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PERSPECTIVE

Moving from nudging to boosting: empowering behaviour change to address global challenges

Ralph Hertwig[1], Susan Michie[2], Robert West[3] and Stephen Reicher[4]

[1]Center for Adaptive Rationality, Max Planck Institute for Human Development, Berlin, Germany; [2]Centre for Behaviour Change, University College London, London, UK; [3]Institute of Epidemiology and Health Care, University College London, London, UK and [4]School of Psychology, University of St. Andrews, St. Andrews, UK
Corresponding author: Ralph Hertwig; Email: hertwig@mpib-berlin.mpg.de

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Abstract
The COVID-19 pandemic provided a stark reminder that societies will struggle to address global challenges unless they are able to change behaviour at scale. The widely adopted 'nudge' approach epitomizes an individualistic, deficit model of human cognition and motivation that leverages or overcomes people's weaknesses and biases to get them to do things they would otherwise not. By contrast, we argue that tackling the challenges facing humanity requires a collective, capacity-building approach – one that boosts the competences, opportunities, and motivations of individuals to act together.

Keywords: agency; boosting; behaviour change; bounded rationality; nudging

Introduction

Human behaviour can be both the cause of and the solution to many global challenges, including pandemics, non-communicable diseases, antimicrobial resistance, the climate and biodiversity crisis, democratic backsliding, and violent conflicts. A recent example is the COVID-19 pandemic ('Behaviour fuels, and fights, pandemics', 2020). Public policies to contain the spread of the virus included attempts to change people's everyday behaviours, such as reducing physical contact and spatial proximity to others, wearing masks, and frequent handwashing. People were also expected to adopt specific protective behaviours such as regular testing, adhering to isolation guidelines, getting vaccinated, acquiring and understanding novel information and concepts (e.g., exponential growth), and building on or developing new competences such as coping with anxiety when under economic strain, dealing with loneliness in the face of self-isolation and quarantine requirements, cultivating social relationships under profoundly different conditions, considering the perspectives and concerns of others (e.g., people at

risk), coordinating and cooperating with others, communicating with respect, migrating to online environments, developing effective work-from-home arrangements, and managing conflicting demands (Kniffin *et al.*, 2021).

Behavioural science can play an important role in understanding why people behave as they do and how societies can affect behaviour change to meet global challenges (Hallsworth, 2023). One popular approach has been labelled 'nudging'. The nudge approach is based on the idea that human decision-making is often subject to severe limitations that need to be overcome or leveraged, and that small changes to the way that decisions are presented can 'nudge' people to make better choices, without them necessarily being aware of it. We argue that the opposite of this approach is what is needed – one that builds on people's strengths, not just as individuals but as social animals with the ability and motivation to act collectively.

The nudge approach to behaviour change

Nudging is rooted in the idea that 'small and apparently insignificant details can have major impacts on people's behavior' (Thaler *et al.*, 2013, 428–29) and that leveraging such subtle effects is preferable to applying more overt ways of influencing behaviour, such as support, persuasion, incentives, or coercion. To encourage healthier diets, for example, nudging steers clear of instruments like banning products, restricting advertising, or increasing costs through taxation. Instead, it focuses on how and where unhealthy products are displayed in shops or canteens (Bucher *et al.*, 2016; Cadario and Chandon, 2020). By rearranging products so that healthier options are more prominently featured and easier to access, nudging aims to direct people towards choices that are in their long-term best interests.

Nudging exemplifies a 'deficit' model of human behaviour, according to which people's decision-making processes are inherently limited. Cass Sunstein, who together with Richard Thaler invented and popularized the nudge concept, has argued that many consumers struggle with 'inadequate information and behavioral biases, which can produce internalities, understood as costs that people impose on their future selves' (Sunstein, 2024, 1). In other words, due to informational, cognitive, and motivational limitations, people often make choices that have negative consequences for their future well-being. The nudge approach proposes that *behavioural engineers* can leverage such limitations – including overconfidence, loss aversion, status quo bias, framing effects, lack of self-control, myopia, inertia, inattention, and error-prone heuristics – to steer people into doing what is in their interests. In short, nudges are' called for because of flaws in individual decision-making, and they work by making use of those flaws' (Hausman and Welch, 2010, 126).

The mechanisms of nudging

Nudges can be divided into two broad categories: *architectural* and *educative* (Sunstein, 2022). Architectural nudges target the *choice architecture*, or how choices are presented to people. This can include the placement of options in a list or their physical location in space, the language used to present them, and whether people have to opt in or out of them. For instance, placing healthier foods at eye level in a shop

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is a form of architectural nudging. Educative nudges involve providing warnings, reminders, and information to guide decision-making. This includes communicating descriptive norms informing people about others' behaviour (Cialdini, 2007). For example, a sign in a hotel bathroom saying '75% of our guests reuse their towels to protect the environment' encourages people to follow the majority's eco-friendly behaviour.

The nudge approach has been described as a form of *libertarian paternalism* (Thaler and Sunstein, 2003). It is paternalistic because an external authority prompts people to act in ways that the authority has decided is beneficial, individually and/or collectively. It is libertarian because it maintains freedom of choice and does not remove options or force people to act in a particular way.

The appeal of nudging

The nudge approach has proved popular among policymakers, arguably for several reasons. First, nudge policies can be highly cost-effective (Benartzi *et al.*, 2017). Even when they result in very small changes, they do so at low cost and the population-level impact can be significant (Halpern, 2015). Second, because nudging does not involve outright prohibitions or potentially costly support programmes, it appeals to governments that are averse to overt regulation and that advocate for fiscal conservatism and reduced government involvement in societal affairs (Halpern, 2015). Third, unlike other policy options, nudging does not require governments to take on corporate interests. A study of 11 countries that tried to impose sugar taxes on soft drinks, for example, found that all faced energetic lobbying and criticism (Lauber *et al.*, 2022). Fourth, the nudge approach can absolve governments from their responsibility to address collective and societal problems. Framing issues like obesity, ill-health, and poverty as failures of individual decision-making diverts attention from systemic drivers of behaviour for which governments are responsible, such as allowing the production and dissemination of harmful products (Nestle, 2015; Kozyreva *et al.*, 2020; Chater and Loewenstein, 2023). Fifth, nudge arguments align with broader views that politicians often hold about the public. The Hobbesian legitimization of government is that, left to themselves, individuals are incapable of creating a safe and stable society (Hobbes, 1651/2016). Nudging can be seen as providing a 'scientific' justification for this viewpoint and a logical solution for societal problems. The more individuals are portrayed as cognitively and motivationally deficient, the more credible it becomes to blame them for societal issues and to cast nudging as a justifiable solution.

Limitations of the nudge approach

A key criticism of the nudge approach is that it deprioritizes overt and effective behaviour change strategies that are justifiably expensive or coercive, such as mass media campaigns to combat bullying, taxes on alcohol or sugary beverages, bans on smoking in public areas, financial incentives to reduce carbon emissions, and fines for polluting rivers (Chater and Loewenstein, 2023). While recognizing the validity of these criticisms, our focus here is on the individual deficit model

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that underpins the nudge approach. Two critical aspects of this model warrant closer examination: the view of humans as deficient and the focus on individual behaviour.

The deficit model of human cognition

Proponents of the nudge approach frequently refer to an extensive body of research – 'thousands of studies' (Thaler and Sunstein, 2021, 10) – purportedly showing that human thinking is flawed and biased. Indeed, the *heuristics-and-biases programme*, started by psychologists Daniel Kahneman and Amos Tversky in the early 1970s (Tversky and Kahneman, 1974), has profoundly changed how many psychologists and behavioural economists perceive the quality of people's statistical reasoning, intuitions, inferences, and choices, as well as the cognitive mechanisms, or heuristics, that underlie these behaviours.

The main message of the heuristics-and-biases programme is a specific interpretation of Herbert Simon's (1956) foundational concept of *bounded rationality*. Simon, a Nobel Prize laureate in economics, was a vocal critic of the rational choice framework – the classical model of rationality – as a descriptive model of human choice. He noted that this model expects individuals to have unlimited knowledge, computational power, and time to make perfectly rational decisions. Such an 'Olympian model' (Simon, 1983, 19) of rational choice was perhaps suitable for omniscient gods, but unrealistic in the real world. As an alternative, Simon proposed the concept of bounded rationality, which acknowledges that people often approximate rather than optimize when making decisions.

Whereas Simon emphasized that people's approximate decisions can be adaptive, good enough, and satisficing because the 'environments to which [organisms] must adapt possess properties that permit further simplifications of its choice mechanisms' (Simon, 1956, 129), the heuristics-and-biases programme has interpreted bounded rationality to mean systematic biases in human judgment and choice. The research objective, as stated by Kahneman, was 'to obtain a map of bounded rationality, by exploring the systematic biases that separate the beliefs that people have and the choices they make from the optimal beliefs and choices assumed in rational-agent models' (Kahneman, 2003, 1449). Richard Thaler, who worked closely with Kahneman and Tversky, famously reinforced this perspective by concluding that 'mental illusions should be considered the rule rather than the exception' (Thaler, 1991, 4).

The deficit view extends beyond cognitive deficits to include motivational deficiencies: the idea that people's motivations are inherently maladaptive and that they cannot be trusted to do the right thing. Take the example of the UK government's response to the COVID-19 pandemic. In early March 2020, the UK's Chief Medical Officer, Chris Whitty, expressed concern that the public would be unable or unwilling to adhere to virus containment policies for long: '[T]here is a risk if we go too early, people will understandably get fatigued and it will be difficult to sustain … over time' (The Telegraph, 2020). Similarly, the government feared that 'anything too onerous suggested by the government … might be adopted enthusiastically for a few weeks but then people get bored and leave their homes just as the peak of the illness hits' (Proctor, 2020). As senior cabinet minister Michael Gove testified to the UK COVID-19 Inquiry,

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there was a 'broad view at the time that … the public … would not endure [lockdown measures] for long' (UK Covid-19 Inquiry, 2023). Consequently, stay-at-home measures were only implemented on 23 March 2020, a delay that resulted in possibly tens of thousands of unnecessary deaths (Stewart and Sample, 2020).

Another example of the deficit view in the public discourse concerns democratic processes. A strand of libertarian scholars has challenged the quality and, by extension, the legitimacy of democratic decision-making. To support their 'skepticism about democracy, these libertarians appeal to findings in cognitive and social psychology and political behavior to claim that decision making by ordinary citizens is unlikely to be rational or well grounded in evidence' (Farrell *et al.*, 2023, 767). Voters are characterized as irrational (Caplan, 2008) and 'systematically incompetent' (Brennan, 2016, 201). Based on such arguments it has been asserted that 'rule by demagogues … is the natural condition of democracy' (Caplan, 2008, 19). There is no mincing of words when it is suggested that some individuals 'ought not have the right to vote, or ought to have weaker voting rights than others' (Brennan, 2016, viii). Additionally, it has been claimed that 'widespread public ignorance is a type of pollution' and that 'democracy might function better if its powers were more tightly limited' (Somin, 2016, 6, 9).

The focus on individuals

Nudge theory focuses on individual decision-making. Yet this is often too narrow a focus, as illustrated by the 'behavioural fatigue' line adopted in the UK in the first wave of COVID-19. The assumption that people would not stick to stay-at-home measures for long was proven wrong; levels of adherence remained high despite psychological and economic hardships (Duffy and Allington, 2020). It soon became clear that a sense of shared identity and community was a critical factor in maintaining adherence (Jackson *et al.*, 2020), a finding subsequently corroborated by multiple studies (Stevenson *et al.*, 2021; Van Bavel *et al.*, 2022). This comes as no surprise to those who study mass behaviour in emergencies. Research has consistently shown that people tend not to panic or act destructively in crises (Johnson, 1987; Drury *et al.*, 2013). Rather, a sense of common fate engenders a feeling of shared identity which, in turn, leads people to support and expect support from others (Drury, 2018). This shared identity helps to sustain adherence to demanding measures in hard times.

Moreover, focusing solely on individual limitations neglects the crucial role of trust in behaviour change. Governments basing policy on an individual deficit model which assumes that people are neither willing nor able to make good choices are unlikely to use strategies known to build shared identity and trust, such as listening to the public, engaging with them, co-producing policy, and showing respect (Tyler and Blader, 2003; Bonell *et al.*, 2020). Trust was vital to the success of public health responses during the COVID-19 pandemic (Bollyky *et al.*, 2022; Lenton *et al.*, 2022) and played a significant role in vaccine uptake, both internationally and in the UK (Paul *et al.*, 2022; Viskupič *et al.*, 2022; Allington *et al.*, 2023). In autumn 2021, while over 90% of White Britons had been vaccinated, the figure for Black Britons was only around 60% (Dolby *et al.*, 2022). A lack of trust contributed to this disparity; 60% of Black Britons felt that health services were less concerned with their issues than with those of White people (Joint Committee on Human Rights, 2020). Addressing this mistrust through a

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process of engagement (Burgess *et al.*, 2021) – by going to Black communities, working through community representatives, and listening and responding to concerns – proved highly effective (Halvorsrud *et al.*, 2023). However, at a national level, such engagement was largely absent. Instead of fostering dialogue and trust, government representatives voiced disdain, labelling those who remained unvaccinated as 'selfish.' (BBC, 2021).

An alternative approach to behaviour change based on boosting human abilities

An alternative to the individual deficit model of human cognition consists in identifying the social dynamics and human competences needed to tackle global challenges, and exploring how these can be harnessed and developed. We have already touched on the importance of social dynamics, such as building trust, strengthening communities, and fostering collective resilience (Reicher and Bauld, 2021; Reicher, 2022). Here, we focus on human competences. In our view, the public's ability to adapt to new challenges will depend not on superficial nudges but on sustained interventions and investments designed to develop human capital.

Boosting competences

The *boosting* approach to behavioural public policy works by harnessing and building on human strengths (Hertwig and Grüne-Yanoff, 2017). Boosts are interventions designed to improve people's competences to make informed choices that align with their goals, preferences, and desires. To illustrate, Table 1 lists six societal challenges alongside the competences needed to address them and boost interventions that have proved successful in developing those competences.

By fostering existing cognitive and motivational competences or instilling new ones, boosts make it easier for people to exercise their own agency. The emphasis on agency in the boost approach has both ethical and efficacy dimensions. From an ethical standpoint, individual autonomy and freedom cannot be achieved without nurturing citizens' agency. From an efficacy perspective, interventions that fail to promote agency – as many nudging interventions do – risk leaving citizens in the dark, unable to take ownership of the process of behaviour change. This lack of agency can have several negative outcomes: non-persistent treatment effects, compensatory negative spillovers, or psychological reactance and backfiring effects (Banerjee *et al.*, 2024). What is more, failing to engage with and listen to people may undermine trust (Tyler and Blader, 2003), which, as we have seen, is critical for successful behaviour change.

Boosts can be classified according to the kinds of competences they build or enhance. *Digital literacy boosts* involve strategies like lateral reading, modelled after the methods used by professional fact checkers to efficiently and effectively assess the credibility of unfamiliar websites, posts or information (Kozyreva *et al.*, 2024). *Risk literacy boosts* include experienced simulations of risks that help people understand the temporal and cumulative nature of health risks (Wegwarth *et al.*, 2022). *Financial literacy boosts* might employ simple heuristics to help people understand compound interest and exponential growth (Foltice, 2017) or enable microentrepreneurs to clearly

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Table 1. Six examples of global challenges, competences needed to address them, and tried-and-tested boosts

Global challenge	Competence	Boost intervention
How to overcome statistical illiteracy – for example, in the context of treatment decisions?	Statistical competences, such as the ability to properly interpret health statistics and medical test results.	Training people to convert statistical information (e.g., prevalence of a disease; sensitivity and specificity of a test) into natural frequencies helps them interpret the information more intuitively, and has been shown to be more effective and more lasting than directly teaching Bayes' rule (Sedlmeier and Gigerenzer, 2001; Gigerenzer *et al.*, 2007).
How to overcome poor financial decision-making, especially among people with lower levels of income, education, and savings?	Basic accounting competences and/or simple financial self-control strategies.	Training in basic accounting heuristics and procedural routines has proved to be more effective than conventional accounting training for small business owners (Drexler *et al.*, 2014). A meta-analysis found that 12 self-control strategies (e.g., wait before making the purchase) reduced spending and increased saving significantly (Davydenko *et al.*, 2021).
How to empower citizens to cope with the 'infodemic' – the tsunami of misinformation online, on social media and on instant messaging services?	Competence to reliably assess the trustworthiness of online information and sources.	Training people to use the methods of professional fact checkers – i.e., using a search engine to see what others say about the source of the content (*lateral reading*; Wineburg *et al.*, 2022) rather than critically thinking through the content itself (*vertical reading*) – has been shown to be effective in assessing the credibility of websites. School-based interventions with instructional strategies like teacher modelling and guided practice can be used to teach lateral reading. Pop-up graphics can be used to prompt social media users to read laterally (Kozyreva *et al.*, 2024).
How to fight maths anxiety – a widespread issue associated with lower maths achievement and STEM career participation (Barroso *et al.*, 2021)?	Parental competence to support their children's playful engagement with maths.	Reading bedtime stories that incorporate fun maths problems in the *Bedtime Math* app has been shown to significantly increase children's maths achievement relative to a control group – and to enable children whose parents have maths anxiety to catch up with their peers (Berkowitz *et al.*, 2015).

(*Continued*)

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Table 1. (*Continued.*)

Global challenge	Competence	Boost intervention
How to help people to reclaim their self-control in online environments?	Competence to self-regulate one's online consumption by actively (re)designing the online choice environment to prevent excessive smartphone use and mindless scrolling (and thus becoming a citizen choice architect; Reijula and Hertwig, 2022).	Installing *one sec*, a self-nudging app that forces one to wait before opening target apps (e.g., social media apps), has been shown to reduce the use of those apps by 57% after six weeks (Grüning *et al.*, 2023).
How to combat overweight and obesity, especially in children and adolescents?	Parental competence to design the family meal environment is crucial (Dallacker *et al.*, 2019): Children who learn unhealthy eating patterns are at much higher risk of obesity in adulthood (Simmonds *et al.*, 2016).	Increasing the duration of family mealtimes by just 10 minutes has been shown to improve the quality of children's diets (i.e., to increase their intake of fruit and vegetables, but not of dessert; Dallacker *et al.*, 2023).

separate business and private accounts with the help of physical analogues (Drexler *et al.*, 2014). *Statistical reasoning boosts* might contrast correct solutions with typical biased responses in one-shot (Morewedge *et al.*, 2015) or repeated trials (Franiatte *et al.*, 2024), or train people to transform complex probability representations into simpler frequency representations (Sedlmeier and Gigerenzer, 2001). *Health literacy boosts* enable people to understand drug labels (Sahm *et al.*, 2012), recognize and monitor symptoms, and employ simple strategies like using implementation intentions to improve self-regulation (Oettingen *et al.*, 2000). *Decision-making boosts* such as decision trees support decision-making in domains such as finance, medicine, human resources, and science education (Katsikopoulos *et al.*, 2021; Osborne and Pimentel, 2022). *Motivation boosts* can help to overcome maths anxiety and enable parents and children to engage playfully with maths tasks (Berkowitz *et al.*, 2015).

Boosting can also empower citizens to turn the choice architectures around them into strategic allies, a concept known as *self-nudging*. In self-nudging, the individual serves as both the nudger and the nudgee, effectively becoming a *citizen choice architect*. This approach addresses several major objections to nudging in addition to those discussed above, such as concerns about paternalism and the uncertainty and heterogeneity of preferences (Reijula and Hertwig, 2022). An example of self-nudging is the mobile phone app *one sec* (Grüning *et al.*, 2023), which empowers users to substantially reduce their social media consumption. (See Herzog and Hertwig, 2025, for a comprehensive review of boosts.)

Boosting involves more than just enhancing people's competences; it also means shaping the environment to maximize individuals' ability to use those competences. All behaviours involve an interaction of competences, opportunities, and motivations (Michie *et al.*, 2011). Competences are only useful to the extent that the environment enables them to be deployed effectively. For example, understanding the importance of ventilating indoor spaces to avoid the spread of airborne viruses is useless if buildings do not allow for windows to be opened. Similarly, understanding the importance of

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self-isolating when infected with a dangerous pathogen will only get a society so far if citizens lack the necessary economic, practical, and social support to do so.

The need for urgent action

Now is the time to rethink strategies for behaviour change. The deficit model, exemplified by nudging, urgently needs to be replaced by an approach that can achieve the global behaviour changes needed to cope with the multiple crises humanity is currently facing. The things we all do drive pandemics (e.g., travel, meat-rich diets), and therefore the next – potentially more lethal – pandemic could be emerging as we write this. The climate emergency is already claiming countless lives and damaging economies. In conjunction with other challenges, such as biodiversity loss, antimicrobial resistance, democratic backsliding, and global conflicts, humanity's continued progress may be in jeopardy.

Yet we have the opportunity to build on our achievements as a species and create a society capable of meeting current and future challenges, in which social agents actively shape their futures. The concept of agency – and the recognition that people are empowered to make changes when they act together (Drury and Reicher, 2009) – marks a critical dividing line between approaches to behaviour change. The problem with the individual deficit model of the nudge approach is that it merely tweaks behaviour at the margins. What is needed are wholesale, sustained, and evidence-based efforts to capitalize on and develop collective human agency.

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