behaviourally enlightened. The very foundation of what we now refer to as "the behavioural lens" – the use of behavioural theories and concepts to comprehend and anticipate human decision-making – can be traced back to the brilliance of thinkers like Kahneman, who kept pushing the field to its boundaries, questioning established knowledge, welcoming new thoughts and inviting critical thinkers to challenge his views. In this spirit, and to cite one of his famous lines, let's get to work.

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APPLICATIONS

Behavioral Science to Save Democracy

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Democracy is at a crossroads. While billions around the world participate in elections, trust in the process is dwindling. Fueled by misinformation, political polarization is running riot. The stress on those who run our elections is leading to a precarious workforce, and all while AI threatens to turn everything on its head. This piece explores innovative ways in which behavioral science can improve democracy—focusing on practical and innovative solutions to restore faith in and improve the efficacy of the electoral process. Ultimately, however, if democracy is to be 'saved', it will be done through evidence-based election administration, incremental experimentation, and scaling what works.

Introduction

If we take the long lens of history, democracy is flourishing. About half of the world's population will take part in (or at least live through) a national election this year (Ewe, 2023), and we have already seen Mexico usher in a new leader, India re-elect their incumbent (albeit with less veracity than before), and the UK and France decide on their new leaders. Democracy, arguably, remains the best available form of governance we have—and it is (hopefully) here to stay.

Also, however, democracy is failing in many ways. Trust in elections and political leaders is alarmingly low in many nations, whilst misinformation, spurred by ever more convincing AI, has wreaked havoc in recent years. Furthermore, political and cultural polarization is rife throughout the western world, especially in the USA, where discontent has manifested not only in an attempted overthrow of the government in response to election results, but also in the first attempted assassination of a president or presidential candidate in decades. The people who administer and run our elections are aging and at risk of not being replaced, due to the abuse they receive from critics of electoral processes. And lastly, for many of us, our ability to have an impact through democracy feels minimal—we vote at rare intervals and choose between minimal, ill-fitting options that often don't appear to impact our day-to-day lives.

As we saw in the riots following the 2020 US presidential election, the line between a strong democracy and a failure in the transition of power can be unnervingly thin. For democracy to continue to flourish and move society from strength to strength, we must solve these problems. Fortunately, many of them are behavioral at their core, which gives us, as behavioral scientists, as social innovators, an opportunity to strengthen—if not save—democracy.

Transparency in Electoral Systems

Trust in democratic processes is pivotal, yet it is often elusive. Without trust, our democratic systems simply don't function, and as we saw in 2020 in the USA, people will not respect the vote count, the intent of election officials, or the transition of power if they lack faith and trust in the democratic process itself.

Election processes are complex and vary greatly, both between and within countries. Nevertheless, a prevalent problem among voters' perceptions of election processes is the illusion of explanatory depth, i.e., a voter's belief that they understand the complexities of electoral systems more than they actually do. This cognitive bias can exacerbate distrust by leading voters to perceive issues like miscounts as systemic failures rather than isolated incidents. The illusion of explanatory depth is particularly threatening when paired with availability bias, or our tendency to rely on information that comes to mind easily. If we see news stories about flawed electoral

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processes more than stories about successes, we are likely to assign those stories disproportionate levels of meaning.

In *The Submerged State*, Susan Mettler points out that a great deal of the operations and functions that governments perform are hidden from view—even those that directly benefit constituents (Mettler, 2011). She suggests that increasing transparency by uncovering hidden processes, people, and effort can increase trust in government. The processes that enable our elections, for most of us, are submerged in this way but could be improved with increased transparency.

To overcome our illusion of explanatory depth, which is fueled by submerged election processes, the answer is operational transparency. Making the invisible, visible. By exposing voters to the roles staff and volunteers play, and the security mechanisms in place, we can build a perception of transparency and thereby increase trust.

So, pragmatically, how might we do this?

First, clearly explaining the mechanisms behind voting systems, the security of votes, and the maintenance of electoral integrity to demystify these processes for the public. Clean visuals on the process will likely go a long way! Going further, we need to engage social media—think short TikToks from election offices on the election process and Insta Influencers breaking down how they voted.

Second, especially with mail-in or postal voting, it is understandable that sending in a ballot and never hearing what happened to it is disconcerting and ambiguous, especially given highly publicized stories of absentee ballot voter fraud in past elections. We should be able to let people know where their ballot is, and when it's counted. If Dominos can give you an estimate of where your pizza is, surely the biggest democracies in the world can give you an update on your ballot.

Now, at least some states in the USA do this. At a minimum we should be giving people a ballot sent (to you), ballot received (by the election office), and

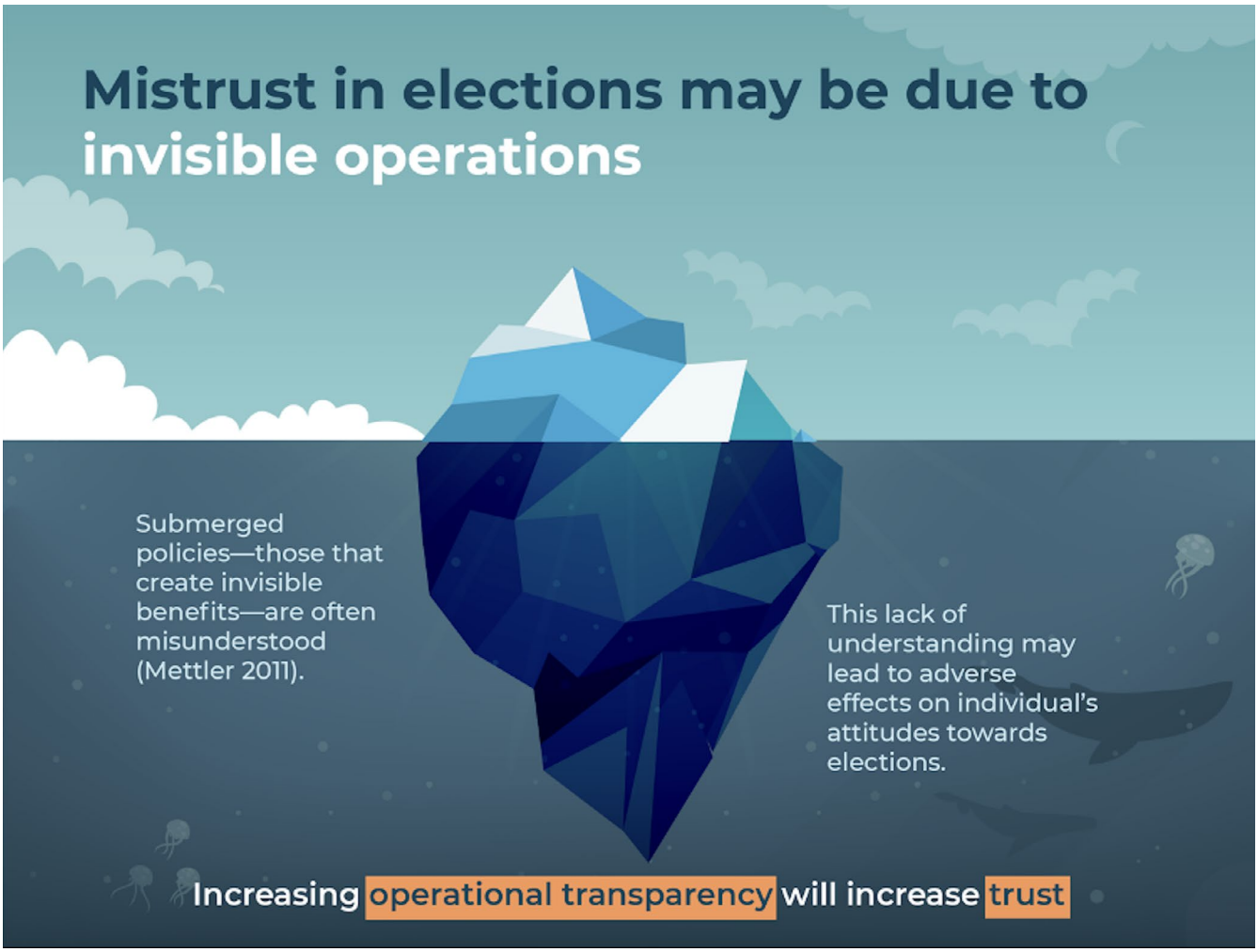

Figure 1: To increase trust in elections, we need to increase operational transparency.

Figure 2: Dominos offers operational transparency on their order. *Image Credit:* Fast Company.

a signature verified (all clear or needs attention) notification. Ideally, we would track the ballot more thoroughly and be able to give people a blow-by-blow account of where it is and what comes next. As this develops, we may even consider moving to Blockchain technology: wouldn't that be something?

Figure 3: We should at least communicate when a ballot is sent, received, and verified.

Lastly, let's think about poll-watching. Poll-watchers get a bad rap, but poll-watching effectively and transparently could enhance trust. One way to scale it beyond those who are willing to sit outside polling stations in deckchairs is to provide live streams. For instance, the Texas Election Code requires that every county with a population over 100,000 should livestream, from the process of delivering ballots to the central counting station, to the ballot-counting process and results. This would likely give people the real-time operational transparency they need.

However, live streaming might backfire if it is not done correctly. For instance, people watching it for the purpose of serving as indirect or informal citizen observers might not know the context exactly, and contextless videos can be used as a tool for disinformation; for instance, a video showing an unidentified person taking a box of ballots from the area might seem suspicious.

We might overcome this potential hurdle by providing a running commentary, a live chat to ask questions. Election offices might even consider giving in-person or virtual tours to help the public really grasp the processes and procedures.

Overall, giving people a clear sense of how the electoral process works will at least help them understand and respect it, even if they don't like the results. But elections are complicated, and most people will not need complete information about every step in the process; in fact, too much transparency could overwhelm the electorate. The key will be to share enough information to the point where voters perceive transparency, which will allow them to feel that they understand the electoral process well enough to trust it.

The Crucial Role of Trusted Messengers

The impact of communication about elections largely depends on the credibility of the messengers. Trusted messengers—who are viewed as honest,

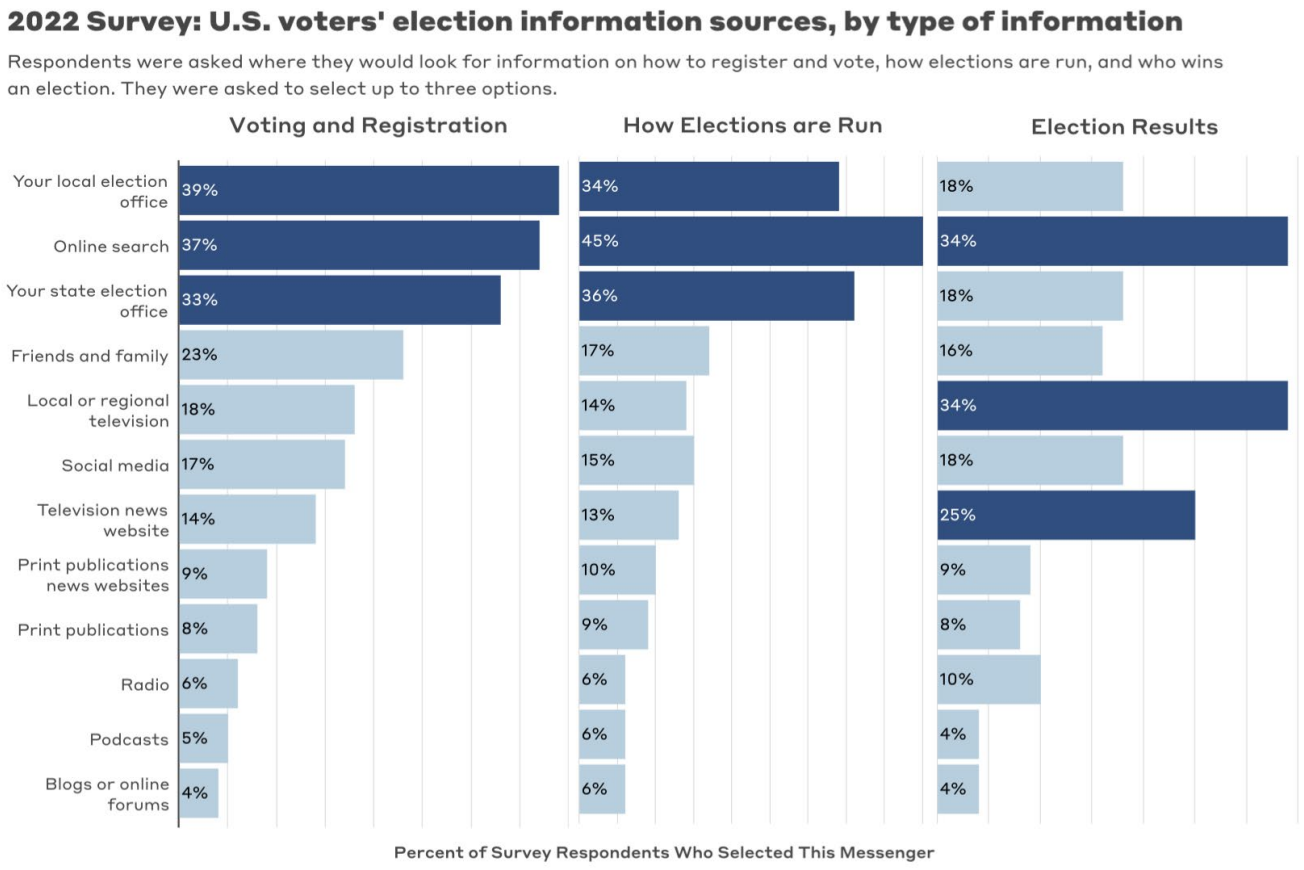

Figure 4: Voters get information about elections from a wide variety of sources. *Image Credit:* Bipartisan Policy Center, 2023.

competent, and relatable in terms of demographics or political views—can significantly improve the reception and trustworthiness of the message. As elections become increasingly tribal, we expect citizens to trust voices on their own side. So, what can we do when we need a majority to trust the same message?

When you are sick, you look to the doctor and trust them to give you solid advice. Elections are no different. At election time, we look to the election officials—the people who lead the vote counts—to give us accurate and fair information. Local and state election officials are seen as particularly credible sources, given their proximity to and familiarity with elections (Bipartisan Policy Center, 2023). Their role capitalizes on local trust and in-group biases, making their communications more effective. In a polarized world, having neutral arbitrators of truth that we can trust is both increasingly rare and increasingly critical. The election official can be that person.

Admitting Mistakes

At its core, trust depends on vulnerability. To trust someone or something, it is essential that you are comfortable being vulnerable to them. But it's also true that when a person is vulnerable with *us*—for instance, by admitting and apologizing for mistakes—we are more likely to trust them.

Mistakes happen in election administration. Many of those that are made around elections have little to no impact on the outcomes and are rectified quickly, but they are still taboo—especially if those who made the mistakes were previously viewed as infallible experts. To promote long-term trust in elections, election offices should be transparent about mistakes when (not if) they make them, and about the steps they're taking to resolve them. If we increase transparency and admit to mistakes, it is possible people will be more forgiving and see election officials as humans worthy of trust, rather than as cogs in a flawed machine.

This humility seems nice in theory, but in reality caution is important. In Antrim County, Michigan, Clerk Sheryl Guy admitted to a human error in reporting the 2020 election results, which initially showed incorrect tallies (Bowden & Teague, 2021). The mistake was due to a failure to update software, leading to inaccurate results. Guy corrected the error and updated the results, confirming the true winner.

However, the admission fueled widespread conspiracy theories and became a focal point for claims of election fraud despite subsequent audits confirming it was an isolated incident. Widely-publicized and isolated admissions of mistakes have the capacity to erode public trust, exacerbate conspiracy theories, and be used for political weaponization. But if we *normalize* public acknowledgement of errors and mitigation efforts, we could build trust in admittedly imperfect institutions rather than losing trust in them when their imperfections are inevitably revealed.

Election Staff Are People, Too

If election officials admit mistakes, they are going to get heat. In the USA, the share of voters who were "not at all confident" in the counting of national votes soared from 9% in 2016 to 26% in 2020 (MIT Election Data and Science Lab, 2021), and election officials are dealing with the fallout in the form of fielding phone calls and emails from upset members of the public and experiencing online abuse and even death threats. This is contributing to high turnover rates and a decrease in the pool of experienced personnel willing to manage elections who are crucial to their administration.

This is a substantial problem, but it is also not that different to other burnout and retention problems that behavioral science has helped alleviate. Developing systems to recognize and reward the hard work of election volunteers might go some way to boosting morale, and this could include appreciation, public acknowledgments, or even small tokens of appreciation like gift cards. Applying a behavioral science perspective, we might even develop social norms around respecting and supporting poll workers, just as some communities did for frontline workers at the height of the Covid-19 pandemic.

Establishing support systems for election workers is also crucial. This might involve access to counseling services, stress management workshops, and regular debriefing sessions post-election to address any emotional or psychological distress experienced by election staff, who are most vulnerable to misinformation or partisan-fueled attacks.

Bipartisanship of Process

It is much easier to admit to mistakes in the process when that process has bipartisan agreement. Most democratic systems are built on checks and balances, which make it harder for any one side to make sweeping, self-serving changes.

For example, India's Election Commission is an independent body responsible for administering elections at the national and state levels. In theory, it ensures free and fair elections by overseeing the electoral process, regulating political parties and candidates, and enforcing electoral laws. This independence helps maintain the integrity of the democratic process.

The USA has the Legislative Branch (Congress), The Executive Branch (President), and the Judicial Branch (Supreme court), and this approach filters down in many ways to the lower levels. Relating to election administration, we can point to bipartisan election boards, poll workers from both parties, parties having equal input into voting policies, and joint audits and recounts. The net result, in theory, is that decisions around how elections are run are very often a result of bipartisan deliberation.

The challenge is that most people don't know this. It is easy to assume, because often we are told that elections are run by political parties and it's all rigged. This is a great exaggeration, as US elections are almost always done correctly. As such, we might make progress reducing our partisan tensions by highlighting all the ways that electoral processes are bi-partisanly determined.

Further, in a social media landscape where all we see is cross-party bickering and slander, highlighting examples of friendly, respectful, or cooperative relationships between those (election officials, lawmakers, community members) affiliated with different parties would likely go a long way to increasing trust.

One example in this regard is an intervention tested by Voelkel et al. in their mega study that showed how partisan co-operation between two Utah candidates—"Our common values transcend our political differences"—reduced support for undemocratic candidates.

Polarization May Be the Biggest Threat

Speaking of support for undemocratic candidates, let's next consider political polarization. In recent decades, it has emerged as a substantial and lingering threat to our democracies. Breaking this problem

Figure 5: An intervention in Voelkel et al.'s mega-study, wherein two competing candidates for political office explain that their common commitment to democracy is more important than their differing party affiliations. *Image Credit:* Voelkel et al.

down from a psychological perspective, we can think about partisan identity, partisan animosity, and support for undemocratic candidates.

Partisan identity refers to the strong affiliation and loyalty that individuals feel towards their political party. This identity often goes beyond mere agreement with political ideologies; it becomes a fundamental part of an individual's self-concept. As partisan identity strengthens, it can lead to an 'us vs. them' mentality, where the opposing party is seen not just as different but as a direct threat.

Partisan animosity can arise from intense partisan identity. It involves not only strong dislike but also active hostility towards members of the opposing political party. This animosity can manifest in social exclusion, verbal aggression, and in some extreme cases, physical violence. It deteriorates the quality of democratic discourse, leading to a breakdown in communication and an increase in conflict within the political arena.

In environments with high partisan animosity and strong partisan identities, there can be increased support for undemocratic candidates—for instance, those who openly contest election outcomes, or endorse their supporters' interference with democratic processes. These are political figures who may not commit to upholding democratic principles and norms, but are supported because they represent a win for one's own party over the opposition. This scenario is particularly dangerous as it can lead to the erosion of democratic institutions and norms, jeopardizing the entire democratic system.

Thinking like a behavioral scientist, how can we solve this...? Voelkel et al. crowd source and test a host of ideas that they narrow to some particularly interesting ones.

Emphasizing Common Identities is perhaps the most obvious remedy for political divisions—in essence, all that unites us is greater than that which divides us. Encouraging participants to reflect on shared identities that transcend political divisions, such as national or community identities, has been found to significantly decrease animosity.

In a similar vein, much of the divide might be a result of misperceptions. We tend to operate in partisan bubbles and echo chambers that make it too easy to conflate the most extreme view as the most common view of the other side. The internet has made this isolation easier than ever. In other words, we think all outgroup party members are on the extreme end. Like with other misperception corrections in behavioral science (e.g. correcting misperceptions of social norms), disproving perceptions about people on opposite ends of the political spectrum can go a long way towards reducing polarization.

Taking a punchier approach, Voelkel et al. show that highlighting examples of what happens when democracies collapse—presenting scenarios depicting the severe consequences of democratic failure, such as instability and violence—seems to temper anti-democratic attitudes.

Lastly, while we know polarization is rife in lots of western democracies, it is undoubtedly fueled by a minority of loud voices that are picked up and amplified by algorithms on social media, given more airtime than it should, and is targeted at the most vulnerable amongst us. In contrast, lots of us are in a quiet majority but we don't realize it and don't express our views loudly. This offers an opportunity: if this quiet majority were more inclined and able to respond to nefarious actors and their responses were effective, we could see a turn in the tide of the currently spiraling democratic system.

AI and Misinformation

Complaints about misinformation can be heard on all sides of the political spectrum, from Trump's perpetual cry of "fake news" regarding mainstream news outlets, to Biden's claim that it's "hard to debate a liar" following his poor debate performance

against Trump. As both candidates seem aware, misinformation can have a major impact on election outcomes. One infamous example is a story falsely claiming that Pope Francis had endorsed Donald Trump, which received almost a million engagements (likes, shares, and comments). The Brexit campaign witnessed significant misinformation, with the most notorious claim being that the UK sent £350 million a week to the EU, which could be used to fund the NHS instead. This figure was widely discredited, yet it appeared prominently on the Brexit campaign bus and was repeatedly used in campaign material.

Social Psychologist Sander van der Linden accredits the spread of misinformation to the following six "degrees of manipulation": impersonation, conspiracy, emotion, polarization, discrediting, and trolling (Van der Linden, 2022). Misinformation can prove more effective when targeting certain groups of people, making our politically polarized environment extremely susceptible. Conservatives in the US are particularly susceptible to misinformation, in large part because such a vast amount of available misinformation favors their positions (Garret & Bond, 2021). In recent years, Artificial Intelligence (AI) has contributed to the development and spread of even more misinformation and, unfortunately, has made it more convincing.

AI poses a threat to democratic processes for several reasons. First, it rapidly spreads misinformation, much of which is very advanced. Ahead of the 2024 presidential primary in the US state of New Hampshire, many voters received robocalls seemingly voiced by President Biden, instructing them *not* to vote in the election. In reality, the call was an AI-generated "deep fake" spreading false information to minimize democratic voter turnout.

AI also creates opportunities for personalization of misinformation, which makes it appear all the more believable. In the case of the Biden robocall, the call was not simply sharing incorrect facts from a neutral source—it was taking advantage of a voice and persona that voters respected, and whose values presumably aligned with theirs. Ultimately, this rapid spread of believable and personalized misinformation threatens voters' abilities to make informed decisions.

Luckily, behavioral science may offer some strategies to mitigate the spread of misinformation. We can encourage critical evaluation of information and increase the use of fact-checking services. Gordon Pennycook and David Rand conducted a meta-analysis of 20 studies and found that accuracy prompts are an effective and easily-replicable way to reduce the spread of misinformation online (Pennycook & Rand, 2022). Pop-up reminders or interface changes on social media platforms can prompt users to slow down, think, and verify the credibility of information before sharing it, thus acting as a cognitive speed bump. For instance, Gosnell et al. of Irrational Labs reduced the spread of misinformation on TikTok by 24% with accuracy prompts, which warned users when they were about to share videos containing unverified information. According to Pennycook and Rand and Gosnell et al., people typically value truth, which makes interventions that tap into this value effective in mitigating the spread of misinformation.

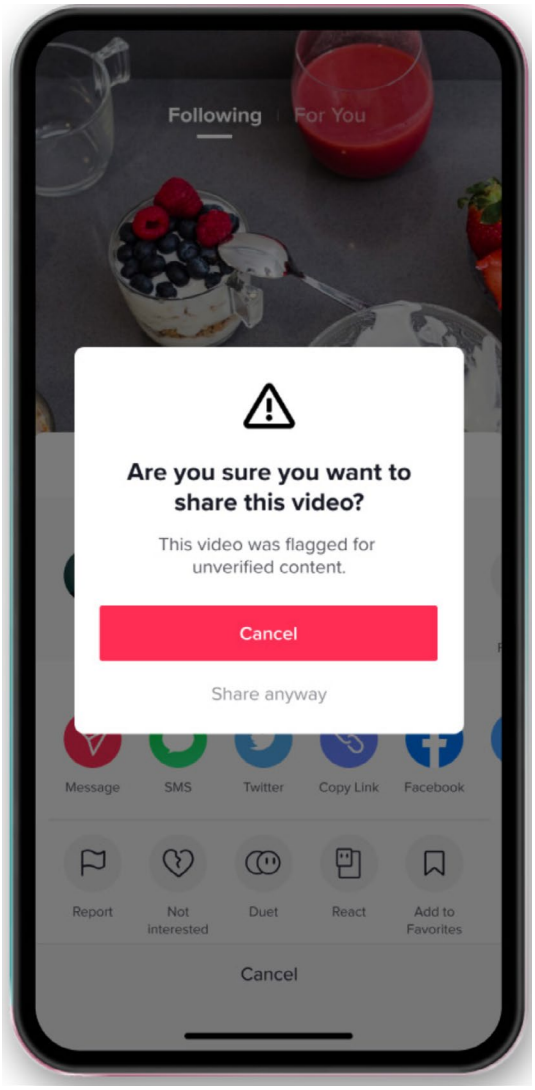

Figure 6: Accuracy prompts can reduce the spread of misinformation on TikTok by tapping into people's tendency to value truth. *Image Credit:* Gosnell et al.

Another behavioral strategy to diffuse misinformation is pre-bunking, which involves intentionally exposing people to false information. The small dose of misinformation is then followed by an explanation as to how individuals can avoid falling victim to these attacks.

The gamification of news has also proven effective in teaching individuals how to distinguish fact from fiction. Behavioral scientists can incorporate fake and real news into simulations of social media feeds and analyze the actions of subjects through testing. Past studies have shown that playing games can boost an individual's ability to identify misinformation by way of inoculation, also known as 'pre-bunking', i.e., when participants are exposed to misinformation in controlled settings, they are better protected against it in the future. For instance, Roozenbeek, Traberg and Van der Linden (2022) conducted a study in which the treatment group played a fifteen-minute game requiring them to rate the reliability of different social media posts. The authors found that the game boosted resistance against real-world misinformation spread by the same manipulation techniques against which the game inoculated participants.

Figure 7: Roozenbeek et al.'s game required participants to rate the reliability of different social media posts, some of which use manipulation techniques like conspiracy language (above). *Image Credit:* Roozenbeek et al.

Granular Democracy

As discussed, we have a polarization problem, but it's easy for this to be the case when there is no nuance. When we vote only periodically and between few, ill-fitting options, it's too easy for voters to get sucked into polarized groups. Democracy isn't really democracy when we only vote once every four years. One solution here is just to have more frequent and granular opportunities for democratic participation.

Analysis from Frey and Stutzer on Swiss cantons (member states of the Swiss Confederation) showed that direct democracy (via initiatives and referenda) and local autonomy systematically and sizably increase individual well-being. Further, Johnson et al. (2023) revealed that the participation hypothesis bears out: taking part in granular democracy, in the form of participatory budgeting, increased individuals' probability of voting in a bigger election by an average of 8.4 percentage points. In short, granular democracy offers both the prospect of increased happiness and an increase in further civic participation. A virtuous circle of sorts.

Ballot Design—an Ignored Essential

When behavioral science first made a splash on the applied policy scene, one of the biggest areas of application was in form redesign. Led by initiatives with names like 'Formapalooza' or 'ReForm', there were near endless opportunities to reduce government bureaucracy or 'sludge' by streamlining forms as decision contexts. A decade and a half on and there is surprisingly little evidence on what is arguably the most important form of all in a democratic nation: the ballot.

Elections very often hang on fine margins and last-minute decisions, meaning that even seemingly arbitrary design and wording choices on ballots can impact the choices people make in the voting booth. The structures within which people make voting choices is tremendously important and yet insufficiently explored. It is well documented across behavioral science that decision aids improve decision-making; for instance, calorie labeling on menus has a significant impact on food choices. It seems obvious, then, that we should be looking carefully and deliberately at choice architecture in the area of democracy reform, where choices have major, long-lasting impacts for a society.

A prime example of the consequences of poor ballot design was the 'butterfly ballot' in Palm Beach County, Florida, during the 2000 US presidential election. The layout had candidate names staggered on opposite sides with punch holes in the center, causing voter confusion and leading to mis-votes. Many voters accidentally selected a candidate that they did not intend to support, notably reducing the

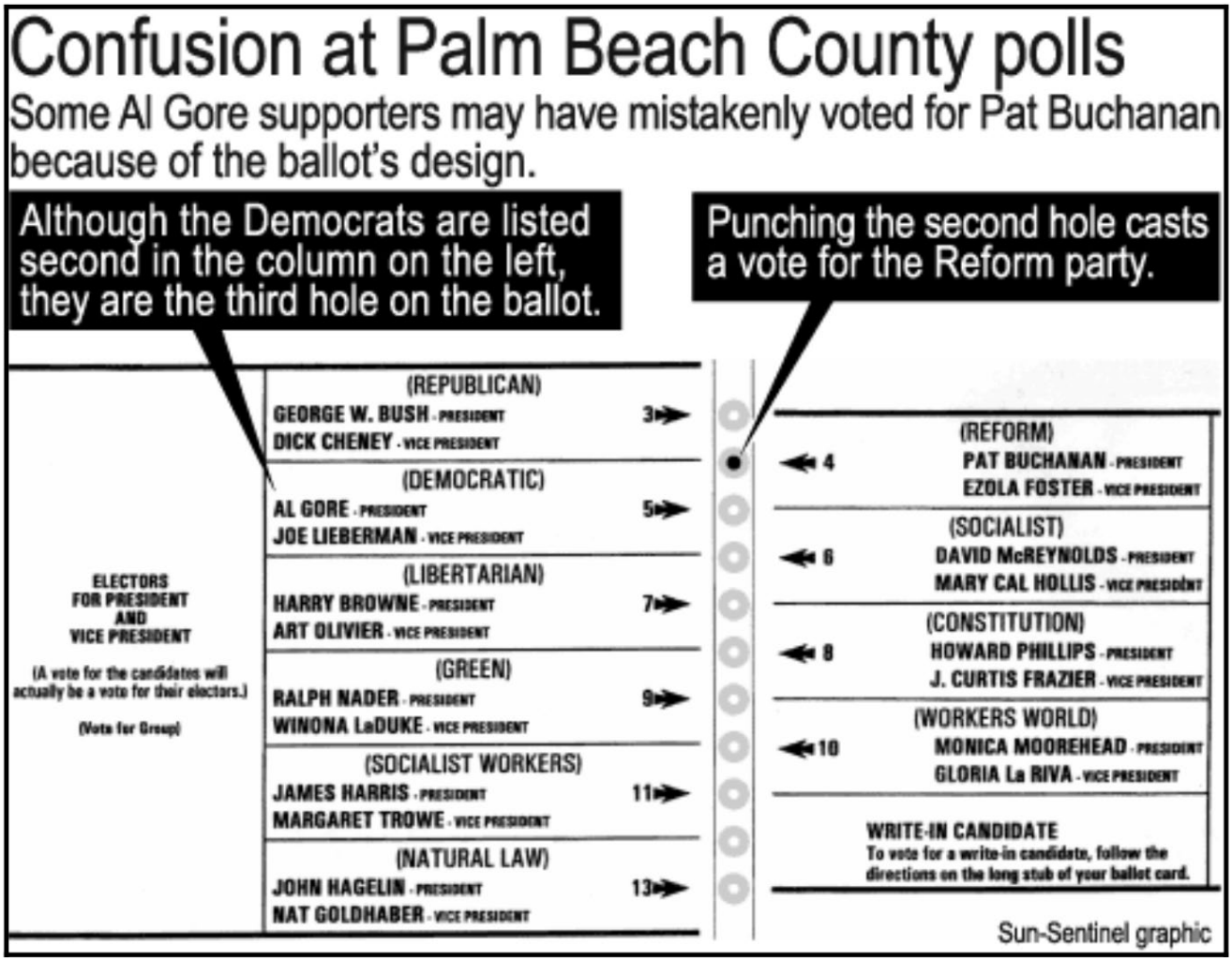

Figure 8: A more user-centered ballot may have greatly impacted the results of the 2000 presidential election in some highly contested regions. *Image Credit:* Tidwell, 2000.

number of votes for Al Gore and leading to extensive recounts and legal battles, ultimately influencing the election outcome.

More generally, studies have shown voters are more likely to select candidates listed first, due to a 'primacy effect,' whereby items at the beginning of a list are more easily remembered and thus more likely to be chosen. Randomizing candidate positions on the ballot has been suggested as a measure to counteract this bias.

Ultimately, the choice architecture of a ballot is incredibly influential. The option of doing nothing doesn't exist, and so we need to design ballots in some direction. We can do it poorly, confuse people, and increase mistrust (as in Florida in 2000), or we can do it thoughtfully and empirically and, hopefully, help people make good decisions while obviously not trying to influence the direction in which people vote. Clearly, we need to run more experiments in this context.

Evidence-Based Election Administration.

And speaking of experimentation... At its core, behavioral science teaches us humility. We know that no person is truly the rational ruler of their own mind, and that includes researchers—no amount of theoretical knowledge lets us know exactly what interventions will work and which ones will fail. To improve democracy with behavioral science, we need to experiment.

None of the ideas laid out here will save democracy, that's for sure. But testing these solutions, one idea at a time, and scaling what works can have a big impact. To do this we need to overcome our squeamishness against running experiments on our democratic and election processes. At the end of the day, it is just administration. The ballot is ultimately just another form. The way we have done things in the past might not be best for the present or the future—more testing and more data is exactly what our modern democracies need.

To this end, as behavioral scientists, we need to roll up our sleeves and form partnerships with election officials and actors to try things out. We might call this evidence-based election administration. This is how, slowly, we save democracy!

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Joseph Sherlock is a principal behavioral scientist at Duke University where he leads a team focusing on using behavioral science to bring innovation into civic society. He is also a PhD candidate at the London School of Economics, where he is exploring how behavioral ideas can increase trust in elections and enable pro-environmental behavioral spillovers. His passion is using behavioral science as a vehicle for evidence-based and evidence-generating innovation. He is also an incoming assistant professor at The Policy Institute at King's College London.

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From Mindless Consumer to Mindful Citizen: A Behavioral Lens Approach

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Consumerism, or mindless consumption, is a key driver of socio-economic and environmental issues plaguing societies around the globe. In this chapter, we explore consumerist societies through a behavioral lens. We do so by applying insights from behavioral economics to explain what behavioral biases are underlying consumerist tendencies, such as overconsumption or hedonism, and illustrate these biases in a behavioral map along the typical consumer journey. After gaining a better understanding of consumerism and its driving forces, we showcase how the identified cognitive biases can be used to inspire behavioral interventions to counter consumerist tendencies. While these suggestions mainly speak to policymakers, our insights can inform consumers and entities more broadly on how to shift behavior from mindless consumption to mindful consumption.

Understanding Consumerism

A consumerist society is one in which goods play a significant role in individuals' psychological and social lives, with material things holding strong emotional and symbolic significance. This makes ownership of consumer products a central element in discussions about status, identity, social cohesion, and the pursuit of personal and cultural meaning, turning material products into true icons.

Although we are speaking mostly of "material" products in this paper, it is important to acknowledge that consumerism and materialism also extend into the realm of non-material products. Digital products and entertainment in the form of gaming and streaming services, for instance, are already taking a substantial share of consumers' time and spending. With the advent of digital innovations such as virtual reality, crypto currencies, and virtual products such as non-fungible tokens (NFTs), the influence of non-material goods on consumer spending is poised to grow even further.

So, what does this mean? If individuals' identities are deeply intertwined with the ownership of goods, this can lead to a broad spectrum of implications. While many implications may not be overtly negative, several problematic aspects can be identified across four main categories: economic and financial, wellbeing and hedonic, social, and environmental.

For example, excessive consumer spending can destabilize personal finances and broader economic health. Furthermore, in terms of wellbeing, mindless consumerism can trap individuals in a 'hedonic treadmill' (Mochon et al., 2008), creating a cycle of temporary satisfaction and endless acquisition, worsened by too many choices. Socially, it fosters divisions and disparities, whilst environmentally, overconsumption leads to pollution, resource depletion, and a large carbon footprint, thereby exceeding sustainable limits (Kaza et al., 2018; Ellen MacArthur Foundation, 2017).

This chapter explores the psychological roots of mindless consumption and thus suggests ways for governments and other influencers to promote mindful consumption through behavioral interventions.

Consumerism through the Lens of Behavioral Economics

Behavioral economics, i.e., merging insights from psychology and cognitive science with economic principles, sheds light on the non-rational aspects of human decision-making that exacerbate consumerism's societal and economic impacts. Moving

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beyond the classical economics model of the perfectly rational "homo economicus," behavioral economics introduces the concept of "homo consumericus," a model aiming to reflect real human behavior better (see Figure 1).

The shift to "homo consumericus" reveals that consumption is driven by not only practical utility, but also feelings and signals. The utility implications of such psychological (vs. physical) consumption have been described via several different concepts that can exacerbate material tendencies. Conspicuous consumption (Veblen, 1899), for example, describes the practice of purchasing goods or services with the primary purpose of displaying wealth or social status. Thus, some people drive luxury cars for the status they convey, not just their better physical experience. Such status-oriented consumption leads to 'positional externalities' (Frank, 1985), prompting others to also buy luxury cars to maintain or improve their relative social standing. More generally, psychological consumption is influenced by surroundings and social expectations (Ariely & Norton, 2009), and as such expectations can be driven or influenced by markets and ads, consumer desires are created by the very processes that satisfy them. This cycle was coined the 'dependence effect' in the late 1950s (Galbraith, 1958) but still fuels consumerism today.

Behavioral Diagnostic of Mindless Consumerism

Understanding the behavioral factors that play into mindless consumerism is essential when seeking to craft effective interventions for a potential remedy. In this section, we offer a closer look at the patterns of mindless consumerism through a behavioral map, revealing the behavioral and structural drivers or barriers at play (see Figure 2).

Structural Barriers vs. Behavioral Barriers

Structural factors describe features of the broader environment, such as economic factors, legal frameworks, and other more systemic features of society, within which consumers operate and that enable consumerism in the first place. Key factors are lack of financial literacy, generous pensions or social safety nets, easy credit access, product abundance, and limited upcycling or reselling options. While some of these structural barriers could be targeted also by governmental initiatives, they commonly require systematic changes. Thus, the focus of this chapter lies more on targeting behavioral biases.

Unlike structural barriers, which are imposed externally, behavioral barriers are more internally driven. These encompass psychological, social, cognitive, and emotional aspects influencing consumer decisions and responses to their environment. In the following sections, we identify behavioral barriers underpinning mindless consumption. In so doing, we distinguish between socially conditioned behavioral barriers and more general cognitive biases that influence consumer behavior.

Socially Conditioned Behavioral Barriers

First, we investigate socially conditioned behavioral tendencies, which reflect the human need for social connection and feeling belongingness.

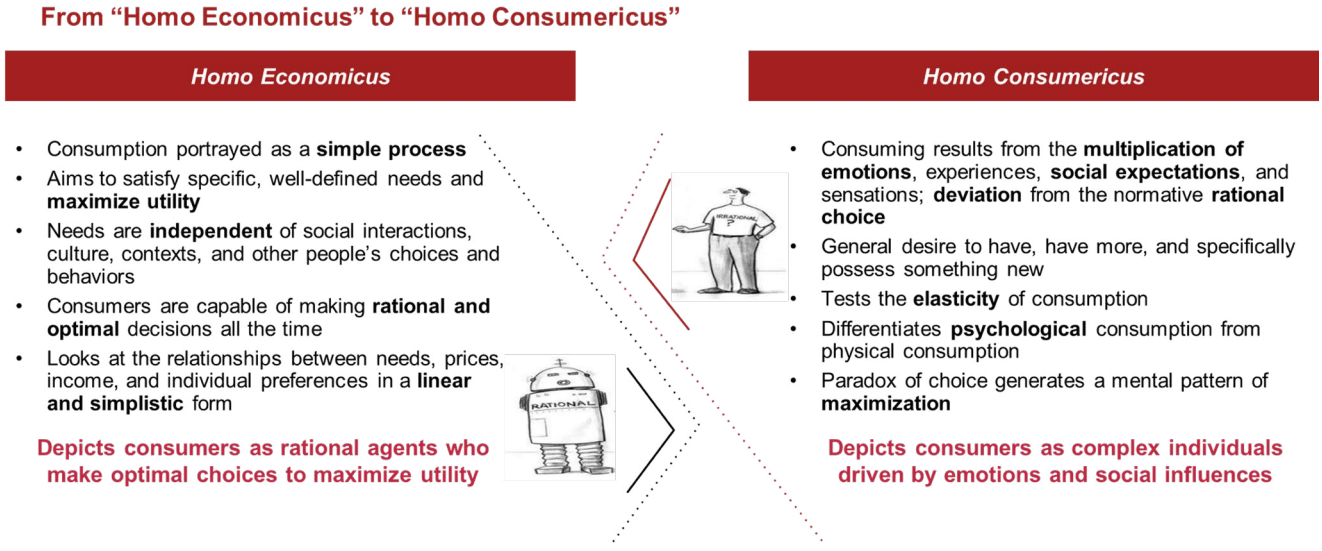

Figure 1: Characteristics of homo economicus vs. homo consumericus.

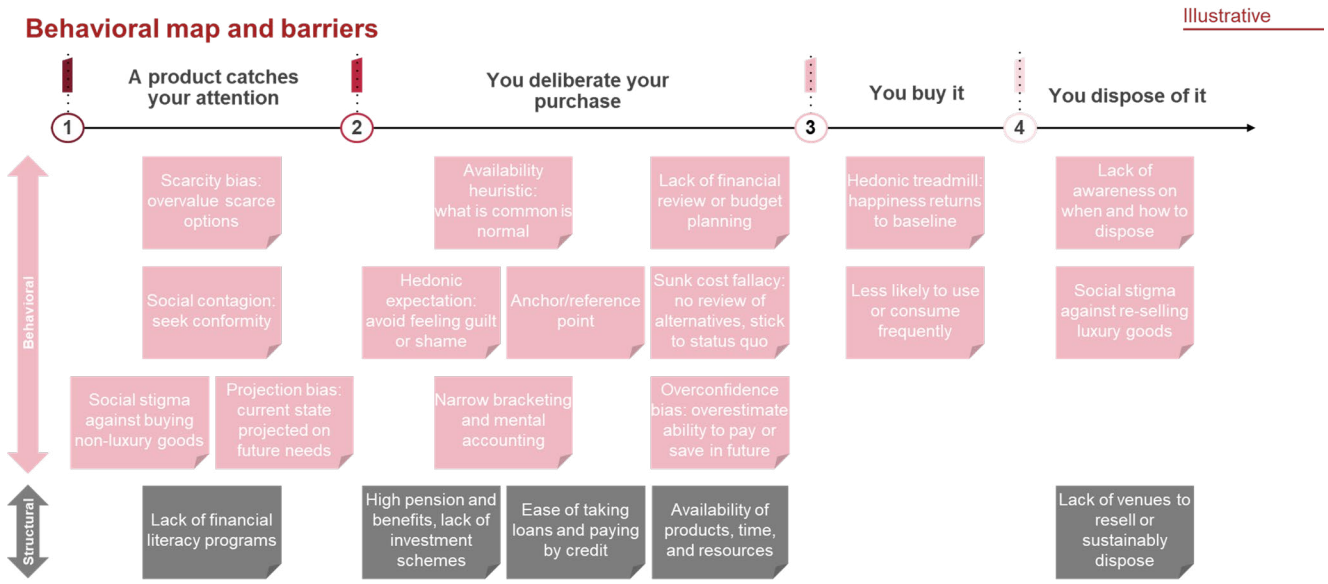

Figure 2: Behavioral map of mindless consumption.

However, the pursuit of these social connections in the marketplace can lead to consumption behaviors that are counterproductive to wellbeing. Like other human instincts, these behaviors evolved under different conditions but can be co-opted for profit in modern contexts (Avsar, 2019).

Hedonic Treadmill

"Just one more watch, and I am happy!" We often think that buying, owning, getting a specific item, or achieving a milestone will increase our happiness and life satisfaction in the long term or indefinitely. However, this contradicts the concept of the hedonic treadmill (Mochon et al., 2008), describing how people always converge to their baseline level of happiness, regardless of what happens. We tend to estimate that buying a new luxury car will increase our happiness, but we find ourselves returning to our initial level of happiness after some time (Ianole & Cornescu, 2013).

Social Norms

"Everyone is doing it." Consumers can develop a preference to conform with the behaviors of their peer groups. Social norms are powerful influencers of consumption and can lead people to spend more than they would personally prefer to spend without those social elements involved. The discomfort associated with raising concerns around spending or financial circumstances compounds this problem—if everyone is doing it, no one wants to be the one to throw cold water on a hot trend. Social expectations also fuel many of our decisions and behaviors, in that we may use information around not only what others do, but also what others expect us to do. For instance, a young couple might feel societal pressure to host an extravagant wedding, leading them to prioritize meeting these expectations and resulting in excessive spending. Social norms also influence how people value goods based on their psychological consumption value. Therefore, social norms, or social programming and socialization in general, are strong drivers of consumption.

Priming

"That speaks to me." Strategic marketing incorporates the principle of priming, which engages our tendency to be influenced unknowingly by one stimulus in terms of how we respond to a subsequent one. Advertisements and marketing messages are omnipresent, often processed subconsciously by consumers, like background noise. Priming's effectiveness relies on anchoring bias, whereby initial information heavily influences perception, overriding subsequent insights. Thus, first impressions hold more sway than later learnings and affect our "reference points." Consider a teenager whose first encounter with a particular clothing brand occurs via a marketing campaign that features his favorite musician in a documentary about adventure travels. The documentary is sponsored by the clothing company, and the musician and his bandmates are outfitted exclusively by the brand.

Even though the brand is never mentioned in the show itself, it is prominent and the sponsorship is listed in the credits. Even more than a year later, when it comes to making a purchase decision, the teen associates the brand with his favorite musician and what he considers an adventurous lifestyle.

Free-Rider Problem

"Why should I sacrifice if others don't?" A free-rider problem describes a situation in which some people, i.e., "free riders" in this case, can benefit from a public good without contributing to it. Free riders create a disincentive for people to contribute to the public good, as they benefit from the contribution without paying their fair share. As people hold fairness preferences and do not want to be taken advantage of due to inequity aversion, this leads to the under-provision of public goods. In the context of consumerism, this means that people are hesitant to sacrifice their unsustainable consumption habits for the benefit of society. For example, why pay more for a sustainable product trying to save the environment if others save money buying the less sustainable option? As a result, people tend to act selfishly as consumers.

Cognitive Biases as Behavioral Barriers

Apart from socially conditioned behavioral tendencies, numerous, more general cognitive biases impact consumption choices. Such biases refer to individuals' inherent psychological tendencies and heuristics that lead to systematic deviations from rational decision-making. Some of the most well-known biases affecting mindless consumption tendencies are discussed below.

Mental Accounting

"This is my 'fun' money." True accounting rests on having a consistent numerical reference point and the principle of fungibility, whereby the financial unit of value remains constant. However, we often struggle to apply the principle of fungibility to all our money. Instead, we do mental accounting, wherein we think differently about money depending upon how we earned or gained it, how we plan to use it, and how it makes us feel. Consider a professional who receives an unexpected salary bonus at the end of the year. Despite having very specific financial goals that this unexpected bonus might help him and his wife achieve ahead of schedule (e.g., paying off a mortgage), neither of them thinks of this money in the same way as they think of regular income. This is *bonus* money in their mental accounting, and so different rules apply. They use it instead for a pricey vacation. Notably, this is not an inherently "bad" decision as a one-off splurge, but mental accounting, when it becomes habitual, has the potential to erode our ability to achieve financial stability and long-term goals.

Present Bias

"Spend now, worry tomorrow." Many mechanisms enable this behavior, such as credit cards or other pay-over-time models, allowing for immediate purchases with or without full accounting in mind. Present bias, driven by the desire for immediate gratification, often leads to less measured decisions, thereby relying on the belief that future prudence will compensate for current indulgence. This bias is compounded by factors like "hyperbolic discounting" and "money discounting," when consumers overestimate future savings or accept smaller financial gains to satisfy immediate desires. From a behavioral standpoint, present bias is a very significant factor, as it can play a powerful role in influencing other cognitive biases, such as the mental accounting discussed above. Consider an older woman shopping for shoes from her favorite fashion brand. Despite knowing they will be discounted by 20% in two weeks' time, during the regular holiday promotion, she is swayed by a soon-to-expire 10% coupon. Present bias drives her to buy them now despite the likelihood of better savings later. She convinces herself she will make up for it next time, thus compounding her decision.

Overconfidence and Optimism

"I am sure it will be fine!" Overconfidence and optimism often lead individuals to overestimate their abilities and expect positive outcomes, disregarding potential risks. When financial decisions are influenced by overconfidence and optimism that come with high risk tolerance, these decisions can be reckless and problematic. Rapid accumulation of debt through "buy now, pay later" commitments is common, accompanied by neglect of long-term savings and the potential for exponential

growth from compounding interest. For instance, the young professional earning a modest salary but with a high credit limit is susceptible to these cognitive biases. With enough income to cover expenses and access to easy credit, she may impulsively acquire items beyond her means. Rationalizing the decision, she might think she has time to save later, being young and just starting out.

Scarcity Bias

"It's now or never!" While genuine scarcity is absolutely a factor in the basic supply and demand equation that underpins classical economics, scarcity can be a matter of perception—which can be manipulated by creative marketing and strategic product deployment. When a known brand announces a limited-edition product drop, people are likely to respond simply because of the perceived scarcity of the product. This is particularly true in the context of luxury goods, where conspicuous consumption is a major factor. Thus, when a high-end accessory manufacturer reaches out to existing customers with a "by invitation only" new handbag, the scarcity bias is immediately activated. Whether or not there is sufficient inventory to supply everyone invited does not really factor into the thinking of the excited customers. The default presumption is that there is not, and so a sense of urgency is instilled. Word spreads, "fear of missing out" kicks in, and orders come pouring in, regardless of the inflated price point. When the supposedly scarce handbags appear everywhere, some may be skeptical, but this will not diminish their feeling of having participated in an exclusive offer.

Endowment Effect

"What's mine is mine." There is a tendency for people to place a higher value on things simply because they own them, known as the endowment effect. This bias can make it difficult for people to part with things they own, or to share them, and it can also affect their decisions when buying or selling goods. The endowment effect becomes apparent with items that have an emotional or a symbolic significance to the individual. The emotional attachment to things once we own them seems to be related to upbringing and more ingrained in some cultures than others. As a result, sharing economies have a hard time being adopted in some cultures or contexts.

Loss Aversion and Status Quo Bias

"Losing hurts." Loss aversion describes the fact that people tend to feel the pain of losing more strongly than the pleasure of gaining the same thing. This can lead to risk aversion and status quo bias, or a tendency for consumers to stick with familiar choices, rather than exploring alternatives. For example, people tend to stick to their barber and do not try cheaper alternatives, as the potential gain from a less expensive haircut weighs less than the anticipated disutility from a horrible cut. "I'll have the usual, please." Status quo bias is a cognitive bias that refers to the tendency of people to prefer things to remain unchanged or to stick with familiar situations, even when better alternatives are available. For example, this could explain why people tend to stick with service subscriptions like insurances for years, without considering looking for better deals.

Reference Point

"I've had better." People tend to evaluate outcomes relative to a reference point and then classify them as gains or losses. Reference dependence, together with the idea that "losses loom larger than gains," is one of the central ideas of prospect theory (Kahneman & Tversky, 1979). The reference point could be related to people's previous consumption (of themselves or others) and their expectations for future consumption. This concept can be seen as one of the driving factors explaining the hedonic treadmill or consumers' desire to strive for consumption of more and better products. It also explains why people often live beyond their means, have a hard time adjusting to lower standards of living, and are unhappy when consuming below their "standards" or even when receiving gifts. For example, if parents buy an exceptionally expensive birthday gift for their kid, they raise the expectation or bar for next year's birthday.

Towards Mindful Consumption—Behavioral Interventions

Herein, we propose different categories and examples of behavioral interventions that help people develop healthier, more balanced consumption patterns. In line with the concept of "nudging" (Thaler & Sunstein, 2008), these interventions

leverage behavioral barriers underlying consumerist tendencies to influence people's behavior without restricting their freedom of choice. The intervention categories are described below and illustrated in Figure 3, using the example of increasing savings.

The Power of Now

Interventions that leverage the Power of Now take advantage of opportune times to maximize impact. These might include incentives and commitment schemes that will increase the propensity of savings plans. Moreover, actions could be based on identifying timely moments when consumers are most receptive to changing their habits and consumption patterns. For instance, banking mobile apps could prompt users with investment opportunities as soon as they receive their salary deposits. Finally, Power of Now actions could seek to incentivize sustainable choices by front-loading benefits (e.g., tax credits that provide immediate savings). For example, the Save More Tomorrow program, developed by behavioral economists Richard Thaler and Shlomo Benartzi, makes use of hyperbolic discounting to increase savings by allowing people to commit to save a portion of their future income increases but without feeling the pain of saving immediately (Thaler & Benartzi, 2004).

The Power of Norms

Most people want to fit in with the various conventions followed by their peer groups, generation, fellow citizens, or role models. Thus, there exists the opportunity to use this desire or the Power of Norms to create interventions that can yield financial sustainability and other benefits. By raising awareness and more open communication, the cultural narrative around expectations for excess and high consumption could be changed. For example, the use of dynamic norms highlighting culture shifts to more mindful consumption, or social media influencers promoting such values, could establish new trends in sustainable, conscious consumer behavior. Finally, efforts to normalize savings and investment programs could embed these patterns into popular culture and everyday conversation. For example, social norms and peer pressure have been successfully used to encourage college students to save money by informing them about their peers' savings (Cheung et al., 2021).

The Power of Emotions

Interventions using the Power of Emotions can foster desired behavior through increasing positive feelings around savings and mindful consumption, as well as making negative emotions associated with mindless overconsumption more salient. To increase the positive feelings of desired behavior, efforts to leverage pride in sustainable consumption through campaigns can replace feelings of inadequacy from not engaging in excessive consumption. Also, investment, pension, and savings options can be simplified to increase their appeal by removing intimidating factors. To strengthen negative emotions with mindless spending, the financial impact of spending in general can be made more salient. For example, a Swiss smartphone app used an emotion-based approach to highlight credit card transactions, making users more mindful of cashless spending (Huebner et al., 2020).

The Power of Collective Action

People's actions as consumers often lean toward selfishness due to the free-rider problem. To counter this issue, and to encourage socially-oriented purchasing, mechanisms for conditional cooperation and collective action can help (e.g., Fischbacher et al., 2001). For instance, allowing decisions based on others' choices is effective in charitable programs, where actual transactions of pledged donations depend on reaching a funding threshold. This approach could similarly be applied to sustainable consumption, for example in the context of offsetting CO2 emissions. That is, instead of only offering individuals the opportunity to pay to offset their individual emissions directly, one could offer them the chance to pledge to offset their emissions if enough other people do so as well, thereby reducing the free-rider problem.

The Power of Framing

Framing, or how a message is presented, is known to cause large differences in people's reactions to a message. Using this knowledge to reframe certain messages or change how people think about specific choices can lead to vastly different outcomes. For example, reframing "savings" as "investments" was found to increase suggested pension savings by 33%

among young people (BIT, 2020). Thus, reframing can be used to change people's perspectives and affect their choices as a result.

The Power of Priming

Priming, or exposing people to a stimulus ("prime") to temporarily activate specific mental concepts, can be an effective way to influence people's behavior in a passive or even hidden manner. For example, a clean, citrus smell, or placing a picture of male eyes over a hand gel dispenser, was found to improve visitors' compliance with hand hygiene compliance in a hospital in Miami, Florida (King et al., 2016). Similar priming interventions could be used to change people's consumption behaviors. For example, Wang et al. (2023) demonstrated over a series of experiments how exposure to art leads to less interest in status-oriented luxury consumption through priming or inducing a mental state of self-transcendence, thereby suppressing mundane concerns such as status-seeking.

Conclusion

There is no doubt that we live in a consumer society. Despite all the advancements that the market economy has brought to our global society, it has also introduced problems and potential liabilities. Thus, a consumer society is a double-edged sword.

Balancing this requires understanding the factors shaping our behavior. This chapter has offered a unique perspective that unpacks the complexities of consumerism through a behavioral lens. Using a behavioral diagnostic, we highlighted the behavioral barriers and biases influencing consumer decision-making.

Finally, we suggested potential ideas for behavioral interventions that leverage the Power of Now, the Power of Conformity, the Power of Emotions, the Power of Collective Action, the Power of Framing, and the Power of Priming to help mitigate these behavioral barriers. Further research is needed to test some of these suggested solutions in specific contexts through evidence-based behavioral experiments. These insights will provide policymakers with the knowledge and tools necessary to reduce mindless consumption and, ultimately, foster more mindful citizens.

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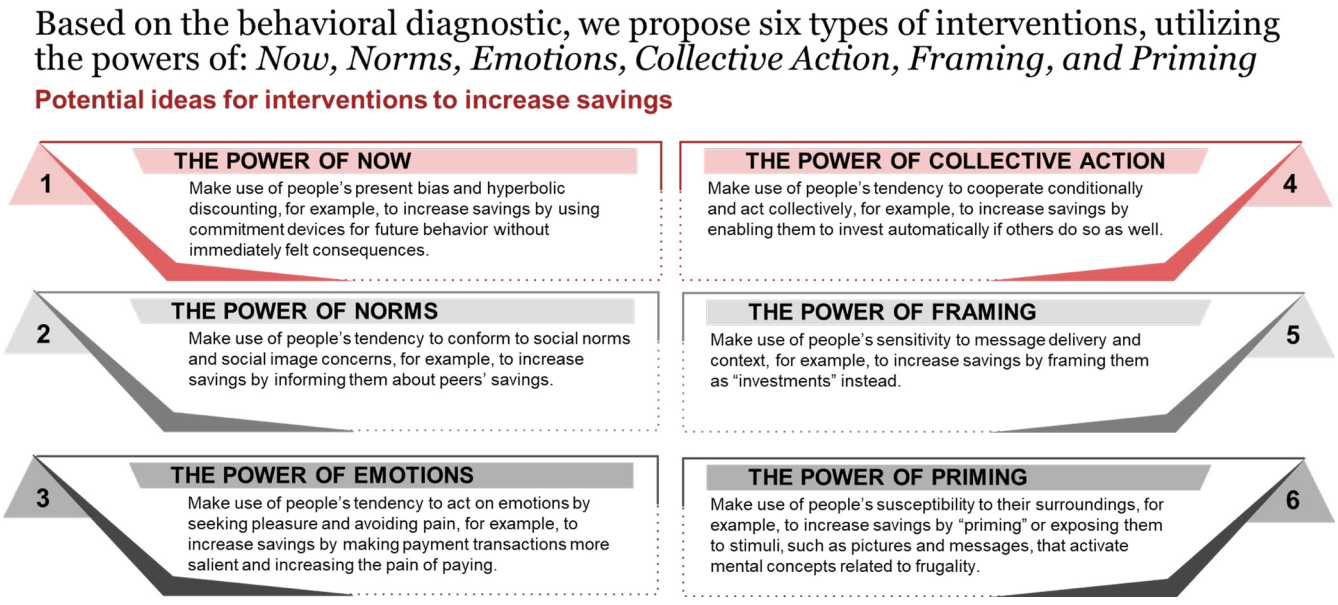

Figure 3: Behavioral interventions to increase savings.

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ACKNOWLEDGMENTS

The author team wishes to thank Paul Cumbo of PJC Editorial for his assistance in drafting this paper.

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Pricing Strategy: The Lessons of Inflation

HENRY STOTT, BENNY CHEUNG, JERRY LUUKKONEN[1] AND ALICE PEARCE

Dectech

The cost of living crisis has delivered inflation levels in the UK, USA and EU not experienced by consumers for a generation. Painful as this has been for many, it has also generated a unique dataset on how consumers perceive, interpret and alter their behaviours in response to large and well-publicised price rises. In effect, with inflation varying from sector to sector, the UK has inadvertently undertaken a large-scale, natural experiment on the dos and don'ts of increasing prices. Combining this data with findings from an immersive randomised controlled trial which examined the effect of different price rise justifications, we find that providing any justification is better than providing none, whilst justifications perceived as fair can substantially increase customer satisfaction and repurchase likelihood.

Executive Summary

This report combines field data from the cost of living crisis with our own Behaviourlab experiments to extract and explore insights on how consumers perceive, interpret and alter their behaviours in response to price rises. Based on this work, we draw the following main conclusions:

News Media Mediates Perceptions: Naturally, people's inflation judgements are not a carefully weighted blend of personal price rises; instead, they are a chaotic collage of known value item prices, word of mouth, news media and so forth.

Price Experts Matter: 12% of consumers account for 65% of price rise noticing. It is their opinion that needs to be managed.

Beliefs are Inaccurate: Because inflation judgements originate from a combination of events, they are weakly correlated with reality. In practice, many people over-estimate inflation.

There's a Narrative: Consumers have differing beliefs about inflation's causes, including rising production costs and profiteering. Their beliefs vary substantially by category, and some causes are judged fairer than others.

Large Long-Term Effects: People not only trade-down and buy less in response to inflation, but they also do a lot of complaining. This has knock-on effects that can cause greater damage to enterprise value.

Narrative Dominates Numbers: The reason behind inflation is more influential than the inflation itself. A price rise for a bad reason has the same behavioural effects as a +16% higher price rise for a good reason.

Narratives are Sector Specific: Everything varies by category. Different categories have different "price experts," existing trust levels, acceptable inflation causes, behavioural responses and so on.

Learnings from the Cost of Living Natural Experiment

According to Google Trends, the cost of living crisis is over. Searches for the phrase peaked in September 2022 before falling back over the following year. As Figure 1 shows, this exactly parallels headline inflation, thus highlighting the role of news media. In practice, monthly inflation peaked four months earlier in May 2022, but the news always focuses on the trailing 12-month period. The implication is that people's inflation perceptions are influenced as much by the news media as by any detailed understanding of their own expenditure.

Against this backdrop, then, how do consumers form their inflation judgements? The answer is not obvious, and some of the problems are well illustrated by how the Office of National Statistics (ONS), i.e., the national statistical institute of the UK, calculates the consumer price index (CPI). It does

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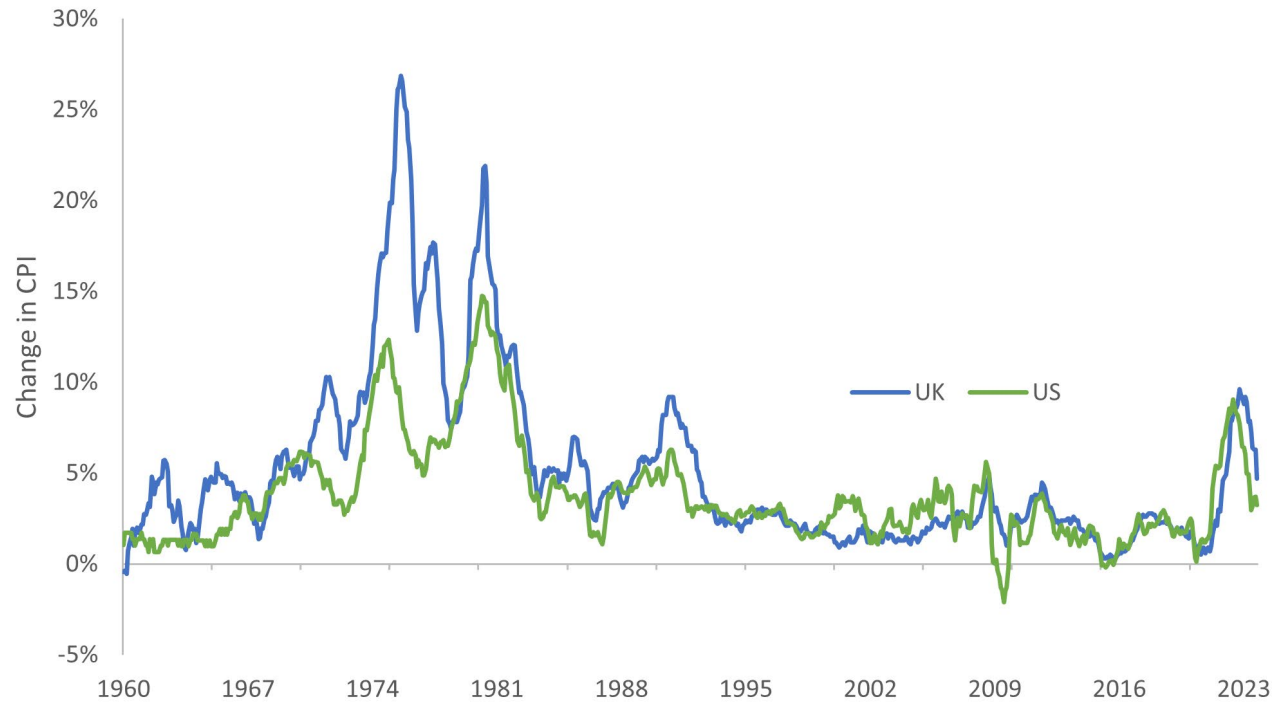

Figure 1: US and UK Inflation (OECD, 2023).

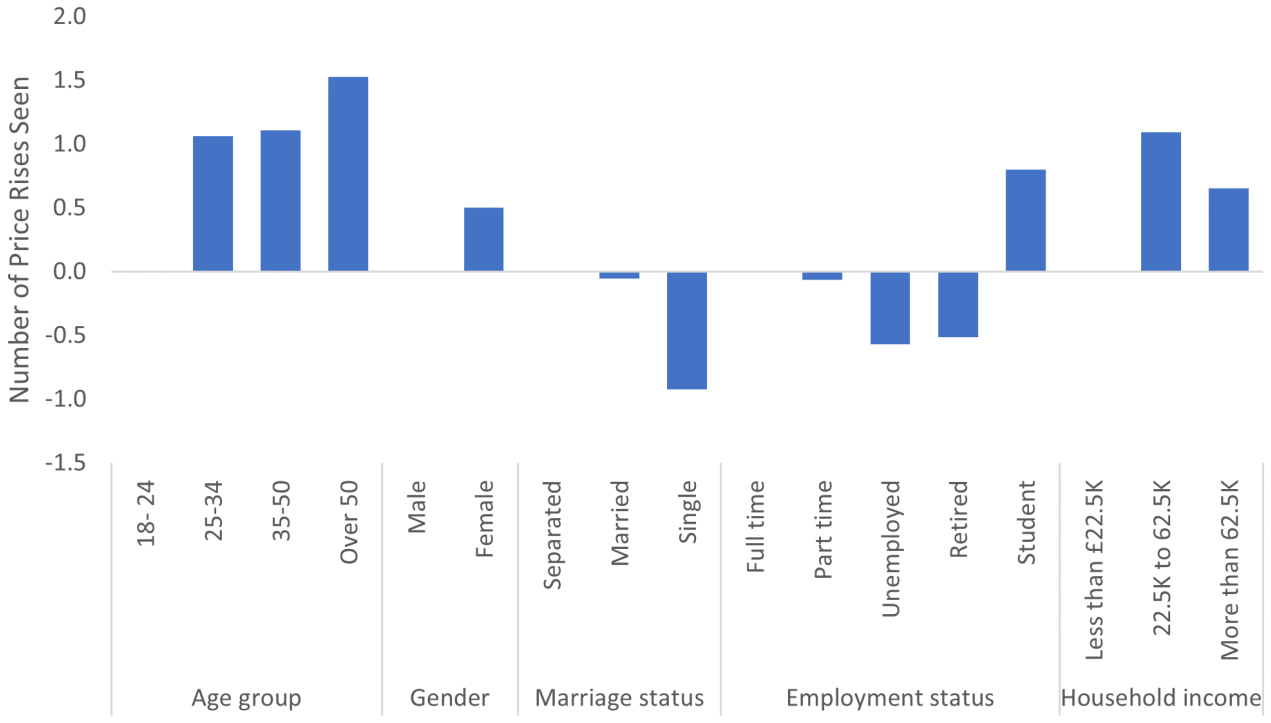

Figure 2: Who notices price rises? *Source:* Dectech fieldwork, March 2023 (N = 2,021 nat. rep.). Respondents were asked, for a selection of 16 products, what price increases they had seen in the past 12 months. Product categories were selected based on those used by the ONS. The graphic shows regression betas, using demographics to predict how many rises respondents observed.

so by tracking prices across channels, geographies and retailers for 700 items, generating hundreds of thousands of prices, alongside multiple sources of purchasing volumes, following which an impressive series of analyses is undertaken, resulting in a final CPI. Yet, inevitably, it is impossible to convert all this information into a single figure that reflects price rises seen by everyone. What people purchase varies from person to person and changes over time. Product attributes, such as quality and weight, also

fluctuate, and new products are invented, and old ones phased out. As such, different methods of calculating inflation can vary wildly (Horner, 1971)

Why do consumers, therefore, believe there's inflation? Because they see individual price rises? Because their weekly shop is more expensive? Because they have less money left at the end of the month? Because the ONS tells them? This report explores some of these questions, particularly those that are relevant to the people setting prices. We argue herein that inflation is a belief, not a concrete fact, which means it is an impression that should be managed. Specifically, we discuss who notices price changes, how they form their inflation judgements and – crucially – how they change their behaviours in response.

Price Rise Perception

Surprisingly few customers actively engage with prices. For the 16 products shown in Figure 3, for instance, the typical respondent noticed price rises in only half despite inflation across nearly all the categories, albeit it is notable that 12% recognised price rises in at least 13 categories. When prices are raised, these price experts need to be considered: in this dataset, they account for 65% of all the price rise noticing.

So, who are these price experts and how does one talk to them? Figure 2 illustrates the demographic signature for this cohort. Single people notice one fewer price rises across the 16 categories than the average shopper. Price experts are typically older, married and middle-income earners. Nevertheless, demographics are not particularly helpful, as price experts are likely best defined by their purchasing behaviours; for example, they likely visit price comparison websites, use coupons and exploit shop promotions.

Having found the people who notice price changes, how do they form their inflation opinions? The research literature is useful in this regard, highlighting that people are better at encoding prices than recalling them (Monroe & Lee, 1999). In effect, when consumers see a packet of biscuits at £1.25, they form a noisy memory of £1.25. Later on, asked whether they would

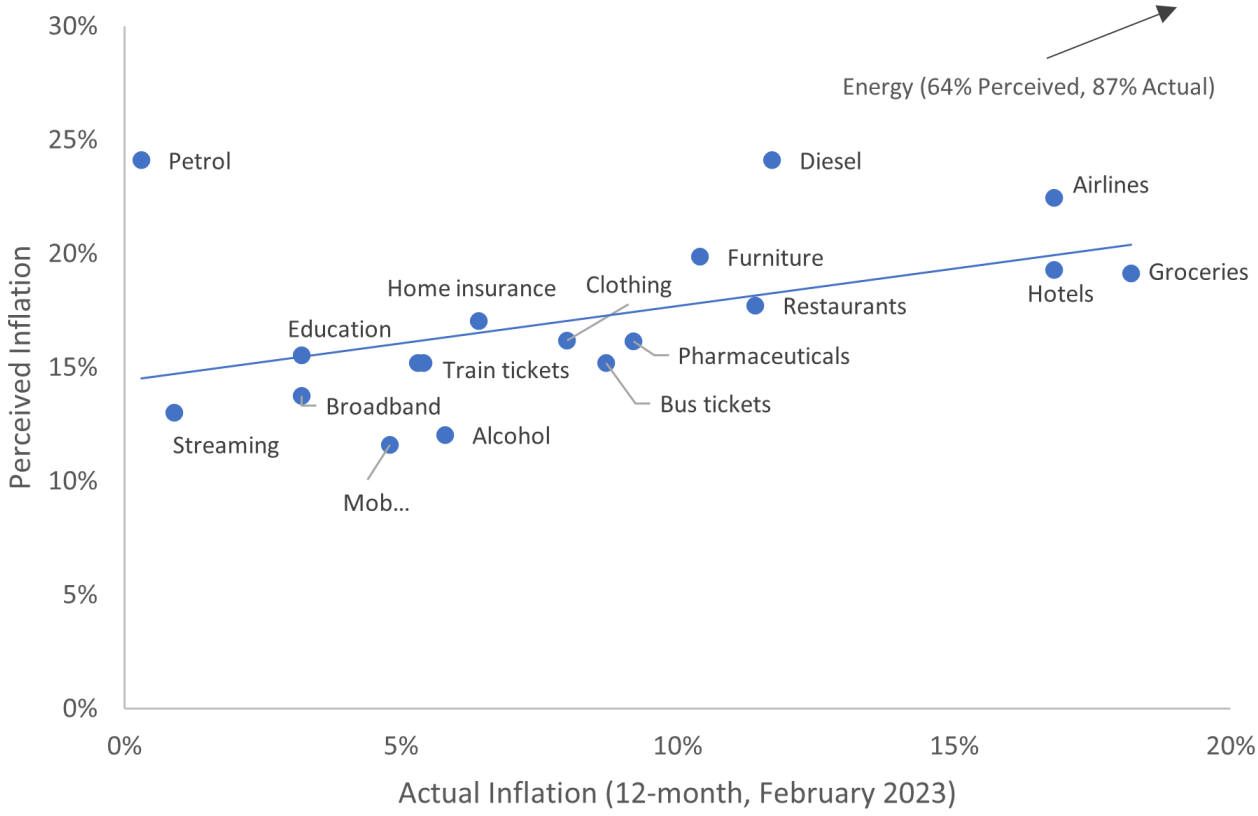

Figure 3: Perception accuracy. *Source:* Dectech fieldwork, March 2023 (N = 2,021 nat. rep.), together with March 2023 ONS consumer price inflation data. Respondents were asked for inflation estimates for three of the products for which they had seen price rises.

pay £2.00, they can confidently say it is bad value, but asked to recall the exact price, they have to generally take a guess.

Consumers are not computers with high-fidelity price memories that can be compared over time and then aggregated, like the ONS. It is expected that consumers' inflation opinions are pretty sloppy, event-dependent and derived from many sources, such as direct experience of sticker shocks, what's in the news, a friend complaining about being ripped off and so on. Figure 3 corroborates this view and shows actual inflation versus people's perceptions across categories. There are several insights, as discussed below.

First, everyone in the sample felt maligned, i.e., although headline inflation was 9% at the time, all the estimates were higher – higher even than the peak six months prior. Second, the R2 of this scatterplot was a moderate 21% when excluding energy: people's estimates contained some convergent signal binding them to the ONS assessment. Third, substantial mean reversion meant that the range of people's estimates across categories was much smaller than the ONS's. Finally, people were imprecise in terms of timeframe. Petrol started 2022 at 145p per litre, went up to 191p and then fell back to 149p. As such, the chart shows nearly no ONS inflation. This is technically correct, but it does not represent how people actually felt.

The headline, then, is that people's price rise perceptions are derived from many sources and are not particularly scientific or accurate in that sense. As such, it is not just about the actual price, it is about signalling, messaging, framing and so forth. There is something here that needs informed management as a retailer. Retailers cannot just meticulously determine the optimal price and then post it; they have to then sell that price rise.

Perceptions of Fairness

People noticed inflation in 2022, but did they think it was fair? This is an important question for several reasons. First, there is extensive evidence that perceived fairness affects repurchasing (Homburg et al., 2005), i.e., exploitative pricing drives churn. Second, unfair price increases erode trust and thereby

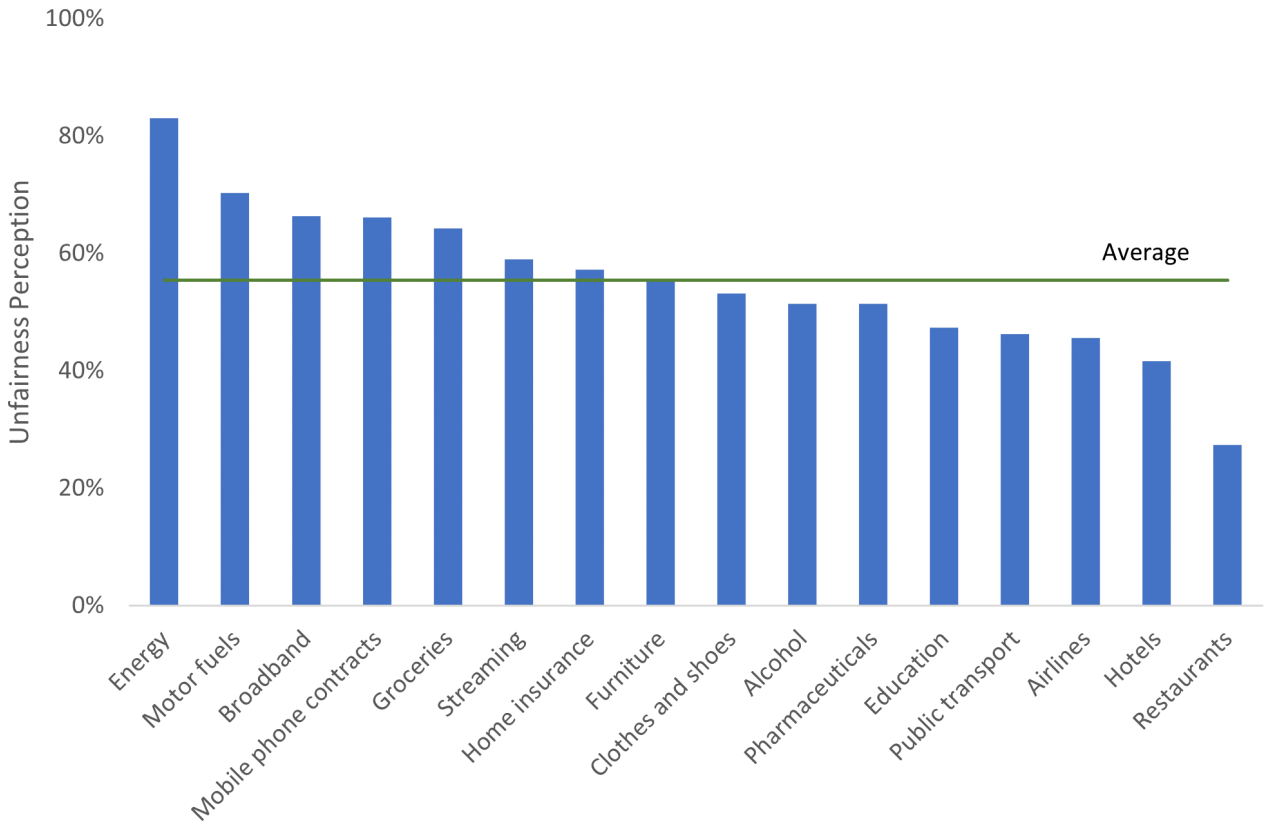

Figure 4: Inflation unfairness *Source:* Dectech fieldwork, March 2023 (N = 2,021 nat. rep.). Respondents were asked to indicate on a 7-point Likert scale, ranging from "Justified" to "Unjustified," how they felt about price increases for three of the products for which they had seen price rises. Scores of 1 to 3 were classified as unfair.

longer-term enterprise value – beyond the direct sales impact, there's always additional collateral damage. Third, the public's poor opinion can cause industry-wide problems such as more legislation, an upset regulator and so on. Of course, retailers need their customers onside.

Figure 4 shows how many people thought that the experienced price rises were unjustified. These fairness judgements vary considerably. Despite well-publicised wholesale energy price increases, 80% of consumers thought that their higher electricity bills were too high. People also thought that the higher pump prices in mid-2022 were excessive. Conversely, these wholesale energy cost pressures were seen as justifications for higher prices in hospitality and travel, in that these businesses were still recovering from the pandemic and, in the case of restaurants, differentially shopped by a type of consumer, namely those with higher incomes, who tend to be less resentful of price increases.

Clearly, bigger price rises generated greater consternation; however, the chart reveals that this was not the whole story. Specifically, consumers were more or less tolerant of price increases, depending on the industry's circumstances, which is in line with the literature. For example, Kahneman et al.'s (1986) work on price fairness concluded that passing through higher input costs (i.e., cost plus pricing) was more acceptable than charging more because retailers could do so (i.e., value minus pricing). In their experiment, charging more for snow shovels – just because it had started snowing and there was limited supply – was not a crowd pleaser.

Price Rise Beliefs and Stated Behaviours

As the above section on fairness discusses, inflation levels experienced across some sectors were seen as more justifiable than others. These fairness judgements were a function of the inflation amount as well as the perceived cause. Motivated by this insight, Table 1 illustrates what consumers believed caused inflation in 2022. The "Overall" column shows the main effect, with most people simply blaming inflation itself. Then respondents started to cite actual underlying causes, such as corporate greed and input costs, followed by causes of the causes, like Brexit.

Table 1: Inflationary Causes

		Relative to Overall			
	Overall	Energy	Groceries	Airlines	Streaming
General Inflation	67%	-7%	8%	1%	-9%
Increase Profits	62%	14%	2%	-2%	1%
Increased Costs	54%	-5%	6%	7%	-17%
Brexit	42%	3%	11%	4%	-19%
War in Ukraine	39%	19%	16%	11%	-18%
Increased Demand	32%	0%	3%	8%	-2%
Investment	31%	-1%	-2%	6%	0%

Source: Dectech fieldwork, March 2023 (N = 2,021 nat. rep.). Respondents were asked to indicate on a 7-point Likert scale, from "Strongly Disagree" to "Strongly Agree," how much they agreed that the price increases they had seen were caused by various potential reasons. Scores of 5 to 7 were classified as agreement.

Crucially, though, this picture is not uniform. Four sectors illustrate this point. As we know, people do not trust energy providers. Accordingly, exploitative margin increases alongside higher wholesale energy costs, due to the Russian invasion of Ukraine, were seen as relatively important drivers in this sample. Conversely, airlines were seen as facing the same cost pressures, but were not blamed for taking more

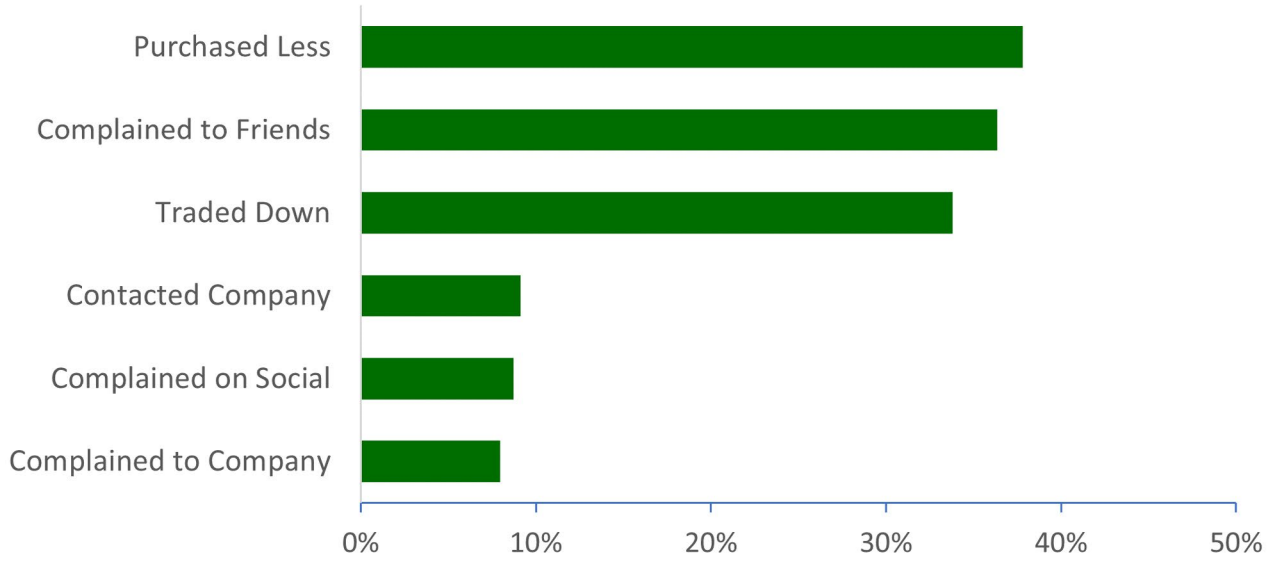

Figure 5: Resultant behaviours. *Source:* Dectech fieldwork, March 2023 (N = 2,021 nat. rep.). Respondents were asked to indicate from a list of options the behaviours they had undertaken for three of the products for which they had noticed price increases. Scores of 5 to 7 were classified as agreement.

margin. Next, cost increases resulting from Brexit were perceived as important for groceries. Finally, streaming services had no excuse beyond buying more content and stiffing people on the margin.

Figure 5 reveals how this inflation altered respondent behaviours. As noted in the section on fairness, price rises drive churn because people either purchase less or trade-down, both of which are widely recognised forms of elasticity in promotion modelling. But people also undertake activities that erode brand value by complaining to friends, on social media and to the company. These indirect effects are typically more important than short-term sales effects. Thus, just because they are harder to measure does not mean they should be ignored.

So, consumers estimate inflation and attribute that to different causes, but they also judge some inflation as more unfair. This fairness judgement is partly driven by perceived causes. They then respond with changes to their purchasing and other behaviours.

The key takeaway is that companies should not only focus their efforts on determining the optimal price increase, but just as important is optimal messaging. As such, companies should consider how to explain any price increase and attempt to exert some control over that narrative. The perceived reasons for the price increase will impact both short-term purchasing behaviours and long-term enterprise value.

Findings from a Behavioural Experiment Deep Dive

The large-scale, real-world price rise experiment that was the cost of living crisis contains important insights into how price rises influence consumer behaviour. Predictably, people reduce expenditure, trade-down to other products and report lower customer satisfaction. Crucially, all these effects depend on what consumers believe has caused the increase.

To deconstruct and measure their relative importance, we ran a behavioural experiment. The protocol involved choosing between three products (e.g. basic, gold and platinum home insurance) and then repeating that purchase decision after prices had risen. This purchase task was drawn from across the five industries shown in Table 2. Different participants saw different price increases and one of the six inflationary causes listed in Figure 6. The appendix contains more details on the experiment design.

We measured two main outcomes. First, short-term sales impact was evaluated using the change in purchase likelihood between the pre-price rise and post-price rise product choice tasks. Second, we measured customer satisfaction after the price rise, using a composite 0 to 10 score driven by seven emotion ratings (i.e., how happy, annoyed, etc. are you?). In our experience, these composite scores contain more signal, and they are therefore more diagnostic than simpler methods like the Net Promoter Score.

Prior behavioural research on how people react to prices has found that perceived price fairness increases customer satisfaction (Herrmann et al., 2007) and that higher customer satisfaction in turn reduces the negative impact of price increases on purchase intention (Homburg et al., 2005). Perceived price fairness itself is higher when customers understand how a price was determined (Kim & Mauborgne, 1996; Maxwell, 1995), and so not communicating why prices have increased reduces fairness perceptions the most (Bieger et al., 2010; Ferguson & Ellen, 2013).

In terms of specific explanations, price increases due to excess demand are perceived as less fair than those due to increased costs (Kahneman et al., 1986; Bieger et al., 2010; Rotemberg, 2011), with cost-based pricing generally perceived as more fair than other forms of pricing (Kalapurakal et al., 1991; Tarrahi et al., 2016). Internally controllable costs, however, are perceived as a less fair reason for cost increases than exogenous causes (Vaidyanathan & Aggarwal, 2003; Bieger et al., 2010). In general, price increases are also more likely to be seen as fair when customers perceive a firm as benevolent (Rotemberg, 2011).

Given these findings in the literature, we made and tested the following hypotheses:

H1: Providing any price increase justification will reduce the impact of price increases on customer satisfaction.

H2: Price increase justifications appealing to cost increases will be more effective than justifications appealing to increases in demand at reducing the impact of price increases on customer satisfaction.

H3: Price increase justifications appealing to industry-wide causes will be more effective than justifications appealing to firm-specific causes at reducing the impact of price increases on customer satisfaction.

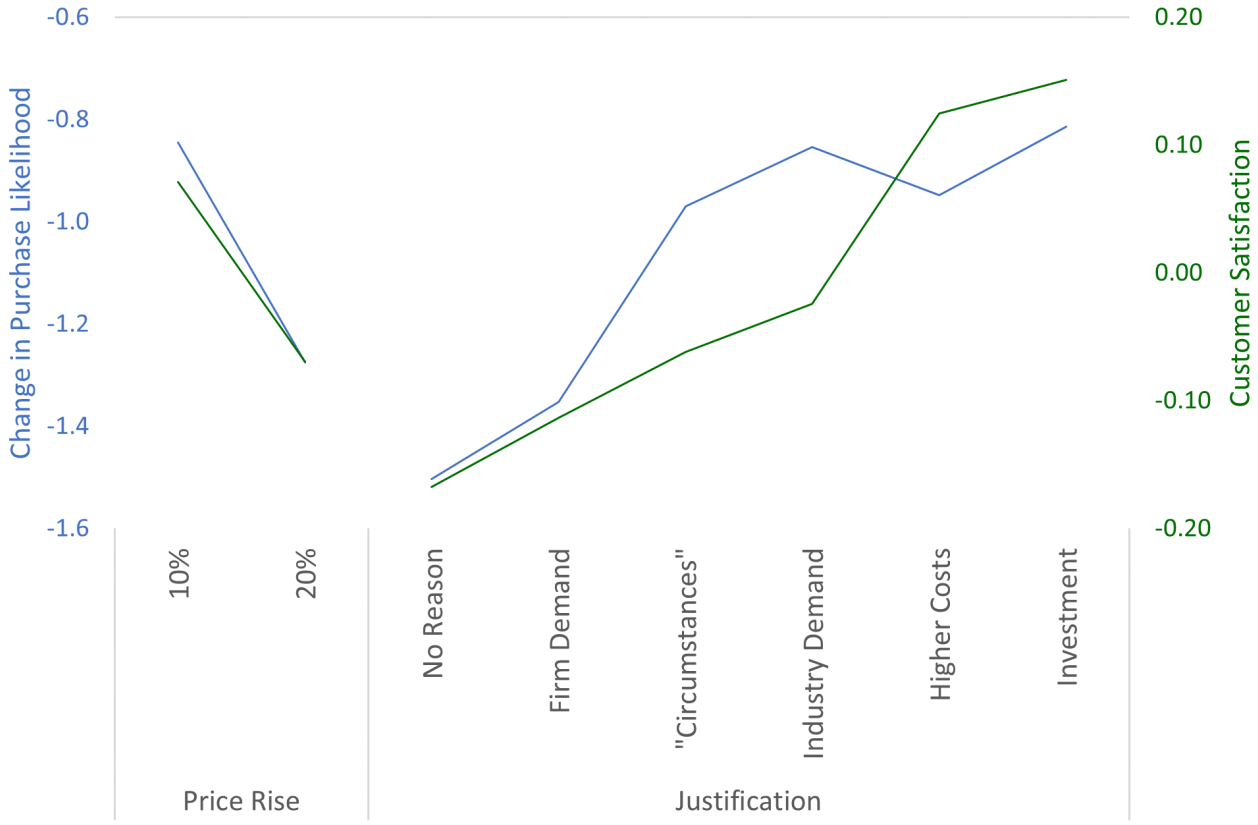

Figure 6: Customer satisfaction and purchase likelihood impact. *Source:* Dectech fieldwork, March 2023 (N = 2,021 nat. rep.). The experiment randomly increased prices and displayed one randomly chosen justification. Respondents chose one of three products and then indicated their purchase likelihood on an 11-point scale before and after the price rise. Customer satisfaction is an approximately N(0,1) principal component based on ratings for seven emotions, post-price rise. The graphic shows average scores from the sample. Effects were statistically significant in our models.

> *H4: Price increase justifications positioning the firm in a benevolent light will be effective at reducing the impact of price increases on customer satisfaction.*
>
> *H5: Price increase justifications that reduce the impact of price increases on customer satisfaction will also increase purchase likelihood.*

The changes in purchase propensity and customer satisfaction shown in Figure 6 have a consistent pattern, in that both are significantly worse after a +20% price rise compared to +10%. Likewise, some causes are better than others. Providing no reason has the most adverse effect, with exploiting increased demand next. The uninformative "due to recent circumstances" is better than nothing because at least the retailer has the decency to own the price rise. The best performers were having to pass through cost increases or needing additional funds for product development.

These findings are aligned with both the prior research and recent UK inflation experience. In 2022, people thought that energy price rises were partly caused by higher margins and that this was unfair. Conversely, airline price rises were seen as fairer because they were caused by the need for post-pandemic investment, higher input costs and greater industry-wide demand.

But perhaps the starkest finding from the experiment is the relative scale of these effects. Going from the best to the worst inflationary cause is equivalent to a +16% price increase. In other words, a +20% price rise with an explanation that you are investing in the product has the same sales effect as a +4% price rise without any explanation. Customer satisfaction is similar. Why people think retailers raise prices has a larger commercial effect than the amount by which they actually raise them.

Table 2: Customer Satisfaction Impact

Justifications	Overall	Telecom	Grocery	Insurance	Airlines	Streaming
No Reason	-0.17	-0.29	-0.23	-0.12	0.21	-0.30
Firm Demand	-0.11	-0.51	0.04	0.00	0.08	-0.32
"Circumstances"	-0.06	-0.24	-0.04	0.12	0.00	-0.15
Industry Demand	-0.02	-0.32	0.03	-0.02	0.13	0.00
Higher Costs	0.12	0.06	0.04	0.06	0.43	0.04
Investment	0.15	-0.21	0.35	0.15	0.42	0.02

Source: Dectech fieldwork, March 2023 (N = 2,021 nat. rep.). Overall customer satisfaction effects are the same as those shown in Figure 6. The other columns show the average scores from data restricted to the given category in the purchasing task.

Finally, and again resonating with the cross-industry effects seen during 2022, Table 2 shows how the impact of inflationary causes on customer satisfaction is not uniform, as different narratives are more or less effective across different industries. For example, whilst "Firm Demand" doesn't work well in general, it is particularly damaging in telecoms; putting prices up because there is a surge of people buying products, even when the retailer does not have supply constraints, really annoys people. Conversely, raising prices to invest in the product works particularly well in the grocery and airline sectors, where people want to see better ready-meals and new airplanes.

Recommendations

This research points to six main recommendations on how businesses should optimise, budget and communicate price rises in the future:

- **Correct Misconceptions**: Consumers' inflation perceptions are not well calibrated, and loss aversion means that over-estimates are twice as damaging as under-estimates. Businesses need to identify and remedy when and where they are being unfairly blamed for large price

rises that have not happened.

- **Engage price experts**: Great swathes of the market do not engage with prices: they may not care, or they might not have the time or the ability to deal with the issue. Any communications should therefore engage the 12% of consumers who do notice price changes and are interested in their causes.
- **Manage the Narrative**: Providing reasons for price rises has as much – if not more – of an impact on customer behaviour as the amount of price rise. Businesses need to communicate the narrative underlying any price increase. Providing no reason is typically the worst strategy.
- **Optimise the Justification**: Price rises that are beyond a business's control or will eventually benefit the customer work best. But we have tested a limited and generic set of reasons. Businesses should spend as much time identifying the optimal narrative as they spend identifying the optimal price.
- **Track Beyond Sales**: A successful price rise can be partly judged by using sales, but there are other long-term effects. Businesses should track these via word of mouth and try to shape that dialogue with appropriate call centre scripts, social media strategies and so forth.
- **Tailor, Tailor, Tailor**: Every product is different. Which customers are price experts differs. Which price rise causes are most credible differs. With this in mind, then, businesses should make sure everything is adapted to their specific product in this competitive market and at this stage of the economic cycle.

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APPENDIX: METHODOLOGY

Sampling

The primary research undertaken for this report was conducted online in March 2023, soon after the cost of living crisis ended and whilst those memories were still fresh in respondents' minds. Respondents were a nationally representative sample of 2,021 UK consumers aged 18 and over who were responsible within their household for purchasing the products later presented to them during the experiment (mobile contracts, groceries, home insurance, flights and/or streaming service subscriptions).

Behaviourlab

Behaviourlab is our bespoke online test platform that uses a randomised controlled trial to address key commercial questions more accurately. The method follows modern academic standards of eliciting consumer preferences and forecasting their behaviours.

This research involved putting participants through a realistic simulation of an online purchase task that was later repeated following a price increase (see Figure 7 for an example). Each participant was asked to purchase one of three products from one of five randomly chosen industries: telecommunications (mobile phone contracts), grocery store (selection of groceries), insurance (home insurance options), air travel (different class seats for a flight to Spain) and streaming services (different sized bundles of streaming providers). To proceed, participants had to purchase one of the presented products.

Following the first purchase task, participants were asked to answer various questions, after which they were again asked to purchase one of the products they had been shown. However, participants were also informed that the prices they had previously seen had increased due to one of seven randomly chosen reasons (see Table 3). Specifically, these reasons included: (1) no reason given by the company, (2) a rather vague "recent circumstances," (3) an increase in demand for the company's products, (4) an increase in demand within the entire industry, (5) cost increases for the company, (6) cost increases industry-wide and (7) to allow for more investment into improving products. To make sure participants

noticed the price increases, the previously seen prices were also shown just before the second task.

Table 3: Summary of Experiment Conditions

	Element 1	Element 2	Element 3	Element 4	Element 5	Element 6	Element 7
Industries	Telecom	Grocery	Insurance	Airlines	Streaming		
Price Increase	Small (10%)	Large (20%)					
Justifications	No Reason	"Circumstances"	Firm demand	Industry demand	Firm costs	Industry costs	Investment

After choosing a product in each journey, participants indicated their likelihood to purchase the product on an 11-point Likert scale, ranging from "Extremely Unlikely" to "Extremely Likely". By subtracting the purchase likelihood of the second purchase (after the price increase) from the purchase likelihood of the first purchase, we obtained a measure of the change in purchase likelihood. In addition to changes in purchase likelihood, we also saw some trading-down to cheaper products. Nevertheless, about 70% of respondents stuck with the same product, which is why we focused on changes in purchase likelihood as a better indication of short-term sales impact.

Participants were also asked to rate the product they chose in the first purchase task on a number of different perception statements and to rate how they felt after seeing the price rise in the second purchase task. The emotion prompts included "Happy," "Sad," "Annoyed," "Confused," "Interested," "Excited" and "Angry," and they were all rated on a 7-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree". Principal component analysis was conducted with these emotion ratings to find a hybrid measure of customer satisfaction. This score was approximately normally distributed (N(0,1)) and was used as an indication of the impact of price increases on long-term brand value.

Modelling

The analysis involved statistically modelling whether the size of the price increase and justifications shown affected the change in purchase likelihood and customer satisfaction. An ordinal logistic regression was used to model purchase likelihood, and a linear regression was used to model customer satisfaction. The purpose of modelling is in part to control for the impact of other information (such as consumers' age) and thereby isolate and estimate the effects of different benefits on the dependent variables. The set of controlling factors included personality traits, demographics and usual monthly spend on the product category presented during the experiment. Modelling also allows us to identify the statistically significant effects and avoid reporting insights that are simply noise.

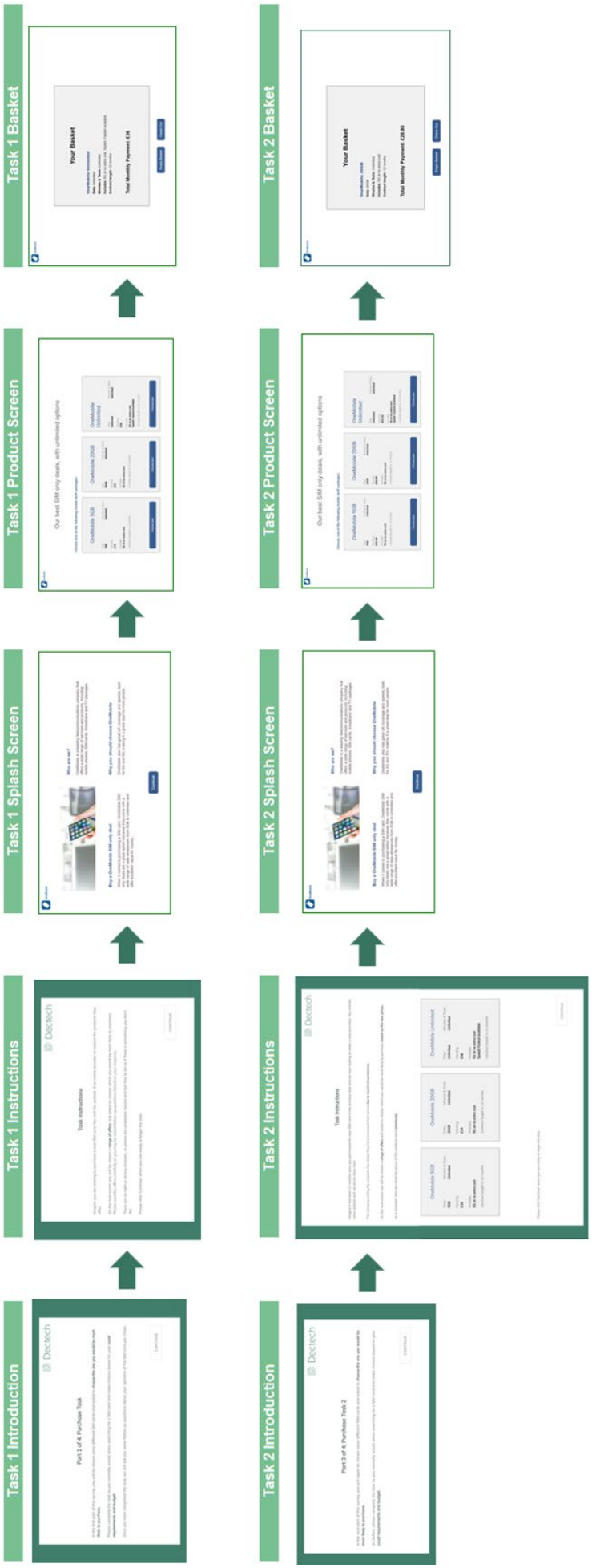

Figure 7: Example Product Purchase Journey

Transitioning to a Behavioral Insights Unit for Impact and Implementation

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Behavioral Insights Units (BIUs) have emerged globally as successful entities that use behavior science to tackle complex policy problems. Despite this success, these units face numerous challenges, ranging from scalability to contextual adaptation. This paper, based on our collaboration with UNICEF, envisions an ideal state of BIUs that deeply integrates the behavior insights lens across governments and their enabling ecosystems. However, to advance to this stage, a transitional BIU phase is proposed, emphasizing five core elements, namely, networked assembly, stable leadership with state buy-in, impact-oriented approaches, sustainability focus, and ethics and transparency safeguards. By adopting these elements, BIUs can transition towards this 'ideal state', where a BIU is more than a unit but becomes a mindset increasingly intrinsic to the policymaking process by using a behavior insights (BI) and human-centered design (HCD) process to solve complex problems.

Introduction to Behavioral Insights and Behavioral Insights Units (BIUs)

Behavioral science has been widely recognized for its potential to offer cost-effective solutions to key policy challenges. This recognition has spurred the global establishment of behavioral insight units (BIUs) since the late 2000s, initially in the UK and the US (Halpern & Sanders, 2016). Starting with novel policy experiments (Anderson-Carpenter et al., 2023), BIUs have become integral to decision-making in public and private sectors worldwide. Currently, behavioral insights are applied in over 300 institutions across 63 countries, demonstrating their extensive adoption (Hubble & Varazzani, 2023). This widespread implementation enables BIUs to tackle complex societal issues effectively, particularly in the domains of public health (Hallsworth, 2017), environmental sustainability (Rankine & Khosravi, 2021), financial decision-making (Muradoglu & Harvey, 2012), and social welfare (Hantula, 2019).

Furthermore, BIUs increasingly influence critical policy areas. For example, the UK's Behavioural Insights Team (BIT) increased tax compliance by highlighting neighbors' timely tax payments (The Behavioural Insights Team, 2014). Similarly, the Social and Behavioral Sciences Team (SBST) under the Obama administration boosted college enrollment by sending personalized text reminders to low-income students about pre-matriculation tasks (Social and Behavioral Sciences Team, 2015). Although the SBST was successful, it was disbanded in 2017 due to political shifts, thereby highlighting BIUs' vulnerability to external influences despite their effectiveness (Stillman, 2017).

Therefore, it is essential for BIUs to evolve their methodologies from their current state to mitigate such vulnerabilities. By focusing on the implementation of solutions, working in upstream policy development, achieving greater stakeholder buy-in, enhancing transparency and carefully considering

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ethical implications, BIUs can ensure long-term sustainability.

In this chapter, we present a perspective that advocates for *BIUs to transition to an ideal state where they are no longer separate units but are fully integrated into the mindset, thinking, and decision-making processes of key policymakers and on-the-ground functionaries. Achieving this ideal state requires passing through a transitional phase characterized by enhanced adaptability, ethical responsibility, and deep integration within policy systems.* In collaboration with UNICEF's India Country Office, we are part of an effort to develop state-led BIUs in six Indian states by rethinking the concept based on a comprehensive review of the lessons learned from existing implementations.

This chapter outlines strategic directional elements for the evolution of BIUs to address modern policy challenges and influence program design through behaviorally informed, human-centered solutions. It first assesses the current state and challenges of BIUs, then moves on to explore the ideal state as the ultimate goal, and finally delves into the transitional state, identifying five critical elements essential for navigating the path to this envisioned state.

Current State of BIUs

BIUs leverage behavioral science to enhance policy and organizational strategies, and they are able to achieve this while functioning within three broad organizational and operational structures. First are government BIUs, embedded within government agencies or ministries to directly impact policy, including examples such as the Behavioural Economics Team of the Australian Government (BETA), established in 2016, and similar units at the state level, like New South Wales (NSW) BIU and Victoria BIU (Afif et al., 2019). Additionally, the Ministry of Education (Minedu) in Peru established MineduLAB in 2016, a cost-effective innovation laboratory leveraging behavioral insights to enhance educational outcomes (Afif et al., 2019). Second, internal BIUs (Busara, 2022) reside within private and nonprofit organizations, improve organizational outcomes and engagement; notable examples include the Commonwealth Bank of Australia and Save the Children. Lastly, external BIUs (Busara, 2022), such as ideas42, Busara, and Final Mile, function independently and offer consultancy services across sectors.

The operational style and effectiveness of government BIUs are shaped by their institutional setup: centralized, decentralized, or networked (Afif et al., 2019). Centralized units such as Germany's, which is housed within the Chancellor's office, command broad mandates across departments. Decentralized units, like the UK's, operate independently across various departments, allowing for localized adaptation. Networked units, such as those in the Netherlands, promote collaborative strategies, thereby enhancing the cohesive application of behavioral insights (Afif et al., 2019).

From a review of literature on BIUs, and learnings from a decade of applying BI to various complex problems, the practice of behavioral insights has evolved from ad-hoc efforts and fragmented research to centralized and embedded demand and supply of behavioral insights, such that BI has become an integral component of the policymaker and development practitioner toolkit (Busara, 2022). They have transformed from small, experimental teams to integrated entities across government, internal, and external settings (Busara, 2022). Initially, these units began with the academia-focused technical expertise of a few (Ball et al., 2017), but they have now expanded strategically to incorporate various skillsets in policy, project management, and human-centered design (HCD). Despite their pivotal role, though, these units face challenges (Figure 1) that hinder their operational efficiency and impact. Central among these challenges are issues related to scaling interventions, the variability of effect sizes, and the adaptability of methods across diverse contexts (Bryan et al., 2021; Hallsworth, 2023).

Ideal State of BIUs

The recognition that government, organizational, and public policies need to adopt and integrate an understanding of human behavior (OECD, 2017; United Nations, 2016) and HCD (Blynn, 2021) is well established. However, current BIUs often operate with either an academic focus, which emphasizes research over practical application, or a consulting approach that prioritizes short-term projects over sustainable and embedded solutions (UNICEF, 2024; WHO, 2022b). These orientations create challenges in scaling interventions and achieving long-term impact. In order to fulfill initial ambitions and maximize the impact

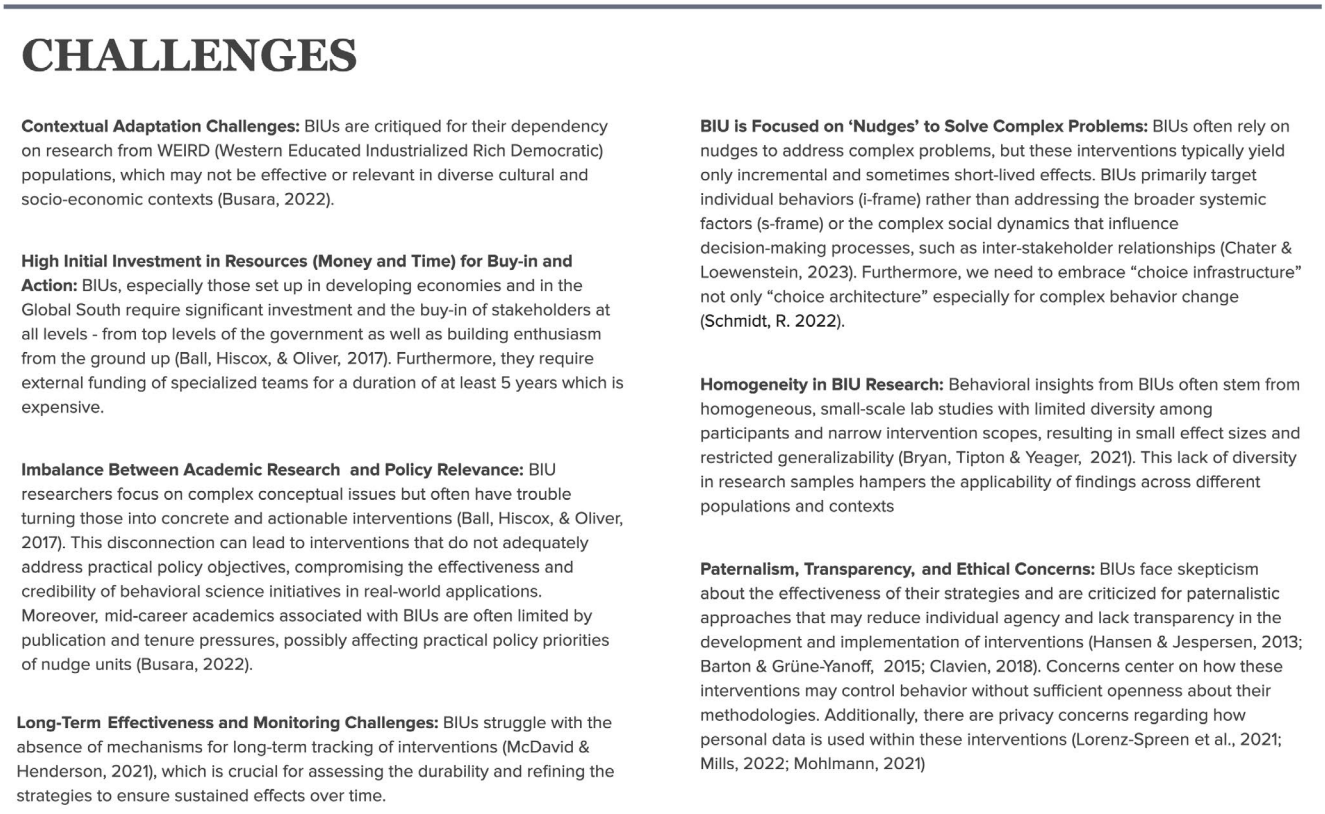

Figure 1: Challenges faced by BIUs.

of behavioral insights, significant modifications in the visions and operation of BIUs are imperative.

The envisioned ideal state of a BIU is not as a unit but as a problem-solving mindset integrating BI and HCD in governments and their ecosystems. This mindset involves keeping the end-user at the forefront of policy and interventions, by understanding their context, goals, cognitive limitations, heuristics, and emotions to shape effective policies, and co-designing sustainable solutions for behavioral change. This approach does not look at BI and HCD as expert-driven or top-down methods but rather leverages expertise and strengthens capacity across the entire system. Just as evidence-based policy has become deeply embedded in health systems and among policymakers (Brownson et al., 2009), BI and HCD should be ingrained in the policy-making process.

Building upon the existing foundation of BIU, the envisioned ideal state of a BI and HCD mindset is shaped by two trends. First, behavioral scientists are championing the implementation of BI within policymaking and advocating for its deeper institutionalization through approaches such as 'using BI as a lens' and the development of 'behaviorally enabled organizations' (Hallsworth, 2023) in which the influence of behavioral science transcends mere intervention design and becomes a core element permeating the entire organization. Second, building on our previous successful work in Kenya and Eswatini with the LISTEN model (Local Initiatives Scaled Through Enterprise Networks), working with communities of practice (CoPs) at local-community, regional, and national levels and enabling them through the use of human-centered design and a problem-solving mindset accelerates and scales up both current and new solutions for reducing HIV rates (Hanschke et al., 2021).

For the mindset to be seamlessly integrated throughout government and support its ecosystem partners, transforming BIUs from isolated entities into embedded components and with capacities running top-down and bottom-up is critical. The following elements are essential towards this endeavor:

Process: Implement an integrated BI- and HCD-informed problem-solving process across the government ecosystem that involves understanding the problem and co-designing solutions for behavior change with a behavioral and human-centered lens. Rather than a one-size-fits-all approach, adapt the process to different levels of government—national, state, and district—considering the varying degrees of rigor, scale, scope, and fidelity needed to meet

specific goals, needs, and constraints at each level.

Capacitation: Tailor capacitation efforts for the integrated BI and HCD process to the unique needs of the different levels of a government and its ecosystem. The focus should be on the varying degrees of rigor, scale, scope, and fidelity required at each level of government, catering to learners' needs to ensure the process is implementable and effective.

Structure: Build a bottom-up and top-down BI and HCD implementation system. Centrally, the focus would be on solving major national priorities through the rigor and precision of BI and HCD. Teams with diverse expertise should work on complex problems influencing policy and product design from an upstream position. These teams should employ rigorous sampling and tools to ensure the impact and applicability of their solutions, contextualizing them and implementing through a bottom-up district machinery.

At the ground level, the focus would be to address local issues with local resources (and budget) using the integrated HCD and BI process. These teams should leverage local administrative machinery to understand and address local issues, using a more agile and simplified BI process. This will enable the design of contextually relevant solutions within their sphere of influence, encompassing communication and service delivery while adhering to both district-level and broader state or national guidelines.

Sustainability will be inherent, as integration within the current ecosystem and processes will eliminate the need for additional resources. This will in turn ensure that behavioral insights are embedded into decision-making across government bodies and are considered early in the policy development process (OECD, 2017).

Five Elements of a Transitory State

To progress towards this ideal state of behavioral insights capability, which could take several years to fully develop, it is crucial to consider the elements of a BIU that is in the "transitional state". This interim phase requires strategic planning to bridge the current state with the end goals of the BIU that ultimately lay the foundation/groundwork for the internal capabilities that we aim to achieve. We have been working with UNICEF's India Country Office towards institutionalizing BI and building BIUs in a few states in India, based on the five elements of the transitory state.

For the transition state, the BIU's fundamental purpose is to be an action-oriented, implementation-focused unit that has an integrated BI and HCD process for research and design. Such a unit would be driven by strong BI leadership and a bottom-up philosophy whereby the unit uses expertise at every level to do research in the local context and pilot ideas in a rapid and an agile way. This will ensure not only a simultaneous process of research and design, as compared to a serial process of research followed by design, but also BI capacity being rooted at the ground level. The following elements comprising the transitional model of the BIU may vary in their manifestation, whether within or outside the government, or within an institution. In this chapter, we will be laying emphasis on units within the government, however these five elements should remain effective across structures

1. Networked Assembly

Government agencies are grappling with the best ways to integrate behavioral insights into their policymaking processes (Jones et al., 2021). To ensure the fundamentals of being grounded in the local context, being agile, and being application-oriented, an advanced networked model is proposed. This model provides avenues to build a network involving district officials, implementation partners, district-level program teams, state-level departments, BI research associates, and BI experts. This network assembly of the BIU entails the following:

Team multi-disciplinarity: It is imperative to staff the team with a blend of specialized skills that will help navigate the complexities of managing a project (Jones, et al., 2021). This should feature a multifaceted team, comprising experts proficient in not only behavioral sciences, but also human-centered design, economics, sociology, public policy, data science, and sector-specific knowledge. The 'BI Lead' and 'State Lead' of the BIU, respectively, must have technical expertise in the subject matter and the inner workings of the organization in which the BIU exists. Furthermore, the inclusion of seasoned professionals skilled in project management is imperative to its success. Including academics may also help expand the BIU's credibility and methodological rigor (Busara, 2022).

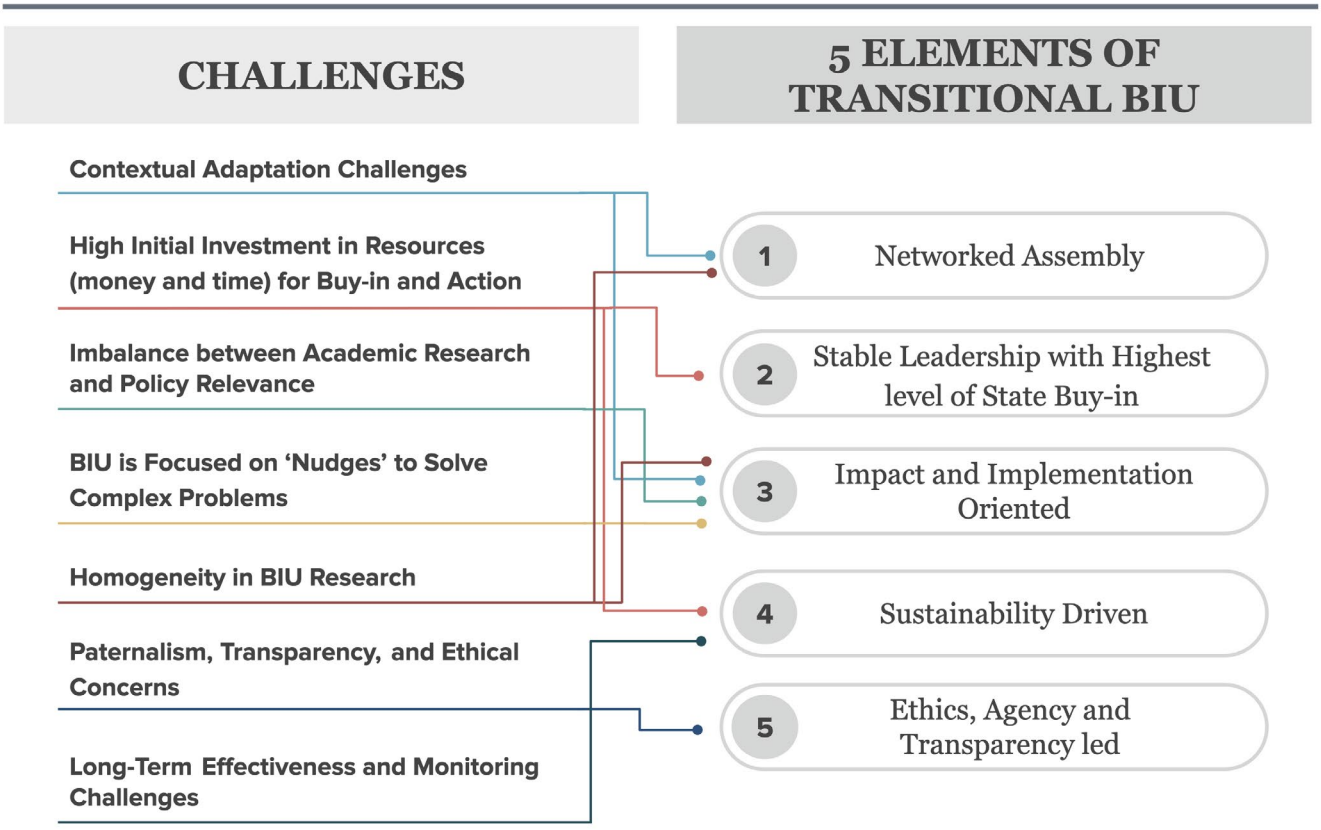

Figure 2: Challenges faced by BIUs mapped to the five elements of a transitional BIU.

Decentralized structure: Behavioral insights teams must be integrated throughout government structures at central, departmental, regional and district levels, especially at bottom-up levels encouraging collaboration across levels (Afif et al., 2019). This helps in bringing in bottom-up or grassroots expertise from district levels along with buy-in from the highest level. Implementing this structure will also help support a network-centric philosophy and enhance agility by allowing for the BI and HCD process to work at different levels with different fidelities.

Learning and coordination: The 'BI Lead/Expert' can serve as a facilitator of knowledge aggregation and an advocate for integrating behavioral insights into government policies. This will involve educating colleagues across levels and other stakeholders in the unit about behavioral science principles and the BI and HCD process through diverse knowledge-sharing initiatives (Hanschke et al., 2021).

2. Stable Leadership with the Highest level of State Buy-In

The BIU should have visibility and buy-in from the highest level of government for greater impact (WHO, 2022a). Such a buy-in may be either direct, where the government authority is directly involved in the BIU structure, or indirect (through a steering committee), where said authority provides its explicit support to the BIU. This would help with the strategic alignment of the goals and projects initiated by the BIU to contribute directly to overarching governmental goals. Being in close proximity to the government, however, could mean that the success of the BIU may be significantly affected by political shifts or changes in administrative structures in the organization (Jones, et al., 2021). To counter these challenges, it is crucial for BIUs to maintain steady leadership to see policies throughout the life cycle and have a longer-term mindset through shifting governmental priorities. This can be achieved by having two leaders at the top, namely a 'BI lead' and a 'State lead'. While the latter position may undergo changes, the former will provide stable, expert oversight.

3. Impact- and Implementation-Oriented

The BIU should be application-oriented, and its aim should be to implement behavioral insights generated by in-context research and not be restricted to solely insighting (Busara, 2022). It should also seek to create impact by using a BI and HCD process

focusing on understanding the end-user's needs and incorporating their considerations throughout the entire design process.

Decentralized hierarchy: Having a decentralized BIU ensures that research is context-driven, as it capitalizes on the government regional bodies' proximity to local communities and stakeholders, thereby allowing for a deeper understanding of local contexts and constraints. Furthermore, such a structure should enable agile testing and prototyping with both end-users and service providers, thus ensuring the interventions are more iterated and refined based on end-user feedback.

Data focused: State BIU credibility requires it to produce evidence and pilot interventions to demonstrate the effectiveness of the produced research insights. Qualitative methods can also serve as a valuable source of data in this regard, complementing quantitative methods by providing nuanced insights into the human impact of interventions and their contextual relevance. In regards to quantitative methods, randomized controlled trials (RCTs), while excellent in simpler contexts, may face challenges in more complex systems (Hallsworth, 2023). In certain situations, implementing a rigorous RCT to measure impact, while ideal, can be excessively time-consuming and resource-intensive. Given the dynamic nature of government environments and resources, exploring alternative evaluation methods becomes essential. Conducting quasi-experimental studies and pilots may be helpful in discerning how effective strategies are to achieve the desired outcome. Some examples include regression continuity design, propensity score matching, and the difference in differences method or agent-based modeling (OECD, 2019).

4. Sustainability Driven

The unit needs to be built for sustainability to create a continuous impact and support a BI ecosystem in the state.

Feeding off an existing ecosystem and partners: Units should tap into and contribute to the existing ecosystem of partners, stakeholders, and institutions. Current literature underscores the importance of aligning BIU initiatives with established networks, including government departments, academic institutions, non-profit organizations, and private sector entities (WHO, 2022a; Common Thread, 2020). Collaborative efforts can enhance the effectiveness of behavioral interventions, leverage diverse expertise, and ensure sustainability by embedding behavioral insights within existing systems. Additionally, ensuring the sustainability of interventions involves prioritizing practicality over novelty, and rather than pursuing interventions solely for their novelty, it is crucial to focus on those that align with the available context and resources, including budgets and personnel.

Integration with existing department and state ecosystems: Effective integration of the BIU requires efforts to embed behavioral insights into the fabric of state administration. This involves leveraging synergies within the state ecosystem, fostering collaboration with relevant departments, agencies, and policymakers. By aligning with existing priorities and strategies, the BIU can leverage resources, access data (Common Thread, 2020), and co-create interventions that address real-world challenges effectively.

Continual internal funding: Sustained funding for the BIU is critical for its success (Afif et al., 2019) and needs to be intentionally designed for. Current literature suggests that securing funding involves demonstrating tangible outcomes through small-scale projects that deliver measurable short-term wins (Ball et al., 2017). However, it is also crucial to establish a robust evidence base concurrently through longer-term, higher-impact studies to ensure sustainability over time (Ball et al., 2017). By thinking about sustainability from the start, a road map should be built for long-term sustainability by advocating for internal funding of the unit from diverse sources, such as integrating the BIU into an existing program that receives continuous funding through the national budget (WHO, 2022a).

5. Ethics-, Agency-, and Transparency-Led

"Nudge units" have faced increased scrutiny around using behavioral insights to change human behavior (BETA, 2023). Thus, applying BI raises several ethical considerations due to the involvement of data collection and analysis that goes beyond what is standard in policy, such as collecting primary data on individual- or group-level behaviors and leveraging these insights to inform policymaking (OECD, 2019). Ensuring ethical considerations in the

application of these insights from the beginning of the BI process to the end is paramount in guaranteeing that research conducted by the unit is in the best interest of the people.

Transparency: A major concern with behavioral sciences has been a perception of these fields leading to a 'nanny state' (Kuehnhanss, 2019), where paternalistic tendencies are feared. Maintaining transparency throughout the process, from the point of pre-registering trials to making findings from the study public by publishing research papers and blogs, is vital. These factors must be addressed in both real and perceived terms by ensuring:

a. Every intervention has in-built transparency.
b. People should be easily able to opt out, should they feel strongly against any of the efforts.
c. People should not be coerced or influenced into certain behaviors against their will.

Agency-led co-designing: A crucial part of the BI and HCD process is co-designing and intentionally involving the end-user in creating solutions by ensuring that they are not just passive recipients but also active contributors of solutions that directly affect their lives. Involving end-users and understanding their needs, preferences, and goals at every point of the process helps preserve agency and democratize decision-making. Additionally, the iterative nature of the process allows for more effective, tailored, and appropriate interventions that respond to a broader range of evidence (Richardson & John, 2021).

Data collection considerations: An implementation-oriented unit that strives to produce evidence requires supervision of data collection and analysis. This can be done by establishing an independent ethical review board or tying up with academic institutions' IRBs to help ensure compliance with all ethical review considerations (WHO, 2022a), thereby adhering to GDPR principles (GDPR, 2016) as a guiding framework for safeguarding personal data and promoting transparency. Furthermore, it involves building comprehensive, trauma-informed research and participatory research guides from the outset, designed to be essential reading for all project participants, iterating these guides over time to ensure that they abide by the evolving ethical considerations and community needs. Additionally, establishing clear guidelines for the use of AI for the purpose of data protection is essential.

Negative externalities: When designing interventions, it is crucial to engage in careful deliberation regarding both the short-term and long-term unintended effects or "spillovers" that could impact various stakeholders and systems. Furthermore, the literature increasingly contains discussions on 'spillunders' (Krpan et al., 2019) that lead to change in present behavior due to anticipations of behavior

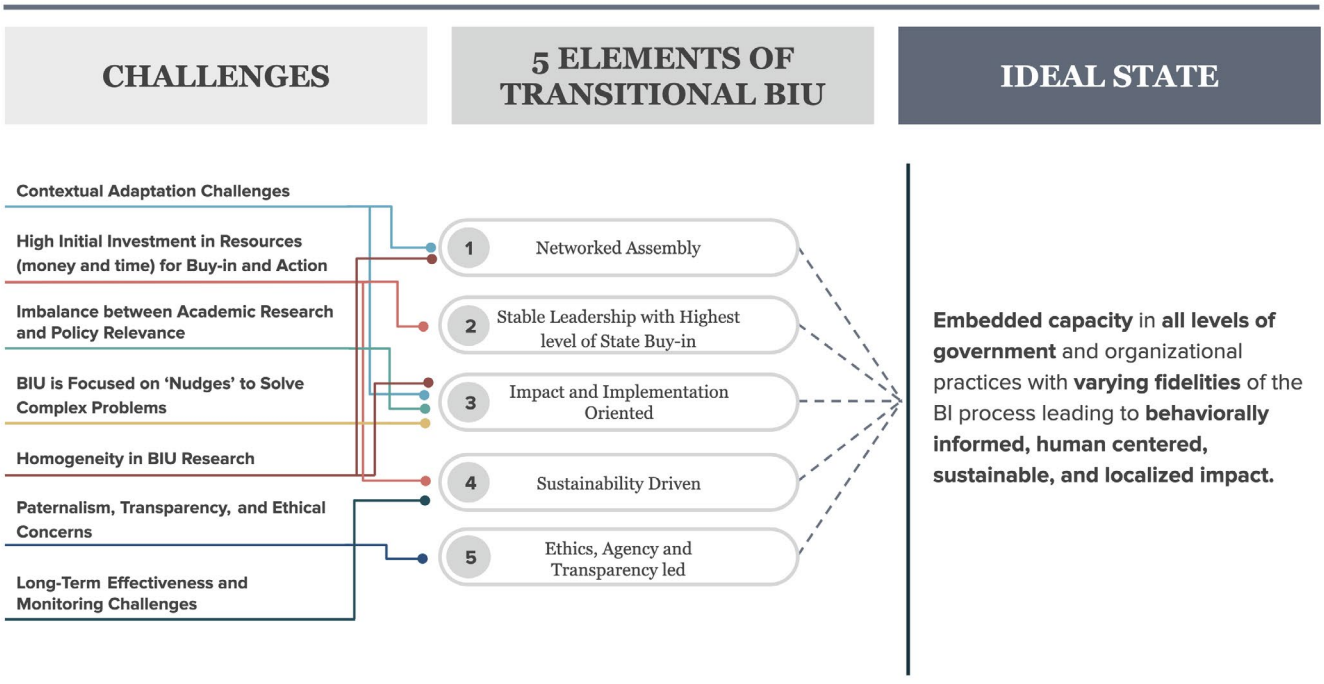

Figure 3: The five elements of a transitional BIU mapped to the ideal state of the BIU.

in the future. Therefore, assessing potential repercussions on individuals, communities, and broader societal dynamics helps ensure interventions are ethically sound and aligned with desired outcomes.

Conclusion

In conclusion, the widespread adoption of behavioral insight units (BIUs) underscores the increasing recognition of behavioral science's potential to address complex policy challenges. From their inception to their current role in decision-making globally, BIUs have demonstrated their effectiveness across various domains, including public health, environmental sustainability, financial decision-making, and social welfare. However, to maximize their impact, BIUs must evolve to a state where they are seamlessly integrated into policy development processes. In our collaboration with UNICEF, we recognize the necessity for a transitional phase characterized by strategic planning and adherence to five critical elements: networked assembly, stable leadership with the highest level of state buy-in, impact and implementation orientation, sustainability-driven approaches, and upholding ethics, agency, and transparency. By embracing these elements, BIUs can navigate the path towards their envisioned ideal state, where behavioral insights become intrinsic to policymaking, thus fostering human-centered, evidence-based solutions to contemporary challenges.

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A Recipe for Scaling at Speed: A Case Study of Reducing Food Waste in the UAE's Hospitality Industry

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Behavioral Science Group

At COP28, ne'ma (The National Food Waste and Loss Initiative) and the Behavioral Science Group (BSG) announced the results of their national scale-up of behavioral solutions to reduce food waste. The program reduced plated food waste by 8.3% in the hospitality sector across the UAE. These results were the culmination of 18 months of work, including system mapping and the pilot and scale-up of solutions. We describe our learnings across three project phases, unpacking the key steps of the process. First, we look at how system maps reveal market incentives and identify actors, which can offer solutions to captive audiences. Second, we recommend going beyond a single intervention by outlining a menu of nudges presented in a digestible way when exploring solution design. Finally, when designing the evaluation, we recommend stress-testing solutions during pilots, to ensure that they work when scaled to bigger batches.

Introduction: Moving From Pilot Studies to National Scale-up

'Nudges' are light-touch behavioral solutions often designed to shift the dial at scale (Thaler & Sustein, 2008); yet, very few graduate from pilot to scale-up. Those studying scalability argue that many nudges, however smart or elegant, are not designed to leave the lab's petri dish (List, 2022; List, 2024; DellaVigna & Linos, 2022).

In this article, we offer an example that has worked to scale behavioral solutions in the UAE to cut food waste.

Food waste is a critical issue in the UAE, and national policymakers have been keen to leverage behavioral science to reach an ambitious national target: reduce food waste by 50% by 2030 (ne'ma, 2022). Working towards this target, the BSG partnered with ne'ma, the UAE's National Food Loss and Waste Initiative, to test and rollout solutions.

In the year leading up to COP28 in Dubai, a coalition of partners[2] ran behavioral pilots focused on hotel canteens and restaurants. The first pilot targeted hotel staff eating at buffets in canteens, achieving an impressive 44% reduction in plated food waste (Ramsey et al., 2023). The second pilot was conducted with customers during Ramadan to reduce food waste at Iftar (i.e., the meal when Muslims break their fast), achieving a 12-15% reduction in food waste. Figure 1 shows the menu of nudges that were deployed in both pilots. In this article, we refer to specific restaurants or canteens across the hospitality industry, including high-end hotels, independent businesses, and many other settings.

After the pilot success, we swiftly moved to scale these impactful programs in restaurants, hotels, and canteens across the seven Emirates. As seen in Table 1, between 2022-2023, there was progress at speed to run the two pilots in a contained number of sites, followed by implementation at scale.

In the national scale-up, we engaged 220 hotels, restaurants, and staff canteens across the UAE. This flagship partnership curbed food waste by 8.3% in the UAE in a 10-week trial across the hospitality industry (see Figure 2). This amounts to 15.2 tonnes of food waste saved.

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2 The partnership was led by ne'ma, and included The Behavioral Science Group, The Behavioral Insights Team, and Acurro and Hilton.

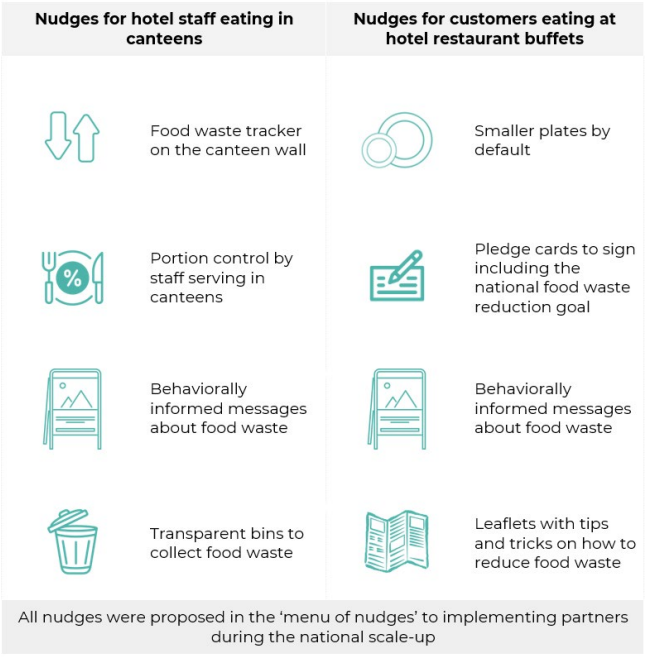

Figure 1: Nudges applied in the pilots and scale-up.

Wider studies looking at the effect of solutions by applied nudge units have an average effect size of 1.4% (DellaVigna & Linos, 2022; Simonshon et al., 2022). Achieving an 8% reduction, and saving more than 15 tonnes of food, is therefore both a significant and a substantial result for a scale-up. Even if there was a reduction in the interventions' efficacy compared to the pilots, as typical, the scale-up can still be considered highly impactful (List, 2024; Straight Talk on Evidence, 2018).

To implement the scale-up, we engaged a large number of hospitality partners, onboarded them onto a centralized data portal, and conducted workshops to co-create implementation plans. In these plans, the hospitality entities chose which nudges they would implement from the pilots, and how these would work as part of their business model.

Following COP28, ne'ma continues to promote these solutions across the industry.

Scope to Scale

Applied behavioral scientists need to unpack broad policy briefs, such as reducing food waste or increasing public transport uptake. To understand how to apply our discipline to deliver impact in a short time, careful scoping is key. The scoping phase should map complex systems and webs of behaviors, which will help identify where there is scope to scale at speed by tapping into touchpoints that leverage actors' incentives and access to existing audiences.

Start by Mapping the System to Find Solutions That Will Scale

Behavioral science experts often speak of moving away from the focus on individual behaviors to look at systems (e.g., Hallsworth, 2023, Del Valle et al., 2024, Chater & Loewenstein, 2022). However, to shape the system, you must see it, i.e., doing the groundwork to build a behavioral map is the first major step in designing solutions that can scale within complex systems.

Food waste is a complex issue, triggered by a web of behaviors from farm to fork. Hence, the project journey started with the development of a behavioral map across the value chain, scoping solutions that might be prone to scaling. The map was crafted by triangulating existing literature on effective interventions with

Table 1: Project Progression from Pilots to Scale-up

	Pilot 1	Pilot 2	National Scale-up
Stage	Pilot in staff canteen with hotel staff	Pilot with customers at hotel buffets during Ramadan	National scale-up with the hospitality industry in customer-facing settings and staff canteens
Number of sites	7 staff canteens	5 hotel restaurants	220 hospitality sites
Outcomes	44% reduction in plated food waste	12–15% reduction in plated food waste	8% reduction in plated food waste
Year	2022	2023	2023

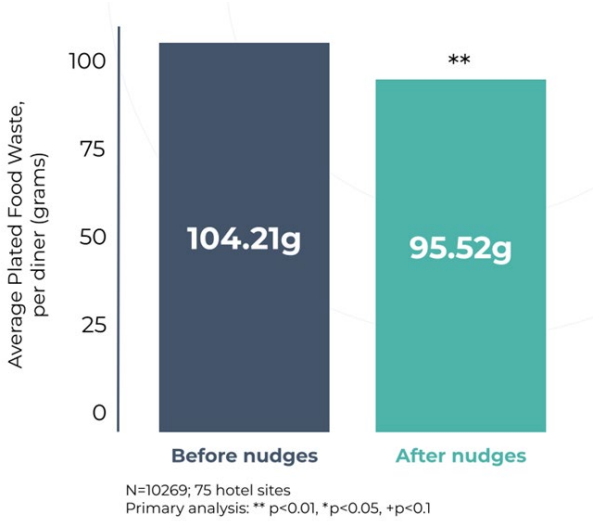

Figure 2: Results from the national scale-up.

data from focus groups, ethnographic fieldwork gathered in supermarkets and restaurants, and solution workshops with stakeholders.

This is a laborious process but should be considered an essential step for scaling at speed. Mapping food waste behaviors and the complex ecosystem of actors clarified two key elements: (1) actors' interests and (2) where we could tap into a captive audience at speed.

These factors helped us identify a target behavior for interventions: reducing plated food waste at canteens and hotel buffets. The following sections show why, among all the pathways for reducing food waste nationally, this was one of the best routes to have an impact in a short time frame.

Scope Solutions That Are Appealing for All

Our programs were set up to scale at speed because they aligned with both the hospitality industry's market incentives and our social impact purpose.

In fact, social scientists often fail to take into account that behavioral interventions are likely to make it out of the lab at speed *only* when they align with actors' economic incentives (Tembo, 2015; Hallsworth & Kirkman, 2020). The system map exercise and the ongoing initiatives clearly showed that hotels and restaurants were also interested in cutting plated food waste. Curbing food waste would help them both 'green' their business and improve their balance sheets.

A number of real-world examples of promising behavioral solutions have struggled to scale widely because of misaligned incentives. For instance, there are excellent studies on how redesigning the UX of delivery apps can reduce over-ordering—which in turn could cut both calorie consumption and food waste (Bianchi et al., 2022). Developing this type of evidence is essential in creating initial political interest before regulation can ensure that well-evidenced ideas are implemented. Naturally, this means it will take longer for ideas to spread in the real world.

Speaking practically, for a solution to be implemented quickly, on a voluntary basis, and without the need for regulation, it needs to align directly with industry needs. It should be noted, however, that sometimes you need to go beyond the existing wants and incentives of industry actors to be transformative.

Design Solutions for Existing Audiences

The second key step in designing readily scalable solutions is identifying which actors have captive audiences (List, 2022), as they do not need to recruit beneficiaries to implement solutions. In our case, the implementers (hospitality entities like large hotel restaurants) had a secure audience of hundreds of customers and staff eating on their premises every day. This access to captive audiences made hospitality a more suitable touchpoint to scale at speed compared to alternatives. For example, running a campaign to shift household behaviors would have required a gradual and slower approach to reach the target audience.

This stands in contrast to projects in which practitioners launch new digital products for social impact, without an existing user base. Even if at first glance these seem like scalable tools, promising low unit costs, they can be just another product competing for our attention in an overcrowded digital ecosystem (e.g., Kizilcec et al., 2020; Kopka et al, 2023).

Solve to Scale

Once the starting point has been identified on the system map, it's time to design the solution. We provide two recommendations for designing impactful solutions that can be implemented and scaled at speed. The first is to design a range of solutions, while the second is to craft a user-friendly and well-designed guide for implementation. This will become an invaluable tool that can help partners choose which solutions they want to adopt, and how to self-implement.

Offer a Menu of Solutions From Which to Choose

In the solution design stage, we suggest designing a menu of simple solutions, rather than offering only one option.

As depicted in Figure 1, both our pilots rolled out a set menu of four nudges, one designed for hotel customers and one for hotel staff. In the national scale-up, different players chose to implement different nudges; i.e., some opted for the full course, while others limited themselves to the messaging. This flexible approach helped ne'ma's recruitment for the initiative. Having multiple options is particularly beneficial when working with a range of diverse partners, as it allows for tailoring to different settings. For example, providing customers with small plates may not be a suitable option for fine-dining restaurants, where chefs plate artistically on oversized plates.

Giving partners a menu of solutions can help overcome internal organizational frictions and gain swift permission to implement interventions—an essential factor when designing solutions to be scaled at speed. This links to an interesting idea recently proposed by Thaler, *permission bias for implementers* (Thaler, 2023). Permission bias is the idea that lighter-touch nudges, often in the form of messaging, are more likely to gain the permission to be rolled out. On the other hand, more intensive choice architecture changes often do not obtain any permission for implementation.

A menu of nudges can help overcome permission bias in two key ways.

First, it can boost the impact of pilots, thereby helping in a swift transition to scale-up. There is evidence that combining behavioral solutions in what is dubbed 'multi-component interventions' can have higher impacts (e.g., Ashton et al, 2019; Podina & Foder, 2019), which may be why this approach helps deliver pilots with large effect sizes (such as our 44% reduction in pilot 1). Substantial effects are key to gaining momentum when moving from a pilot to scale-up at speed.

Second, having a choice between nudges can help implementers pick the solutions that are best suited to their business practice and organizational culture. We know that choice architecture nudges are likely to have greater effects than messaging interventions (Mertens et al., 2020). This was also seen in our scale-up, in that entities that chose to implement smaller plates by default saw larger effects than those only opting for messages. However, it is often easier to get swift permission to implement light-touch messaging, rather than altering the design of spaces in a more substantive way. For example, offering smaller portions of commonly wasted breakfast foods like croissants requires shifting several kitchen operations and recipes. Hence, offering a menu with a choice of implementers can help involve players with different internal frictions to change their practices. This flexibility helps in rapidly implementing impactful choice architecture nudges for those less affected by permission bias, rather than opting everyone into messaging nudges.

This pragmatic approach seeks to reframe the 'kitchen sink' to a 'menu of nudges'. Those trained in behavioral labs advocate testing one intervention at a time, to establish causality in a reliable way, which is why testing more than one intervention at once is dubbed the 'kitchen sink', thus emphasizing the messy nature of the process. Nevertheless, in the real world, hungry for impact, policymakers often implement many things at once. Creating a perfect testing condition, without considering the interaction of multiple interventions, is likely not to resemble the real conditions in which these policies will be implemented.

It is key to note that in our pilots, we did not venture into uncharted territory but combined solutions that had already been tested (Reynolds et al., 2019).

Design a User-Friendly Menu to Help Partners Choose Solutions and Implement Them

In addition, investing in the design of the nudges menu will pay off. In this regard, ne'ma designed an easy-to-use guide to help partners in their nudge selection and implementation (ne'ma & BIT, 2022). The guide was visual and carefully designed to be user-friendly for implementing partners, thereby making it an invaluable tool to make the process digestible to the wider network of partners, and thus enable scaling with minimal support. Figure 3 shows an extract from the guide that ne'ma provided to hospitality entities, setting out a clear path for implementing solutions (see Figure 3).

Figure 3: Extract from the ne'ma guide for hospitality: How to reduce food waste, using three low-cost nudges.

Test to Scale

The next step following the scoping and solution design is testing the intervention and measuring impact. During the pilot phase, we recommend stress-testing the interventions to see if implementation is easy and does not require non-scalable inputs like talented individuals. This is a first step in understanding if solutions will swiftly scale. When moving to effectiveness testing, we suggest looking beyond experimental methodologies balancing pragmatism

and rigor. Finally, we recommend building a digital data collection infrastructure to measure impact across large samples in limited timeframes.

Stress-Testing Solutions in Pilots to Show Their Scalability

Pilots are often designed to test efficacy, not effectiveness (List, 2022; Mobarak, 2022), which means assessing whether the solution works in highly controlled conditions with the highest quality of inputs. This is akin to breeding a new seedling which flourishes in ideal greenhouse conditions, and then expecting it to take root in the wild. Instead, it is essential to stress test the creation in the lab, to explore whether it might bloom outside.

As our pilots involved a contained sample of sites, they were designed via block randomization. In practice, this meant that in order to have sufficient observations for experimentation, restaurants were randomized to implement the nudges during some weeks but not others (Ramsey et al, 2023). During this process, it became clear that the nudges could be easily applied and removed. This stress-tested the interventions, showing that they could be applied with ease and with little reliance on highly trained individuals on duty. Having interventions which are agnostic to implementers' skills is essential for scaling (List, 2022; List et al., 2021). Our pilot corroborated this idea.

Using Experimental Methods When Piloting and Considering Other Methods When Scaling

It was beneficial to use experimental methods when piloting, but we used a pre- post design during the scale-up evaluation. Since we were working at speed in the lead up to COP28, running a large-scale randomized controlled trial to test the impact across 220 sites would have generated significant complications for our implementation.

The need for a control group would also have been difficult to sell to entities, all of which wanted to boast food waste mitigations for the global conference. From our experimental pilots, we were confident of the efficacy of the interventions. After the scaling process, we sought to measure effectiveness with a pre-post design, which was a strategic choice to balance the pressure to maximize tangible impact with the rigor of our practice.

Building the Data Infrastructure to Measure Outcomes at Scale and Ensure Longevity

Lastly, we recommend creating the right data collection infrastructure when scaling. During the pilots, kitchens measured food waste and reported it on hand-written sheets sent later to the research team. This process, however, was too resource intensive. As a result, ne'ma worked with the BSG to design a centralized platform data portal where entities could upload data. Creating and on-boarding partners onto this tool was an essential step of scaling. More importantly, the tool may incentivize other evidence-based approaches to tackling food waste-related issues. By starting to establish a national baseline on the levels of food waste in the UAE, it allows future initiatives to input data on this platform. For example, during Ramadan 2024, the team used the same platform to measure whether there was a spike in food waste in hospitality.

Conclusion: A Recipe for Scaling at Speed

In this article, we offer a case study of how our program moved from pilot to scale-up. We suggest three key ingredients for applied behavioral scientists aiming to scale at speed.

Scope to scale: Designing an effective and scalable solution requires plenty of background work to understand the system and its actors. This is a necessary set-up cost to scale at speed. The upfront cost to map the system from farm to fork helped reveal key details, such as market incentives and intervention audiences.

Solve for scale: When working with a wide range of implementing partners with different business operations and capabilities, offering a range of options fast-tracks a scale-up. Our pragmatic approach consisted in offering implementers a menu of evidence-based nudges, which was presented through easy-to-use tools like a guide or playbook. This flexible approach also helps those who face less friction to implement more impactful choice architecture nudges.

Test to scale: When designing pilots for a future scale-up, stress-testing the intervention can go a long way to seeing if it will take root in the wild. Our block randomization approach helped test and establish that the solutions were quick and easy to implement for our partners. While experimental methods can be

the best option for a pilot, considering quasi-experimental methods for the scale-up can help swift en masse testing. This is particularly important when all partners in a national project are keen to benefit from an intervention and may feel short-changed if allocated to the control group. Last, building the necessary data infrastructure can simplify the scaling process, but it can also secure the longevity of the initiative while embedding evidence-based policy in organizations for the future.

Partner Acknowledgement

This article explores the flagship work delivered by the Behavioral Science Group (BSG)—a specialized unit within the Office of Development Affairs, which is part of the UAE's central government. The success of this work was largely due to the collaboration and efforts of our partners.

Special recognition goes to ne'ma, the National Food Loss and Waste Initiative, for initiating and spearheading this call to action and bringing trusted partners on board. ne'ma is a reflection of President His Highness Sheikh Mohamed bin Zayed Al Nahyan's vision and call to action to reduce food waste, encourage social responsibility, and promote sustainable practices across the food supply chain.

The Behavioral Insights Team (BIT), as strategic partners of the BSG, played a pivotal role in running the initial pilot project and scaling the impact of the program.

Other private-sector partners were essential in running the pilots and scale-up.

A special thanks go to Acurro as our key partner in the first pilot, and Hilton to enable the second pilot, while the scale-up would not have been possible without a number of partners across the UAE's hospitality industry.

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From Insights to Ownership: Community-Led and Behaviorally-Informed Action for MMR Vaccination Uptake in the Philippines

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AHA! Behavioral Design

The Philippines is the second-highest country in the East Asia and Pacific region, and fourth in the world, in terms of numbers of children with no vaccinations against measles, rubella, and polio (WHO, 2023). Increasing immunization is a challenge across the globe, but solutions must be localized. Using behavioral and cultural insights, AHA! Behavioral Design (AHA! BD) worked with local communities to create intervention tools to nudge Filipino caregivers to vaccinate their children. The first intervention targeted the planning behavior of the caregiver, while the other concentrated on the side-effect management behavior of the caregiver. The results showed that from the first dose to getting the second dose, there was a significant relationship between use of planning behavior tools and vaccination uptake. This is an opportunity for policymakers to address low immunization by using a planning behavior intervention that communities can sustain.

Introduction

The Philippines is a low- to middle-income country (LMIC) in the Asia Pacific with a population of 108 million, making it the world's 13th most populous country. It has a government-led Expanded Program on Immunization (EPI) that provides free vaccines, from infancy up to 5 years old, against 13 vaccine-preventable diseases, including measles, mumps, and rubella (MMR). While this basic immunization is "mandatory" under Republic Act 10152, the law does not punish refusal to have the vaccines.

The EPI started in 1976 but is still short of meeting its target to immunize 95% of children fully (Ulep & Uy, 2022), and the country is still playing catch-up in terms of MMR vaccinations, with the Western Pacific facing the risk of an outbreak (WHO, 2024). In 2019, a decline in immunization resulted in an outbreak in the country (Raguindin et al., 2021), resulting in a series of concerning numbers: a 335% increase in measles and rubella cases from January to November 2023, compared to the year before (Montemayor, 2023). According to the Philippine Institute for Development Studies (PIDS), a state think-tank, there is a gap in the DOH's "delivery system, financing, and leadership" that adversely impacts EPI performance (Ulep & Uy, 2022). Compounded by uncertainties and misinformation during a previous controversy surrounding a Dengue vaccine, as well as the COVID-19 pandemic, vaccine hesitancy increased in the Philippines, as the perceived importance of vaccinating children decreased by 25% (UNICEF, 2023).

The major barriers to vaccine confidence in the Philippines are trust, underestimating the severity of the ailment, and access to service (Busara & Save the Children, 2022). The AHA! BD study is based on the premise that vaccine hesitancy has multiple layers of determinants (Baldwin et al., 2023). Nudges, therefore, need to be targeted and precise. The study looked into primary caregivers' behavioral and decision-making contexts to understand vaccine hesitancy further and to develop contextualized solutions.

AHA! BD worked closely with local communities to identify the best nudges for Filipino caregivers to vaccinate their children. Intervention tools were

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designed in collaboration with the community and tested across stages. The study moved forward to another level of intervention through social marketing program development galvanizing BHWs Workers, as the first-line community health service implementers to own the program.

The World Health Organization (WHO) has drawn up a five-year framework for Europe to "set a regional course of action in the field of behavioral and cultural insights (BCI) for better health in the region" (WHO, 2023). AHA! BD seeks to contribute to that vision by pioneering the integration of BCI into health-promotion innovations. This study employed a pioneering method of socio-cultural insighting to go beyond nudges and move toward evolving specific facets of the subculture, as this precision leads to a more tailored and impactful intervention and lays the groundwork for a social health movement.

Key Moments in Caregivers' Vaccination Journey

The study was conducted from March 2023 to February 2024 and divided into two stages, namely designing and testing. Stage 1, or the design, was divided into four phases. At each level, the team identified target behaviors, biases and moments. *Phase 1* conducted qualitative interviews with 36 caregivers to define the problem.

It was further cemented that MMR vaccination truly lies in the decision of caregivers, who access information about vaccines through a variety of sources. In the Filipino context, immunization is a big challenge for BHWs (local workers) because they are the primary sources of information, especially in rural areas, and although different media can have an influence, BHWs' intimate access to caregivers makes them the most effective in communicating information in this regard. The study's original scope did not tackle the vaccination status of the caregivers, or determine whether this would influence their decisions on behalf of their children; however, it does present an interesting avenue for future investigation.

Moreover, existing literature uses segmentation based on psychographics, but a unique point in the study was segmentation based on context and target behavior. The team segmented the caregivers into two groups: those whose children had no doses, and those whose children had been administered one dose but did not go back for the second one.

Phase 2 involved another round of in-depth interviews, with behavioral insighting involving 72 caregivers and 18 influential social actors to give the team a clear picture of a caregiver's vaccination journey. The team identified four key moments (Figure

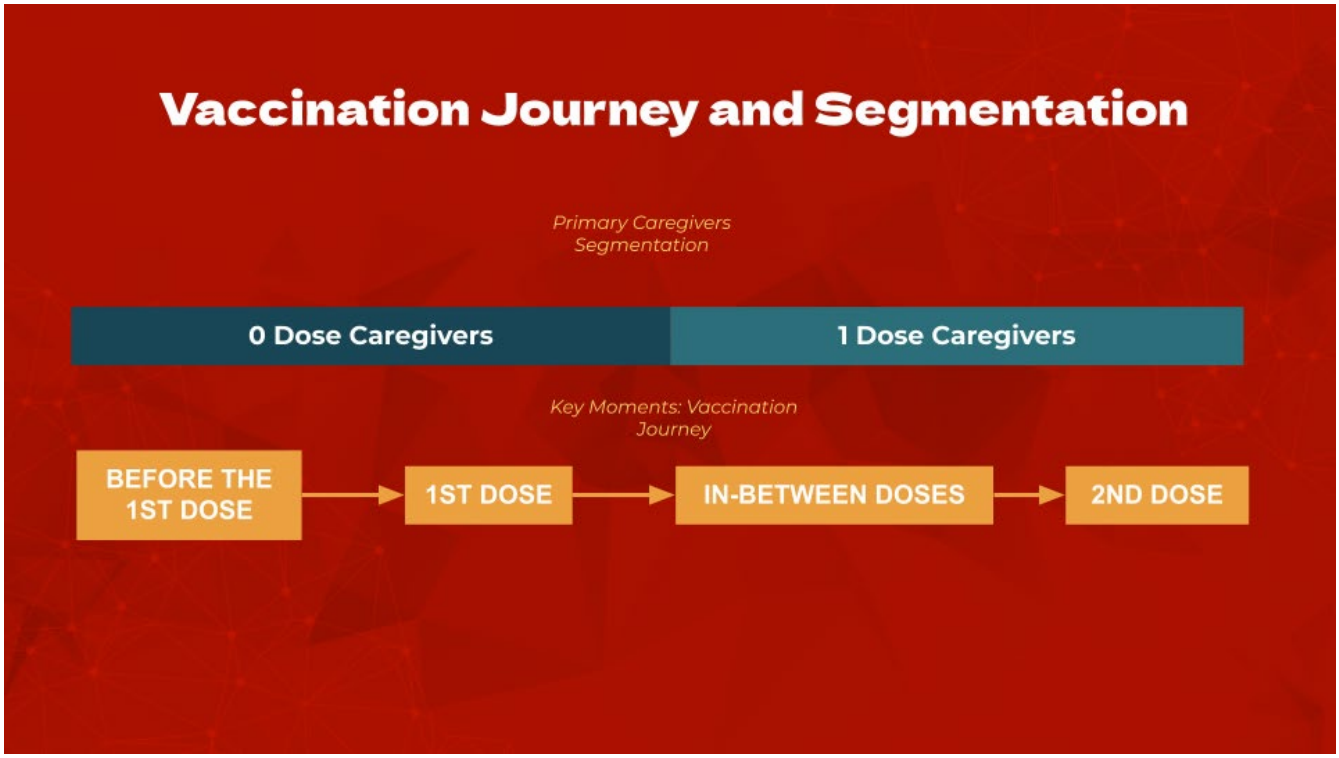
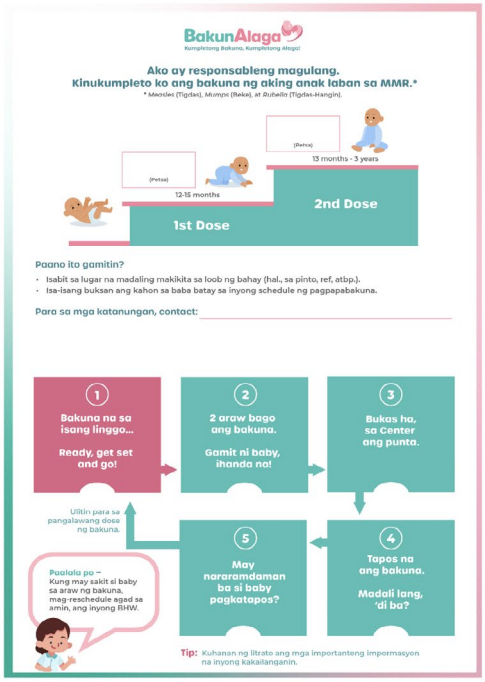


Figure 1: Caregivers were divided into two groups. The zero-dose caregivers went through the first two stages in the vaccination journey, while the single-dose caregivers progressed to the two last stages.

PHYSICAL



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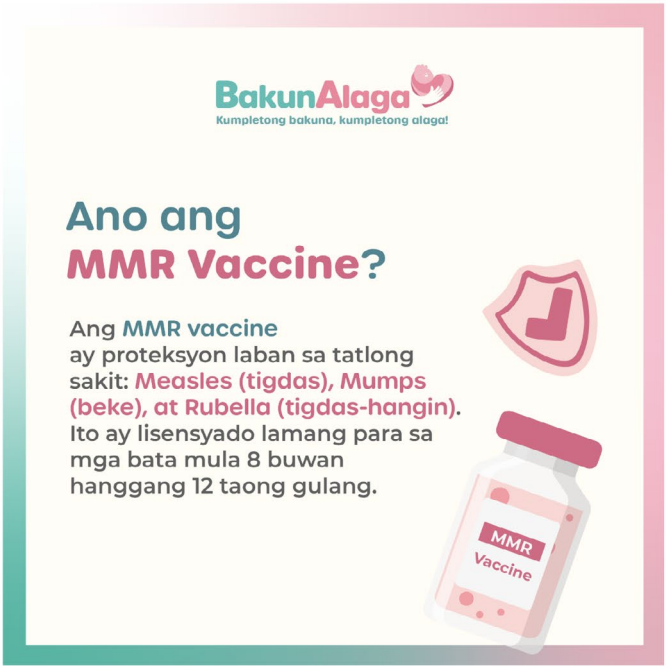

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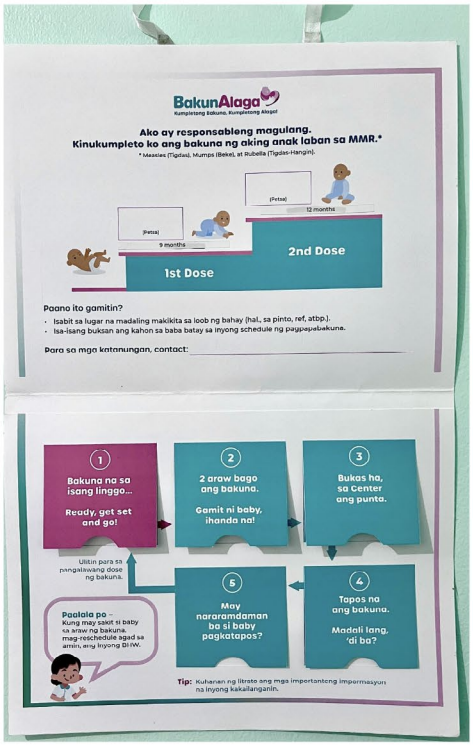

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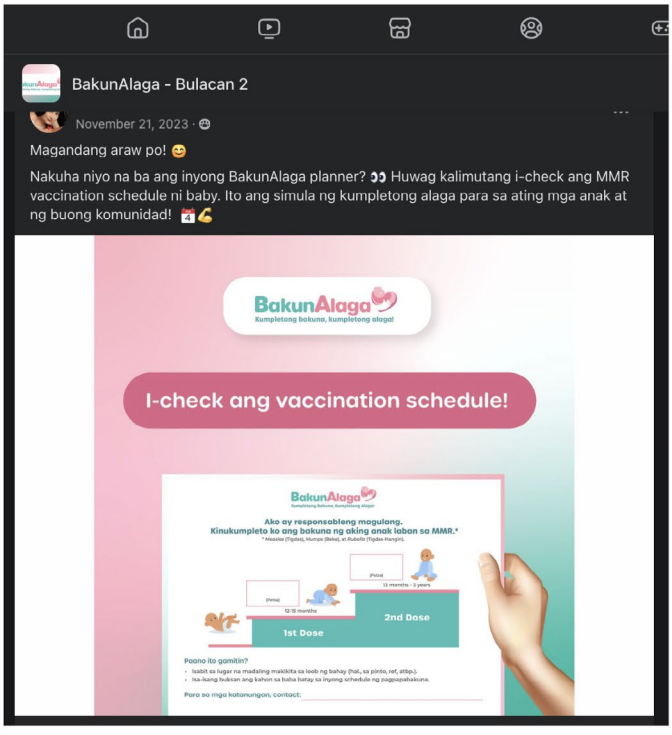

Figure 2: This prototype emphasized key messages relating to reducing friction and the difficulty of planning behaviors, as well as increasing the intention to secure a scheduled date.

1), i.e., 1) before the first dose, 2) during the first dose, 3) in between doses, and 4) during the second dose.

Before the first dose was the point at which caregivers tried to distill all information about the vaccine, highlighting the role of BHWs in order to debunk misinformation. The team developed bite-sized information, incorporated into the two intervention tools, to help caregivers move past the first moment.

During the first and second doses, caregivers balanced all the information with practical concerns such as schedule conflicts or leaving the house on the vaccination date. This insight led the team to design an intervention tool that would help a caregiver plan for a vaccination.

In between doses was the moment when anxiety heightened because of possible side effects, which is why the team designed the care kit as an intervention tool to help caregivers manage any such issues.

Behavioral and Cultural Insights for Interventions

Stage 1 *Phase 3* involved ideation and prototyping through a Behavioral Design Sprint workshop, participated in by both caregivers and BHWs. The team co-designed two prototypes with the community to target their planning and side effect management behaviors.

These prototypes were designed based on the key insight that during their vaccination journey, caregivers often rely on mental shortcuts, or heuristics, to make their decisions. During the insighting stage, the team also found a profound shift from planning behavior before vaccination to side effect management behavior thereafter. The planning tool and the care kit were therefore designed based on four main operating biases: *implementation intention*, *friction reduction*, *social norming*, *and appeal to altruism*.

To nudge the caregiver to vaccinate, the planning tool encouraged caregivers to write down vaccination dates as a way to make them commit, using the *implementation intention* principle. Prior research highlights the importance of an intention to implement a goal, rather than a mere intention to achieve it (Gollwitzer & Sheeran, 2006), for example by increasing the number of plans that result in a positive health behavior (Hagger & Luszczynska, 2013). A Guatemalan study, for instance, found a 2.2% increase in the likelihood of vaccination if caregivers were given reminders (Busso et al., 2015). The team's planning kit had multiple plan-making prompts such as writing dates, and ticking off a checklist for vaccination needs, which includes securing a household caretaker for any vaccination days. These multiple prompts ensured that caregivers would "specify the when, where and how aspects of the plan" (Rhodes et al., 2020), thereby minimizing the chance of forgetting to go through with the desired behavior. Furthermore, the planning kit's checklist and other reminders were also based on the principle of *friction reduction,* i.e., reducing barriers to goal behavior. WHO has defined convenience as a key factor for vaccine hesitancy, but the planner provided convenience through a simple list of information points leading to vaccination. Moreover, the behavior change wheel identifies enablement as a key intervention, which includes reducing barriers or making vaccination accessible and convenient (Michie, 2022).

The care kit to help manage side effects was based on the *social norming* principle, i.e., normalizing side effects as a component of vaccines. Social norms play an important role in public health, particularly vaccination (Vriens et al., 2023). Norm-setting to drive vaccination uptake in a low- or middle-income country (LMIC) like the Philippines must include messaging on side effects (Solís Arce et al., 2021). The fact that the care kit included an art card about one's responsibility to the community was an *appeal to altruism*—a type of an identity-based messaging that has been found as a key vaccination driver. Specific to this prototype was: *"Ako ay isang responsableng magulang at mamamayan na may ambag sa kaligtasan at kalusugan ng aking komunidad* [I am a responsible parent and a member of society who contributes to the health and safety of my community]". Research has found that more than presenting facts, listing those who will benefit can actually encourage positive behavior (Cucciniello et al., 2022). The kit also included a thermometerand fever medicine.

Proof-of-concept testing involving 156 caregivers was conducted from August to October 2023 during Phase 4 of Stage 1, using quantitative data analysis techniques, specifically ANOVA and paired t-test analysis. Initial findings from this stage revealed a meaningful link between how often the tools were used and the perception of the vaccine's benefits. Exposure to the prototypes also led to greater

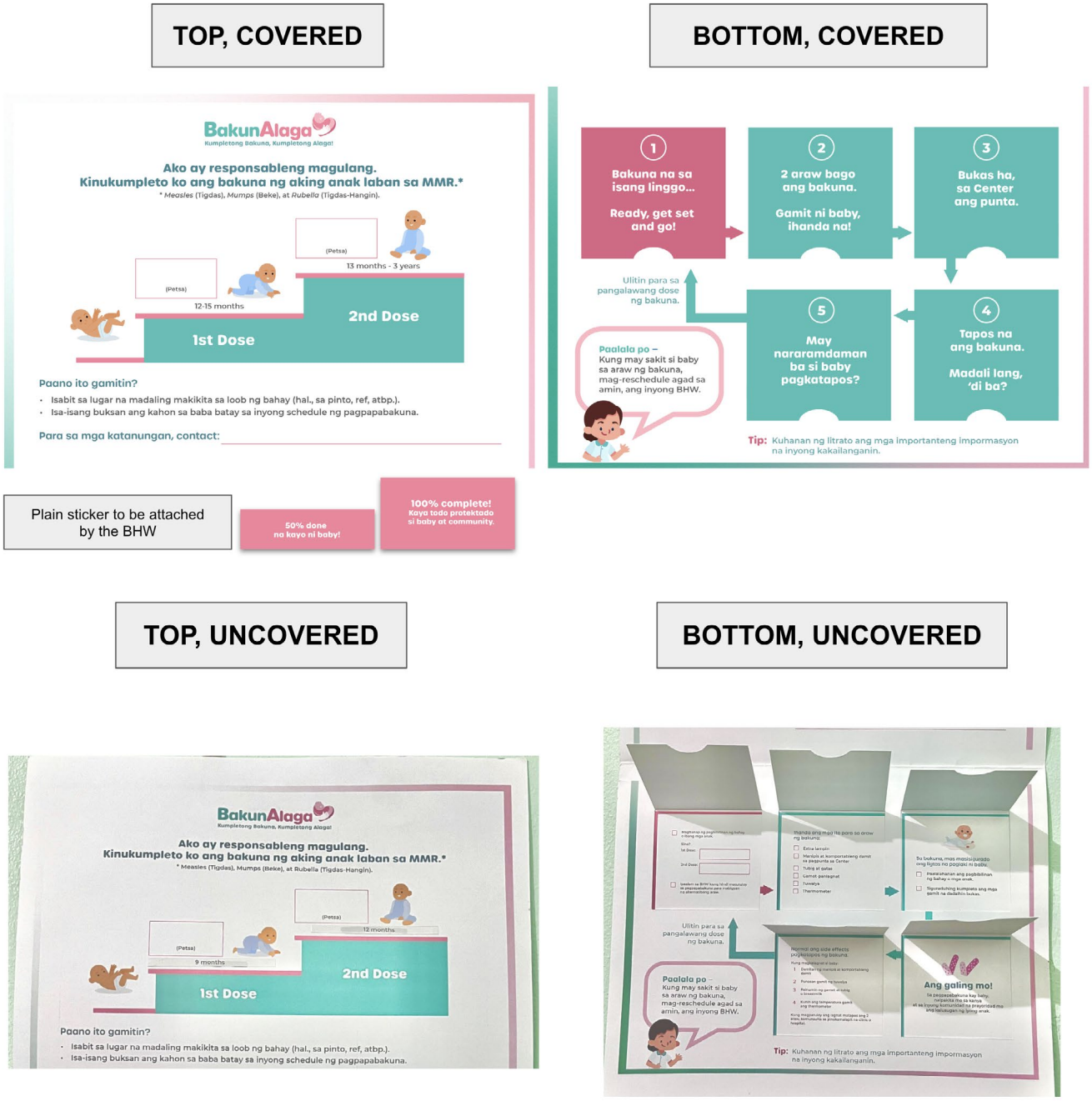

Figure 3: This prototype emphasized key messages relating to reducing friction and the difficulty of planning behaviors, as well as increasing the intention to secure a scheduled date.

openness toward MMR vaccination. These key insights became a crucial foundation for Stage 2A, or scaled testing, which sought to establish causality using a *difference-in-difference* methodology.

Relationship between Intervention and Behavior

The testing stage covered 143 *barangays* (villages) located in three regions, namely, Central Luzon, MIMAROPA, and Central Visayas. They were selected because their collective five provinces and 12 municipalities had the highest increases of measles in 2022. It is important to acknowledge that these pilot sites may not be a perfect representation of the overall country, because they did not include highly urbanized areas, albeit sites with the highest MMR increases were indeed rural and peri-urban areas, thereby reflecting the urbanization level of most areas in the Philippines (Gray et al., 2022). The study's future second stage, or the social marketing

Figure 4: The BakunAlaga kit emphasized key messages appealing to altruism and their identity as caregivers for their children and their community, as well as increasing social norms in terms of normalizing vaccine side effects.

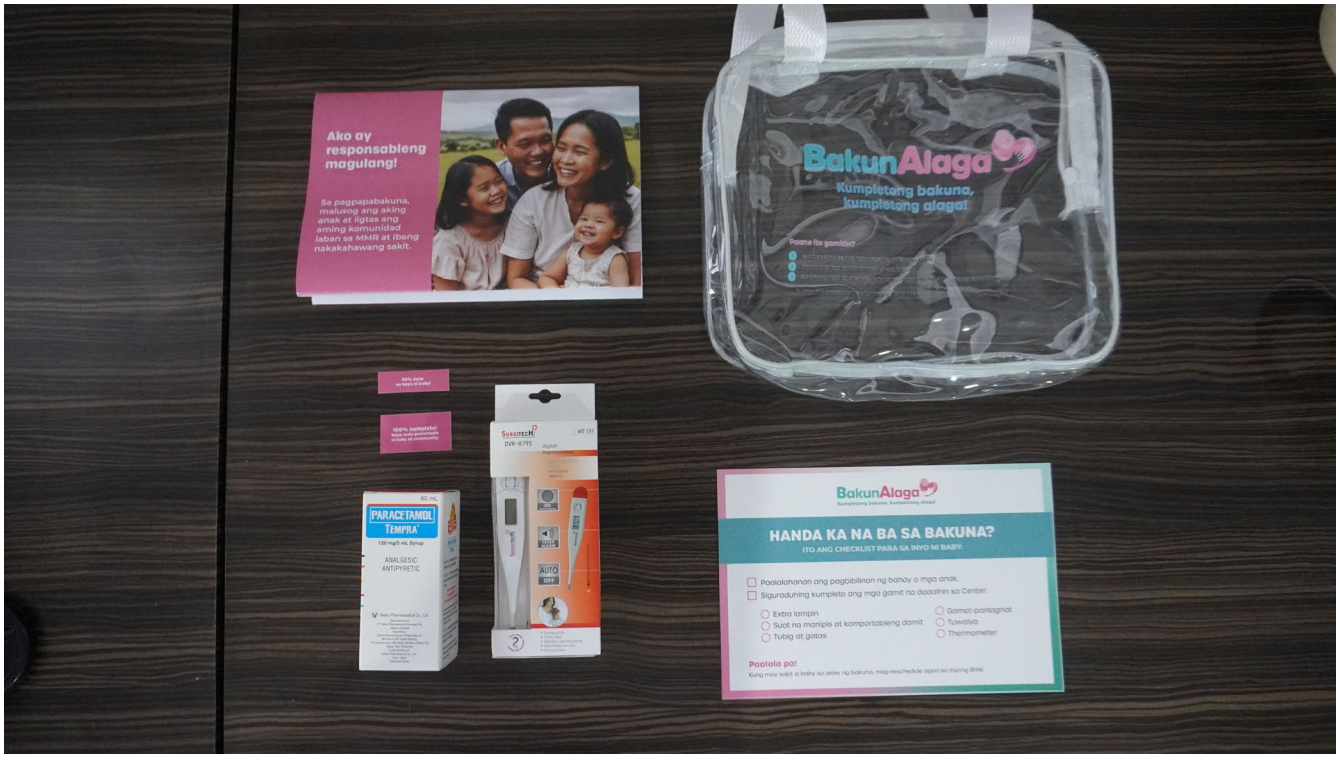

Figure 5: Actual BakunAlaga Kit provided to the caregivers during 2A: Scaled Testing

development program, addresses this gap because it will allow communities to tweak interventions to their specific contexts.

The main question of the study was whether the intervention tools drove MMR vaccination uptake. To find an answer in this regard, Stage 2A involved conducting a scaled testing using a difference-in-difference among 699 qualified caregivers who were divided into three groups. The first group was a control group, the second treatment used the planner, and the third used the care kit. Sampling size per group was based on a hypothesized percentage of vaccination incidence, with a power estimate of 80% and an alpha of 0.05. Any possible attrition was also accounted for. To increase data robustness, participants were randomly assigned to the groups after they passed eligibility checks, and they were not made aware of the treatment rationale of the group to which they

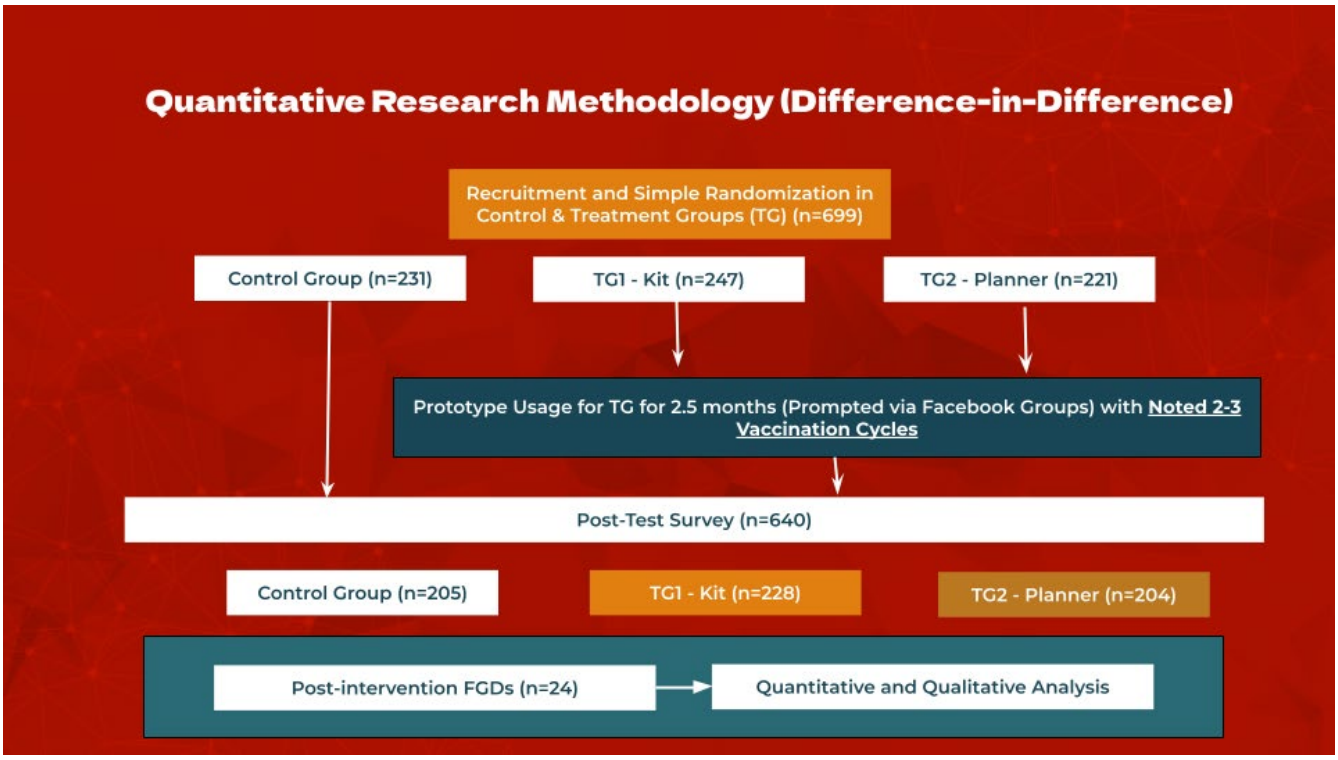

Figure 6: Difference-in-difference quantitative research methodology.

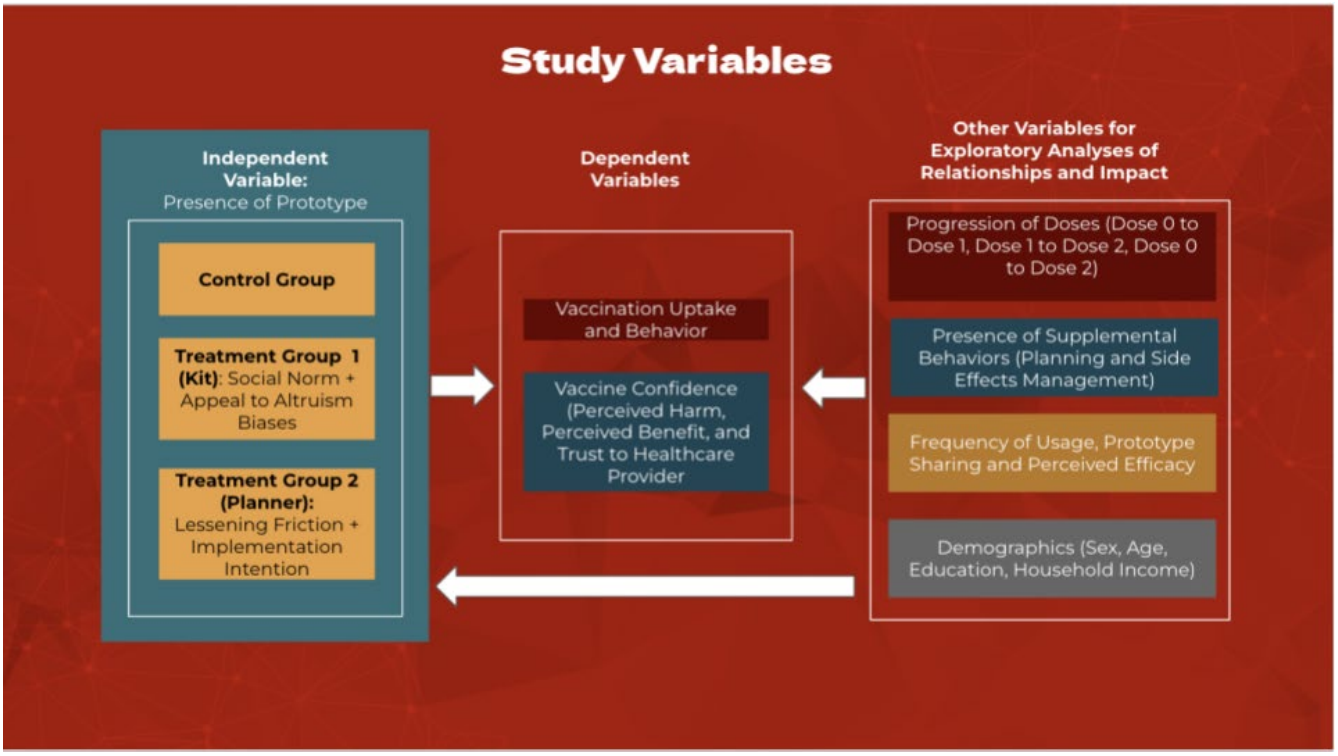

Figure 7: Schematic diagram for the study variables. The study looked at whether there were other factors (e.g., dose progression, supplemental behaviors, efficacy, demographics) that influenced prototype usage, overall vaccination behavior, or vaccine confidence.

were assigned.

After two-and-a-half months, with two groups utilizing the intervention tools, 640 caregivers returned their self-administered surveys (Figure 6), which were then used to gauge vaccine confidence, using the standard eight-item vaccination confidence scale. To determine if there was any vaccination uptake, the team used these self-administered surveys, which were verified and confirmed with the information on the caregiver's baby book (record of vaccination) and

provided by their healthcare center. Post-tests that did not pass data triangulation, or those who reported positive vaccination behavior but were not verified either in the baby book or by the health center, were removed from the final analysis. In the analysis, the following inference criteria were utilized to draw conclusions on the data:

- Significance of p-value – p<.05
- Comparison of conditions across all dependent variables through ANOVA
- Strength and direction of relationship between variables

The study also employed an exploratory analysis (Figure 7), using other variables such as demographics, frequency of usage, and perceived efficacy, to see if they had any relationship with or an impact on the outcome.

Planning Behavior Emerges as Critical

Looking at the vaccination uptake results using linear-by-linear association yielded key insights, especially for the planning tool. There was a discernible linear trend and a pronounced difference between treatment groups when data based on the dose progression (Figure 8) were analyzed. For 0- to 1-dose participants, the kit group (4.5% increase) and the planner group (10.2%) had a higher vaccination uptake compared to the control group. Even more significant, for the 1- dose to 2-dose participants, the planning group had a much higher (42.1% increase) vaccination uptake than the kit group (18.4%) and the control group. The 1-dose to 2-dose progression trend indicates that the planning tool is a potentially effective nudge for a caregiver who has had an initial vaccination but did not proceed to another dose. This strong statistical analysis in the second dose moment provides future researchers with a key insight, because lower utilization rates for the second MMR dose have been a challenge (Dalaba et al., 2023) due to the moment's layered determinants.

Further analysis also revealed that after utilizing the intervention, the planner group exhibited improved planning behaviors, especially in terms of the following:

- Having someone watch over their house on vaccination days, before and after the interventions (F=52.01, p<.05)
- Preparing things to take on vaccination days, before and after the interventions (F=32.62, p<.05) and across the different conditions (F=8.33, p<.05)
- Writing a vaccination schedule (r=.17, p<.05) in easily-seen places, showing that it was more likely that a child would get vaccinated if the vaccine schedule was written in a visible space.

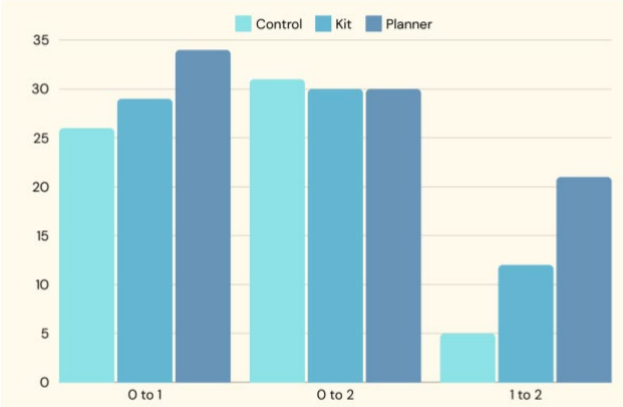

Figure 8: Difference in overall vaccination uptake across groups, post-intervention. The graph shows that only five caregivers from the control group had the second dose, whilst 12 caregivers who used the kit had the second dose, and 21 caregivers who used the planner had the second dose.

These findings strongly suggest that planning is a critical factor in improving vaccination rates. Anecdotal evidence from select BHWs further supports this conclusion.

The study also wanted to identify whether the interventions would improve vaccine confidence, using latent variables such as perceived benefits, harms, and trust. Exploratory analysis revealed a positive association between the frequency of usage of an intervention, particularly the planning tool, and an improvement in vaccination confidence. Using the correlation coefficient as a statistical measure ('r'), the data indicated that as planner usage increased, so did the perception of trust (r=.215, p=0.31) and benefit (r=.287, p =.004). This demonstrates the strong potential of a planning tool to enhance vaccine confidence. If perceived benefit is high, then so is overall vaccination behavior. The same trend has been established for trust in healthcare providers.

An added insight was noted in the perception of harm (Table 1). The data illustrated that for caregivers who had one dose toward their second dose, perceived harm about vaccines increased for both the planner and the kit groups. Only the control group exhibited a decrease in perceived harm over time, which suggests

that perception of harm is not necessarily a barrier to vaccination behavior and confidence, because even as it increased, feedback on the efficacy of the intervention tools was predominantly positive, particularly for the kit (M = 4.14, SD = 1.03) and the planner (M = 3.52, SD = 1.42). This may indicate that if a caregiver perceives the vaccine as having a harmful element, they are more likely to plan for vaccinations and manage side effects.

Empowering Caregivers and Easing the Burden on Health Workers

The study revealed that caregivers are beginning to be self-reliant when vaccinating their children. BHW participants observed that since the study, caregivers are now calling either to follow up on their schedule or to inquire about schedule: "Now, because of what they read and hear about the importance of baby vaccines, especially MMR, many are messaging us, asking about the vaccination schedule and if they [adults] can still get vaccinated, even if they're no longer within the age range for vaccination," one BHW said in Filipino. Another BHW said that house-to-house visitations had decreased since the study, saying that more caregivers are now aware that healthcare centers have weekly vaccination clinics.

The study implemented Stage 2B, or social marketing program development, using a pioneering socio-cultural insighting method with 30 community members composed of BHWs, primary caregivers, other family members, and village leaders. Stage 2B yielded a groundbreaking framework for creating community-specific profiles and examined factors such as accessibility to health centers, efficacy of communication channels, and the presence of vaccination advocates. The social marketing program kicked off using campaign materials, one of them a card on which they put in their name, address, and contact numbers, which was then put in a drop box. This card was an indication to the BHW that they were interested in vaccination. Another campaign material was a poster listing a number of vaccination benefits, on which a BHW would fill out their name and contact details, for caregivers to contact. This type of tailored campaign gave caregivers a sense of ownership. Ownership intervention, such as labeling a vaccine by the recipient or caregiver's name, invoked a sense of ownership and was cited in one study (Dai et al., 2021) as a nudge toward Covid-19 vaccination.

Limitations

The typical interval between doses is three months, but the testing stage was limited to only two-and-a-half. Although communities have shorter waiting times than the typical three months, the test's 2.5-month period may still be a confounding variable. The Department of Health's (DOH) expanded immunization program was ongoing, which could have also influenced the behavior of the participants. In addition, the fact that the testing phase coincided with the holiday season may have disrupted the regular vaccination schedule. Furthermore, it is also plausible that caregivers might have missed a vaccination cycle due to travel, family gatherings, or other holiday-related commitments.

Sustainable Design for Filipino Communities

The study promoted behaviorally-informed interventions to protect a person's agency, rather than infringe on their autonomy. The intervention tools allowed caregivers to plan for their children's vaccinations and manage any side effects. The results highlight a strong relationship between improved planning behavior and increased vaccination

Table 1: Relationship Between Harm, Tool Efficacy, and Planning Behaviors

	Perceived Harm (Post)	Planning Beh 1	Planning Beh 2	Planning Beh 3	Planning Beh 4	Planning Beh 5	Managing Side Effects
Test efficacy	.23*	.15*	.22*	.15*	.20*	.21*	.16*

* *Note:* p<.05

behavior and confidence.

As some caregivers still lacked meaningful internet connectivity, social marketing development adopted a blended approach involving social media and house-to-house visits. During the campaign, other *barangays* (villages) asked for a linkup with their own BHWs: "They even accompanied me to the BHW's house, and since then, I have always kept in touch through Facebook Messenger. The Barangay Captain was even the one who called me to welcome me," the BHW said. Policymakers have a real opportunity to adopt similar planning interventions tailored to their own contexts.

Additional research supports the notion that in other LMICs like the Philippines, nudging toward immunization can be achieved through trusted messengers in a social network. The same research provides evidence that planning tools, or reminders, are an effective nudge in other LMICs (J-PAL Policy Insight, 2022). Potentially unique to the Philippine context is the role that BHWs or local health workers play in that social network. The Philippines has a well-established network between families and BHWs, and nudges that target specific local beliefs and customs might be effective, albeit only in countries with a similar system.

AHA! BD will employ a multi-sectoral approach to disseminate the study and collaborate on strategies to scale up the program, and even to identify key points that can inform other immunization programs. There are no new nudge strategies to date, for example, to increase COVID-19 vaccination in the Philippines. Moreover, as of this writing, a policy brief has been sent to all 24 members of the Senate, 12 members of the House of Representatives, and four officials of the DOH. The Senate Majority Leader asked the team for a presentation during this year's budget hearing period. Another senator endorsed the study to the Secretary of Health. AHA! BD is optimistic that community-driven campaigns using the study's framework will help boost the country's immunization from the ground up.

THE AUTHORS

Timothy John "TJ" Agulto spearheads the Vaccine Confidence Fund Implementation-Research Project as its principal investigator, leveraging a robust background in Behavioral Design. He maintains an ongoing collaboration with Dr. BJ Fogg, the pioneering figure at Stanford University's Behavioral Design Lab, enhancing his expertise in the field. TJ has received personal training from global thought leaders in Management and Organization Development at MIT's Presencing Institute. His academic journey includes completing a course on Behavioral Insights in Public Policy at Harvard Kennedy School. Active in several prestigious organizations such as the International Behavioural Public Policy Association and the Behavioral Science Group of the United Nations Innovation Network, TJ is pivotal in advancing the application of behavior and decision sciences, both locally in the Philippines and internationally.

Maria Shairra Alyssa "Shairra" Bello holds pivotal roles as a founding partner and the head of the Behavioral Innovation and Insights Unit at AHA! Behavioral Design. As the first Philippine-based behavioral scientist, she utilizes her extensive skills in behavioral insighting, testing, analysis, and design to drive innovative solutions aimed at increasing MMR vaccination uptake in the Philippines. Shairra earned her BS in Psychology with a minor in Marketing from Ateneo de Manila University, and she furthered her education with a Master's in Behavioral Sciences from Durham University. Her academic and professional accolades include receiving the highly selective Atlantic Fellowship for Health Equity in Southeast Asia. Her leadership in the project integrates these diverse experiences, emphasizing equity and community-specific strategies.

Mary Louise "Louise" Rivera is advancing her expertise by pursuing a Master's in Health Social Science at De La Salle University, having previously obtained a BA in Psychology and a BS in Business Administration from the University of St. La Salle. A certified psychometrician with additional certification in Good Clinical Practice (E6), Louise applies her substantial research capabilities across various sectors to design and implement effective behavioral interventions. She bridges theoretical research with practical applications by pioneering Behavioral and Cultural Insighting (BCI) methodologies in the Philippines—ensuring that strategies are both evidence-based and contextually adapted for maximum impact.

Rachel Angela "Rachel" Gutierrez studied Business Economics at the University of the Philippines

Diliman, and she has led numerous award-winning initiatives in public relations and social marketing. As the social marketing lead for the project, Rachel conceptualized and spearheaded the development of the BakunAlaga campaign—utilizing behaviorally and culturally informed social marketing frameworks to craft messages that effectively reach and resonate with community members, thereby fostering greater vaccine confidence and uptake. Their strategic approach combines Applied Behavioral and Decision Sciences and Behavioral Economics principles with marketing and communications expertise to enhance community engagement and health communication.

John Dominic "Dom" Rodriguez is the program manager for the Behavior Change Lab for Healthier Filipinos & Communities at AHA! Behavioral Design. He graduated cum laude with a BA in Communication Research from the University of the Philippines Diliman. His extensive background in health includes roles such as healthcare research execution lead at a multinational consulting company, as well as global partnerships manager at an international health-tech social enterprise. These experiences have deepened his understanding of health issues and community needs, which he adeptly applies to his current role. Dom has furthered his professional development by attending international conferences such as the UCL Center for Behaviour Change Conference, focusing on Behavior Change for Health and Sustainability. His expertise is instrumental in steering the project's initiatives towards enhancing community health outcomes through innovative behavioral interventions.

Christopher Joshua "CJ" Villaester, a BS in Psychology graduate from Ateneo de Manila University, is Manager for Behavioral Insights and Innovation within the Vaccine Confidence Fund Implementation-Research Project. As a board-certified psychometrician, CJ holds additional certifications in Emotional Design Psychology, Behavioral Economics in Action, and Good Clinical Practice. His robust experience with multinational organizations significantly contributes to his leadership in terms of managing the research aspects of the project. CJ's role is pivotal in ensuring technical excellence and the precise application of Applied Behavioral and Decision Sciences, driving the project's initiatives forward with rigorously developed, culturally attuned, and scientifically validated implementation strategies.

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How Machine Learning Can Reduce the Behaviour Tax by Informing Hyper-Personalised Nudges

PAUL NIXON[1] AND EVAN GILBERT

Momentum Investments

The "behaviour tax" is defined as a lower investment return from investor decision-making rooted in both cognitive and emotional bias. As investors experience the ups and downs that often come with investing, they may react due to a range of behavioural biases, such as loss and regret aversion (together forming the disposition effect), risk aversion and herd behaviour. This in turn may move their actions out of sync with one that is best suited to achieving their long-term goals. These biases and resulting actions can be the result of the investor's risk perception, their belief system about investing and how these two shorter-term elements do not coordinate with their long-term risk attitudes – known as their "risk preference." This paper provides evidence of a behaviour tax in South Africa from the switching behaviour of investors between mutual funds (or unit trusts). It also demonstrates practically how unsupervised machine learning (clustering), as well as supervised machine learning (behavioural prediction), can be used to segment and predict this value-eroding investor behaviour. With this knowledge it is possible to communicate with the right cluster at the right time, using behavioural science principles in order to reduce this behaviour tax.

Introduction

Several studies (Morningstar, 2023; Dalbar, 2023)[2] have confirmed that returns experienced by investors are worse than those reported at a fund level due to the negative impact of their behaviour on their investment return. This behaviour tax is often the result of emotional rather than rational investment decision-making. During the Covid pandemic, a collective behaviour tax of ≈ $36 million (at R18 = $1) occurred for Momentum Investment's clients in South Africa that had invested in discretionary unit trusts or non-discretionary living annuity products (Nixon, 2021). The living annuity is particularly concerning, as the ≈ $27 million (75% of the total value) loss was from retired clients who expose their retirement capital to higher-risk investments in the hope of keeping pace with inflation over the long term. This equates to a 6.9% performance sacrifice for the period in question (Nixon, 2021). These clients are older, have more to lose and less time to recover, which likely heightens their perception of risk and appears to increase their propensity to switch. Also noteworthy is that the behaviour tax is not incurred uniformly. Nixon and Gilbert (2022) clustered 35,199 South African investors' switching behaviour, over an extended period (2006 – 2021) and using the Partitioning Around Medoids (PAM) clustering algorithm, which revealed four statistically significant behavioural patterns. The algorithm organically split the population of "switchers" into four groups, each incurring different levels of behaviour tax at different times. This prompted the notion of further investigating switch propensity.

This task was taken forward by Nixon and Gilbert in 2023. Propensity to switch was investigated by employing the random forest algorithm used in the realm of supervised machine learning to provide a predictive model for investment switching. The result

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2 https://www.morningstar.com/lp/mind-the-gap; https://www.dalbar.com/QAIB/Index. This is the 28th annual study that Dalbar has conducted on this topic – all with similar results to Nixon (2021).

was a predictive behavioural model with an area under curve (AUC) greater than 0.80, which is deemed acceptable for commercial application (Allwright, 2022). This is based on a vastly expanded version of the Nixon and Gilbert (2022) paper's dataset of over 13,385,128 observations (switches and non-switches), taken from 87,592 clients between 2018 and 2022. This would allow financial services providers and administrative platforms to engage proactively with the right customer cluster and client within that segment at the right time (when the prediction score is highest) with an appropriate marketing message or a nudge to save them measurable behaviour tax and improve their investment outcomes.

Risk Behaviour Theories

A recurring theme in the literature is the interplay between an investor's long-term risk attitudes and at times contradictory behaviour in the short term (Sitkin & Pablo, 1992; Weber & Milliman, 1997; Nosic & Weber, 2007; Van Raiij, 2016). Irrespective of this long-term risk attitude, the way risk *feels* in a given situation or stage of life can vary substantially, thereby causing contradictory risk behaviour. To provide a deeper understanding of this notion, the definitions of and differences between three key elements are discussed below.

Risk preference: This refers to our inherent and stable long-term attitudes towards risk. Weber and Klement (2018) showed that while risk-taking in portfolios changed during the 2008 global financial crisis as shorter-term risk perceptions (see the next paragraph) rose, their longer-term risk preferences remained relatively static. This view is supported and demonstrated by Weber and Milliman (1997), who showed through a stock market game simulation that the proportion of cash to stocks, representing risk preferences, remained static even when participants received persistent negative outcomes leading to changes in the content of their stock portfolios.

Risk perception: This concept refers to the assessment of risk that can be affected by recent events. Weber and Milliman (1997) also confirmed via their stock market game experiment that repeated positive outcomes led investors to assume higher risk stocks due to decreased risk perception, with the converse also true. While prospect theory may predict assuming more risk to avoid painful losses (i.e., negative outcomes), Weber and Milliman (1997) offered evidence that both negative *and* positive outcomes influence risk perception and associated investment decisions.

Beliefs: Nosic and Weber (2007) distinguished between beliefs about the returns (outcomes) of risky investments and the belief of the volatility of these returns. Kuhnen and Knutson (2011) detailed how beliefs are formed as well as updated over time, by incorporating learning or outcomes into beliefs. Situational reinforcement strategies such as "win-stay" or "lose-move" often outcompete Bayesian updating strategies, and ultimately, they provide a body of literature to demonstrate that feelings generated by past outcomes and subsequent updating of beliefs are likely a good source of the patterns seen in financial choices.

Unsupervised Machine Learning for Behavioural Segmentation

The preceding sections have shown that in order to understand an investor's risk propensity or inclination to switch, we need to understand their long-term and relatively stable risk preferences. To do this, the switch behaviour of 35,199 South African investors from 2006 – 2021 was clustered, using the partitioning around medoids (PAM) clustering algorithm (Nixon & Gilbert, 2022). This revealed four statistically significant behavioural patterns or investor behaviour clusters when each investment switch was classified in respect of risk and return characteristics. These four clusters and their descriptions are shown in Table 1.

Unsupervised machine learning algorithms are used to automatically identify patterns or commonalities between variables. They are useful in examining a time series of data and extracting patterns over time. An interesting feature of this study was that the algorithm was only provided with information on the risk and return attributes of each investment switch made but organically split the groups into these four clusters with different levels of behaviour tax. This reinforces the idea that value is not destroyed uniformly or randomly but in a consistent manner and in line with different risk preferences over the long term. Nixon and Gilbert (2022) also showed that three of the four clusters studied maintained their risk behaviour between 70% and 90% of the time;

consequently, an "assertive" investor's switches are characterised by up-risking and chasing past performance, and this group performs this behaviour 90% of the time. This finding reinforces the notion of stable risk preference abandoned only on occasion (10% of the time in this case), the root causes of which likely result from risk perception and beliefs, as defined earlier.

An investor's perception of risk changes in the short-term, for example when they receive consistent positive outcomes and risk perception decreases. This may lead someone who generally avoids risk to up-risk their portfolio and chase past investment performance, thus contributing to their "win-stay' belief system, and so they continue the behaviour as long as they experience these positive outcomes. Similarly, when investors receive persistent negative outcomes, risk perception increases and they respond in the manner of the anxious investor, i.e., by de-risking their portfolios and moving money to the perceived safety of cash. This reinforces the "lose-move" belief system, as acting provides emotional comfort.

Table 2 shows an extract from a study over a shorter period of analysis. In this case, the clustering algorithm is only provided with switch data from the 2020 calendar year. Once again, from their corresponding behavioural pattern, it is clear that each segment destroys different amounts of value (behaviour tax) during this period.

Table 1: Behavioural Clusters Identified in Nixon and Gilbert (2022)

Behavioural Cluster	Description
Market Timer	Chases past performance (when others chase past performance) and moves to safety along with others when markets become turbulent.
Assertive Investor	Only chases high levels of past investment performance and regularly up-risks their portfolio.
Anxious Investor	Loss-averse investor that takes an investment risk but at the first sign of market turbulence de-risks their portfolio.
Avoider	Risk-averse investor that avoids taking risk but remains invested in lower-risk portfolios for an extended period.

Table 2: Behavioural Clusters Using the PAM Clustering Algorithm for the 2020 Calendar Year

Behavioural Cluster[3]	Average Switches	Annualised Behaviour Tax[4]
Market Timer (34%)	2.68	4.79%
Assertive Investor (22%)	1.29	4.53%
Anxious Investor (28%)	1.69	3.73%
Avoider (16%)	1.58	2.23%

3 Note that the percentages in brackets refer to the population proportion.

4 A positive percentage value here indicates value destroyed.

The algorithm identifies Market Timers as making up a large cohort that is more active (switches more) and is the only group to perform all behaviours identified regularly. Unsupervised algorithms give no indicator of predictability, however, which would allow financial services providers to communicate proactively with an investor with the intent of avoiding the behaviour tax. This issue is dealt with in the next section.

Predicting the Behaviour of Behavioural Segments Using Supervised Machine Learning

Machine learning is "supervised" when the data is labelled so that the algorithm can learn the relationships between the inputs (data labels) and outputs (risk behaviour – "switch" or "don't switch"). Here, a vastly expanded dataset of 13,385,128 observations was used to align labels in the literature (risk preferences, risk perception and beliefs) with observed switching behaviour from 2018 to 2022. This working paper is available from the authors on request. A significant advantage of the random forest algorithm used in the exercise is that the inherent decision tree architecture naturally ranks data labels by how much they add to the model's predictability, termed "information gain" (Kelleher et al., 2020).

The Nixon and Gilbert (2023) working paper assessed 37 factors possibly considered by investors when deciding whether to switch. Figure 1 shows the 12 factors that were found to be significantly more important, i.e., adding more to the predicted probability than the remaining features (light blue bar). These less important features relate to market variables such as the gold price, market interest rates, market returns, a volatility index, GDP growth, the R/$ exchange rate and changes therein over different time periods. This provides a view of potential factors influencing investor decision-making when deciding whether to switch.

These 12 key factors can be grouped into those relating to risk preferences (white bars), risk perception (orange bars) and beliefs (yellow bars), as discussed below. The authors recognise here that there are many possible interpretations of the reasons behind an investor's switch decisions, in addition to those discussed herein.

Risk preferences (white): The higher the portfolio value or assets under management (AUM), and the greater the number of mutual funds selected together with investor age, likely points to older investors and their related retirement investments. In this group, the possibility of loss aversion influencing decision-making is most probably elevated, as

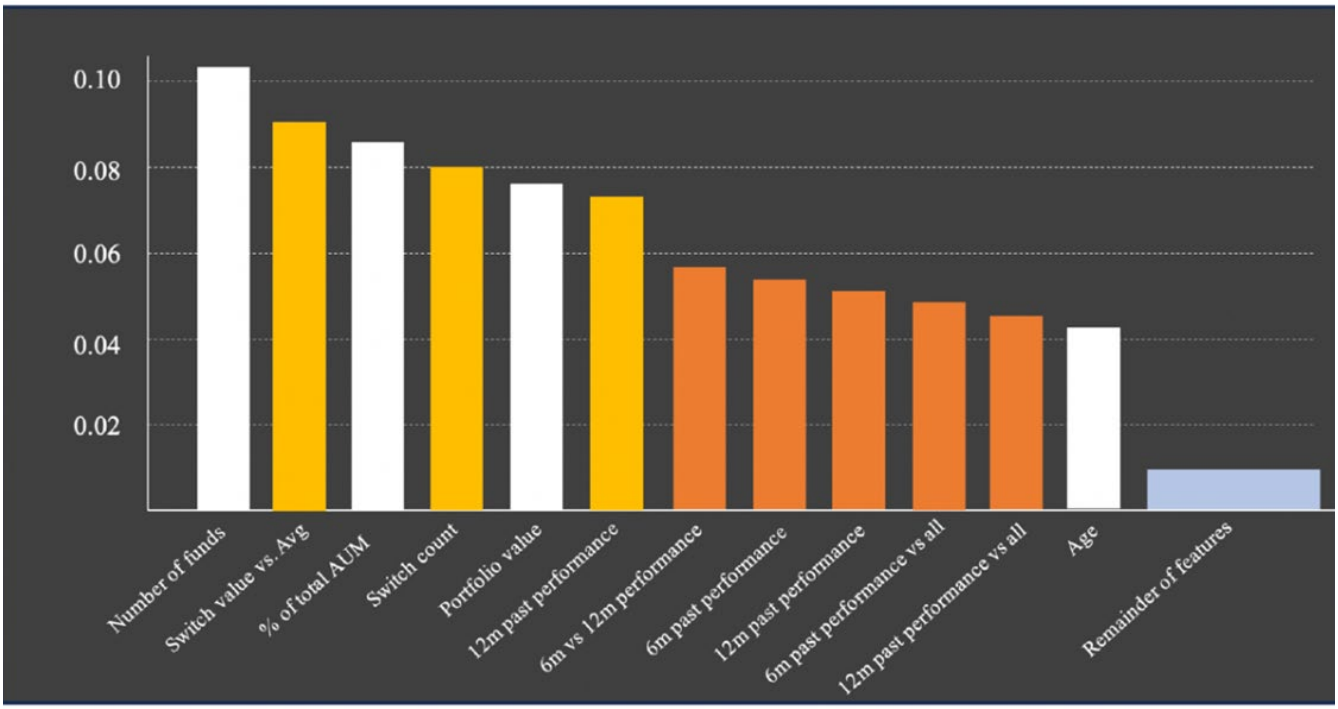

Figure 1: Key factors that might predict an investment switch.

investors have more to lose and less time to recover losses. This in turn influences their risk attitudes and the likelihood they react to the outcome (returns).

Risk perception (orange): The factors in this category are all performance-related, absolute and relative (versus other unit trusts), and they are likely to alter risk perception, resulting in increased probability of switching. This is ultimately how investors experience outcome uncertainty as the difference between their outcome expectation and the actual outcome realised. Note that the 12-month past performance metric in this context refers to the average 12-month past performance of funds previously switched by the investor.

Beliefs (yellow): The greater the prior switch value (related to the size of the portfolio), and the greater the number of prior switches, the more likely the investor is to repeat this behaviour, due to them formulating beliefs. The random forest algorithm provides a critical link between the risk behaviour literature and actual investor behaviour from the large dataset of observed behaviour (Kelleher et al., 2020).

Figure 2 shows how successful the random forest algorithm was in predicting a true positive, in that an investor who was predicted to switch, switched. The baseline (grey diagonal) represents a 50% correct prediction rate (model performs in line with a random prediction), while the blue and red lines represent the area under curve (AUC) metrics for in-time and out-of-time data. Percentages along the y-axis represent the true positive to false positive ratios at various decision thresholds, with the decision threshold where the blue and red lines are closest to the top left of Figure 2 representing the optimal true positive to false positive ratio.

The dataset is split initially into the main dataset (in-time) from January 2018 until mid-2022 and an out-of-time portion from July until October 2022, which represents data to which the model is not exposed. The model is trained on in-time data (red line) and then applied to the new out-of-time data (blue line). It is to be expected that the out-of-time results will be less accurate, as with in-time data the algorithm will also learn noise in patterns that have little relevance to decision-making. In this case, however, there is only a minimal difference. The AUC metric indicates the model is 89% correct in predicting a switch correctly. This is a compelling result and well above the 0.80 hurdle deemed acceptable for commercial application (Allright, 2022).

Combining Unsupervised and Supervised Algorithms

As discussed, unsupervised machine learning is very useful in revealing behavioural patterns over time. The Market Timer cluster described earlier is of particular interest for understanding the link between unsupervised and supervised machine learning, and

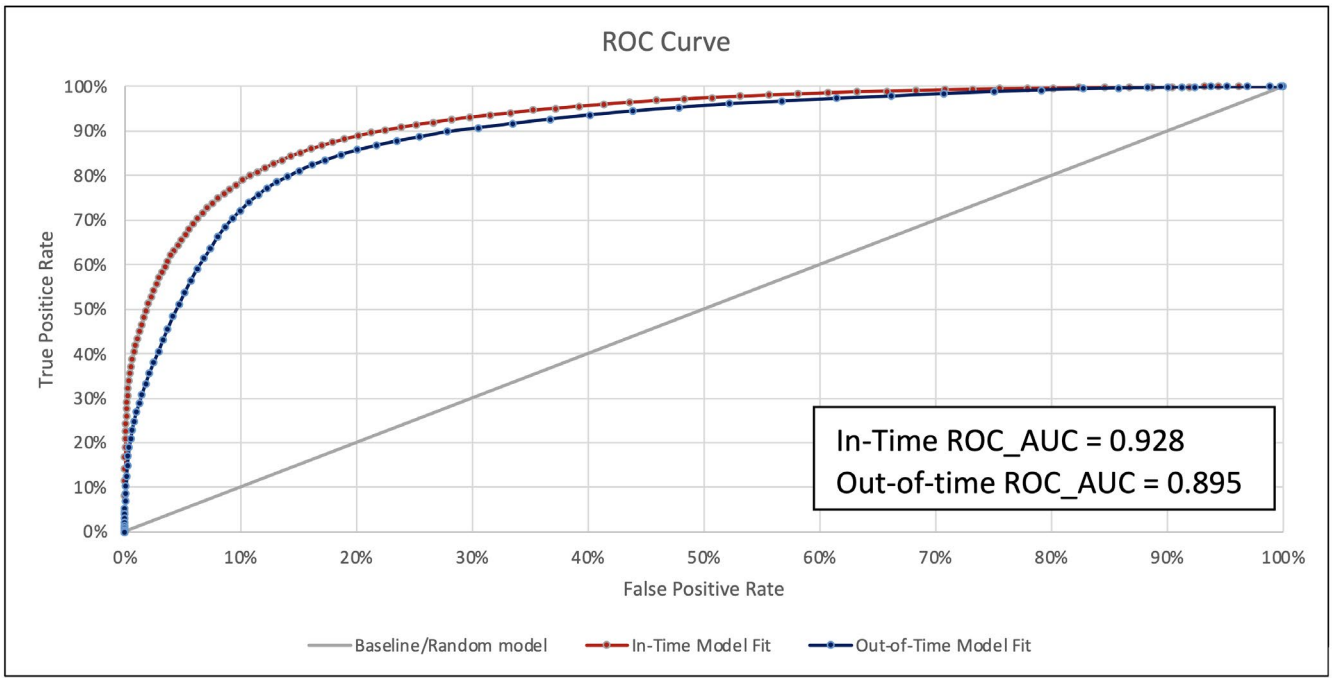

Figure 2: Receiver Operator Characteristic curve for in-time and out-of-time model fit.

it is defined by two key features. First, this group of switchers had the highest switch frequency. When revisiting the clustering period in the more recent timeframe, the average number of switches per investor was nearly two per annum. Second, the Market Timer is active in both chasing past performance as well as de-risking their investments in the face of market turmoil. They were the only archetype to exhibit this combined behaviour.

Figure 3 shows the varying propensities of the four clusters to switch. When the switch history of each investor is hidden from the algorithm, it still predicts a much higher switching rate from the Market Timer cluster, as seen by the orange line. The algorithm identifies a group that appears far more sensitive to the 12 key features influencing investor decision-making (see previous section).

As shown earlier, the Market Timer incurred the highest behaviour tax during the Covid period of 2020 and is also the largest cluster of investors at 34% of the population. When reviewing the probability of switching for Market Timers, Figure 3 above shows a clear and consistent higher switch predictor for this cluster over time.

This provides important confirmation that unsupervised and supervised algorithms produce consistent results, and it serves as a distinct behavioural insight for financial services providers into a behavioural cluster that consistently destroys the most value, thereby enabling these providers to send point-in-time, targeted communications and nudges for behavioural intervention.

Using Behavioural Science in Communication for Better Outcomes

This paper has provided insights into which segment to target, and when. The logical next step would be to target the Market Timer segment when their behavioural predictor (probability to switch) reaches a specific rate (say 80%). Finally, in respect to the communication or nudge strategy rooted in behavioural science, the OECD (Hansen, 2019) also provides valuable guidelines and strategies in working with changing belief systems or enhancing willpower or commitment relevant to this type of risk behaviour. Some considerations in this regard are mentioned below.

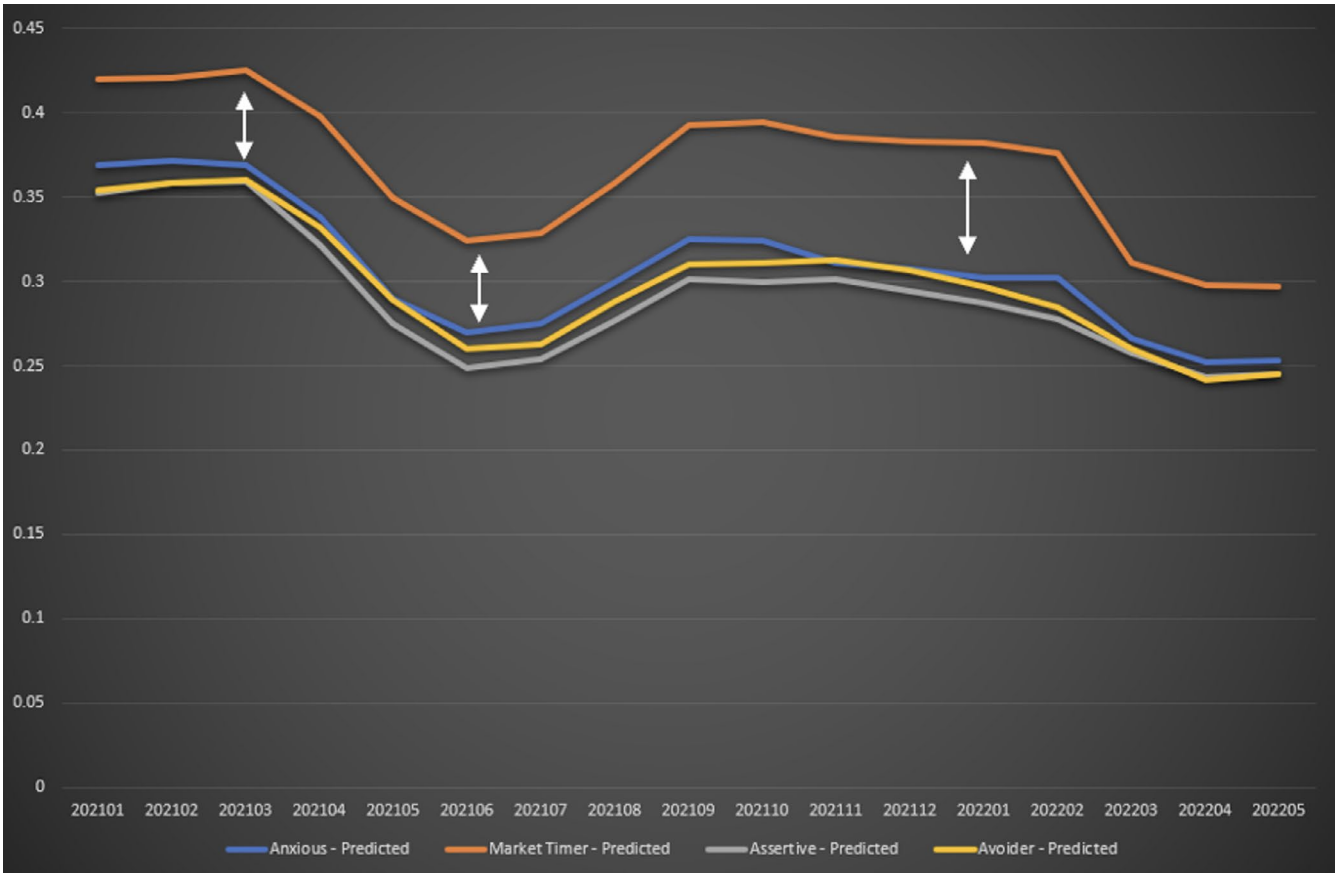

Figure 3: The Market Timer archetype has a higher propensity to switch.

Working with friction: Can friction costs be removed or added? Should it be made more difficult to switch? Care needs to be taken here, as adding too much friction goes from nudge to sludge.

Provide feedback: Can we provide feedback to investors or advisers around their behaviour, and what value does this erode? I.e., real-time insights into the behaviour tax. This assists in changing the belief system.

Commitment devices: Can investors publicly – or at least via their local rewards programme – commit to the better behaviour? Should they commit on social media accounts, for example, to staying invested. This could reduce the perception of risk by creating a focus on long-term volatility which is far lower than short-term volatility.

Leveraging social norms: Can we provide evidence that investors who don't switch get a better return than those that do?

A formal intervention targeting Market Timers, using a randomised control trial, could be set up and tested based on the delivery of nudges according to the above categories in an effort to reduce the investor behaviour tax and secure better investment outcomes. This study is currently underway.

Conclusion and Recommendations

This paper has shown how an important bridge can be built between the risk behaviour literature and large datasets to benefit individual investors and their financial services providers seeking to assist their clients in lowering their own behaviour tax. Both supervised and unsupervised machine learning work well in tandem here to address significant groups exhibiting similar behaviours, such as the Market Timers revealed in Nixon and Gilbert (2022), which answers the question of who to target. Supervised machine learning then highlights when to intervene, via systematic engagements or nudges targeted at the right individual, at the right time. Finally, nudging efficacy can be enhanced using behavioural science principles such as commitment devices, and it answers the question relating to how to engage with the targeted cluster. This paper has also revealed the relevance of the risk behaviour literature provided by Nosic and Weber (2007) in predicting switch behaviour, where one may have assumed that market-related variables play a far more important role in behavioural prediction then they do in practice.

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Using Behavioral Science to Tackle Health Misinformation on Social Media

BEHAVIORAL RESEARCH HUB[1]

This article investigates the development of behavioral interventions aimed at countering health misinformation on social media. The core objective is to reduce the spread of false news by examining behaviorally informed messaging techniques. The study examines eight interventions leveraging the messenger effect and the framing of different messages addressing both false and real news—ultimately measuring the effect of these interventions on individual behavior. Experimentation reveals that utilizing health experts and authoritative accounts to deliver emotional and endorsed responses significantly diminishes the spread of health misinformation and promotes the spread of factually true news. While the use of an artificial intelligence fact-checking account had a limited effect in terms of countering false news, it nevertheless shows promise in relation to increasing the spread of factually true news. These findings offer crucial insights into designing effective policies for online government communication and demonstrate effective methods to combat health misinformation. The study not only contributes to the understanding of communication efficacy in digital platforms, but also serves as a guide for public health officials in combating misinformation.

Introduction

While misleading information has existed throughout history, the speed, reach, and affordability of online communication have significantly amplified the dangers of misinformation. This widespread dissemination of falsehoods has the potential to cause serious harm to individuals, hinder the implementation of effective policies, and skew public opinion (Nielsen et al., 2020).

Fabricated stories are significantly more likely to be shared through social media platforms and specifically on X (formerly Twitter), with some indicating a 70% higher chance of retweets compared to truthful content (Vosoughi et al., 2018). Furthermore, the economic impact of misinformation is substantial, costing the global economy an estimated minimum of 78 billion US dollars annually (CHEQ & University of Baltimore, 2019).

Key Concepts

The terms "misinformation" and "disinformation" are often used interchangeably, but there's a crucial distinction between the two. The former arises from innocently sharing something untrue, often due to a lack of knowledge or verification, whilst the latter, on the other hand, is far more malicious and is employed with a clear intent to deceive and manipulate. Disinformation involves the deliberate creation and propagation of false information with the aim of causing harm or sowing discord for personal gain, or to serve a particular agenda (Adams et al., 2023).

A massive amount of information, both factually true and false, flooded social media platforms during the early days of the COVID-19 pandemic. Consequently, the United Nations and the World Health Organization coined the term "Infodemic", which combines the words "information" and "epidemic" to describe the rapid spread of both true and misleading information (PAHO, 2020). With so much misinformation about coronavirus in circulation, more than 6,000 people around the globe were hospitalized in the first three months of 2020 (WHO, 2021).

Key Channels and Domains

In general, three key channels are used to promulgate misinformation: (1) Social circles, i.e., misinformation spread through friends and family via word of mouth; (2) Traditional media, such as TV, radio, and newspapers; and (3) Social media platforms, such as

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X, Snapchat, Facebook, etc. (Alasmari et al., 2021).

An analysis of the spread of misinformation in Saudi Arabia found that a staggering 87% was funneled through social media and messaging services, with the WhatsApp private communication service leading the charge as the source of nearly half (46%) of online rumors, followed by X, a social media and public communication service, at 41% of rumors (Alasmari et al., 2018). With the wide spread of social media and internet access, misinformation has become a disease infecting every field (Adams et al., 2023). An analysis of 125 misinformed posts in social media found that 67.2% of these posts are health-related, followed by religiopolitical at 16.8% and the remaining domains (political, crime, entertainment, religion, and miscellaneous) at 16% (Al-Zaman, 2021).

Due to the critical growth of misinformation in public health, and its significant impact at both individual and societal levels, this study aims to investigate health misinformation, focusing on short-term solutions governments can apply (and scale) in their communication strategies to protect vulnerable groups and reduce related issues.

Literature Review

Factors Influencing People's Susceptibility to Misinformation

Susceptibility to misinformation and sharing behaviors is a complex issue with variance in the evidence and literature surrounding it. Exposure to misinformation can affect individuals' actions and beliefs, and the extent of this impact varies depending on multiple influencing factors, including the platform, the message, the messenger, and the recipient.

1. The Platform

Platforms, through various mechanisms, play a significant role in shaping user behavior. These include reward systems that incentivize sharing through monetary rewards (Ecker et al., 2022), platform points, badges, and access to special features. Additionally, platforms optimize engagement by making it easy to share content (Liu & Choi, 2024). Algorithmic amplification occurs when algorithms prioritize, promote, and further personalize an experience by promoting trending content and content recommended based on user behavior (Yesilada & Lewandowsky, 2021). Presentation cues, such as design elements and the ways in which information is presented, can also influence how users interact with content (Cann & Katz, 2005).

By optimizing engagement and algorithmically amplifying content, platforms personalize user experiences to a concerning degree. This can lead to an "echo chamber" or a "filter bubble" effect, whereby users are primarily exposed to information that confirms their existing beliefs and interests, thereby potentially limiting their exposure to diverse viewpoints (Yesilada & Lewandowsky, 2021).

2. The Message

The content itself also plays a role in how susceptible individuals are to misinformation. Messages that exploit pre-existing beliefs tend to resonate more due to the tendency of individuals to maintain consistency between their beliefs, attitudes, and behaviors (Bryanov & Vziatysheva, 2021). Additionally, messages that manipulate emotions, whether positive or negative, can capture attention and influence judgment (Van Der Linden, 2022). Misinformation may also exploit "bandwagon cues" to persuade people by suggesting widespread acceptance of an idea, implying that "everyone is doing it" (Bryanov & Vziatysheva, 2021). Furthermore, it can leverage the false consensus effect, whereby individuals overestimate the extent to which their beliefs, opinions, preferences, values, and habits are normal and typical among others (Ecker et al., 2022).

3. The Messenger

The source of the message significantly impacts its perceived credibility. Trusted endorsements from experts, celebrities, peers, or user reviews can lend legitimacy to misinformation (Mena et al., 2020). Community norms, i.e., the shared expectations and rules that guide behavior, also influence how people perceive and spread information (Jones et al., 2021; Andi & Akesson, 2021; Gimpel et al., 2021), with social influence, namely, the way individuals conform to the behavior of others, such as sharing something friends have endorsed, further amplifying the impact of the messenger (Cann & Katz, 2005).

4. The Recipient

Individual characteristics also play a role in susceptibility to misinformation. Socio-demographic factors like age, income, religion, education, and geographical location can influence how people process information (Taft, 2020), while cognitive factors like memory, IQ, attention, and pre-existing beliefs also come into play (Scherer & Pennycook, 2020). Motivational factors, such as the desire for authority, achievement, or simply curiosity, can also influence information-sharing (Van Der Linden, 2022). Finally, cognitive biases, which are systematic mental shortcuts that can lead to errors in judgment, can further cloud judgment and increase susceptibility to misinformation (Kaufman et al., 2022).

International Efforts to Combat Misinformation, Using Behavioral Science

Efforts to combat misinformation can be broadly categorized into four approaches (see Table 1). Legislative solutions focus on implementing laws and regulations to hold the creators and distributors of misinformation accountable, including fines and penalties. Corrective solutions involve fact-checking and debunking false information through human expertise and reliable sources, often provided by dedicated organizations. Technical and algorithmic solutions leverage machine learning and AI algorithms to identify and flag misinformation in real-time. These algorithms are trained on large datasets of labeled news and other content to recognize

Table 1: International Efforts to Combat Misinformation

Behavioral Concept	Country	Executor	Intervention	Impact
Debunking	Germany	Ministry of Health	The German Ministry of Health used debunking—the process of exposing false information and correcting it with accurate information to counter attitudes and beliefs based on misinformation—to counter misinformation about the vaccine.	Helfers & Ebersbach (2022) analyzed the Ministry's debunking campaign and found that it may help combat misinformation when individuals have weak to moderate beliefs, but it may not be effective in combating deeply entrenched beliefs. They found that debunking backfired on vaccination intentions when applied to people who had strong, misinformed beliefs.
Debunking and Social Norm Modeling	Netherlands	eClinicical Medicine (Yousuf et al., 2021)	A randomized controlled trial (RCT) was conducted during a COVID-19 vaccination campaign to improve people's acceptance of it and to correct misleading information about it. Pre- and post-experiment surveys were requested from the following samples: A sample presented a video containing information about the vaccine and influential figures from the community encouraging its uptake. Another sample presented a video clarifying what was explained to the first sample, in addition to correcting misleading information about the vaccine.	Combining several strategies, such as providing information about the vaccine, debunking misleading information, and highlighting influential figures in the community, contributed to promoting the rejection of misconceptions about the vaccine and enhancing trust in the government.

Behavioral Concept	Country	Executor	Intervention	Impact
Pre-bunking/ Inoculation	United States, Germany, Switzerland, Poland, Italy	Cambridge University & Bristol University (Basol et al., 2021; Lewandowsky & Van Der Linden, 2021)	The participants were exposed to pre-inoculation doses of misleading information through videos and games designed to immunize them and educate them about the content and methods used to disseminate misleading information, to increase cognitive resistance.	The intervention had positive effects in improving individuals' ability to recognize gaming techniques and increasing resistance to misleading information. The game demonstrated effectiveness in reducing the credibility of manipulated content and increasing participants' confidence in identifying such content, thereby reducing the likelihood of sharing it.
Media Literacy	Italy	Ministry of Health (Lovari, 2020)	The Italian Ministry of Health established a Facebook account to share updated official data during the pandemic, and it posted 301 publications about the pandemic.	Clarified the accuracy of information sources, improved communication with citizens, and increased engagement: the average engagement rate reached 2,652 likes and 1,983 shares per post, with 378 comments per post. Likes increased approximately seven-fold over a period of three months.
Social Media-Based Counseling	Nigeria	Health Promotion International (Talabi et al., 2021)	Two experiments were conducted to measure the effect of behavioral intervention on the study sample: 1. First Experiment: A group was exposed to misinformation about the vaccine through conversations on WhatsApp. 2. Second Experiment: The intervention group was guided through social media platforms to correct the misinformation they were exposed to during the first experiment.	This behavioral intervention contributed to influencing social media users to initiate vaccination by 95%.

patterns associated with misinformation. Finally, behavioral solutions aim to educate the public on biases and critical thinking skills to reduce the impact of misinformation on beliefs and decision-making.

Experiment Design

In general, interventions can be categorized into long-term interventions and short- to medium-term interventions. For the latter, interventions can cover three types: pre-bunking/inoculation, at exposure and debunking. Our intervention scope covered "at exposure" and "debunking". Given the prevalence of health-related misinformation on social media, our experiments focused on short-term solutions that can be applied to counter misinformation over a brief period. These solutions are designed for governments to integrate and scale within their communication strategies.

We conducted two between-subject field experiments to explore the influence of various factors, using the Arabic language, on responses to health misinformation on social media. In "Experiment A",

we examined the influence of the messenger (i.e., who communicates the message), while in "Experiment B", we combined the messenger with framing (i.e., how the message is communicated). Participants were randomly assigned to a control group or one of the treatment groups. For both experiments, we measured the extent of believability and sharing using 7-point Likert scale (from 1 = Strongly Disagree to 7 = Strongly Agree). To ensure quality, we presented multiple attention checks and excluded those who failed the test.

News Selection

To cover popular and recent health misinformation, we built our news pool from various sources, including the Ministry of Health's (MoH) "Yogoolon[2]" campaign, the Gulf Health Council debunking guidebook, and the Saudi Food and Drug Association website, which publishes rumors and facts, in addition to other various news channels and fact-checking accounts/websites.

After reviewing over 100 news articles, we short-listed them based on filtration criteria, including articles containing high-risk misinformation that could impact individual and societal health, as well as those with high engagement levels on X (formerly Twitter). Also, we excluded news related to Covid-19 or items targeting a particular demographic group to ensure news was relatable to all participants in the sample. This resulted in 30 news items, which were further evaluated by social scientists based on the above criteria. Furthermore, cognitive interviewing was conducted to test the experiment design and assess participants' overall understanding and ease of use. Finally, 16 news headlines were selected for the final design.

Method and Procedure

To investigate the research questions at hand, we selected a representative sample of 3,456 Saudis via a market research company. The recruitment process aimed to ensure that participants had a certain level of familiarity with X (formerly Twitter) as a crucial criterion for selection, since our intervention mimicked the platform's interface.

Initially, we administered pre-experiment questions to understand participants' behavior and preferences in relation to social media. Subsequently, they were exposed to 16 randomized headlines (eight real news and eight false news items). Figure 1 shows a mockup of the experiment design, while the control group was exposed to news alone, without a reply. After each news piece, the participants were asked about their tendency to believe and share, as well as their level of familiarity. Finally, they answered post-experiment questions covering demographics and the main news sources on which they rely and trust.

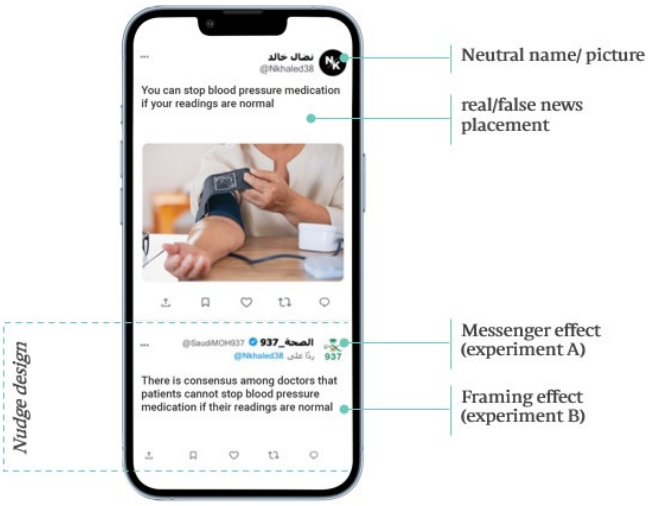

Figure 1: Mockup of the experiment design.

Experiment A: Messenger Effect

The experiment included three treatment groups using mock-ups of X posts, including the following:

- MoH 937 response: The Ministry of Health utilizes the MoH 937 account to engage with the public on a wide range of health-related issues, addressing inquiries from urgent to non-urgent.
- Health expert response: factors such as expert name and profile picture have been taken into consideration to avoid potential biases.
- AI fact-checking response: to reflect the growing trend to utilize bots for fact-checking.

The research questions are focused on measuring the influence of the messenger effect in simply refuting or confirming news.

- Q1.1: What is the influence of the messenger on the recipient's propensity to believe?
- Q1.2: What is the influence of the messenger

2 *Yogoolon* is an Arabic word that can mean "Rumor has it".

on the recipient's propensity to share?

Experiment B: Framing Effect

The experiment combined messengers different framings, including the following five treatment groups:

- Debunking news issued by the Ministry of Health.
- Debunking news provided by a health expert.
- Using emotional framing (i.e. affect) in the Ministry of Health message.
- Using endorsement by the Ministry of Health, i.e., showing numbers of studies confirming/rejecting the news.
- Using the bandwagon effect through the AI fact-checking account, i.e., tailoring the response to align with popular trends or behaviors to create a sense of social validation.

The research questions are designed to measure the combined impact of the messenger (who delivers the message) and framing (how they deliver the message).

- Q2.1: What is the combined impact of the messenger and framing on the recipient's propensity to believe?
- Q2.2: What is the combined impact of the messenger and framing on the recipient's propensity to share?

Results

In the messenger effect experiments, we found that the highest statistical significance on believability was found in the Ministry of Health (MoH) (p=0.025) account group followed by the expert group (p=0.035) when it comes to debunking false news, as shown in Figure 2.

Furthermore, Figure 3 reveals that there was a statistically significant effect on the participants' propensity to share false news when it was refuted by the health experts group (p=0.025), followed by the official MoH account group (p= 0.032).

Moreover, the framing experiment showed that emotional framing (i.e. affect) and endorsements had the highest statistical significance in the MoH account group (p=0.001) *and* (p=0.009), respectively, when it comes to participants' propensity to believe false news, while debunking had the highest statistical significance (p=0.003) in the experts group (Figure 4).

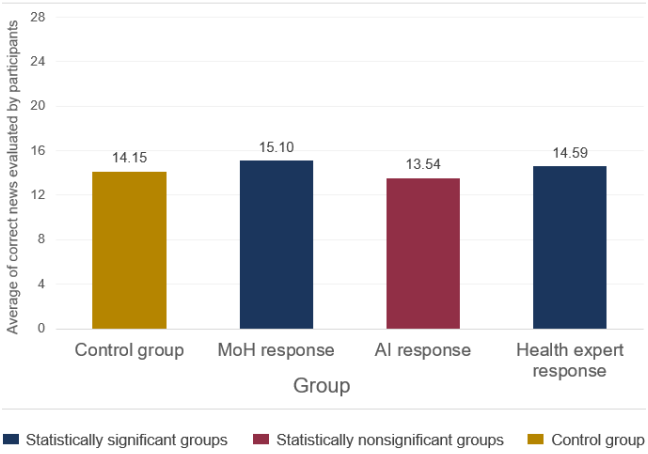

Figure 2: Significance of refuting false news on propensity to believe.

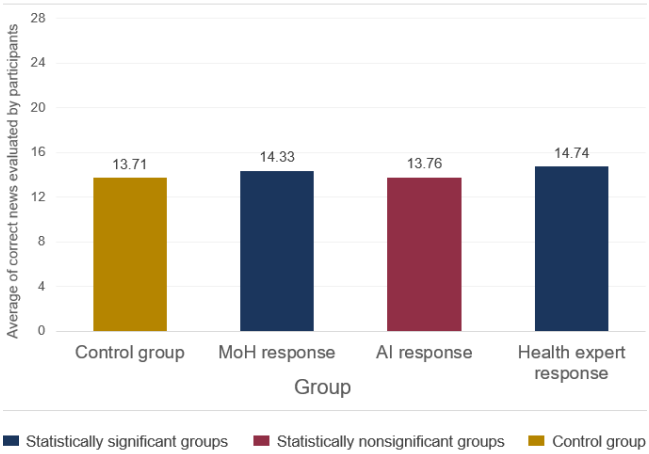

Figure 3: Significance of refuting false news on propensity to share.

Additionally, the results indicate that using emotional framing (i.e., affect) to refute false news had the highest statistical significance (p=0.002) within the MoH account group when measuring participants' propensity to share (Figure 5).

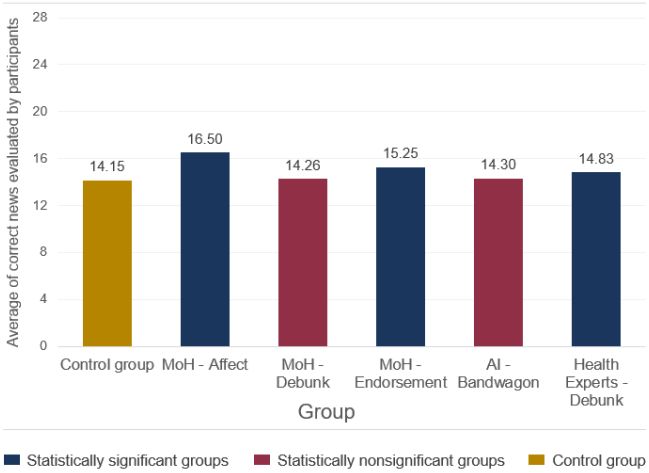

Figure 4: Significance of refuting false news on propensity to believe.

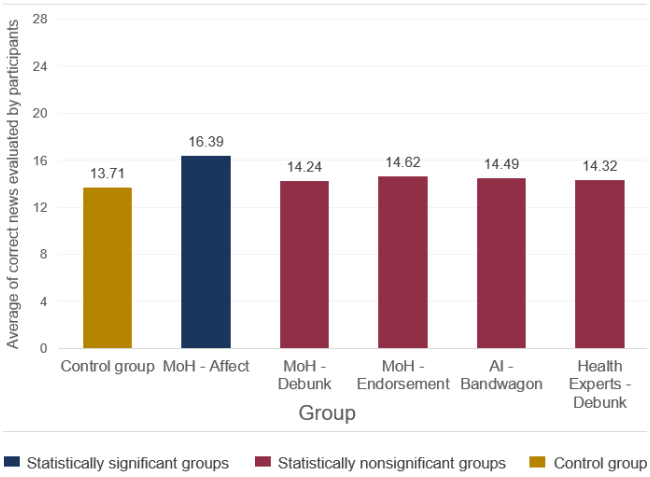

Figure 5: Significance of refuting false news on propensity to share.

Key Takeaways

The experiments derive key takeaways for government online communication strategies. One central finding is the significance of authoritative accounts as influential messengers for shaping behavior and countering false news. These accounts, by virtue of their credibility and expertise, hold the potential to combat misinformation effectively. Interestingly, the study also revealed that AI fact-checking, while not effective in directly refuting misinformation, displayed a potential for increasing the dissemination of real news. This suggests that further exploration and refinement of AI-driven approaches could contribute to the promotion of reliable information.

Moreover, the study underscores the importance of adopting a multifaceted approach in responding to misinformation, because simply relying on logical arguments may not suffice. The use of endorsement and emotional framing (i.e. affect) techniques, for instance, has had positive effects on individuals' responses to misinformation, while leveraging emotional appeals and social validation can significantly enhance the strength and impact of a message. These findings emphasize the need for government communicators to be strategic, adaptive, and creative in their efforts to combat misinformation and effectively engage with the public online.

Limitations and Future Research

It is essential to emphasize the significance of context, as the results of the experiment may vary when conducted in different countries, languages, or domains. Therefore, further research is warranted to explore the influence of these contextual factors on the observed outcomes. Furthermore, it is crucial to consider the ethical implications and ensure transparency when using such techniques to avoid manipulation or—ironically—misinformation.

While the results of this study provide valuable insights to inform communication strategies, it is important to acknowledge that there is still much more to explore and test in the realm of online misinformation. Future research endeavors could (a) conduct similar experiments in various countries to investigate potential cross-cultural differences, (b) expand research to medium- and long-term interventions, and explore their effectiveness in combating misinformation over extended periods, and (c) collaborate with social media companies to design and test interventions.

THE AUTHORS

The **Behavioral Research Hub (BRH)** plays a pivotal role in promoting Behavioral Science to support decision-making in Saudi Arabia. The BRH conducts comprehensive behavioral studies, creates tools to bolster evidence-based decision-making, designs and implements training programs, and fosters knowledge exchange opportunities. Furthermore, it is part of the Decision Support Center (DSC), which was established in 2016 as part of Saudi Vision 2030 and functions as an independent advisory body, offering evidence-based insights for policy development. It serves as a research organization that brings knowledge and policymaking together to form effective insights as well as capacity-building in specialized areas. The DSC strives to excel in various fields, including public policy, decision sciences, future insights, economic intelligence and behavioral sciences.

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Navigating the Behavioral Economics Landscape in Nonprofits: Insights, Applications, and Challenges

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Nonprofits rely on the contributions of various types of stakeholders who are dedicated to their development and continuously making decisions that influence the nonprofit's impact. Behavioral economics provides a framework to analyze decision-making processes at all organizational levels, identifying obstacles that hinder desired behaviors. By examining case studies and successful applications, including insights from our collaboration with the Spanish NGO Plan International, this article highlights the potential of behavioral insights to help nonprofits overcome psychological barriers, leverage social norms, and improve donor and volunteer retention. These insights from behavioral economics can offer nonprofits powerful tools to drive meaningful change and strengthen their connections with supporters, ultimately enhancing their ability to serve communities and foster sustainable development.

Introduction

Nonprofits are vital to society, as they advocate for social, economic, and environmental issues, drive policy changes, and represent marginalized communities while promoting social justice. In addition, they hold governments and other organizations accountable, ensuring that policies serve the needs of citizens and uphold transparency and good governance. As agents of change, nonprofits address service gaps, support the underprivileged, and encourage innovative solutions to a variety of social challenges.

In this context, understanding and navigating the behavioral economics landscape becomes vital for nonprofits. Several organizations have already realized the benefits of behavioral economics in this area: Save the Children's CUBIC team, for instance, offers behavioral science training, leads programmatic research, and supports global campaigns across multiple continents; the World Bank's eMBeD unit advocates for the use of behaviorally informed tools in development projects; the Behavioral Insights Team (BIT), as we shall see further on, performs projects based on behavioral insights in the nonprofits sector; and, on a smaller scale, the NGO ActSEA (formerly WISE) implements behavior change, community-based interventions to achieve goals such as environmental protection and promoting hygiene practices.

Nonetheless, there is still vast potential for the application of behavioral economics in nonprofits, as most nonprofit programs and interventions have not been subject to rigorous evaluation, nor have they demonstrated impacts (Haskins, 2018), in addition to the constraints imposed by the 85% pass-through target for nonprofits' operational efficiency (Gregory & Howard, 2009).

This article examines how behavioral economics can enhance the efficacy of nonprofit organizations, aiming to shed light on how they can leverage behavioral economics to maximize their impact and drive meaningful change in society. This chapter uniquely focuses on their distinct mission-driven goals and resource constraints, which differ fundamentally from the profit motives of for-profit organizations, even though both sectors increasingly prioritize

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social and environmental responsibility.

Following an introduction on how behavioral economics can be applied to help nonprofits, three key areas will be explored: attracting donations, promoting volunteer engagement, and communicating effectively. Then, a case study is presented to show the value of applying behavioral economics in a real project with the Spanish NGO Plan International. The chapter then finishes with a review of aspects to consider when applying behavioral economics in nonprofit projects.

How Can Behavioral Economics Assist Nonprofits?

A nonprofit's every move is intrinsically engraved in human behavior and motivation. Behavioral economics understands that humans not always make rational decisions, so incorporating this knowledge helps break the discrepancy between what people intend to do and what they actually do (the *intention-action gap*) that exists in supporting nonprofits. Some of the most recurring barriers where behavioral economics can enhance facilitators are as follows.

Psychological barriers, which may prevent people from following through with an intended behavior (Kahneman, 2011). For instance, the paradox of choice occurs when people end up taking no action if too many choices are offered (Schwartz, 2004).

Social factors, particularly what others are doing, which may also impact people's actions (Cialdini, 2009). In fact, people feel safer making decisions that others similar to them have previously made (Cabinet Office and The Behavioral Insights Team, 2013).

Feelings of uncertainty, which in this context may occur when people do not know the ideal amount of money to donate. In this case, the first piece of information given to them often serves as a reference point for this decision, in line with the anchoring effect (Tversky & Kahneman, 1974).

Cognitive biases, which may also alter people's perceptions. For instance, optimism bias illustrates how people tend to overestimate the impact of their actions (Sharot, 2011). When the actual effect is less than expected, it can lead to demotivation due to the gap between expectations and results. A useful behavioral tool to counter this bias is the reciprocity principle, where people feel compelled to return favors, even if unprompted (Cialdini, 2016).

When discussing nonprofit behavioral patterns, donor behavior is often the first thing that comes to mind. However, the nonprofit sector includes a broader range of participants, such as "volunteers, employees, managers, board members, and recipients" (Qu & Mason, 2023), who are involved in various decision-making stages that influence a nonprofit's actions. We will now analyze different areas where behavioral economics can enhance nonprofit efforts.

Attracting Donations

In the field of donations, convincing a person to donate has become a central task, with various positive initiatives already up and working. Yet, the long-term relationship with the donor has been left behind, as shown, for instance, by the fact that a quarter of donors in the UK say that they have changed or are planning on changing their charitable giving habits (Charities Aid Foundation, 2023).

This long-term retainment of donors is especially important in this field, given that acquiring new donors can cost from 50 to 100% more than the amount they end up donating, making their retention much less costly and time-consuming than acquiring them in the first place (Kessler, n.d.). In addition, inflation rates play a role in donation placements, requiring a yearly increase from existing donors (The Behavioral Insights Team, 2013).

Behavioral economics emphasizes real behaviors over expected ones, which requires a comprehensive understanding of each nonprofit's context before designing or implementing any interventions. In addition, each donor profile will vary depending on the motivating characteristics they possess (what the donor feels, what motivates them, what their priorities are, what barriers the donor comes across, what they seek when donating, etc.). These factors add a new dimension to understanding their behavior (Bekker & Wiepking, 2011; Cabinet Office & The Behavioral Insights Team, 2013).

The following table presents the two types of donor profile described by Andreoni (1990):

Table 1: Donor Types (Andreoni, 1990)

Altruistic Donor	"Impure" Altruistic Donor
Their motivation is only in the outcomes, and they like to know what is happening to their money and to what end it is going to. Their main motivator to collaborate is empathy (Allen, 2018), so incorporating positive emotional aspects is key to creating a stronger bond.	They have other motives or follow through in a 'warm glow' giving way, meaning that they get some 'selfish' pleasure from doing good things for others. They like the reward component that public recognition brings to them (Bekkers & Wiepking, 2011).

Likewise, donors can be categorized into major donors, who provide large contributions, and individual donors, who typically donate smaller amounts regularly (Wagner, 2015). Research indicates that major donors prioritize the stability and effectiveness of a charity, value transparency and certainty during the donation process, and appreciate feeling involved in the organization, fostering a sense of belonging. Furthermore, they are generally less interested in post-donation updates (Cabinet Office & The Behavioral Insights Team, 2013).

Once nonprofits identify the distinct traits of their donors' profiles, they can develop tailored behavioral strategies. For instance, the Behavioral Insights Team (2013) utilized the EAST model (a framework that aims to make behavior easy, attractive, social, and timely) to streamline the donation process and reduce potential behavioral barriers, thereby simplifying and enhancing the donation experience.

They conducted five randomized controlled trials to test different elements of the EAST model separately. The following significant results were shared:

Table 2: Conditions Tested and Their Results (Behavioral Insights Team, 2013)

Condition	Results
Change in **framing** to increase donation amount	No effects on donation amount
Set **default** to automatically increase donation by 3% annually	39% of donors did not opt-out of automatic increase
Peer effects to encourage donations, by adding a picture of others similar to them donating	4% increase in sign-ups with addition of picture
Personalized appeals and **reciprocity principle** after receiving thank you gift	Tripled donation rates to 17%
Social norms of leaving money in their will to donate	Increase in 10% of people who left donation money in their will, once they were told others were doing so

The different trials conducted provided feedback to the Behavioral Insights Team, helping them understand which behavioral interventions worked best in this particular context. By identifying these behavioral obstacles, nonprofits can refine their strategies to encourage engagement and donations in a better way.

In addition, to maintain long-term donor engagement, nonprofits should continuously track donor interest, satisfaction, and involvement. Establishing a milestone cycle can help, possibly incorporating gamification elements whereby individuals select which nonprofit sector they want to support. By becoming a 'member' of a specific segment, donors are

automatically enrolled in a default monthly donation plan, with the option to opt-out. This approach has proven effective in other cases, increasing follow-up donations from 6% to 49% (Charity Link, 2013).

Promoting Volunteer Engagement

Behavioral economics can provide key insights with regards to the promotion of volunteer engagement, which is another integral part of nonprofit success that has important side-effects, namely, the potential to reduce mortality risks, as several studies have shown that volunteers live longer than non-volunteers (Konrath et al., 2012; Jenkinson et al., 2013).

Several experiments have demonstrated methods to encourage people to volunteer. Nelson & Norton (2005) found that priming individuals to think about superhero characteristics increased their likelihood of helping others and volunteering, with this effect lasting up to three months. The impact was stronger when participants thought of their favorite superhero rather than a specified one. Similarly, Gaesser, Horn, and Young (2015) revealed that episodic simulation, where individuals imagine themselves helping others, significantly enhanced the intention to engage in prosocial actions compared to merely observing or thinking about helping.

Another application of behavioral science helps volunteers stick to their commitments. For instance, a study by Rai et al. (2023) found that breaking a 200-hour goal into smaller targets, such as 4 hours per week or 8 hours every two weeks, increased volunteer hours by 8% over 12 weeks.

In an effort to simplify the application of behavioral principles for recruiting and retaining volunteers, the Sport and Recreational Alliance (Fujiwara et al., 2018) developed the acronym 'GIVERS' to highlight six key principles:

Table 3: GIVERS Framework for Volunteer Recruitment and Retention (Fujiwara et al., 2018)

Growth	Impact	Voice	Experiences	Recognition	Social
Offer opportunities for personal development	Show how volunteers make a difference	Frame messages effectively and choose communicators wisely	Ensure easy enrollment and flexibility for volunteers	Provide rewards and gratitude	Emphasize social connections through volunteering

Applying these principles, the Behavioral Insights Team worked with North Yorkshire County Council during the COVID-19 pandemic to boost volunteer sign-ups. They implemented various evidence-based interventions, such as:

- **Evoking reciprocity:** "*If you were a vulnerable elderly person, what kind of support would you need from your community right now?*"
- **Supporting self-efficacy:** "*It's normal to feel a bit helpless during these uncertain times. But you don't need special skills to make a difference in your local community.*"
- **Network nudges:** "*Can you think of any friends or family who might like to volunteer?*"

They also developed messaging strategies to maintain volunteer engagement, including:

- **Focusing on positive impact:** "*Volunteers like you have helped thousands of people get food, care and emotional support. It's hard to describe the difference you have made!*"
- **Highlighting progress:** "*Thanks for all your help so far! We have new volunteers joining regularly and they would love to hear your top tips for helping others. Please click here to share what you wish you had known when you first signed up to volunteer.*"
- **Message from a trusted messenger**: "*I would like to thank each and every person who has helped out during this difficult time. I couldn't be prouder of the North Yorkshire community.*" *[Leader at North Yorkshire County Council]*

Although these messages were not tested through randomized controlled trials, they nevertheless provide examples of potential behavioral insights for engaging volunteers in nonprofits.

Communicating Effectively

All this knowledge helps personalize outreach to a nonprofit's audience, but behavioral insights are useless without effective communication. It's not just *what* you communicate but *how* you do so that matters. Without this consideration, the message might be lost or come across incoherently.

In fact, purposeful communications can trigger motivations to take action, given that, as shown by Fogg (2019), abstract motivations do not produce results. The following example provides a clear reference on how to make an impact tangible:

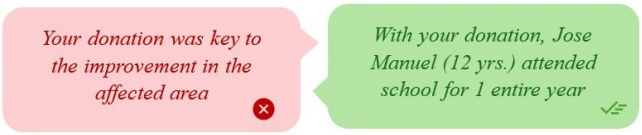

Figure 1: Example of a tangible impact.

When we talk about the players involved in nonprofits, it is crucial to maintain an encouraging tone (Allen, 2018). By using a behavioral map, barriers to desired behaviors can be identified and addressed, which means communication is important throughout the entire process, not just at the start. Once barriers are identified, behavioral principles can be applied to the communication strategy.

For example, a classical concept in charity communications is the identifiable victim effect, where "we feel greater empathy, and an urge to help, in situations where tragedies are about a specific, identifiable individual" (The Decision Lab, n.d.-b). This happens because individuals' emotions serve as motivators to get involved in any kind of nonprofitable action. The moving force comes from within the person to help another with whom they can identify and that has a greater impact than a generalized description of a situation or even a group of people.

Moving on to a specific case study, a simple and effective example of a change in communication can be seen in Urban Alliance, a nonprofit that offers a professional development training program for high school seniors, where professionals from different fields mentor students. They decided to implement behavioral interventions in the overall communications for this mentorship program. As a result, they shared three major themes that improved the mentoring program (King, 2017).

"**Being clear about next steps can encourage action**": Mentors received a checklist with different tips and guided steps for the mentoring process. This helped break the uncertainty they had in terms of what they had to do.

"**Identity priming can help encourage behavior**": Mentors were allocated to situations where their personal identity could come up. At the same time, they received a monthly survey in which they had to reflect positively on their experience as mentors, which strengthened their identity.

"**Providing deadlines and reminders elevates their importance**": The use of loss aversion, i.e., the human tendency to avoid losses over acquiring equivalent gains, is applied once mentors agreed to help. They were provided with invites to future events, which incentivized them to go because it provided an opportunity they did not want to miss out on or lose once they had been invited.

Case Study – Our Collaboration With the Spanish NGO Plan International

While it is relevant to understand the behavioral theory behind the communications and touch points of an NGO, it is also interesting to observe how these effects play out in the real world, proven by the fact that some nonprofit organizations are already applying behavioral insights and seeing great results. Below, we present how we applied behavioral insights to donations made to the Spanish NGO Plan International.

Plan International was founded in 1937 in Spain with the aim of helping children who became orphans during the Spanish Civil War. Since then, it has expanded its work to more than 80 countries through programs in Africa, Latin America, Asia and Europe, working to promote children's rights and equality for girls. Its main activities include providing emergency responses, ensuring education, health, protection, and economic empowerment, as well as promoting child and youth participation, with a reputation that undoubtedly stands out thanks to its strong commitment and ethical approach to projects.

The objective of this intervention was to directly apply different aspects and principles of behavioral economics that would help telephone agents further personalize their messages to accompany, guide, and improve the experience of potential donors during

calls and other points of contact.

The project was developed in the following phases:

Figure 2: Phases of the behavioral intervention.

Phase 1. Understanding Donor Behavior

The purpose of this phase was to gain an initial understanding of the context to be addressed, with a special focus on developing a behavioral diagnosis of the donor's behavior and environment. To this end, academic research, a behavioral diagnosis, and a benchmark were developed. These activities provided a clearer view of the donors' motivations and possible barriers, and so we were able to define four lines of work at the behavioral level for the subsequent development of materials and initiatives proposed, as illustrated in Table 4, below.

Phase 2. Building the Optimal Decision Architecture

Once the initial phase was completed, new support and training materials were designed for telephone agents, incorporating the good practices identified in the initial phase.

In this way, five different and personalized behaviorally informed scripts were constructed that corresponded to the different areas of action for Plan International. Specifically, one of the key purposes was the design of a newly optimized script to contact customers with whom they had never previously had contact (cold calling).

These materials not only included illustrative examples of possible arguments to be used in these calls, but they also explained in detail the behavioral aspect to be enhanced at each moment so that, as the telephone agents resorted to it, they could naturally acquire greater knowledge and awareness of the behavioral fundamentals applied.

As a last activity in this phase, in addition to these new scripts, a training session on behavioral economics was held for members of the treatment group to tell telephone agents more about the project and how it was developed, with a special focus on the new behavioral levers incorporated and why they had an effect through different experiments in situ and in group exercises.

Phase 3. Testing and Measuring Impacts

This third and final phase aimed to measure the effectiveness of the newly proposed script for cold calling. The experimental design and results shared below are shown in relative terms for confidentiality reasons.

A representative sample of telephone agents was selected and divided into two differentiated groups with homogeneous characteristics. The control group continued to use the materials they had used previously, and the treatment group only used the new behavioral scripts.

In addition, the managers of this treatment group were given training on the incorporated aspects of behavioral economics. It should also be noted that both groups were isolated throughout the testing period to achieve greater objectivity and avoid possible contamination in the experiment.

Table 4: Principle Behavioral Lines of Work

LINE OF WORK #1 ***Promote personalization, empathy, and reciprocity*** *to get closer to the donor and generate an emotional bond*	**LINE OF WORK #2** ***Reduce the degree of uncertainty*** *by sharing information in a simple way and making the steps to follow clear*
LINE OF WORK #3 ***Make the impacts of donation tangible*** *in a clear and more visible way for donors, partners, or sponsors*	**LINE OF WORK #4** ***Facilitate and speed up a donor's decision-making****, for example by highlighting what other potential partners do*

Figure 3: Results of the behavioral initiatives.

After measuring and monitoring these variables over the 5 weeks during which the experiment was carried out, the results of the experiment were calculated by using as a reference the 5 weeks prior to the launch of the experiment (see Figure 3).

In summary, we can say that the proposed behavioral initiatives had a positive impact, and, in fact, all telephone agents involved in cold calling currently use the proposed script.

Conclusions and Implications

As seen in the Plan International project, the use of behavioral economics in nonprofits opens up a spectrum of possibilities to increase the impact of these organizations on the people who need it the most. As previously mentioned, the ability to understand and apply behavioral principles turns out to be a key factor in deepening not only emotional, but also psychological connections. This reinforces compromise and strengthens the bond with the different causes in the long term.

However, this approach implies a heavy ethical challenge, which brings up the need for a rigid ethical framework as well as a responsible and conscious application of these tools, which is key to ensuring that respect for individuals' autonomy remains at the center of all actions. Therefore, the success of these initiatives should be measured not only in terms of economic results, but also in terms of the safeguarding of an ethical balance that protects the freedom of choice of individuals and strengthens generosity and altruism. This much needed harmony, without a doubt, is a key pillar not only for the validation of the behavioral interventions inside the nonprofit sector, but also for keeping the trust and sustained support of the community.

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Neuro-Nudging and Predictive Models: Adaptive Ethics for Behavioural Science in a Changing World

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In an increasingly complex future, the ethical principles underpinning applied behavioural science may become disputed. Broadening thinking to anticipate future challenges can prepare behavioural science practitioners better for possible future shocks. Using a strategic foresight approach, this paper presents four plausible future scenarios that could change the societal and policy landscape within which behavioural science teams operate in the future. Set in 2040, the scenarios explore the interplay between applied behavioural science and individual autonomy in an increasingly automated, digital and polarised world. We argue that the social licence to operate for future behavioural science practitioners relies not only on technical expertise, but also on deep ethical discernment. Proactively considering future challenges promotes resilience by encouraging practitioners to reflect on what changes might be needed to ensure success under the broadest range of future possibilities.

Introduction

Behavioural sciences study cognitive, cultural and contextual influences on human behaviour and decision-making and are increasingly applied to guide effective policymaking (Wagner, 2021). Recognising that human decision-making is not unboundedly rational and is strongly influenced by situational factors, applied behavioural science (sometimes labelled behavioural insights) has provided important contributions in shaping policies and systems to support people's wellbeing and prosperity.

Behavioural science practitioners hold a position of power which necessitates ethical guidelines to govern interventions and ensure transparency, fairness and respect for autonomy (Sunstein, 2015; Hallsworth, 2023), whilst ethical principles have been established to guide behavioural science practitioners in the fair design and implementation of their behavioural interventions (see box).

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This paper prompts behavioural science practitioners to consider whether the ethics principles guiding their work might be challenged in a future in which the societal and policy landscape has evolved. What is deemed by society to be ethical changes over time, and there is some evidence that ethical standards are rising (Emerson & Conroy, 2004). Rapid technological advancements, huge demographic and societal shifts and geopolitical transformations, though, might reshape societies and change the fabric of what is deemed acceptable (Capasso & Umbrello, 2022). There is thus an imperative to anticipate and navigate these shifts to ensure that behavioural science practitioners remain aligned with evolving societal values and expectations.

Anticipating the Future in 2040

This paper applies a strategic foresight approach to examine future scenarios that might influence the work of behavioural science practitioners in the year 2040, a year chosen because it is far enough into the future to allow for the possibility of transformational change. Strategic foresight is a structured and systematic approach for envisioning future possibilities, and it does not aim to predict the most likely future but to inform strategic decision-making and planning (Lavery, et al. 2023) by prompting reflections on current practices and how these might need to adapt. Furthermore, strategic foresight is used by organisations and governments around the world; for example, it was recently employed by the OECD to stress-test net zero transition policies against a range of possible future scenarios (OECD, 2023).

Exploring different possible futures stimulates thinking about how current and future trends might impact citizens, societies and governments. Creating diverse scenarios allows behavioural science practitioners to stress-test the current ethical principles and guidelines guiding their work by reflecting on how they would perform in each scenario and take steps to address any identified weaknesses.

The scenarios were created by the world's foresight experts on the futures of society and behaviour. They imagine a future in which behavioural science practitioners increasingly need to grapple with questions that are not only ethically nuanced, but also deeply consequential, such as the balance between paternalism and individual autonomy, the ethical use of emerging technologies, and the implications of shifting societal norms and values on policy interventions.

The scenarios explore plausible extremes of current trends, including polarisation and emerging technologies such as artificial intelligence and neurotechnology. These emerging trends, and others beyond the scope of this paper, have the power to revolutionise the work of behavioural science by offering new tools and insights that will significantly advance our understanding of human behaviour, improve the effectiveness of behavioural interventions and uncover new and innovate behavioural approaches. However, each will come with novel ethical challenges

Responsible by Design – Principles for the ethical use of behavioural science

The OECD Good Practice Principles for the Ethical Use of Behavioural Science offers a flexible, adaptable framework to support ethical practices from policy ideation to implementation. It translates abstract ethical concepts into concrete actions with real-world examples and case studies.

The OECD ethics principles emphasise transparency, stakeholder involvement, risk mitigation, fairness and accountability in designing and implementing behavioural interventions. They stress verifying the relevance of behavioural science for policy goals, responsibly gathering, and storing behavioural data, and integrating ethics throughout the design, implementation, and scaling of interventions.

The guide includes questions to prompt behavioural scientists to consider the ethical implications of their actions, emphasizing the importance of considering unintended consequences, pre-registering research, protecting data privacy, and being thorough in how results are shared with the public. These principles aim to standardise and systematise ethical processes in policymaking, addressing concerns about inconsistent and ineffective applications.

Source: OECD (2022).

that behavioural science practitioners should start to anticipate now in order to prepare proactively for future opportunities and challenges (Wagner, 2021).

Scenarios: Exploring Visions of the Future in 2040

Scenario 1: Advances in Neurotechnology are Embraced for "Neuro-Nudging"

Written by Dr Virginia Mahieu, Neurotechnology Director, International Center for Future Generations.

Wearable devices with tiny EEG sensors and integrated feedback mechanisms are affordable and commonplace across most of the world in 2040, offering cognitive augmentation and behavioural guidance through neuro-feedback. Early experimentation by academic researchers and private companies found ways to detect how users felt about, and reacted to, economic incentives, allowing for guidance on better day-to-day ecological and financial decision-making. Established neurotechnology companies soon jumped on these results, and "life-hacking" devices for people struggling with self-control through neuro-informed behavioural nudging were soon coined "neuro-nudging".

Popular "neuro-nudging" devices guide users to reconsider guilty-pleasure purchases, or combine data on sleep, energy levels and weather to prompt them to choose to walk when the conditions are right. Safety devices can even gather data on intoxication or fatigue to nudge taxi use when driving becomes unsafe.

These devices have piqued the interest of behavioural economists in public administrations, who have partnered with private companies to conduct small trials and test government-led economic incentive schemes with voluntary participants. Privacy advocates have raised objections about neuro-nudging, especially with the announcement of public-private partnerships, invoking terms such as "paternalism" and "government mental manipulation."

Despite the controversies, many people in the trials felt they benefited from these devices and felt they should be deployed more widely to promote voluntary participation in economic policy design based on real-time neuro-behavioural data. With the increasing widespread use of neuro-nudging devices by governments, concerns regarding the privacy of data, its security and potential biases in incentives due to relatively small sample sizes remain unresolved

Ethical Questions for Behavioural Science Teams in a Neurotechnology-Informed World

Neurotechnology designed to enhance cognitive functioning could become widespread, creating more disparities in cognitive abilities. How might behavioural science interventions need to change to ensure ethical treatment, regardless of neurological disparities?

Everyone has the right to "freedom of thought," so what might occur as a result of the commodification of neurodata? For example, if data collected from citizens without their explicit consent by a private organisation resulted in new neuroscientific discoveries that could be applied to enhance the effectiveness of behavioural interventions, would it be ethical to apply this knowledge?

In the future, brain activity may be able to be extrapolated from other biological data such as facial micro-expressions, posture and biometrics. To what extent is it ethical to extrapolate brain data based on these factors, and does this require explicit consent from research participants? Should this type of data be treated differently to bona fide neurodata?

Brain-sensing technologies used in – or to inform – behavioural interventions will likely provide information beyond the scope of the intervention under investigation. What new ethical challenges might this bring? For example, if a participant in a trial showed brain activity associated with early signs of cognitive decline, would the team conducting the trial be required to inform the participant?

Scenario 2: Generative AI's Potential to Supplement Care and Support

Written by Dr Caroline Emmer De Albuquerque Green, Institute for Ethics in AI, University of Oxford.

In 2040, homes with "smart" integrated technology support people with their daily tasks, monitor their health and wellbeing and connect them with relevant individuals and services when necessary. Generative AI plays an important role in many of the products and solutions found in people's homes, adapting to the needs and preferences of the individual(s) over time.

Mary, an 85-year-old with minor memory problems, has various products that are supporting her through daily personalised information. Mary's AI assistant, Sage, accesses the weather forecast each day and makes recommendations to Mary in terms of appropriate clothing. Sage also provides daily reminders about everything, from medication, to medical appointments and family members' birthdays. Sage also links to family members living in other cities, as well as relevant health and emergency services, and automatically provides notifications of Mary's current health data and any predictions for possible medical deterioration or risks of incurring injuries, such as falls.

After evolving over decades, "smart home" capacity can now safeguard for longer the independence and autonomy of older people with emerging or current care needs. Smart homes have become crucial in a context of global demographic ageing, with people living longer but with higher care needs and fewer formal family support structures in place. Early alerts about emerging health risks provided by smart homes mean the business of government health services is increasingly focused on providing early assistance to prevent a medical event, rather than responding after the fact.

Despite these benefits, ethical concerns over smart homes and the role of generative AI in them remain. These include privacy issues, given that private companies "own" a large amount of personal and sensitive data on people, which can be – and at times is – used in non-beneficial or even malicious ways against them. For Mary, her smart home means that there are fewer reasons to engage with other people, which ironically has led to her feeling less connected to her community and her family.

Ethical Questions for Behavioural Science Teams in a World of AI-Enabled Care

In 2040, AI assistants might help most people navigate their day-to-day lives. What ethical principles might be needed to guide the use of behavioural interventions on AI platforms, including those owned by private organisations? What safeguards might need to be introduced to protect vulnerable users, and to help participants understand how the AI technology is being used?

Generative artificial intelligence technologies engage with deep-learning models to adapt and create new knowledge based on the data it accesses. If behavioural science makes use of generative AI to design powerful and personalised interventions, how can ethics be adequately considered, given that the system is constantly evolving when exposed to new data? Is adequate human oversight possible in this case?

There is evidence that humans might respond differently to behavioural interventions provided by AI as opposed to those provided by humans. How might this need to be taken into account when designing future nudges in an AI-enabled world?

Scenario 3: New Methods of Sensing Raise Novel Ethical Questions

Written by Erica Bol, European Commission, based on work outlined in "Futures Garden".

In the Symbiocene era of the 2040s, a profound shift has reshaped public sector governance as humanity embraces a broader understanding of intelligence. At the forefront of this evolution is the "Umwelt Immerse" device, enabling individuals to explore the sensory realms of other intelligent beings. This technological

breakthrough heralds a new era of interaction between governments, people and other living beings, presenting both opportunities and challenges.

The Umwelt Immerse device prompts a re-evaluation of the relationship between governments and people. By offering unprecedented insights into the experiences of diverse populations, the device has the potential to foster empathy and understanding, transcending linguistic and cultural barriers. However, ethical considerations loom large. Questions arise regarding privacy, autonomy and the responsible use of umwelt data for policy formulation.

Moreover, for the first time, humans are able to experience non-human sensing mechanisms, thus raising profound questions about the inclusion of non-human entities in governance processes. Should animals be considered as citizens, and should they participate in deliberative democracy? As the boundaries of citizenship and personhood blur, calls for inclusive governance models, including those that consider the unborn future generations, resonate.

As humanity navigates the uncharted territories of symbiotic consciousness, the imperative to redefine governance paradigms becomes increasingly urgent. Through thoughtful reflection and inclusive dialogue, stakeholders can chart a course towards a future where the interaction between governments, citizens and other living beings is characterised by mutual respect and ethical consideration, thereby ensuring a more equitable and sustainable society.

Ethical Questions for Behavioural Science Teams in a World of Neurodiversity

Might an increased understanding of neurodiversity lead to an ethical imperative to consider sensory-inclusive policies and regulations? How might this impact the ethics of large-scale behavioural trials and the amount of testing actives to examine the impact of trials?

How might a move from a purely human-centric worldview toward a deeper understanding of life on Earth influence the work of behavioural scientists?

Scenario 4: The World Reverts to Analogue in a More Confusing and Contested World

Written by Alex Zafiroglu and Jessamy Perriam, School of Cybernetics, Australian National University.

Breaking News: Celebrations in Parliament today as CLOVIS reaches 20 million service provisions, slashing fraudulent claims by nearly 30% in the last five years and stabilising the country's human services "Centrelink" budgets for first time since 1998.

Minister for Social Services Emily Nguyen led festivities to celebrate the 20 millionth service provision by the stations that have come to define the "Nguyen era" of high approval ratings for Centrelink, not seen since before the Robo-debt scandal two decades ago. CLOVIS (Centerlink's Official Verified Integrated Services) stations have transformed government service delivery, effectively ending the financial crisis wrought by DeepFaked claims for government services generated when the country declared that citizens do not have a right to be analogue. Initially declared a success, Centrelink's digital transformation to video-first, then video-only appointments showed signs of distress when staff increasingly couldn't tell if the citizens in appointments were enhanced, synthetic, hallucinated, hallucinating or frankly had any relationship with an analogue person. The market in so-called "Obamavatars" that were the nail in the coffin of US social services spread across the world – until Centrelink revised its stance and declared citizens have an obligation to be analogue, even as services are digitally delivered. Each fully automated CLOVIS kiosk travels thousands of kilometres weekly its route, dynamically updated with real-time data on social service needs. For citizens, accessing digital services comes with the obligation on them to assure that they – and only they – are receiving benefits. Secure identification based on dental imprints, gait analysis and

(contained) sneeze signatures have proven more reliable than easily deep-faked retinal scans and fingerprints.

Despite the celebration of 20 million successful service provisions, the CLOVIS kiosks are not failsafe. Residents of a remote town, for instance, were stuck in a 350-metre-long queue to access services after a particularly energetic identification check left both the CLOVIS and a resident with black-market dental implants out of commission. While the resident is recuperating at home on a liquids-only diet, the CLOVIS is unresponsive despite being turned off and on again several times. Residents now must wait for an engineer to travel over 700km for repairs. Local woman Kylie Sinclair says this is the third time this year that CLOVIS has broken down: 'When CLOVIS isn't working, it's the difference between being able to pay for physiotherapy to let me spend time with my friends or being left inside with chronic pain because I can't make a claim that week. It's CLOVIS or nothing'.

As she faces another week of delays, Kylie's reminded of other Centrelink improvements gone awry: 'I reckon it's a bit like Robodebt – we still can't bite back'.

Ethical Questions for Behavioural Science Teams in a Contested World

In a contested 2040, where even the most well-meaning citizen is left confused about who or what to believe, behavioural science teams may be called upon to provide guidance to help people make sense of a confusing world. Who is the arbitrator of truth in a contested world? How might behavioural science ethics principles need to adapt to ensure that they manage the balance between paternalism and individual autonomy?

As sophisticated AI-enabled mis- and disinformation campaigns operate automatically and continuously, how might behavioural science teams need to prepare for a greater scrutiny of their work by actors looking for opportunities to discredit governments? How might they gain consensus on what is ethical in a more contested context?

Building capacity for geo-strategic communications, including the use of structured analytic techniques such as "red-teaming" (where a group pretends to be an enemy and designs an attack for the purpose of showing weaknesses), is increasingly necessary in many policy areas. How might behavioural science teams need to engage with these practices to understand better the potential for mis- and disinformation associated with behavioural interventions?

Adaptive Ethics for Behavioural Science in a Changing World

In navigating the ever-evolving landscape of public policy, behavioural science teams rely on frameworks such as the OECD's "Good Practice Principles for Behavioural Science in Public Policy" to inform their decisions and guide their work. However, rapid societal evolution will almost certainly ensure that interpretations about what is ethical are not stable over time, and future ethics standards may vary from those that guide behavioural science teams today. In a future in which we strive to accommodate people with diverse values, cognitive abilities and access to technologies, determining what is ethical may need to be considered on a much more nuanced basis than what occurs today, and with consultation from the target population.

AI systems have already surpassed human intelligence in some areas and are capable of analysing vast amounts of behavioural data more efficiently than humans. In future, they may offer deeper insights into decision-making processes and behavioural patterns, potentially with minimal human oversight. Behavioural science teams wanting to embrace the transformative opportunities offered by AI will need to address novel concerns around the ethics of using a third-party "black box" system whose workings may not be sufficiently understood (Schmauder et al., 2023). Interventions may be effective at changing behaviour, but this might occur without a true understanding of the human cognitive processes underly the behaviour. The ability of these systems to refigure themselves continuously and evolve over the course of an intervention means they have the potential to diverge away from initial conditions, raising questions about what level of human oversight is necessary, or even possible, in a system that may be designed ethically but can evolve over time in ways that are not sufficiently understood.

Novel ethical concerns may also arise as a result of advances in neurotechnology. Techniques such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) already allow for real-time observations of brain activity, providing valuable data on the cognitive processes that drive human actions. In the future, brain activity may be cheap and easy to collect, or even extrapolated from other biometric data. While this will advance neuroscience and help behavioural scientists to develop more accurate models of decision-making and identify novel intervention strategies (Varazzani, 2017), it raises questions about the use of neuroscientific data (including extrapolated data) by those outside academic or research institutions who will not be subject to formal oversight or be required to abide by the ethical research principles.

Brain-computer interfaces (BCIs) and neurofeedback systems enable direct interaction with brain activity, allowing for tailored interventions based on individual neural profiles and offering the possibility of personalised behavioural interventions. Leveraging these technologies to design interventions that target the specific neural pathways associated with a particular behaviour could optimise intervention outcomes and promote personalised advances, for example in healthcare, education or addiction (Arzi et al., 2014, Hu et al., 2015, Koizumi et al., 2016), by measuring implicit cognitive processes that are not accessible through traditional self-report methods. This includes subconscious biases, emotional responses and physiological indicators of decision-making. Uncovering these hidden drivers of behaviour could allow for the development of powerful interventions that address underlying neural mechanisms but raise questions about the extent to which participants are willing to share thoughts they would prefer to remain private.

In a world of more diverse views, either as a result of increase neurological diversity and abilities or increased polarisation, the work and ethics of behavioural science teams may come under increasing scrutiny. In addition, declining trust in government and authority as a result of polarisation may lead to behavioural science teams becoming the target for campaigns of mis- and dis-information. As AI-enabled misinformation campaigns become more sophisticated and prevalent, preparing for these campaigns might become a core component of any behavioural intervention. The use of structured analytic techniques designed to anticipate and prepare for mis- and dis-information strategies could deepen our understanding of potential risks, allowing for proactive practices that might pre-empt and mitigate the threat of these campaigns.

Conclusion

Behavioural science practitioners have thus-far held themselves to the highest levels of ethical conduct; however, the quickly evolving societal and political landscape may challenge the validity of existing ethical principles. Stress-testing current ethical guidelines against the futures described herein can be a useful mechanism for highlighting gaps or uncertainties for further exploration. The scenarios can be used to stimulate "What-if" conversations and strategic planning sessions within behavioural science teams to foster a culture of open discussion, ethical reflexivity and adaptive governance, all of which is grounded in the principles of justice, transparency and human dignity.

THE AUTHORS

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Dr Chiara Varazzani is the Lead Behavioural Scientist at the OECD, where she fosters a global community of behavioural experts, helps governments tackle policy challenges, and runs experiments - to better understand what works, for whom and in what context in many policy areas including environment, competition, health and misinformation. Previously, she was Principal Advisor of the Behavioural Insights Unit in Australia, advisor to the Australian Federal Government, and Research Fellow at the Behavioural Insights Team in London. Dr Varazzani holds a PhD in Behavioural Neuroscience from Sorbonne University and an MSc from the School for Advanced Studies in Social Sciences and École Normale Supérieure.

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People Are Different! And So Should Be Behavioural Interventions

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Behavioural economics is increasingly recognising the key role of individual heterogeneity in understanding human behaviour. People differ in many ways: preferences, attitudes, beliefs, socio-cultural and economic backgrounds and cognitive responses to external stimuli. Effective behavioural interventions (BIs), designed to influence and change human behaviour, must therefore account for this heterogeneity. Today, there is a spectrum of BIs beyond the popular "nudges" for influencing behaviour, including boosts, thinks and nudge+. Responses to these are complex and varied, driven by numerous psychological mechanisms. We illustrate this point by reviewing experimental evidence from a recent stream of behavioural economics experiments on food choices, which highlights the role of individual heterogeneity in behavioural responses. We recommend that behavioural economists must systematically and holistically test a wide range of BIs, complement the analysis of average treatment effects with localised effects and use computational social science methods to adaptively tailor and test BIs for different population segments.

Introduction

One of the main contributions of behavioural economics to date has been to enrich and augment the standard model of economic behaviour and decision-making by acknowledging the central role played by human diversity and heterogeneity (Thaler, 1985, 1988, 1990, 2016; Loewenstein, 1987; Camerer, et al., 1989; Loewenstein & Prelec, 1993). There is not just one type of representative human agent: people are different. One of the earliest areas of interest for pioneering behavioural economists was the conceptual and empirical analysis of fundamental economic preferences such as risk, time and social preferences, with the immediate recognition that there is indeed a remarkable heterogeneity in human preferences, as witnessed by the many instances of so-called "behavioural anomalies" and "exotic preferences" documented in early studies (Kahneman & Tversky, 1974; Loewenstein & Thaler, 1989; Camerer & Thaler, 1995; Charness & Rabin, 2002; Frederick, et al., 2002; Fehr & Schmidt, 2006; Loewenstein, 2007).

There are indeed multiple sources of heterogeneity characterising human behaviour. To start with, people have very rich and diverse preferences. Take risk preferences, for example: arguably one of the most developed and influential streams of behavioural economics research has been the experimental analysis of heterogeneity in individual risk preferences (Kahneman & Tversky, 1974; Camerer, 1989; Hey & Orme, 1994; Loomes & Sugden, 1995; Ballinger & Wilcox, 1997; Wakker et al., 1997; Starmer, 2000; Abdellaoui et al., 2007, 2008; Harrison & Rutström, 2009; Bruhin et al., 2010; Wakker, 2010; von Gaudecker, et al., 2011; Vieider et al., 2015; Burghart et al., 2020). Similarly striking diversity and heterogeneity in individual preferences has been documented by behavioural economists for time and social preferences, too (Andreoni, 1988; Prelec & Loewenstein, 1991; Loewenstein & Prelec, 1992; Laibson, 1997; Bolton & Ockenfels, 2000; Fehr & Gachter, 2000; Andreoni & Miller, 2002; Frederick, et al., 2002; Dana, Cain & Dawes, 2006; Dana, et al., 2007; List,

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2007; Bardsley, 2008; Cohen, et al., 2019). Alongside diverse preferences, people have very heterogeneous attitudes, beliefs and perceptions, and they make very heterogeneous decisions (Loewenstein, 1996; Loewenstein et al., 2001, 2003; Slovic et al., 2004; Della Vigna, 2009; Galizzi et al., 2024). Of course, people are different in many more dimensions, shapes and forms: from their cultural, evolutionary, historical and geographical backgrounds to their socio-economic conditions, from their personality traits to their cognitive and neurological differences. In parallel to how biodiversity has substantially reshaped natural and environmental sciences in the last decades, neurological diversity is now radically reshaping science, medicine and social sciences, championing differences in terms of how brains and neurological systems work in different people; for instance, about 15% of the global population are estimated to be "neurodivergent", having conditions such as attention deficit hyperactivity disorder (ADHD), autistic spectrum condition, dyslexia, dyspraxia or dyscalculia, among others.

If people are inherently so different, it should not surprise us that they can also respond differently to behavioural interventions (BIs) and policies aiming at changing behaviours. One of the most exciting current developments in behavioural economics is in fact the recognition of the richness, diversity and nuances of behavioural responses to policies, interventions and stimuli. Bryan et al. (2021) describe a nascent 'heterogeneity revolution' defined by the recognition that most 'treatment effects' of policies and BIs are heterogeneous. For example, a BI or policy that is effective in changing behaviour for the majority or a group of people can still have negative consequences for a minority or backfire for another segment of the population (Galizzi et al., 2022; Sunstein, 2022). One size does not fit all, then, and so it is likely that a policy or BI that works for one group of individuals will not work for others (Beshears et al., 2020; Brody et al., 2024; Galizzi et al., 2024). The traditional focus of behavioural economists on simple averages and "average treatment effects" (ATEs) should thus be complemented by paying more attention to the study of heterogeneous treatment effects, over and above simple averages. Localised average treatment effects (LATEs), for example, that measure differential effects of the treatment in given subgroups, are often more informative than ATEs to behavioural economics practitioners, as they offer more granularity on the individual uptake of BIs and policies.

This granularity and diversity of behavioural responses to policies and BIs, and the related heterogeneity in treatment effects, calls for a systematic approach to sampling and moderation in order to account for variations in effect estimates when making conclusions about reproducible and generalisable findings (Bryan et al., 2021; Ghai & Banerjee, 2024). Recent attempts to synthesise available evidence on the effectiveness of BIs, such as nudging (Mertens et al., 2022), have limited generalisability due to the wide disparities in types of BIs and to the specificity of their domains of applications and/or their underlying causal mechanisms, especially when these interventions are clubbed together and compared to one another. These contextual differences further add to the inherent variations in the above-described individual characteristics, as well as in situational constructs in which BIs are implemented and taken up by people.

On the other hand, understanding heterogeneity in the uptake of BIs enables a more tailored approach to delivery, either via market segmentation or by developing micro-targeted, customised or personalised interventions (Mills, 2020). Recent developments in computational social science methods (Sha et al., 2023; Veltri, 2023) now make it possible to infer individual heterogeneities causally in the uptake of BIs (Banerjee & Veltri, 2024), which in turn opens up the possibility of administering and testing the broadest range of BIs. There are also issues of scalability, transferability, legitimacy and public support in relation to BIs and policies, in that not all forms of "one-size-fits-all" BIs generalise or scale up equally well, or receive equal public support or approval, and so understanding individual differences is key to improving their effectiveness and legitimacy (Soman & Hossain, 2021; List, 2022; Sunstein, 2022; Sha et al., 2023; Saccardo et al., 2024). For all these reasons, strategies and policies aiming at influencing – and possibly changing – human behaviour should therefore fully account for the extraordinary richness in individual heterogeneity (Bryan et al., 2021; Veltri, 2023).

In this piece, we illustrate the key role of human behaviour heterogeneity in the context of behavioural interventions aiming at promoting sustainable

dietary choices. We review nudges and two new behaviour change intervention toolkits – boosts and nudge+ interventions – that have been proposed as alternatives to traditional nudges. Both toolkits aim to improve human agency and autonomy (Banerjee et al., 2024), have different causal cognitive underpinnings (Banerjee, 2021) and therefore place different demands on different individuals. We summarise key differences in their operationalisation and draw on growing empirical evidence that suggests differences in the effectiveness of these BIs, especially when systematically compared to each other experimentally in the same sample and at the same time. Specifically, we highlight the case of sustainable diets, where experimental evidence has shown that nudge+ can be more effective than boosting or nudging, for example. We conclude with the suggestion to test a wide variety of BIs systematically in multiple experimental setups, to analyse the heterogeneity in their effectiveness and to ultimately develop a set of common patterns that enables behavioural economics researchers and practitioners to choose one BI over the other.

The rest of the chapter is organised as follows. The next section summarises boosts and nudge+ interventions and highlights key differences in their workings. We then summarise findings from a range of recent experimental studies to compare and contrast these BIs in relation to promoting sustainable diets. We conclude with three recommendations for behavioural economics practitioners to account better for individual heterogeneity in practical applications.

Pluralism in Behavioural Economics Interventions

Nudges

Following the eponymous best-selling book by Thaler & Sunstein (2008), "nudges" are now largely popular mainstream BIs. To qualify as a nudge, a BI must meet some specific features, namely to modify the decision environment (the so-called "choice architecture") without limiting individual freedom and the number of choices, and without altering the economic incentives and the set of available information (Thaler & Sunstein, 2008; Banerjee & John, 2023b). The so-called 'libertarian paternalism' approach has been invoked as the main conceptual framework to justify nudges as politically and ethically acceptable BIs (Sunstein & Thaler, 2003). Such an approach, as well as nudges, has not been exempt from criticisms, arguing, for example, that they seem to rely critically on the assumption that individual decision-makers are largely uneducable because they are inherently cognitively biased (Gigerenzer, 2008, 2015).

Alongside nudges, a growing number of tools have recently been added to the behavioural economics intervention toolbox. This increasing pluralism of tools speaks to the inherent richness and diversity of human behaviour, as well as to the need to be fully reflected by the objectives and strategies of public and corporate decision-makers. Below, we outline two such tools – boost and nudge+.

Boosts

Boosting refers to a behaviour change strategy that seeks to improve people's competencies and upgrade their 'repertoire of skill-sets' (Hertwig & Grüne-Yanoff, 2016). Interventions designed with this principle of enhancing human capacities are referred to as "boosts" (see Hertwig, 2017). As the name suggests, boosts were conceived to empower individuals and enable them to undertake welfare-improving behaviours, which they do fundamentally by promoting people's cognitive capabilities (Herwig & Grüne-Yanoff, 2017). While nudges focus on influencing final behaviours, boosts take a step back and work by influencing people's competencies, which are then expected to change the end behaviour of the individual. Boosts and nudges are rooted in different behavioural schools of thought. For example, nudging and its precedents are based in the "heuristics and biases" paradigm, which links every sub-optimal deviation in human behaviour ("bias") to a given cognitive shortcut ("heuristic") that humans follow: nudging enables decision architects to alter the presentation of choices to people and predictably leads to certain well-defined outcome behaviours ("ends"). Contrarily, boosts relate to the "simple heuristics" paradigm, which assumes that humans often follow simple shortcuts to make *reasonable* choices (also see Madsen et al., 2024); sometimes, they may go wrong, but they do not happen systematically. Furthermore, boosts can be short-term whereby competency-building exercises are tied to a specific context of decision-making. Long-term boosts relate to broader human competences, such

as rules to infer statistics or manage uncertainty better, which can then be applied to a wide range of human decision scenarios. A more detailed overview of differences between nudging and boosting can be found in Hertwig and Grüne-Yanoff (2017; see Table 1, p. 974).

Nudge+

Nudge+ refers to a set of BIs that prompt reflection ("plus") in citizens in addition to nudging them (Banerjee & John, 2024a). Nudge+ interventions are successors of large-scale reflective tools in public policy called "thinks" (John et al., 2011), i.e., citizen forums or deliberative democracies in which people come together in groups to think about a problem and find ways to solve it collectively. While these large-scale thinks were originally effective, they were often too costly to administer (John et al., 2011), so in order to overcome the substantial costs of facilitating group-led thinking, a more pragmatic way to deliver individual mini-thinks was proposed (John & Stoker, 2019). This eventually led to the development of nudge+ – an intervention combining a traditional nudge policy with a deliberative "think", either fused into one another or made proximate to each other. An essential requirement for a BI to classify as a nudge+ is the need to prompt active reflection. Specifically, the nudge+ is based on the psychological phenomenon of "perspective transformation," which works as follows: a nudge+ tool must first prompt reflection on a certain topic, which then allows decision-makers to articulate their priors genuinely, following which they either reassess and transform their prior beliefs (when there is dissonance) or they simply go as they are nudged (Banerjee & John, 2024b). Similar to a nudge, the nudge+ is rooted in the heuristics and biases paradigm. However, like a boost, it is motivated by the need to improve human agency, especially when making decisions under the influence of a nudge. In this way, the nudge+ combines the "best of both worlds," namely the convenience of delivering the nudge, as well as the agency-enhancing capacities like the boost or think. The design and delivery of a nudge+ depend on two aspects: the combination strategy of the nudge and the plus, and the timing of delivery of the plus, which can be either simultaneous or sequential (before or after) to the nudge (Banerjee & John, 2023a). A more detailed overview of the differences between a nudge, a boost and a nudge+ is outlined in Banerjee (2021; see Table 1, p10).

Individual differences and BIs

Nudges, boosts and nudge+ interventions place different cognitive demands on decision-makers. It is thus natural to expect that some people, or groups of people, respond more positively to nudging, boosting or nudge+ interventions than others. For example, one can expect that nudging is better suited and more effective in changing the behaviour of people who might face self-control failures or lack the intrinsic motivation to engage in a certain task, compared to already motivated decision-makers, for whom boosting or nudge+ can be more effective.

Many People, Many Tools

Changing dietary behaviours is a complex problem, as dietary choices are highly individual-specific and subject to the influence of many external factors, such as culture, social network, habits and norms, among others (Rozin, 1996). A shift in diets is necessary for meeting many of the Sustainable Development Goals (SDGs), ranging from mitigating greenhouse gas emissions from livestock farming for climate action, to promoting animal welfare or reducing pressures on land and water use to preserve our ecosystem services and promote biodiversity. This impending 'protein transition', in turn, necessitates the uptake of 'planetary health diets' (Willet et al., 2019), which are diets rich in plant-based food items and low in meat and dairy. This poses an interesting challenge: how can we effectively change people's dietary choices in the long term?

Traditional economic tools, such as standard command and control policies (like a meat ban) or pricing interventions (such as a meat tax or vegan subsidy), are often disliked by citizens[2]. The support for these hard policies has been shown to differ across the population based on individual preferences, such as their political ideologies, which further correlate with differences in basic human values (Morren & Banerjee, 2024). Softer policies such as nudges,

2 See Alderson (2024): https://www.thetimes.com/business-money/money/article/meat-tax-uk-news-rishi-sunak-pay-fj6kx-3z6n

however, have gained popularity. For example, in order to increase the share of plant-based food orders, the Swedish burger chain Max Burgers has set the vegetarian burger as the default option in their digital ordering stations (Gravert, 2023). Gravert & Kurz (2021) conducted a field experiment with a popular business lunch restaurant in Sweden, where they randomly handed out to customers two versions of the same lunch menu: one version of the menu listed the meat option first, while the other one listed the vegetarian option first. After the 3-week experimental period, Gravert & Kurz (2021) found that the share of meat dishes was 46% in the meat-first group while it was only 21% in the vegetarian-first group – a large and statistically significant reduction. A review of the literature suggests that changing the default from meat to vegetarian options is consistently effective in reducing meat-based consumption (Meier et al., 2022). Experimental evidence suggests that nudging food choices consistently has low-to-moderate effect sizes, varying across the exact nature of the intervention deployed (see Byerly et al., 2018; Cadario & Chandon, 2020). However, this light-touch approach is also criticised because these nudged dietary behaviours often reverse once the nudges are removed, thereby lacking persistence in effects.

Banerjee et al. (2023a) started this debate by administering to a large sample of 3,074 UK individuals an online randomised controlled experiment involving ten different BIs. Participants were first asked to consider a food menu and then to place an order for an online delivery, with some participants being paid for their orders. The BIs varied across four different toolkits, namely nudges (default and labelling), boosts (quick rules and implementation intentions), a think (a full pledge) and nudge+ interventions (default and labelling with information disclosures and default combined with parts of a pledge before or after) besides the control condition. While all these BIs were found to be effective in significantly reducing orders of carbon-intensive food items, the nudge+ intervention, which combined the option to pledge first before defaulting people into the green menu, was the most effective. Following this, the implementation intention boost, which allowed people to develop personalised "if-then" eating plans, ranked second-best. More recently, Thamer, Banerjee & John (2024) validated these findings for the nudge+ in a field experiment based in a German cafeteria, where they found that an eco-labelled nudge combined with reflection, either on the nudge itself or one's own goals, reduced meat orders by 5-7 per cent. Both these experiments highlight the importance of letting individuals develop and clearly articulate their dietary preferences before letting a BI influence their food choices.

Banerjee & Picard (2023) extended this line of research by generalising this evidence in the context of social norm nudges. Using a large online sample of 5,555 UK citizens, they showed that norm internalisation, especially matching personal and social norms emphasising vegetarianism, is key to improving the effectiveness of these interventions. Using a similar online food delivery set-up as in Banerjee et al. (2023a), they randomised people into four different conditions: control condition; a social norm treatment, where individuals were presented with a dynamic, descriptive norm highlighting the proportion of UK nationals who were vegetarian; a personal-social norm treatment, where people were additionally asked to reveal their personal preferences around vegetarianism; and finally a personal-social norm with pledge treatment, where people were asked additionally to think if they could pledge to align their personal norms with the social norm. Building on this element of reflection, the social norm nudge almost doubled the effectiveness of the nudge in promoting plant-based orders.

Besides heterogeneous responses to different tools and BIs, there is also the issue of the heterogeneous uptake of treatment owing to individual characteristics. For example, using a subset of the sample in Banerjee et al. (2023a) (N=605 individuals), Banerjee et al. (2023b) established that people's intrinsic motivations, as measured by their short- and long-term intentions, moderated the effect of these BIs. Comparing the think with the nudge+ treatments, they found that when people were nudged towards a green menu after they had openly articulated their preferences (versus being let to think fully), those individuals who had strong short-term positive intentions reacted negatively to the nudge by increasing their meat consumption. However, this "psychological reactance" effect was attenuated when the estimations controlled for their long-term intentions. This reinforces our prior discussion on

the prerequisites of different BIs, suggesting that motivation is a strong predictor of behaviour change for nudge+ (and boosting) interventions.

Along similar lines, Banerjee & Picard (2023) showed in their experiment that a subset of people in their sample – those who had negative personal norms for meat reduction to begin with were nudged – reacted negatively to this social norm nudge by increasing their meat choice. A closer demographic profiling further revealed that people who were more liberal, educated, geographically mobile and female were more likely to respond positively to reflective BIs compared to their counterparts. Psychological reactance in subgroups of people that have been nudged has been documented more widely in the literature (for a review, see Osman, 2020).

A related point requires an assessment of whether people who have been influenced by certain BIs either engage in secondary "promoting" welfare-improving behaviours or simply feel "permitted" or "licensed" to subsequently act poorly. This phenomenon, known as positive or negative 'behavioural spillovers' (Galizzi & Dolan, 2015; Galizzi & Whitmarsh, 2019), is important because different people, given their psychological, socio-economic and personal characteristics, are influenced to act differently in follow-up actions. Understanding individual differences in such behavioural spillovers, especially when influenced by a specific BI, is also key to understanding how different behaviours manifest. For example, using a subset of participants, Picard & Banerjee (2023b) find that while the social norm nudge was effective in increasing intentions to choose vegetarian food, this was driven by a particular subgroup, and there was also a positive spillover, whereby choosing vegetarian food increased donations.

Overall, this section highlights the nuances inherent in applying different BIs. We must account for these individual differences carefully, which then translate into the differential uptake of different BIs in the form of either primary or secondary behaviour change.

Conclusion

We assert the need to employ different BIs owing to the rich individual diversity in human behaviour. Increasingly, efforts are being made to refine the BI toolkit, but they must be stepped up, especially if we are to meet the global challenges we currently face (Banerjee & Galizzi, 2024). To encourage behavioural economics practitioners to account fully for heterogeneity, and to better utilise this richness and pluralism in the behavioural toolbox, we conclude by making three practical recommendations.

Recommendation 1: Behavioural economists must test a wide range of BIs systematically and holistically in order to produce comparative, rigorous evidence on what works. This is the necessary first step to create rules of thumb that practitioners can use to choose between different BIs. Systematic comparisons of BIs are increasing, either through 'mega studies' (Duckworth & Milkman, 2022) or via multi-country comparisons (Ruggeri et al., 2024; Banerjee et al., 2024; Steinert et al., 2022), or by using integrative approaches (see Almaatouq et al., 2023). However, they are not the common standard yet. To build a knowledge repository around what works, it is therefore essential to test different BIs together systematically and in different settings and samples.

Recommendation 2: Behavioural economists must complement the analysis of average treatment effects by considering localised or differential average treatment effects. A wide range of computational social science methods can be used to analyse individual heterogeneity in the uptake of BIs. Focusing on average treatment effects often hides valuable information on specific mechanisms of BIs and their most effective target subgroup, which can inform behavioural analysts on whom – and why – BIs work. It is imperative that we recalibrate our focus now and use 'data science to identify the ways in which an intervention or situation appears to increase inequalities, and reduce them' (Hallsworth, 2023, p. 316).

Recommendation 3: Behavioural economics practitioners must be able to use heterogeneity to adaptively tailor and test BIs for groups and segments of individuals. A growing proposition in behavioural economics, and in behavioural science more generally, is to personalise interventions to improve their efficacy and/or legitimacy. Understanding heterogeneity will be key to this personalisation, as different individuals will respond differently to the BIs.

Through new contexts, multiple samples and innovative methods, understanding and fully accounting

for heterogeneity in human behaviour will continue to remain key for behavioural economics in years to come.

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RESOURCES

Postgraduate Programs

MASTER OF SCIENCE IN APPLIED ECONOMICS

UNIVERSITY OF SAN FRANCISCO

STUDY APPLIED ECONOMICS IN SAN FRANCISCO!

In the San Francisco Bay Area, new technologies are altering the way people live and work throughout the world. New marketplaces and platforms created here are fundamentally changing interactions between consumers, businesses, nonprofits and governments. As a next-generation economist with an M.S. in Applied Economics, you will gain the skills to take a leadership role in this dynamic environment.

PROGRAM HIGHLIGHTS:

- Economics for the digitized age: Study market design, reputational systems, auction theory, pricing, behavioral economics and other concepts essential to understanding and shaping the new economy.
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- Data analysis: Courses in experimental design, machine learning and econometrics take you beyond description and correlation to understand causal processes and economic mechanisms.
- San Francisco Advantage: San Francisco's tech firms are leading the way in digitizing the global economy. Studying at USF positions you to take internships and jobs with global technology giants — or with startups on the way to becoming the next big thing. Graduates have achieved success in their careers, joining and leading teams at companies including Google, Intel, Apple, Amazon, Realtor.com, Morgan Stanley, Visa, Citi, Bloomberg, Disney, and more.
- MSAE is a designated STEM program allowing eligible international students to work in the U.S. for three years after graduation under Optional Practical Training (OPT).

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- Analyze massive and often unstructured data sets.
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- Develop public policies that adapt to, and shape, the impact of new technologies.
- Help non-profits and NGOs take advantage of opportunities that digitization creates.

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The rapid pace of globalization has increased the demand for professionals with training in international economics and economic development. Our one of a kind Master of Science in International and Development Economics (MS IDEC) provides students with the knowledge and skills to understand how market forces can be harnessed to empower developing countries to break from cycles of poverty.

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- Climate change, health and environmental policy in developing countries: Learn about the impact of climate change in developing economies.
- Study the methods of behavioral economics.
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- Senior managers of NGOs working in international development.
- Data scientists at international social media companies.
- Professors of Economics.

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... enjoy all of them and other professors and guest speakers

Our course curriculum, an amazing journey.

Course Title	Credit Hours	Language
Technological Learning Tools.	3	English / Spanish
Origins and Fundamentals of Behavioral Economics.	3	English / Spanish
Biases and Heuristics Deep-Dive.	3	English / Spanish
Psychology and Sociology in Behavioral Economics.	3	English / Spanish
Behavioral Sales and Marketing	3	English / Spanish
User Experience & Behavioral Economics Project Management	3	English / Spanish
Behavioral Finance.	3	English / Spanish
Behavioral Management of Human Capital.	3	English / Spanish
Behavioral Economics Culture and Future	3	English / Spanish
Public and Service Policy.	3	English / Spanish
Research and Scientific Communication	3	English / Spanish
Capstone Project	3	English / Spanish

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Department of
Psychological and Behavioural Science

EXECUTIVE MSc BEHAVIOURAL SCIENCE

UNCOVER THE SCIENCE BEHIND BEHAVIOUR

An increasing number of organisations now engage with the idea of applying behavioural insights to their organisational challenges.

The Executive MSc Behavioural Science, based in LSE's Department of Psychological and Behavioural Science, is taught by experts at the forefront of international research in behavioural science.

Our programme provides rigorous training for professionals who are seeking to expand their knowledge in this emerging and exciting field. Many of our alumni are now prominent behavioural science leaders and experts in a range of organisations around the world.

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For more information, please visit **lse.ac.uk/EMScBehaviouralScience**

Department of
Psychological and Behavioural Science

EXECUTIVE MSc BEHAVIOURAL SCIENCE

A UNIQUE AND DYNAMIC PROGRAMME FOR PROFESSIONALS

LSE's Executive MSc Behavioural Science is taught by specialists at the forefront of international research in behavioural science. Our programme provides the opportunity for full-time professionals working in any sector to obtain a graduate qualification in behavioural science, allowing you to pursue new and expanded opportunities within this emerging and exciting field.

The programme starts in September each year with teaching being delivered during three two-week intensive teaching blocks at the LSE campus in London. You are not required to be in attendance on campus outside of these weeks and can therefore continue to live and work outside of London and the UK. Between teaching sessions you work independently on various assignments. After the final teaching session you complete a dissertation on a topic of your choice with support from your supervisor.

The programme includes unique and innovative modules such as:

- Behavioural Science and Policy
- Behavioural Decision Science
- Research Methods for Behavioural Science
- Frontiers in Behavioural Science Methods
- Policy Appraisal and Ethics
- Behavioural Science in an Age of New Technology
- Corporate Behaviour and Decision Making
- Organisational Culture

OUR STUDENTS

Our students come from a wide range of academic and professional backgrounds from all over the world, but one thing binds them together: a passion for behavioural science and a desire to better understand how principles from behavioural science can be applied in their professional (and personal) lives.

CONTACT US

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Department of
Psychological and Behavioural Science

WHAT OUR ALUMNI HAVE TO SAY ABOUT THE PROGRAMME

LSE's Executive MSc Behavioural Science is second to none in providing a complete insight into contemporary behavioural science debate and methodology, delivered by world-class experts.

Ana, 2021 graduate

The EMSc struck the perfect balance between teaching academic rigour and practical implementation, giving me solid foundations for a complete career change.

Nitish, 2022 graduate

The Executive MSc Behavioural Science has equipped me with tools to address some of the most pressing challenges with strong behavioural roots in the MENA region and the Global South.

Nabil, 2020 graduate

The network built during the EMSc is unmatched by any past professional or educational experience I've had, through faculty support, alumni connections, and lifelong professional and personal relationships.

Madeline, 2019 graduate

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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 (MBDS) 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, the MBDS program creates unique opportunities for students to engage with an exceptional advisory board, apply tools and knowledge in our annual Design Challenge, and pursue independent, cross-disciplinary research throughout Penn.

Meet our alumni:

"I loved learning tools and techniques to evaluate what people were saying and translate that into opportunities for the client. The [capstone] was a really exciting project. I never worked in the digital mental health space before. Having those opportunities to gain insight into different industries has helped me become a chameleon and learn to speak the languages of different clients."

Kathryn Ambroze, MBDS '22
Senior User Researcher, JPMorgan Chase & Co.

"When I was accepted into the MBDS, it was a meant-to-be moment. I felt like there was a link between me and the program. I could take the time to explore behavioral science in an academic setting. Some people love commercial spaces, some want to go into consulting, some people are really into research. I realized health and health outcomes are definitely what I'm interested in, personally and in my career."

Yuzhen (Valerie) Guo, MBDS '22
Behavioral Designer, Lirio, LLC

"One of the amazing things about Penn is that the faculty you work with are heavily involved in research—they're very much at the forefront of their field, so you can take part in a lot of research if you want to. Once I was done with the first project, there were other professors who needed help with different projects."

Max Spohn, MBDS '20
PhD candidate, Harvard Kennedy School of Government

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 Chair
Professor of Philosophy, Psychology and Legal Studies (Wharton)

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 and the Center for Social Norms and Behavioral Dynamics, a major research center at Penn that aims to support positive behaviors on a global scale. Cristina is the author of over 100 articles and seven books.

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 practical experiences.

Meet the MBDS Advisory Board:

Charlotte Blank
Director, Transformation & Analytics, Jaguar Land Rover North America

Claire Hobden
Specialist on Vulnerable Workers, Domestic Work, International Labour Organization

Jeff Kreisler
Head of Behavioral Science for JP Morgan Private Bank and Founding Editor of PeopleScience.com

Pavan Mamidi, PhD
Director of the Centre for Social and Behaviour Change (CSBC), Ashoka University

Namika Sagara, PhD
Co-Founder, Chief Behavioral Officer and Head of Consulting, Syntoniq

Neela Saldanha
Executive Director, Yale Research Initiative on Innovation and Scale (Y-RISE), Yale University

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Lead Behavioral Scientist, Organisation for Economic Cooperation and Development (OECD - OCDE)

Scott Young
Principal Advisor, Head of Private Sector, the Behavioural Insights Team (BIT) North America

Allison Zelkowitz
Founder and Director, Center for Utilizing Behavioral Insights for Children (CUBIC) at Save the Children International

Learn more about our world-renowned faculty and researchers at:

www.upenn.edu/mbds

The MBDS Design Challenge

Every spring, the Master of Behavioral and Decision Sciences (MBDS) program organizes the Design Challenge, where our students partner with MBDS Industry Affiliates to apply cutting-edge knowledge from the fields of behavioral economics, decision sciences, network analysis, and public policy to solve real-life problems. We welcome world-leading clients in industries like health, wellness, sustainability, technology integration in marketing, and finance to collaborate with our students and provide guidance on solving the world's toughest challenges.

In the Design Challenge, MBDS students work to translate academic research, theoretical foundations, and applied frameworks into actionable insights toward a client-focused problem. At the end of the Challenge, students present their proposed solutions to the client's senior management and leadership.

The Design Challenge is an invaluable opportunity for our students to apply their MBDS education toward developing practical solutions while gaining real-world experience.

"Newristics has actually been a client for a couple of the Design Challenges. For many students who might be a little lighter on professional experience, the Design Challenge is a great way for them to talk about how they break down a challenge and use behavioral science to come up with a novel solution."

Michael Hayden II, MBDS '20
Consultant, MedTech & Applied Behavioral Insights

Learn more about how MBDS connects students and industry at:

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Penn
Master of Behavioral and Decision Sciences

MSc in

Behavioural and Economic Science

Do you want to understand the choices people make, why they make them and what influences their behaviour?

The MSc in Behavioural Science and Economics at the University of Warwick combines multidisciplinary expertise from the departments of Psychology, Economics and Warwick Business School that is crucial to understand how influencing people's choices impacts a variety of sectors and industries.

The MSc suits those with a quantitative background (e.g. mathematics, sciences, economics, psychology).

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Why

study Behavioural and Economic Science

This innovative, interdisciplinary programme combines decision science and behavioural economics.

You will learn theory and real-world applications of behavioural economics and the cognitive science of judgement and decision making.

For those looking to pursue careers in business, public policy implementation or research, there are three core modules, a wide variety of optional modules to suit your interests and career goals and a research project.

- Modules span across the departments of Psychology, Economics and Warwick Business School, providing a thorough grounding of both the theory and real-world application of behavioural science.
- Modules on the design, conduction and analysis of behavioural experiments and the analysis of large-scale datasets.
- An empirical research project.

Our 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.

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Why Warwick?

You will be taught by internationally recognised, world-leading researchers in the departments of Psychology, Economics and Warwick Business School.

We also have cutting-edge technology and laboratory facilities for conducting your behavioural research.

Warwick is consistently ranked highly, placing 5th in the UK for Economics *(The QS World University Rankings by Subject 2024)* and we are the 6th most targeted university by the UK's top 100 graduate employers *(The Graduate Market in 2024, High Fliers Research Ltd)*. Behavioural Science was identified as an area of significant academic achievement in the Research Excellence Framework.

By studying at Warwick, you will be part of a global community of students from all over the world from diverse backgrounds. With students from South America, Asia, Europe, the USA and the Middle East, our supportive and inclusive community will enable you to get the most out of your studies.

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Explore the mind of the consumer through The Chicago School's Behavioral Economics programs.

With foundations in advanced psychology, the Behavioral Economics programs at The Chicago School provide students with two pathways to building skills in understanding and influencing consumer behavior: the Certificate in Behavioral Economics, a customizable and abbreviated credential situated within the Behavioral Economics program, and the M.A. in Behavioral Economics, a traditional full master's degree with elective options.

Our M.A. in Behavioral Economics and Certificate in Behavioral Economics programs blend elements of consumer, social, and cognitive psychology to provide a psychological perspective to consumer behavior.

Those who earn their degree or certificate are prepared to deliver professional services, perform research, excel as leaders and policy advisers, and serve diverse populations in business, marketing, and politics with sensitivity and inclusion.

About The Chicago School

The Chicago School of Professional Psychology is a nonprofit, accredited institution with more than 5,700 students at campuses across the country (Chicago, Dallas, Southern California, Washington, D.C., and online). The Chicago School has been an innovator in the field of psychology and related behavioral sciences since 1979. The Chicago School offers more than 30 degree programs and several opportunities for international experiences.

Program features

Dedicated, engaged faculty who are highly experienced professionals and leaders in their respective fields.

A student-faculty partnership model that encourages collaborative work between students and instructors, enhancing professional, academic, and community engagement.

Integrated learning that balances classroom instruction and "real work" research and application.

A curriculum that values exposure to a variety of strategies for understanding and researching diverse human experience and behaviors.

M.A. in Behavioral Economics

The online M.A. Behavioral Economics non-licensure program is designed for working adults interested in psychological perspectives of human decision-making, risk assessment, and consumer behavior. This program provides students an alternative to the traditional MBA by offering a curriculum with a foundation in advanced psychology that addresses broader business applications to decision-making, negotiation, marketing, and consumer behavior.

The M.A. in Behavioral Economics utilizes a competency-based model grounded in consumer, social, cognitive and consulting psychology, as well as political science and infuses multicultural perspectives from diverse market audiences.The curriculum is interdisciplinary in approach and integrates theories of consumer decision-making, consulting, and financial literacy, including coursework in choice architecture, neuromarketing, and persuasive messaging to generate a richer understanding of human behavior.

Graduates are prepared to deliver professional services, perform research, excel as leaders and policy advisers, and to sensitively and inclusively serve diverse populations in business, marketing, and politics.

What Distinguishes This Program?

- The online Behavioral Economics M.A. program provides students with an alternative to the traditional MBA by combining social psychological theory with a practical application toward decision-making and consumer behavior within the context of a psychology degree.

- The program is distinct from those of competing institutions both in its flexible online delivery model and its curriculum, which blends elements of consumer, social, and cognitive psychology while providing a psychological perspective to behavioral economics.

- Upon successful completion of the online M.A. in Behavioral Economics program, students who meet admissions requirements will be prepared to enter The Chicago School's Business Psychology Ph.D. program, allowing them to pursue additional postgraduate and career opportunities.

Career Possibilities

Graduates can consider careers in the following fields:

- **Consulting**
- **Public service**
- **Marketing**
- **Public relations**
- **Health care**
- **Higher education**
- **Human resources**
- **Nonprofit**
- **Government**

M.A. Student Experience

The M.A. in Behavioral Economics program is designed to support interaction and learning among students and faculty by incorporating cohort membership, small groupings, a blended delivery system, active learning, and pedagogical "best practices" within the design.

Cohort model: Students in the Behavioral Economics M.A. program move through a sequence of courses collectively. The common goal of starting and completing the program together encourages students to work collectively, which promotes the development of personal relationships and the building of a professional network. Cohort membership enables students to support and learn from other students.

Small groupings: The program strategically allows for arrangement of students in small groups for online learning that is advantageous for active learning. As approximations, online courses have fewer than 20 students.

Diverse delivery system: This program utilizes both synchronous and asynchronous instructional modalities to provide students an accommodative learning environment that encourages interaction among students and faculty, supports active learning, and respects diverse talents and ways of learning. Asynchronous learning includes the use of online forums, as well as audio and video recordings. Synchronous learning includes the use of live chat sessions and virtual meetings.

Student services: Online students have access to a range of students support services including: access to Library Services, professional skill development through Career Services, opportunities to study abroad, the chance to present original research at the Graduate Research Forum, and engagement opportunities through student groups and societies.

Certificate in Behavioral Economics

Also available is our Certificate in Behavioral Economics. This program requires fewer credit hours than the M.A. yet also blends behavioral economics and business psychology to provide a unique alternative to a traditional MBA. Curriculum begins with an introduction to the fundamentals of behavioral economics. Students then choose two electives that suit their professional goals.

Total program credits: 9-10 credit hours

Length of program: 3 terms

Delivery format: online

M.A. Program Specifications

The M.A. in Behavioral Economics is a non-licensure 40 credit hour program. The program includes:

- **18 credit hours of core course work**
- **16 credit hours of research course work**
- **6 credit hours of elective course work**

The program culminates in an Applied Research Project in which students will apply behavioral economics concepts to an approved topic. Students will complete classwork over the course of their studies that will guide them through the process of writing the Applied Research Project. A faculty member will approve and supervise the project through these courses.

Other Resources

For the most up-to-date behavioral science resources, please visit

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APPENDIX

Author Profiles

Matthias Sutter (Introduction)

Matthias Sutter is director at the Max Planck Institute for Research on Collective Goods in Bonn, Germany, and professor of experimental and behavioral economics at the universities of Cologne and Innsbruck. His work focuses on the economic decision-making of children and teenagers, on team decision-making, on field experiments on credence goods markets, and recently on randomized controlled trials in companies. He has published his work in all top-5 economics journals (i.e., in *Quarterly Journal of Economics*, *Econometrica*, *Journal of Political Economy*, *American Economic Review*, and *Review of Economic Studies*), as well as in general outlets such as *Science*, *Nature Communications* or *PNAS*. In 2023, he published a popular science book about how behavioral economics can be applied to professional life, titled *Behavioral Economics for Leaders: Research-Based Insights on the Weird, Irrational, and Wonderful Ways Humans Navigate the Workplace*, published by Wiley.

Lucia A. Reisch (Guest Editorial)

Lucia A. Reisch is a Professor of Behavioural Economics and Policy for Sustainable Development at the University of Cambridge, UK. Since 2021, she has been the inaugural Director of the El-Erian Institute for Behavioural Economics and Policy at Cambridge Judge Business School. Her research focuses on the theory and application of behavioural insights to promote behavioural change in individuals and organisations, in order to promote sustainability. She brings two decades of experience with high-level policy consulting on consumer behaviour and behavioural policy. She was the founding chair of the Advisory Council for Consumer Affairs of the German Federal Ministry of Justice and Consumer Protection (2014-2018). She was also a member of the German Bioeconomy Council, the German Council for Sustainable Development (2010-2019), and a regular member of high-level scientific committees consulting the German Chancellor Angela Merkel (e.g., the Ethics Commission after Fukushima). Lucia has also consulted on using behavioural insights for international organisations (EU, OECD, UN, World Bank, Inter-American Bank) and governments worldwide.

Malte Dewies (Guest Editorial)

Malte Dewies is post-doctoral researcher at the Institute for Behavioural Economics and Policy at the University of Cambridge, UK. His research interests lie at the intersection of psychology, policy, and public administration, including behavioural interventions and their application. Prior to joining Cambridge, he helped set-up and develop the Behavioural Insights Group Rotterdam as part of his PhD research, for which he was awarded a scholarship from the German Academic Scholarship Foundation. Malte has extensive experience with policy engagement and policy advice.

Alain Samson (Editor)

Alain Samson is the editor of the Behavioral Economics Guide, founder of BehavioralEconomics.com and Chief Science Officer at Behave Technologies (formerly Syntoniq, Inc.). 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 is a Founding Member of the Global Association of Applied Behavioural Scientists (GAABS).

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Contributing Organizations

AHA! Behavioral Design

AHA! Behavioral Design® (AHA! BD) is a best-in-class integrated social and behavior change solutions provider in the Philippines, focused on measurable, scalable, and sustained changes in behaviors. Anchored on Applied Behavioral and Decision Sciences (BeSci), specifically Behavioral Economics – AHA! BD utilizes a transdisciplinary approach enhanced by data & technology, in developing and implementing at-scale Social Marketing programs that not only facilitate change in individual behaviors but also transform mindsets, heartsets, and (social) normsets among targeted segments of the population.

As a research and design firm that co-creates science-based, high-impact, and low-cost programs to nudge people to take the desired action, we provide an end-to-end service covering: Behavioral Insighting; Solutions-Generation through Behavioral Design and Social Marketing Strategy Development for Social and Behavior Change; Proof-of-Concept and Scaled Testing; and At-Scale Program Implementation, MEAL (Monitoring, Evaluation, Accountability, and Learning), and Capacity-building for Sustainability. AHA! BD demonstrates expertise in large-scale program implementation, orchestrating both above-the-line (ATL) campaigns and below-the-line (BTL) activations, to land Behaviorally-informed and Phygital (physical + digital) community-driven Social Marketing programs for solutions development and advocacy.

www.aha.ph

Behavioral Research Hub

The Decision Support Center (DSC) was established in 2016 as part of Saudi Vision 2030 and functions as an independent advisory body, offering evidence-based insights for policy development. It serves as a research organization that brings knowledge and policy making together to form effective insights as well as capacity building in specialized areas. The DSC strives to excel in various fields, including, Public Policy, Decision Sciences, Future Insights, Economic Intelligence and Behavioral Sciences.

The Behavioral Research Hub (BRH) within the DSC plays a pivotal role in promoting Behavioral Science to support decision making in Saudi Arabia. The BRH conducts comprehensive behavioral studies, creates tools to bolster evidence-based decision-making, designs and implements training programs, and fosters knowledge exchange opportunities.

www.my.gov.sa

Behavioral Science Group

The UAE's Behavioral Science Group (BSG) is a specialized unit within the Office of Development Affairs. Our purpose is to support the UAE government in achieving its policy objectives using behavioral science as a fresh lens for new solutions.

To do this, the BSG combines behavioral science expertise with a deep understanding of our local policy objectives and context. By mixing international expertise with national talent, we provide government partners with a novel offer. This blend enables us to design and test practical and innovative solutions to a range of local challenges.

Our mission is to draw on key success stories from the world to replicate and build on them within our nation. Our unit works closely with other government entities, helping them to embed behavioral science in their policy agendas, while building their capacity in the discipline.

diwan.gov.ae/en/

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 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/

Evidentia University

Evidentia University's 100% online Master in Behavioral Economics program from provides an innovative, interdisciplinary approach to the study of economic behavior. This program enables students to gain a comprehensive understanding of how individuals, organizations, and societies make decision\ns, and how those decisions shape economic activity.

Courses in the program span through an array of disciplines like Marketing, Finance, Human Capital, Neurosciences, Game Theory, Risk Management, Public and Service Policy. Students are provided with the opportunity to explore and understand the intersection of economics and psychology, and to learn about the implications of biases and heuristics in decision-making.

Lead by a multidisciplinary, global group of experts in their fields, our faculty is well-equipped to encourage students to design experiments, interpret results, and develop models to simulate and predict behavior while implementing behavioral economics projects in real-world scenarios.

www.evidentiauniversity.com

Final Mile

Final Mile was inspired by intellectual inquiry. Its founders were deeply curious about the potential of behavioural economics and behavioural sciences to explain human decision-making and behaviour more reliably than traditional models of economics or psychology alone.

Founded in 2007, with headquarters in New York City and offices in Johannesburg and Mumbai, Final Mile is an award-winning research & design consultancy built on the precepts of behavioural economics, cognitive neuroscience, and human-centred design with the goal of building behavioural sciences and design rooted practice. Fractal Analytics, a global leader in artificial intelligence and analytics that powers decision-making in Fortune 500 companies, acquired Final Mile in 2018.

Final Mile addresses behavioural challenges in social development contexts by systematically understanding the role of emotions, heuristics and context in the decision-making process and developing design interventions that influence behaviour. As one of the first behavioural science and design consultancies, Final Mile has unique and proven capabilities in addressing complex behavioural challenges, in areas ranging from global health and financial inclusion to public safety.

www.thefinalmile.com

Momentum Investments

Momentum Investments helps individuals, businesses and retirement funds invest with confidence, and stay invested. Our investment philosophy is that over a chosen period, based on prevailing market conditions we target a reasonable return. We define 'risk' as the likelihood that the investment portfolio won't deliver the return it's targeting. It may sound like semantics. However, it means risk doesn't have to be reduced to three simple definitions of 'low', 'medium' and 'high' any longer, but can be described in sync with your goals: Will you or won't you achieve your investment goal and, if you miss it, by how much will it be? We have followed this approach with our institutional clients, such as retirement funds, since 2011 and individuals are also benefitting greatly from the skills and expertise we have gained with this approach. With us, investing is personal. From how our experts push the boundaries to create innovative and tailored solutions that can help you achieve your goals on your investment journey, to how we act as the guardians of your legacy, it's personal.

www.momentum.co.za

Neovantas

Neovantas is a top international management consultancy focused on accelerating change through advanced analytics and behavioral science. We focus on "making things happen" to assure business results in a sustainable way over time. Our consulting team is specialized by sector (retail banking, insurance, telecoms, and utilities) and functions (advanced analytics and behavioral science).

We build strong, lasting relationships with our clients through the effectiveness of our teams, our integrity, our professional excellence, and our entrepreneurial spirit. We aspire to be one of the market leaders in providing businesses with unique, pragmatic, and high-impact recommendations and solutions with our behavioral data approach.

Our international presence has been expanded with projects both in Europe (Spain, Portugal, Germany, Italy, and Poland) and in Latin America (Mexico and Brazil).

www.neovantas.com

OECD

The Organisation for Economic Co-operation and Development (OECD) is an international organisation that works to build better policies for better lives. Its goal is to shape policies that foster prosperity, equality, opportunity and well-being for all. The aims of the OECD is to develop international standards and promote policies designed: (i) to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the development of the world economy; (ii) to contribute to sound economic expansion in members as well as non-members countries in the process of economic development; and (iii) to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations. The OECD carries out significant workstreams on both behavioural science and strategic foresight in multiple policy areas throughout the organisation.

www.oecd.org

Strategy&

Strategy& is a global strategy consulting business uniquely positioned to help deliver your best future: one that is built on differentiation from the inside out and tailored exactly to you. As part of PwC, every day we're building the winning systems that are at the heart of growth. We combine our powerful foresight with this tangible know-how, technology, and scale to help you create a better, more transformative strategy from day one.

As the only at-scale strategy business that's part of a global professional services network, we embed our strategy capabilities with frontline teams across PwC to show you where you need to go, the choices you'll need to make to get there, and how to get it right.

The result is an authentic strategy process powerful enough to capture possibility, while pragmatic enough to ensure effective delivery. It's the strategy that gets an organization through the changes of today and drives results that redefine tomorrow. It's the strategy that turns vision into reality. It's strategy, made real.

www.strategyand.pwc.com

Vrije Universiteit Amsterdam

The Vrije Universiteit Amsterdam is a public research university in Amsterdam, Netherlands, being founded in 1880. VU Amsterdam is one of two large, publicly funded research universities in Amsterdam. Situated within the VU, the Institute for Environmental Studies (IVM) is the the oldest environmental research institute in The Netherlands (est. 1971) and is currently one of the world's leading institutes in sustainability science. IVM's mission is to contribute to sustainable development and to care for the environment through excellent scientific research and teaching. A unique feature of IVM is the capacity to cut through the complexity of natural-societal systems through novel interdisciplinary approaches, such as using behavioural and experimental methods at the intersection of environmental economics.

www.vu.nl/en/