

Economic Issues, Problems and Perspectives

Applied Behavioral Economics

Iñaki Aliende

Editor



Theory, Method, and Practice for Driving Decisions

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Applied Behavioral Economics

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DOI: <https://doi.org/10.52305/CZRL5358>

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Additional color graphics may be available in the e-book version of this book.

Library of Congress Cataloging-in-Publication Data

ISBN: 979-8-89530-929-2 (Hardcover)

ISBN: 979-8-90134-018-9 (eBook)

Published by Nova Science Publishers, Inc. † New York

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To all those who, through institutions,
ideas, and public service, strive to build
economies that uphold cooperation, fairness,
and the enduring well-being of society.

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Part 1.

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Chapter 1

Introduction to Behavioral Economics: A Brief History, Distinctive Elements and Social Contributions

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Abstract

From its historical roots in utilitarian thought and early recognition of social concerns, Behavioral Economics has evolved through key contributions such as Simon's bounded rationality, Kahneman and Tversky's prospect theory, and Thaler and Sunstein's concept of nudges. By integrating insights from psychology, behavioral economics explains why individuals often deviate from rational, utility-maximizing models and instead rely on heuristics, emotions, and contextual cues. The text highlights how this framework not only enhances theoretical perspectives but also provides practical tools for designing interventions in diverse areas including public health, sustainability, finance, education, and consumer behavior. Special emphasis is placed on the role of nudge units, experimental validation, and the ethical boundaries required to prevent manipulative practices or "dark patterns." Furthermore, the intersection of behavioral economics with artificial intelligence and automation are explored, showing how technological advances, both amplify opportunities for positive interventions and increase risks of exploitation. The last part moves from conceptual foundations to methods, applications, and evaluation, offering readers a comprehensive resource that is simultaneously academic and practical. Ultimately, the book positions behavioral economics as a versatile discipline with significant contributions to policy, organisational design, and individual well-being, bridging scientific rigor with societal impact.

Keywords: behavioral science, cognitive biases, nudges, public policy, decision-making

1. Introduction

You are starting to read a book that enables you to apply Behavioral Economics to your environment. This discipline gives economists the satisfaction of contemplating how science

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In: Applied Behavioral Economics

Editor: Iñaki Aliende

ISBN: 979-8-89530-929-2

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can influence society. In my time as a university student, I was grateful when finding an approach to economics that would allow us to articulate interventions and see their results around us and on the lives of citizens. Personally, I enjoyed all those theories or models that were capable of explaining social phenomena. Thus, I immersed myself with special pleasure in reading the works of North and Miller in their analysis of poverty, crime or prostitution; “The Economic Approach to Human Behavior” by Becker about the economy of the family, discrimination or consumption; or “Time on the cross” by Fogel and Engerman about the “viability” of slavery.

It is true that any approach to economics pursues the aim of generating prosperity for society, regardless of the model or theory from which reality is analysed, but often this effort is mediated by extremely analytical models or at the expense of the economic policy decisions of the authorities, distancing the application of science from researchers and students. All of us can become architects of decisions, while many of us will hardly be able to articulate macroeconomic policies for our country. Behavioral Economics allows you to explain everyday phenomena and also empowers you to be the one who uses it yourself. I suppose that researchers in scientific subjects such as biology, medicine, or geology feel something like this when they work in their laboratories.

The fathers of utilitarianism from the seventeenth century onwards, first with Jeremy Bentham and then with Stuart Mill or Edwin Chadwick, had already turned their gaze to social problems beyond growth or the accumulation of wealth for governments. In his “Sanitary Report” (Chadwick, 1842), this London official legitimised interventions in public affairs based on a careful process of prior statistical analysis. As a result of his studies, he showed that Adam Smith’s “invisible hand” could not be the best advisor in matters of economic policy with social effects, so a rich panorama of public fields, lines of research, and options for the regulator emerged from now on for the good of society as a whole. As reformers, utilitarians advocated a collective utility oriented towards common happiness and not just individual satisfaction (Bentham, 1789; Mill, 1859).

In the middle of the twentieth century, behavioral economics began to take shape as an independent current. Katona (1951) stated that the perfect market conditions, described by classical economics, are abnormal, with spontaneous and emotional decision-making contexts predominating. Adam Smith, in “The Theory of Moral Sentiments” (Smith, 1759), had already pointed out the influence of values and biases on economic decisions. Tversky and Kahneman (1979) developed prospect theory, which describes how decisions are influenced by heuristics and biases such as the framing effect or loss aversion. This is how the study of cognitive biases that we will see in this book arises. Unlike classical economics, this theory reveals that people do not maximise utility in a perfect market but instead make decisions based on subjective references and limited contexts. For example, if someone understands the usual price as the price they receive in their environment, they will use that price as a reference to evaluate whether something is expensive or cheap, regardless of the market price. Kahneman and Tversky (1982, 1984) illustrated the importance of heuristics and biases in decisions, such as representativeness, availability, and anchoring. These unconscious influences challenge the idea that consumers have stable, utility-maximising preferences, as advocated by orthodox authors. Instead, every choice is full of emotions, impulses, and contradictions.

Herbert Simon, a Nobel laureate in 1978, introduced the concept of bounded rationality, arguing that agents make decisions based on available information within their cognitive limitations (Simon, 1955). This contrasts with the classic model of optimising “econs,”

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highlighting that the real agents are humans with limited rational faculties, as Thaler and Sunstein (2008) pointed out. They differentiated between the two systems of thought:



System 1 (automatic): Associated with fast, routine decisions based on heuristics. For example, walking, typing, or using the remote control.



System 2 (reflective): Activated on decisions that require analysis, such as solving a math problem or participating in a debate.

Most everyday decisions occur in System 1, which exposes people to biases that can lead to flawed, or at least sentiment-mediated, choices. They developed the concepts of “architecture of choice” and “nudge.” Since people are subject to bounded rationality, choice architects can design contexts that influence decisions using nudges to guide individuals towards beneficial choices without coercion, manipulation, or costly budgets. For example, a supermarket can draw a green arrow that guides shoppers towards fresh food, counteracting biases such as availability (distraction from unhealthy products) or framing (eye-catching fast-food advertising). Iyengar and Lepper (2000) provided an example that perfectly illustrates the importance of considering the existence of the two systems. They conducted an experiment in a supermarket offering free samples of food. In one case, they presented 24 varieties; in another case, only 6. Although more people approached the booth with 24 options, the odds of purchase were higher with only 6 options. In this way, they demonstrated that the principle of non-satiety of classical analysis is not only not true but also harms the decision-maker.

Kahneman et al., (1997) revisits the cornerstone of economic theory. The authors challenge the traditional notion of utility (based on preferences inferred from choices) and advocate for a renewed focus on experienced utility, which is derived from the actual pleasure or pain people experience as outcomes of their decisions.



Figure 1. Example of a visual nudge.

Thaler and Sunstein (2008) introduced the term “libertarian paternalism,” an approach similar to utilitarianism, where architects of choice model the decision environment to promote beneficial outcomes for the individual and society, without eliminating freedom of choice

(much to the horror of orthodox liberals). Kahneman (2011) became a bestseller and delved into the implications of these systems for decision-making and how heuristics can generate errors.

Shortly after, in 2013, in the midst of the hangover from the great financial crisis, the Swedish Academy awarded two antagonistic economists, Eugene Fama, creator of the Efficient Markets Hypothesis (Fama, 1970), and Robert Shiller, who based financial bubbles on the irrationalities explained by behavioral economics (Shiller, 2015). Although Shiller admitted that Fama had developed useful tools for analysing the markets, he argued that they did not fully capture the observed fluctuations in asset prices. Shiller suggested that Fama's theories did not sufficiently consider the impact of psychological, social, and cultural factors on markets. He stressed that prices could deviate from core values due to irrational behaviors, such as overconfidence or emotional contagion.

In 2010, the first “nudge unit” had been founded in the United Kingdom, with the aim of applying behavioral economics to public policies (Halpern, 2015). This initiative ushered in a wave of similar institutions worldwide. These units, which have been established in various government institutions and organisations around the world, use strategies to modify the behavior of individuals, encouraging decisions that promote social and economic well-being. Rather than imposing strict rules, nudges work by altering the environment or the way options are presented, making it easier for people to make beneficial decisions without feeling obligated.

B E H A V I O R A L	YEAR	1759	1789	1842	1859	1945	1951	1955	E C O N O M I C S	
	AUTHOR	A. Smith	J. Bentham	E. Chadwick	J.S. Mill	H. Simon	G. Katona	H. Simon		
	CONTRIBUTIONS	<ul style="list-style-type: none"> The importance of values as a factor on decisions Some cognitive biases 	<ul style="list-style-type: none"> The importance of happiness as an economic purpose instead of profits 	<ul style="list-style-type: none"> The aim for social welfare in public policies 	<ul style="list-style-type: none"> The importance of common wellness 	<ul style="list-style-type: none"> Asymmetric information in decision contexts 	<ul style="list-style-type: none"> Portraits a context of decision spontaneous and sentiment-dominant 	<ul style="list-style-type: none"> Theory of choice based on the organizational context with asymmetric information 		
	WORK	<i>The Theory of Moral Sentiments.</i>	<i>Introduction to the Principles of Morals and Legislation.</i>	<i>Sanitary condition of the labouring population of Great Britain.</i>	<i>A few words on non-intervention.</i>	<i>Theory of Games and Economic Behavior.</i>	<i>Psychological analysis of economic behavior.</i>	<i>A Behavioral Model of Rational Choice.</i>		
	YEAR	1964	1979, 1982, 1984	1997	2004	2008	2010	2011		
	AUTHOR	G. Becker	A. Tversky and D. Kahneman	D. Kahneman	C. Camerer and G. Lowenstein	R. Thaler and C. Sunstein	UK government	D. Kahneman		
	CONTRIBUTIONS	<ul style="list-style-type: none"> Extend the economic approach to social matters 	<ul style="list-style-type: none"> Prospect theory Identification of cognitive biases and heuristics 	<ul style="list-style-type: none"> A theory of utility based on utilitarianism 	<ul style="list-style-type: none"> The explanatory power of behavioral economics 	<ul style="list-style-type: none"> System 1 and system 2 Intervention process for Behavioral Economics 	<ul style="list-style-type: none"> First Nudge Unit in the UK 	<ul style="list-style-type: none"> Identification of cognitive biases and heuristics 		
	WORK	<i>Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education.</i>	<i>Prospect theory, Judgement under uncertainty, Choices, values and frames.</i>	<i>Back to Bentham? Explorations of Experienced Utility.</i>	<i>Behavioural economics: past, present, future.</i>	<i>Nudge.</i>	<i>Inside the nudge unit.</i>	<i>Thinking fast and slow.</i>		
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Figure 2. Storyline of Behavior Economics.

2. A Cross-Versatile Discipline

With this accumulated baggage resulting from the work of all the social scientists we have mentioned, Behavioral Economics is able to explain phenomena that classical economics would find absurd (Camerer and Lowenstein, 2004). For example, what makes people use credit cards even though the interest rates are much higher than they would if they applied for a consumer line of credit. And beyond that, how we can build interventions to prevent citizens from bearing fees that we can describe as abusive for the use of their credit cards.

One of the areas of knowledge where nudge units have had a significant impact is public health (OECD, 2020). Interventions have been implemented to encourage healthy behaviours, such as improving diets and increasing physical activity. For example, in many countries, the visibility of healthy foods has been promoted in school canteens or supermarkets, and product labels have been used to encourage consumers to opt for healthier options. Similarly, nudges have been used to reduce harmful behaviours, such as tobacco or alcohol consumption, by placing visual warnings or designing environments that discourage their consumption. In the educational field, nudge units have worked to improve student participation and performance. Through personalised reminders and the establishment of clear deadlines, it has become possible to increase class attendance and participation in educational programs. These interventions have also been useful in promoting greater parental involvement in their children's education in order to improve long-term academic outcomes.

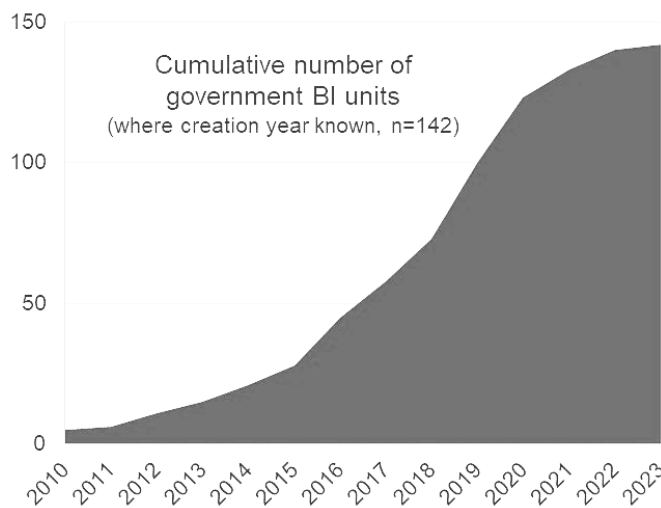


Figure 3. Nudge units around the world according to OECD (2023).

There is an activity that I propose to my students so that they can live the experience of creating an intervention based on nudges that they themselves develop, the creation of a decalogue to control the body mass index within the area of healthy habits. On one of the last occasions I did this practice, the students created a card that they distributed to their relatives and that contained these ten recommendations supported by research in behavioral economics:



Figure 4. “BMI under control” nudge.

In terms of sustainability, nudge units have promoted other beneficial behaviors for their environment, such as recycling or energy saving. A prominent example is the use of energy consumption comparisons in buildings, which allows people to visualise their performance in relation to that of other nearby neighbours, motivating them to reduce their carbon footprint. This type of intervention has proven to be more effective than coercive policies, as it appeals to social competence and the desire to improve. Nudges have positioned themselves as effective tools for promoting environmental sustainability by influencing people’s decisions without restricting their freedom of choice. For example, changing the default settings in energy contracts to make the renewable option a standard can significantly increase the use of clean sources. Similarly, using social norms, such as reporting on water bills that a household’s consumption exceeds the average for their neighbourhood, can motivate people to reduce their use. These subtle nudges, which leverage psychology and behavioral economics, make it possible to promote sustainable practices in an economically and socially acceptable way.

In the field of public policy, nudge units have shown how small modifications in the way options are presented can increase administrative efficiency and improve regulatory compliance. Instead of imposing sanctions, interventions have been used that simplify bureaucratic processes, mitigate friction, or make people perceive that they are making the right decisions aligned with their true interests. Experimentation with nudges through randomised controlled trials has allowed the accumulation of evidence supporting the effectiveness of these interventions in various contexts.

Frictions are impediments that hinder or discourage action in a given context, even when such an action could be clearly beneficial or desired for a person. In behavioral economics, friction is a crucial concept because it highlights how seemingly insignificant factors, such as

complex forms, additional steps in a process, or even slight time costs, can have a disproportionate impact on human behavior. Frictions challenge the traditional assumption of classical economics that agents make decisions in a completely rational manner, as they demonstrate how contextual details can alter decisions and behaviors. For example, something as simple as requiring pre-registration on a website can significantly reduce participation in an activity or purchase. In the design of public policies or nudge-based interventions, reducing these frictions can be as effective as directly incentivising an action. A practical example is the shift from an opt-in model (where people must actively enrol) to an opt-out model (where they are automatically enrolled and must decide to leave if they are not interested), which has been shown to significantly increase participation in retirement savings programs or organ donations. For example, credit cards tend to have higher interest rates due to their revolving credit nature and the flexibility they offer, whereas consumer loans typically have lower rates due to structured repayment terms. However, the overuse of card credit, with higher costs for the user, comes from lower administrative frictions.

The main frictions in decisions arise from a combination of cognitive, emotional, and contextual factors. Together, these frictions can create obstacles that reduce the quality of decisions, leading people to rely on shortcuts or less rational strategies:

- Cognitive friction occurs when people are faced with information overload, complexity, or uncertainty, making it difficult to effectively process and evaluate options.
- Emotional friction can stem from the fear, anxiety, or stress of making high-risk decisions, which often leads to avoidance or indecision.
- Contextual frictions involve external barriers, such as time constraints, social pressures, or limited resources, which can limit the ability to make optimal decisions.

We have worked ahead of us to orient these powerful capacities of Behavioral Economics for purposes beneficial to society and not allow their indiscriminate use for private benefit through manipulative stimuli. Dark patterns exploit cognitive biases and attention limitations to induce poorly informed decisions or decisions that exclusively benefit those who implement them, especially in a digital context. A common example is the use of auto-renewing subscriptions that are difficult to cancel, taking advantage of the user's inertia to keep them paying for services that they may not want. They are also seen in the misleading presentation of choices, such as making the button to decline the cookie consent less visible than the button to accept cookies. Not only may these tactics erode consumer trust, but they can also lead to results contrary to the initial goal of nudges: to promote more informed and beneficial decisions. Therefore, it is crucial to establish ethical limits in their design and implementation, ensuring that nudges do not become manipulation mechanisms under the guise of rational choice. Your mind is lazy about calculations but loves stories.

For example, in the case of tour packages or insurance, it is common for companies to include additional services by default, such as cancellation of insurance or upgrades to the hotel category, leaving the customer with the responsibility to uncheck these options if they do not want them. This design takes advantage of the consumer's inertia or lack of attention to increase the total cost of the package without the consumer easily noticing it. In addition, many companies use messages designed to create guilt or fear by removing these options, such as

warnings such as, “Are you sure you do not want to protect your trip? You could lose your money if something goes wrong.” This type of communication not only manipulates the customer’s emotions, making them feel irresponsible or exposed to risk, but also seeks to pressure them to maintain unnecessary extras, prioritising commercial interests over those of the consumer. Another example is the friendly introduction of the bookseller at home, who, being aware of the social desirability bias, starts his sales speech with “Do you like reading?.” This use of dark patterns not only compromises customer experience but also raises ethical questions in the company-consumer relationship.



Figure 5. “Do you like reading?”

Advances in automation hand in hand with artificial intelligence (AI) will increase these risks. Chatbots are most likely designed with people’s heuristics and biases in mind to maximise their sales options. In the mid-21st century, every day-to-day decision, from choosing breakfast to planning for retirement, is mediated by algorithms that understand preferences. This future is not science fiction; it is the destiny that begins to be drawn as we apply behavioral economics to our lives. AI-powered wearable devices such as Fitbit, Apple Watch, or Garmin leverage advanced machine learning algorithms to provide highly personalised health nudges, grounded in behavioral economics principles. These devices continuously collect and analyse real-time data, such as activity levels, heart rate, sleep patterns, and more, creating detailed behavioral profiles for each user. AI plays a critical role in processing these vast data, identifying patterns, and predicting future behaviors, allowing the device to deliver timely and contextually relevant nudges. For example, AI algorithms may detect periods of inactivity and suggest a short walk, dynamically adjusting the recommendation based on the user’s habits, preferences, or even environmental factors, such as weather.

The personalisation enabled by AI extends to goal setting and motivation. Using predictive modelling, these devices recommend realistic health targets tailored to the individual, ensuring they are neither too challenging nor too easy, a balance informed by behavioral economics insights on goal commitment. For instance, if a user consistently exceeds a step goal, AI can adjust future targets upward in small incremental steps to sustain engagement without overwhelming the user. This dynamic feedback loop fosters gradual behavioral changes while reducing the cognitive load of decision making.

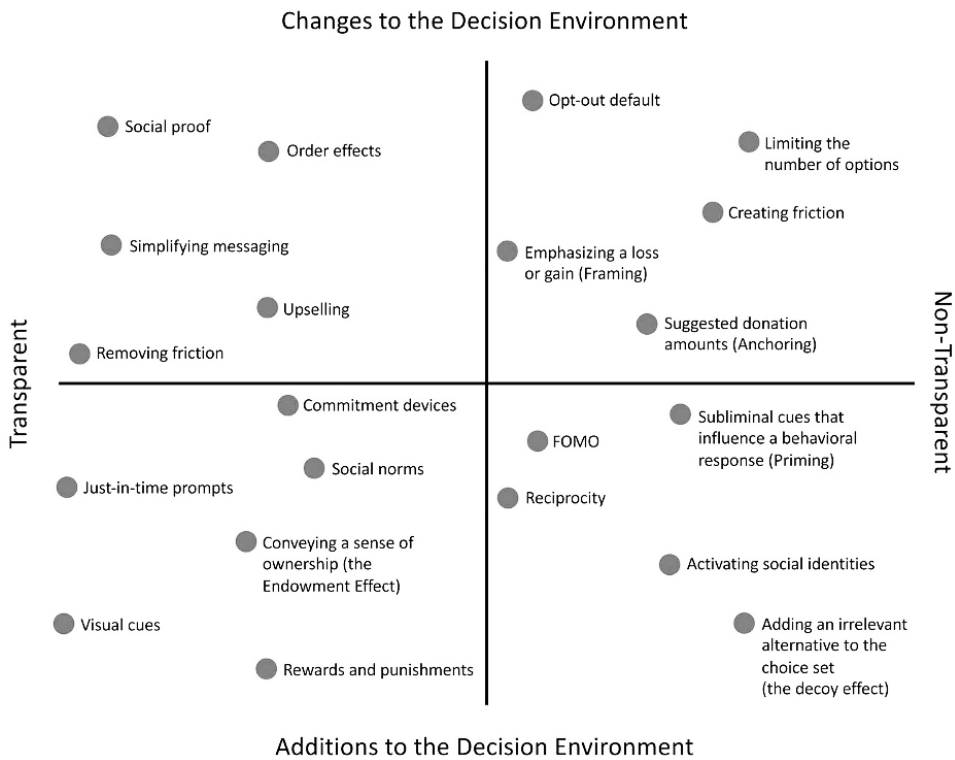


Figure 6. Separation of nudges (left) and dark patterns (right) from Thaler and Sunstein (2008).

AI also enhances social and comparative features, which are central to behavioral economics. Machine learning algorithms analyse a user's social network and behavior patterns to suggest optimal peer comparisons or challenges. For example, AI can identify a peer group with similar activity levels using social norm messaging to encourage users to match or exceed the performance of their peers. Additionally, AI-driven sentiment analysis in notifications can adapt the tone of nudges, whether motivational or congratulatory, based on prior responses, ensuring that communication resonates effectively.

Dark patterns, depicted on the right side of the separation, represent manipulative design techniques that exploit cognitive biases to influence user behavior in ways that primarily benefit the designer or company, often at the expense of the user. Unlike nudges, dark patterns are often deceptive, difficult to avoid, and can lead to negative outcomes. These tactics may include hidden costs, forced continuity in subscriptions, or misleading interface designs that trick users into sharing personal data or making unwanted purchases. The clear distinction between nudges and dark patterns highlights ethical considerations in behavioral design and the importance of transparency and user autonomy in decision-making processes.

3. Footprints on Government Economic Policy

Nudge units provide orientation to governments to facilitate changes in the way choices are presented or structuring the environment in a way that helps individuals make better decisions without restricting their freedom. Among these interventions, one of the most successful and

widespread applications has been in the area of retirement savings. For example, automatic enrolment in pension schemes has been implemented in several countries, including the U.K. and the U.S., where employees are automatically enrolled in pension plans with the option to opt out. This “default option” has significantly increased participation rates in retirement savings, as many individuals tend to stick with the default choice due to inertia, making it easier for them to save for the future. The power of the default choice has also been applied to organ donation systems in various countries, where people are considered organ donors by default unless they actively opt out, leading to higher donation rates and addressing critical shortages in organ transplantation.

Beyond retirement savings, behavioral economics has been instrumental in improving tax compliance and public health. In the realm of tax collection, nudge units have used strategies such as social norm messaging, reminding individuals that “most people pay their taxes on time” to encourage compliance. Additionally, simple reminders through letters or text messages have been shown to reduce late payments and increase overall tax revenue. In public health, behavioral economics has been applied to encourage healthier behaviors, such as higher vaccination rates or improved nutrition. For instance, framing messages around social comparisons, such as informing people that their peers are getting vaccinated or eating healthier, has been shown to motivate individuals to take similar actions. This subtle shift in how information is presented has proven effective in improving public health outcomes without imposing mandates or restrictions.

Nudge-based policies have also been applied to environmental sustainability and consumer protection, areas that benefit from behavioral insights in shaping decision-making. For example, governments have leveraged social comparisons to encourage energy conservation and inform households that their energy consumption is higher than that of similar homes, which often motivates people to reduce their energy use. Similarly, clearer product labelling systems, like the “traffic light” system for food products, help consumers make healthier choices by using colour codes to indicate nutritional value. This type of intervention capitalises on people’s tendency to make quick decisions based on easily digestible information, improving consumer behavior in a way that is both subtle and non-coercive. The effectiveness of these nudges demonstrates how small, thoughtful changes in how options are presented can significantly influence public behavior, improve individual welfare, and address larger societal challenges such as health, sustainability, and financial stability.

As AI and automation evolve, the potential for behavioral economics to shape and improve systems at both individual and societal levels will grow exponentially, driving more efficient and impactful outcomes across various sectors. AI’s ability to analyse vast amounts of data, recognise patterns, and make predictions can enhance behavioral economic models, allowing policymakers, businesses, and researchers to tailor interventions with unprecedented precision. As AI systems become more sophisticated, they can collect and analyse behavioral data from multiple sources, such as consumer transactions, social media, and health metrics, helping identify and understand the psychological drivers behind individual and group decisions. This deepened understanding will allow for more effective behavioral interventions, from personalised nudges to real-time adjustments in policy or marketing strategies that encourage desired behaviors in areas like health, finance, or education.

Automation will further increase the reach and scalability of behavioral economics applications by enabling the implementation of behavioral insights at scale. Automated systems, such as recommendation engines, personalised marketing, and adaptive learning

platforms, can use behavioral economics to optimise user interactions and choices. For instance, AI-driven recommendation algorithms on platforms like e-commerce websites or social media can use behavioral insights to present options in ways that nudge individuals towards making decisions that align with long-term goals, such as purchasing more sustainable products or adopting healthier lifestyle choices. Moreover, automation can enhance the efficiency of public policy interventions, such as automated reminders for tax payments, savings plans, or health screenings, ensuring that individuals receive timely nudges tailored to their preferences and behaviors.

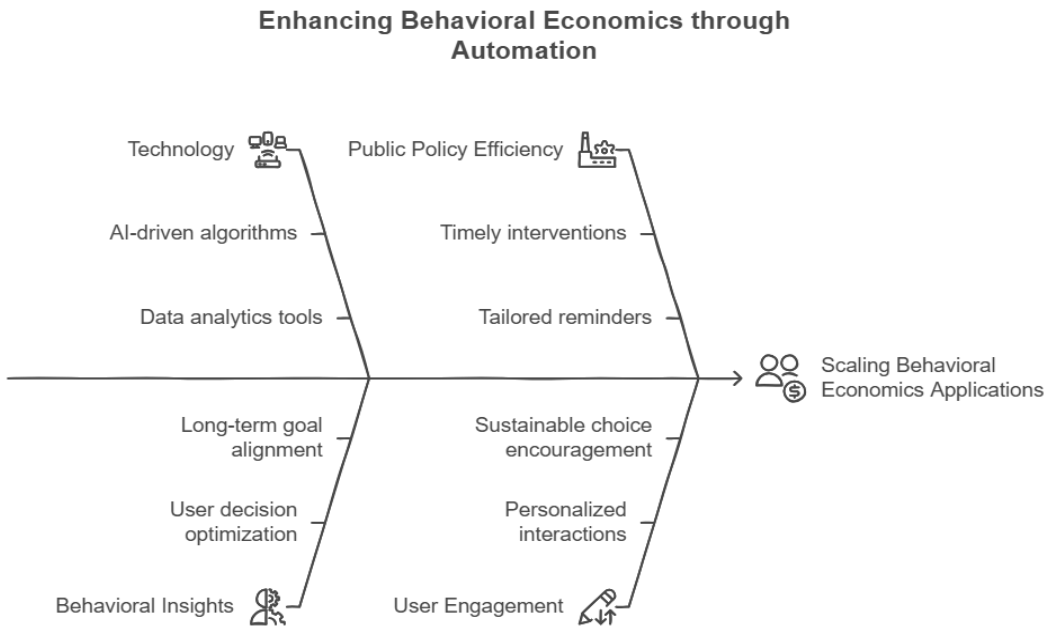


Figure 7. Behavioral Economics and Automation.

Additionally, the increasing use of AI and automation in workplaces, healthcare systems, and government services presents opportunities to embed behavioral economics more deeply into the design of everyday processes. For example, in the workplace, automated systems could apply behavioral insights to optimise employee engagement, productivity, and well-being by customising incentives, feedback, and work arrangements based on individual preferences and behavioral patterns. In healthcare, AI-driven interventions could offer personalised nudges to encourage healthier behaviors, such as exercise or medication adherence, by analysing patients' habits and tailoring suggestions in real time.

4. The Toolbox

As a discipline with a practical vocation, Behavioral Economics required a clear doctrine on how the economy and society work and how we can analyse and intervene in it, something that precisely characterises classical economics, which has a set of assumptions, a model of analysis, and consolidated economic policy alternatives to intervene in reality.

This is an essential and evolving line of research. The contributions of the three Nobel laureates in the field, recognised as behavioral economists in recent decades (Simon, Kahneman, and Thaler), have helped build a fundamental theoretical core. From their work, key concepts emerged in any intervention through behavioral economics, such as the characteristics of a nudge, the main heuristics, or the most common cognitive biases (Aliende, 2020a). From Thaler's central work, "Nudge: Improving Decisions About Health, Wealth, and Happiness," crucial elements are obtained for application methodologies such as the characterisation of situations in which behavioral economics is most effective, being especially valuable in situations where cognitive, emotional, or contextual limitations make optimal decision-making difficult. This occurs, for example, when "Homer Simpson is stronger than Sheldon Cooper," that is, when human emotions, impulses, or weaknesses prevail over rational and logical analysis, as in cases of the temptation to overconsume or under-save. It is also crucial when faced with decisions with uncertain future consequences, where people often overvalue immediate benefits versus long-term outcomes, such as retirement planning or health management. In addition, it is useful in the face of complex decisions involving multiple variables and options, which can lead to confusion or paralysis due to analysis. In rare or unusual dilemmas, where people lack prior experience to guide their choices, behavioral economics can provide structures to facilitate better decisions. Similarly, it is relevant when feedback is not evident or immediate, as is the case in educational or sustainability contexts, where the positive consequences of an action may not be perceived until much later. Finally, its application is relevant to address externalities, that is, individual decisions that affect third parties or the environment, such as the reduction of polluting emissions or the promotion of prosocial behaviours. These characteristics make behavioral economics a powerful tool for designing effective public policies and interventions in the context of high complexity and broad consequences.

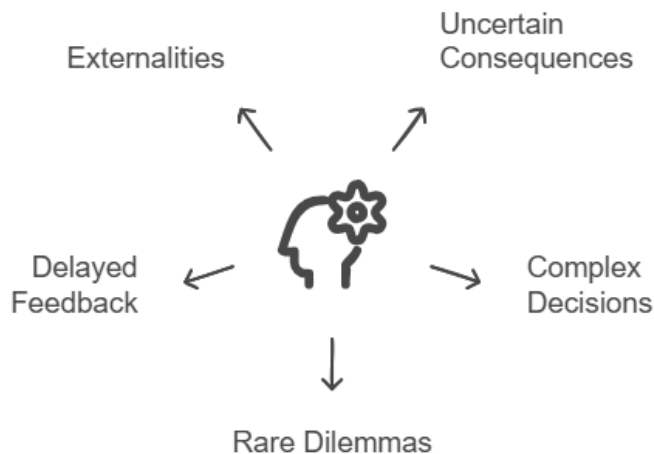


Figure 8. Situations to apply behavioral economics from Thaler and Sunstein (2008).

Thaler and Sunstein also incorporate a classification of nudges that makes it easier to design and adapt to different circumstances. The main types of nudges represent diverse approaches to influencing human behavior without restricting options or imposing obligations. Defaults are default settings that take advantage of human tendencies to avoid the effort of

changing initial decisions, such as automatically enrolling people in retirement savings plans. Error-based nudges seek to minimise incorrect decisions by facilitating corrections or preventing common problems such as automatic warnings in mobile banking apps for unusual transactions. Incentives subtly alter the costs or benefits of a decision to guide behaviors, such as recognition for recycling. Feedback-centric nudges provide real-time information to improve decisions, such as devices that show energy consumption at home and the associated costs. Framing changes the way options are presented, highlighting positive or negative aspects that influence perception, such as emphasising progress over what remains to be achieved. Finally, information relocation involves placing key data in points that are easy to access or serve, such as calorie warnings on restaurant menus. Each of these approaches draws on the principles of behavioral economics to facilitate more beneficial decisions in various contexts.

These contributions were fundamental since the current study suffered from the unification that other authors represented in classical economics, such as the compendium of Leon Walras with his general theory of equilibrium or Alfred Marshall with his model of partial equilibrium and supply and demand. Both provided a general framework on a permanent basis for economists who followed them in the twentieth century and helped to develop the macroeconomic and microeconomic theory that we know and use today. This does not limit economists who have made contributions to the area of behavioral economics or its applications in economic policy. Far from being an isolated current in heterodoxy, behavioral economics has taken part in the evolution of economic ideas, powerfully influencing economists who have marked their distance from the militancy in it, or what is more, proudly militated from the most classical current of economics.

For example, another Nobel laureate such as Vernon Smith, a pioneer in experimental economics, used controlled experiments to study economic behavior, highlighting how people interact in real markets and strategic situations. His experiments sought to demonstrate that markets can function efficiently, even under conditions where the traditional assumptions of economic theory are not fully fulfilled. Shiller incorporated behavioral concepts into the analysis of financial markets, explaining speculative bubbles and investors' irrational behavior. This shows how emotions and psychology affect financial decisions and asset prices. Other authors also alluded to behavioral concepts, such as Becker (1964) with the application of economic theory to non-traditional decisions, such as education, crime, or discrimination; Akerlof (1970) in his analysis of markets, showed how asymmetric information is relevant to understanding that the lack of information affects behavior; or Ostrom with his work on cooperation and commons that includes elements of human behavior.

In the field of nudge units and consulting firms, there are application models that serve as frameworks' (Aliende, 2020b). The BETA model (Australia) and the BIT model (UK) (see BETA, 2016; and BIT, 2012) follow similar structured approaches to applying behavioral economics. Although there are variations in the approaches of different nudge units and consultants, they generally adhere to a similar framework that focuses on understanding and influencing human behavior. First, they conduct behavioral diagnostics to identify the cognitive and psychological barriers that prevent people from making optimal decisions. Based on this knowledge, they focus on the design of nudges, which are interventions that simplify decision-making and guide people towards better options without restricting their freedom. These nudges are rigorously tested using methods such as randomised controlled trials (RCTs), A/B tests, or pilot trials to evaluate their effectiveness. Once an intervention is successful, it scales to reach larger populations or broader contexts, with ongoing monitoring and refinement to ensure that

it continues to have an impact. Finally, evaluation is a critical step, in which data are collected to measure long-term results, and adjustments are made.

The nudge unit BIT of the United Kingdom developed the “EAST cards,” a tool that is used in the application of principles of behavioral economics in public policies and other projects. EAST is an acronym for the four key principles that guide intervention: Easy (making the desired action as easy as possible), Attractive (making the desired option more attractive and desirable), Social (tapping into social influences, such as the behavior of others), and Timed (making the intervention come at the right time). EAST cards contain visual and brief information on how to apply these principles in a practical manner in different contexts. They are designed to help public officials and other professionals remember and apply the principles of EAST in their programs simply and effectively. Each card describes examples of interventions or strategies based on EAST principles and provides clear recommendations for implementation.

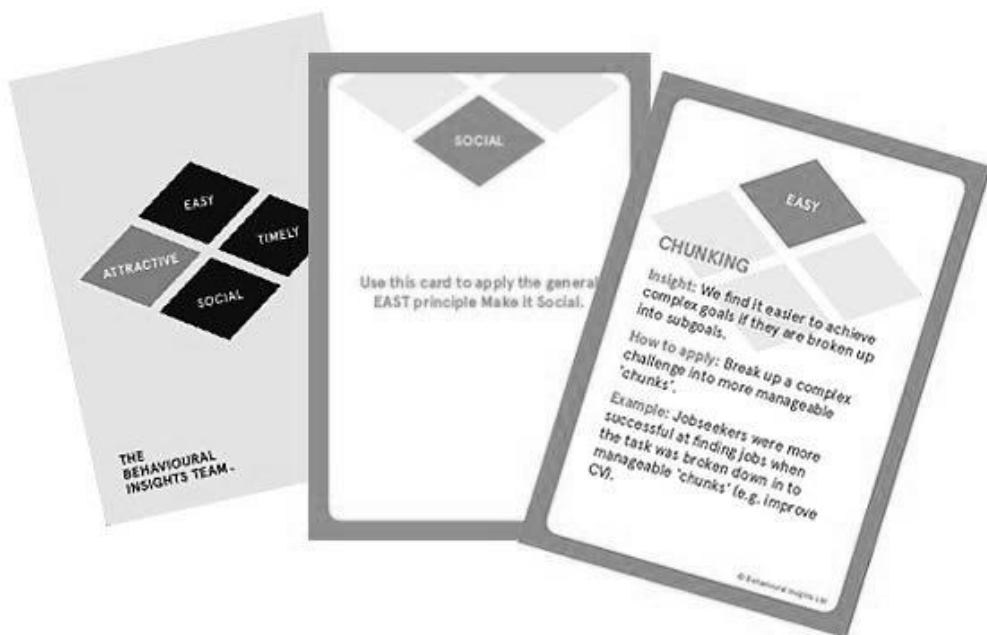


Figure 9. EAST cards.

5. Experimental Economics as a De Facto Partner of Behavioral Economics

The intersection between behavioral economics and experimental economics lies in their joint approach to understanding how individuals make economic decisions, challenging the traditional assumptions of perfect rationality and utility maximisation that define neoclassical economics. While behavioral economics focuses on identifying and modelling systematic deviations from rationality, such as cognitive biases, social preferences, and self-control limitations, experimental economics provides methodological tools to validate these theories in controlled contexts. The convergence of these disciplines has enriched our understanding of

economic behavior and has driven practical applications in public policy, market design, and organizational strategies.

Together, these disciplines provide tools to design more effective public policies, such as nudges, and validate them through experiments before they are implemented. In addition, they allow real contexts to be replicated in the laboratory, refining traditional economic theories by showing how human behavior deviates from classical predictions due to cognitive and social limitations. These shared methodologies, such as discrete choice experiments or economic games, enrich our understanding of economics, challenging assumptions of equilibrium and rational expectations, and generating practical applications in areas such as savings, health, and sustainability.

Answer these two questions, which I usually ask my master's students.

- Chris works in a maternity ward on the night shift. Yesterday, eight babies were born on their shift! Which of the following sequences is most likely in relation to the sex of the babies that were born (A-girl and O-boy)?
 - a) AOAOAOAO
 - b) OOOOOOOO
 - c) OAOAOAAA
 - d) AOOAOOOOA
- You are looking at stores to buy a new TV priced at €800. In a shop on the other side of the province, 45 minutes by car, it is reduced by 300€. Would you travel to buy TV in that store? (Yes/No)

I am going to introduce at this point in the chapter an anecdote about the application of behavioral economics, in order to give you time to answer the two previous questions without consulting the “correct” answers. It is said that in a small cafeteria in a coastal town, the owner noticed that many customers forgot to return the cups they used on the outdoor terrace, overlooking the sea, which increased costs and generated waste. Inspired by a concept from behavioral economics, he decided to implement a simple nudge. Instead of charging for a disposable cup, it offered a symbolic discount to those who brought their own reusable cups. To make it more effective, however, he did something else: he placed a sign next to the checkout that read, “9 out of 10 customers would rather help the planet by returning their cup! Do you too?” This result was surprising. Within a few weeks, 70% of regular customers began to bring their own cups. The curious thing was that the impact did not only come from the discount but also from the psychological effect of the poster, which activated the implicit social norm. No one wanted to be part of the “10%” that did not help the planet. This simple change not only reduced business costs but also created a sense of community among customers. A solution that demonstrates how small interventions can have big effects when the principles of behavioral economics are applied.

Now let us go with the answer to those two situations that I was presenting. The first one had a correct answer. All four options have the same probability. However, a high percentage of students answered that options C or D were the most likely. This is due to representativeness bias, since these options represent all those in which the order of the babies does not follow a specific pattern, as is the case in A or B. B usually seems the least likely, just as it is difficult to believe that the number 00000 is the one that wins a lottery, even though it has the same chances as the rest of the numbers. This proves the representativeness cognitive bias.

In the second situation, there is no right answer, it is a matter of preferences, of whether or not you would visit the store where the TV is on sale. Students usually answered yes. However, what would you answer if the question were the following?: “You are looking at dealerships to buy a new car that is priced at €22,000. At the dealership on the other side of the province, in the best of cases 45 minutes by car, the car you like is discounted by 300€. Would you travel to buy the car at that dealership?” In this case, students usually answer no, especially when I have separated them into two different groups, and each group answers one of these two questions related to offers.



Figure 10. Discounts and behavioral economics.

To the surprise of many of them, the dilemma posed is, in essence, the same, but due to the proportionality bias, they have taken into account the proportional value of the offer with respect to the price of the item, when in reality the decision consists in both cases of whether it is worth travelling 45 minutes to save 300 euros, either to buy a television or a car.

There are many examples of the transcendence of behavioral economics and how we can bring its capabilities to the field of experimentation. Steele (2011) recounts how a young African-American man faced racial stereotypes while walking the streets. He noticed that people reacted with the fear of seeing him, moving away before reaching his height, but he found that by whistling classical melodies like Vivaldi's, perceptions changed. This simple act neutralises prejudices, showing how small adjustments in behavior can drastically alter social interactions. Implicit stereotypes and biases can influence how we perceive and are perceived; however, context and subtle cues can also transform them.

Another famous experiment is that of the UK nudge unit directed by David Halpern. In one of the projects, the most effective message for promoting organ donation was based on reciprocity and framed as:

“If you needed an organ, would you take one? If so, please help others.”



Figure 11. Message to promote organ donation. Halpern (2015).

This message significantly increased sign-ups compared to other approaches because it leveraged a powerful behavioral principle: the social norm of reciprocity. By prompting individuals to reflect on their potential reliance on organ donation, it created a sense of obligation to reciprocate by becoming donors. This emotional appeal, combined with the logic of fairness and mutual aid, resonated more deeply than other messages, such as those based on altruism alone.

Behavioral economics is connected to several other fields that explore how human psychology and social factors influence decision making, such as cognitive, neuroeconomics, psychological, institutional, and evolutionary economics. These approaches share the common goal of expanding economic theory beyond the traditional model of rational decision-making. Cognitive economics examines how individuals process information and use mental shortcuts, whereas neuroeconomics focuses on the brain's role in decisions involving risk and reward. Psychological economics emphasises emotions and social motivations, such as fairness in economic choices. Institutional economics examines how societal norms and institutions shape behavior, and evolutionary economics suggests that decision-making strategies have evolved to adapt to changing environments. Together, these fields complement behavioral economics by integrating other frameworks to capture how choices often deviate from pure rationality due to cognitive biases, social influences, and emotional dynamics.

Conclusion

Behavioral Economics has transformed the way we understand human decisions, challenging classical models and offering practical tools to influence individual and collective choices. The incorporation of concepts such as bounded rationality, heuristics, biases, and nudges has not only broadened the field of economic study but has also made it possible to design effective interventions in areas such as health, the environment, and education.

The framework continues to evolve, showing a balance between theoretical understanding and practical applications to address contemporary challenges in the economy and society.

This book is a manual on the subject, applications and challenges of behavioral economics in today's world and at the same time offers an application guide. Each chapter explores a key aspect of this discipline, from its conceptual roots to its applications in specific fields, ending with the measurement of the impact of interventions. With this structure, the book becomes a useful tool for practitioners, students, and researchers interested in understanding and applying behavioral economics in various contexts.

In the first part, "From foundational roots to modern frontiers," past and future merge, laying the influence of psychology in the emerge of the discipline, and presenting the new scenario depicted by the digital economy and the AI.

The second part, "Methods and Frameworks for Application," explores how "decision architects" operate in practice, presenting research methods, experimental processes, and how nudge units work. It also reflects on the ethical implications of the use of behavioral interventions and their potential to address future challenges, such as sustainability.

In the third and most extensive part of the book, "Fields of application," the reader will discover how the principles of behavioral economics are applied in various sectors and social spheres. Cases in finance, insurance, health, healthy habits, consumer behaviour, the gig economy, talent management, gender issues, and rent-seeking in the political sphere are examined. This section provides a practical perspective on how this discipline can transform key sectors.

Finally, the fourth part, "Evaluation and impact measurement in behavioral economics interventions," delves into the fundamental techniques for measuring the effects of behavioral projects and policies. Qualitative and mixed-methods approaches that complement traditional quantitative tools are explored, providing a comprehensive approach for assessing the impact of behavioral interventions.

Find Out More

- Behavioral Economics Guide 2024. It is an invaluable resource for students and researchers who want to delve into behavioral economics, as it offers a clear view of the latest trends and developments in the field. In addition to providing a solid theoretical foundation, it presents practical tools and methods that allow concepts to be applied in real situations, such as field experiments and public policy analysis. The guide also includes interviews with experts, offering valuable perspectives on the challenges and applications of the field, and providing access to a wide range of research resources, from academic articles to specialist conferences. It also highlights key areas of the discipline, such as neuroeconomics and the integration of artificial intelligence, and shows concrete examples of their use in sectors such as health, marketing, and education, making it easier for beginners to visualise the practical impact of behavioral economics.
- Cartwright, E. (2018). Behavioral economics. Routledge. If I must recommend another manual on the subject, I lean towards this one. The author's purpose was to demonstrate the key concepts of economics and game theory through experiments. This approach captures readers' attention and the importance of behavioral economics, explaining its basic principles, findings, and real-world applications, making the book

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appealing to a wide audience, and particularly useful for those with practical aspirations.

- Halpern, D. 2015. *Inside the Nudge Unit: How Small Changes Can Make a Big Difference*. New York: Random House. It provides a detailed look at the work of the British government's nudge unit, set up to apply the principles of behavioral economics to public policy. Halpern is one of the pioneers in applying these approaches at the government level. It reveals how small modifications in the decision-making environment can have a significant impact on people's behavior without the need to resort to traditional sanctions or incentives. The focus of the book is on the idea that, by understanding the cognitive biases and limitations of individuals, it is possible to design more effective policies that encourage decisions beneficial to society, such as improving personal savings, increasing participation in health programs, or reducing energy consumption. Throughout the text, Halpern presents a series of case studies and concrete examples of how nudges have been used successfully in various areas of government, demonstrating how these approaches can be put into practice to improve social and economic well-being. In addition, the ethical principles that should guide the use of these methods are deepened, reflecting the limits of intervention and the importance of guaranteeing the autonomy and freedom of choice of individuals. This book is an excellent reference for both those interested in the theory of behavioral economics and those who seek to understand how these ideas can be applied in practice in public policy.
- Milkman, Katherine. *Choiceology*: <https://www.katymilkman.com>. In this podcast, Milkman uses case studies, scientific research, and interviews with experts to show how cognitive biases, emotions, and other factors influence everyday decisions, both individually and societally. Through these episodes, the podcast covers a wide range of topics, from procrastination to choices that affect public health, and offers examples of how small changes in the environment can help people make better decisions. The podcast is aimed at a wide audience, providing a dynamic and entertaining way to understand the fundamental concepts of behavioral economics. In addition, Milkman offers a way to apply this knowledge to real life, providing useful tools for those interested in improving their decision-making, whether in personal, professional, or public policy design. His book of the same name also offers valuable insights into how people make decisions and how these processes can be improved or influenced through a better understanding of psychology and behavioral economics.
- Steele, C. (2011). *Whistling Vivaldi: How stereotypes affect us and what we can do*. WW Norton & Company. It is a seminal work in the field of social psychology that addresses how stereotypes affect people's behavior and performance, particularly in academic and work contexts. Steele, a renowned psychologist and pioneer in the study of the effects of stereotypes, presents in his book the theory of the "stereotype threat," which refers to the anxiety that people experience when they feel that their behavior may confirm a negative stereotype about their social group. This threat can decrease performance in areas such as exams, academic work, or even everyday interactions. Through examples and case studies, He illustrates how the threat of stereotyping affects diverse populations, including women in male-dominated fields or people of colour in academic or work situations where prejudice is expected. In the book, Steele

describes how people, consciously or unconsciously, can internalise these stereotypes, often resulting in a decrease in their performance or avoidance of certain environments where prejudice is perceived. In addition to highlighting the negative impact of stereotypes, Whistling Vivaldi explored interventions and strategies that can mitigate these effects, such as context shifting, fostering multiple identities, and reinforcing belonging. Through these approaches, Steele suggests ways in which educational institutions, workplaces, and society can reduce the influence of stereotypes and promote a more inclusive and equitable environment.

Suggested Activities

1. The following are five brief exercises that reflect on key concepts in behavioral economics based on dilemmas of choice:
 - Imagine you are playing a game in which Player A (the proposer) offers Player B (the responder) a share of \$100. Player B can either accept or reject an offer. If rejected, both players receive nothing. Reflect how fairness or emotions, rather than pure economic rationality, might influence the decisions of both players. How does this “The Ultimatum Game” relate to the concept of fairness in economics?
 - Consider the following two descriptions of a medical procedure:
 - “The procedure has a 90% survival rate.”
 - “The procedure has a 10% mortality rate.”
 How do you think people will respond to each description? Reflect how the framing of information influences decision-making and risk perception in real-life scenarios, such as insurance or health care.
 - Suppose you are given a coffee mug for free and later offered the chance to sell it for \$5. Would you sell it? Now, imagine that you were asked to buy the same mug for \$5. Would you buy it? Reflect on why you might value the mug more when you own it, and how this illustrates the endowment effect in decision-making.
 - Imagine you are at a store with 5 types of chocolate bars. You will then visit another store that offers 30 types. Reflect on your decision-making process, do you feel more satisfied when you have fewer or more choices? How does the paradox of choice relate to the idea that too many options can overwhelm or paralyse people, making them less likely to decide at all?
 - You are given a choice between the two scenarios:
 - A guaranteed \$50.
 - A 50% chance of winning \$100 and a 50% chance of winning nothing.
 Reflect on which option you would choose and why. Now, imagine the same scenarios, but this time you face the possibility of losing money (e.g., losing \$50 versus a 50% chance of losing \$100). How does loss aversion bias influence your decision?

2. Create a nudge intervention aimed at promoting environmentally sustainable behavior in a specific context, such as reducing plastic waste, increasing recycling, and conserving energy. Feel free to choose a different field of intervention if you wish.
 - a) Identify a behavioral goal: start by identifying a specific environmental behavior you want to influence. For example, you might focus on encouraging people to reduce water usage in households, recycle more effectively, choose reusable bags over single-use plastic bags, decrease energy consumption in homes or workplaces.
 - b) Understand the current barriers preventing people from engaging in this behavior. These barriers could be cognitive biases (e.g., present bias, status quo bias), social norms, or lack of information, like not understanding how their actions impact the environment, recycling bins might not be easily accessible, a lack of immediate rewards for environmentally friendly behavior, etc.
 - c) Design the nudge: Based on the barriers you have identified, think of a creative way to nudge people into adopting the desired behavior. Some potential nudges could include default options, use social proof, offer recognition for sustainable actions, such as bringing reusable bags when shopping or turning off lights when not in use, present environmental data in a way that is salient, make the information stand out visually (e.g., through colour coding or progress bars), reduce the effort required for sustainable actions by making the behavior easier, etc.
 - d) Test the nudge: consider how you would test the effectiveness of your nudge. This could involve small-scale trials or surveys to gather feedback from the participants. Think about what metrics would help determine whether the intervention is successful (e.g., increased recycling rates and lower energy consumption).
 - e) Reflect and iterate after implementing the nudge, reflect on its effectiveness. Did it work as expected? Were there any unintended consequences? How can you refine or scale a nudge to reach a wider audience or achieve better results?

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