

Rules all the way down: Consumer behaviour from the standpoint of the 'ONE behavioural' research programme

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Abstract

This article sets out a unified behavioural research programme that integrates compatible elements of old, new and evolutionary behavioural approaches to economics as an alternative to the dominant unified approach to economics based on rational choice theory and a Walrasian view of market coordination. However, the proposed programme can also be viewed as a general framework for interdisciplinary research on consumer behaviour. It employs the view of scientific research programmes proposed by Lakatos, setting out groups of 'hard-core' propositions and their associated 'do' and 'do not' rules for the conduct of researchers. The unifying theme is that evolution in the economy (and in human systems more generally) entails the creation, adoption and abandonment of rules for dealing effectively with open-ended choice problems that are bedevilled by infinite regress problems and cognitive challenges that people seek to address via personal repertoires of hierarchically related rules. To anticipate behaviour, researchers need to develop knowledge of these rules (including heuristics and routines), their functionality and the processes by which they get changed or prove difficult to change even where they cause problems.

1 | INTRODUCTION

This article sets out a unifying framework for understanding and studying behaviour in socio-economic systems. The framework is conducive to interdisciplinary behavioural research, and it could be used in applied fields as diverse as economics, marketing, criminology, public health policy and social policy. However, in calling it the 'ONE behavioural' approach, I am using the upper-case 'ONE' as an acronym that alludes to its origins and role in relation to behavioural economics: it entails a synthesis of compatible ideas from what are classified later in this introduction as 'Old', 'New' and 'Evolutionary' strands of behavioural economics, and it is offered as a means by which economics might become 'behavioural' in a more ambitious and more methodologically coherent way than has been evident over the past four decades. When applied to economics, the 'ONE behavioural' research programme offers a means for addressing the

discipline's traditional concerns with issues pertaining to the allocation of scarce resources. However, it entails viewing consumer behaviour in a way that overlaps considerably with how it has been viewed in marketing, a discipline that focuses on different issues and has historically been much more open than economics to taking a highly interdisciplinary approach to understanding consumer behaviour. Indeed, differences between those who focus on 'economic' issues and those who focus on 'marketing' issues in how they seek to make sense of consumer behaviour could vanish if researchers in marketing also adopt the 'ONE behavioural' approach as an organizing framework for their work. If they do so, they will find that it can readily accommodate much of the existing marketing literature on consumer behaviour.

To understand what the 'ONE behavioural' research programme entails, it is necessary to appreciate how economics has evolved as a field of research since the end of World War II. One of the things that

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economists used to feel proud about was that economics had a unifying framework based on rational choice theory and the Walrasian general equilibrium approach to the coordination of decentralized decision-making (epitomized by the work of Debreu, 1959). Such pride was understandable, for being trained in the 'economic way of thinking' was a ticket to roaming freely as a researcher within the many fields that economics covered and being able readily to understand or critique what any of one's colleagues were doing. By contrast, psychology seemed to economists to be a set of sub-disciplines that lacked a unifying core aside from a shared interest in the relationship between mental processes and human behaviour.

This difference between the two disciplines was not conducive to economists drawing on psychology when analysing consumer behaviour. But insisting on reducing all choices to acts of constrained maximization of utility limited what economists could say about consumer behaviour. Adherence to the utility concept impeded the development of testable hypotheses because of its 'impregnable circularity' (Robinson, 1964, p. 58). This left the area open to becoming dominated by scholars from marketing, whose greater need for policy lessons led them to draw on psychology much more than on economics. Their more pragmatic approach resulted in the marketing literature on consumer behaviour having a patchwork-like feel, with different kinds of psychology potentially being included in different modules of complex 'boxes and arrows' models. Conventional economists would view such models with disdain if they encountered them.

However, those who saw economics as a superior discipline because of its unifying foundations (and, for many, because of the mathematical elegance that these foundations made possible) were suffering from hubris. In recent decades, they have had to contend with theoretical and empirical challenges to their traditional core foundations. As Katzner (2006) has emphasized, economic theorists increasingly lost their faith in the general equilibrium framework as they became more aware of the difficulties of establishing that decentralized market behaviour could produce unique and stable equilibria across an entire economy. He argues that the perceived hopelessness of the situation 'led many microeconomists to forsake the general equilibrium conceptualization altogether. As a result, microeconomic theory has, by and large, been reduced to a collection of techniques and tricks for resolving narrow, isolated microeconomic problems and the study of, also narrow and isolated, strategic behaviors' (Katzner, 2006, p. ix).

The empirical applicability and relevance of the general equilibrium framework are questionable, too, as its static view of preferences and production technology aligns poorly with the disruptive role of innovation in the real world, where competition is a dynamic, knowledge-generating process of 'creative destruction' (Schumpeter, 1943) and the economic system has a complex architecture of complementary connections. These factors mean that the application of an innovation in one area may offer opportunities and/or have disruptive impacts not only in that area but also in other areas (see Dopfer et al., 2004). To avoid being left behind by change, consumers and producers must be willing and able to learn.

Half a century ago, when Kornai (1971) mounted a lengthy challenge from this kind of standpoint, his 'anti-equilibrium' critique was

dismissed by Hahn (1973), one of the leading advocates of the general equilibrium approach. But, two decades later, Hahn (1991) himself acknowledged the limitations of general equilibrium analysis and foresaw a necessary change in economics towards taking historical dependency and evolutionary processes seriously. He also anticipated growth in the use of simulation modelling. Today, these predictions are coming true. Kornai's critique was a harbinger of the neo-Schumpeterian evolutionary approach to economics. Key here has been the impact of the work of Nelson and Winter (1982). According to Google Scholar, their *Evolutionary Theory of Economic Change* has been cited over 48,000 times. Despite this, it has not (yet) earned them a Nobel Memorial Prize. It has also not yet had the impact on consumer behaviour research that it deserves to have, given that its focus on the evolution and selection of business routines is readily transferable into understanding how household practices change and, as they do so, how they determine which business practices and products survive (see also Nelson & Consoli, 2010). The study of household practices and how they evolve has instead remained largely the preserve of sociologists, notably Shove et al. (2012).

The rational choice part of the unifying core of economics has similarly been attacked from both theoretical and empirical perspectives. In his 1991 vision of the future of economics, Hahn foresaw acceptance of the bounded rationality perspective that had earned Herbert Simon the 1978 Nobel Memorial Prize in Economic Sciences. Simon (1947, 1957) had questioned the orthodox view of rationality because of its failure to take account of the computational challenges of solving the problem of choice, either at all or within a timeframe that was not dysfunctional. As is evident from Simon's (1991) autobiography, his critique reflected his knowledge of organizational behaviour and emphasized the finite attentive and processing capacities of humans. It led him to argue that decision-making should be viewed as a rule-based 'satisficing' activity that focuses on finding ways of meeting aspiration levels rather than finding optima. Other researchers have suggested alternative rule-based ways of coping with real-world decision problems, stressing that different rule-based approaches may be appropriate for different contexts. The latter literature began with the work of Winter (1964) but is particularly associated with the 'fast and frugal heuristics' research programme of Gigerenzer et al. (see, e.g. Gigerenzer & Goldstein, 1996; Gigerenzer, Todd and the ABC Research Group, 1999; Gigerenzer & Brighton, 2009). This approach has used simulation modelling to demonstrate that rule-based decisions via 'fast and frugal heuristics' can result in better outcomes than those that entail extensive deliberation, especially in fast-changing situations where opportunities can be lost if decisions are not arrived at rapidly (e.g. in the emergency admissions department in a hospital).

The perspectives of Nelson, Winter, Simon and Gigerenzer have had less impact within economics than has been achieved by proponents of critiques of orthodox rational choice models that draw heavily on experimental work in psychology laboratories and inferences about how real-world behaviour is affected by 'heuristics and biases' to produce choices that conflict, at least some of the time, with predictions deduced from rational choice analysis (Kahneman et al., 1982; Kahneman & Tversky, 1979). Pioneering contributions in

this vein were to earn Nobel Memorial Prizes in Economic Sciences for Daniel Kahneman (in 2002) and Richard Thaler (in 2017). Psychology thereby came into economics with a focus on its relevance for understanding and shaping consumer behaviour. However, the emphasis on dysfunctional heuristics has merely diminished the status of the conventional economist's 'one size fits all' perspective rather than dealing a death blow to rational choice theory: many economists continue to view consumers as usually 'rational' in terms of traditional economic axioms while being prepared to look for explanations in terms of the use of bias-inducing heuristics in cases where people seem to be, as Thaler (2015) puts it, 'misbehaving'.

These critical perspectives on the long-held unified vision of economics might appear to imply that research on consumer behaviour, and in economics in general, is heading inexorably towards patchwork-style modes of analysis that lacks unifying principles. However, in this article I will attempt to show that, within these critical perspectives, there are constructive insights that provide the basis for a new unified approach to understanding why people behave as they do. The proposed research programme is unified despite accepting a feature of reality that the traditional 'one size fits all' rational choice approach sidestepped, namely that how consumers behave may differ significantly between contexts (as had been emphasized by Payne et al., 1993). The programme is potential applicable to fields of research other than economics even though its starting point and its author's background are in economics, and its approach entails working without a concern for disciplinary boundaries.

As indicated in the opening paragraph of this introduction, I call this alternative unified research programme the 'ONE behavioural' approach because it involves integrating compatible elements from 'Old', 'New' and 'Evolutionary' approaches to behavioural economics. The 'Old' and the 'New' variants are those identified by Sent (2004): 'Old' behavioural economics refers broadly to the work of Simon and others, prior to 1980, and those who have continued in a similar vein since 1980, whereas 'New' behavioural economics refers broadly to research inspired from 1980 onward by Thaler's use of the work of Kahneman and Tversky. In the 'Evolutionary' category I include both the neo-Schumpeterian literature inspired by the work of Nelson and Winter (who had also employed Simon's work on bounded rationality) and the institutional literature that began with the psychology-inspired work of Veblen (1898, 1899) (see Twomey, 1998). The latter continues today under the leadership of Geoffrey Hodgson, who emphasizes the 'ubiquity of habits and rules' (Hodgson, 1997).

The 'ONE behavioural' approach is employed at length in Earl (2022) without reference to the 'ONE' acronym. In that work, it is employed in relation both to consumer behaviour (where 'New' behavioural economists have concentrated their attention) and the behaviour of firms and other organizations (where the 'Old' and 'Evolutionary' work has largely been focused). In this article, I attempt to set out the essence of what the 'ONE behavioural' approach entails in a way that is not done in Earl (2022). Here, I characterize it as a scientific research programme via the framework that Lakatos (1970) proposed for delineating distinctive methodologies. Lakatos suggests that we should see a scientific research programme as having a set of

'hard-core' propositions that the scientists use as the assumptive foundations for what they do, along with what he called the research programme's 'positive heuristic' and 'negative heuristic', respectively, the 'do' and 'do not' rules that they follow as they go about their work.

Lakatos saw the hard-core propositions of a scientific research programme as being the elements that those who adhere to the programme in question have made a methodological decision to treat as their analytical building blocks regardless of whether their analysis fits the facts that they would like to explain. If empirical anomalies are encountered that the scientists can only accommodate via ad hoc arguments, the research programme is, in Lakatos's terms, 'degenerating'. Conversely, a research programme is 'progressive' if analysis based on its core propositions and undertaken according to its 'do' and 'do not' rules increases the range of phenomena that it is able to predict and/or explain. In these terms, conventional economics is a degenerating research programme, with adherents to rational choice theory appearing to be heading towards an odd form of pluralism as they hire practitioners of 'New' behavioural economics as a means of accommodating phenomena that are anomalous in terms of the rational choice approach, with 'irrational' behaviour judged as such from the standpoint of their cherished axioms. In what follows, I detach elements of 'New' behavioural thinking from the conventional 'rational choice' reference point and incorporate them in a progressive research programme that does not start with the traditional hard-core proposition that every act of choice is (to be viewed as) an act of constrained utility maximization.

The rest of the article is structured as follows. The 'ONE behavioural' approach is characteristics in Lakatosian terms in a series of sections (2–7) that are set out in a logical sequence that begins with a fundamental perspective on the nature of an evolving economy and ends with what can be expected in terms of scope for predicting behaviour. Each section concentrates on a set of related hard-core principles and their associated 'do' (PH) and 'do not' (NH) implications for researchers. PH and NH elements are paired together where this seems appropriate, with extended comments and/or background material added where reinforcement seems necessary. Section 8 offers concluding reflection.

2 | THE CENTRAL PROPOSITION: ECONOMIC PROCESSES ARE RULE-BASED AND SHOULD BE STUDIED AS SUCH

HC1a. Economies are dynamic complex adaptive systems whose evolutionary trajectories are driven by the growth of knowledge. Economic evolution entails the creation of new rules and a competitive selection process whereby the relative populations of different rules (or sets of rules) change, with associated changes in the connective architecture of the economic system and of its subsystems.

This core proposition is particularly associated with the evolutionary perspective of Dopfer et al. (2004); see also Potts (2000), Loasby (2001) and Earl and Wakeley (2010). Within the 'ONE behavioural' approach to economics, things such as the following are viewed as 'rules' or 'sets of rules':

- A generic type of production technology or product (a 'meso' in terms of the micro-meso-macro framework set out in Dopfer et al., 2004) or the 'way' that 'as a rule' a particular manufacturer implements a generic production process or product type (a 'micro' in the Dopfer et al., 2004, framework).
- Ways of doing business, such as franchise systems, outsourcing, vertical quasi-integration and other business strategies or other 'recipes for success' that businesses adopt.
- Fads, fashions and cultural norms.
- A 'way of life' or 'lifestyle' characterized as a structured set of activities, patterns of consumption and associated values and norms (Earl, 1986; Wells, 1975).
- A method that a person uses when forming expectations, making value judgements or taking a particular kind of decision.
- A policy that affects the operations of a market and which has been implemented as an outcome of a political process.

Competitive selection processes thus entail the rise and fall not merely of rules embedded in the products that are bought and sold in markets, but also of favoured ways of doing business that are selected in corporate meetings, and ways of making sense of the world and living that vie to be applied in the heads of consumers. Selection can apply to an individual rule or to a set of rules.

HC1b. The evolving sets of rules, heuristics, principles and routines that decision-makers use to deal with the challenges of everyday life may be genetically inherited, personally created or outsourced/absorbed from social networks, society in a wider sense and market institutions.

This proposition sets economics within the realm of social science, with potential to draw from sociology, to understand the socio-cultural transmission of rules, and from psychology, to understand creative processes and how new rules may be adopted to over-rule some existing rules from an individual's repertoire of rules. It integrates narrower visions that have been evident within the various groups of behavioural economists. Historically, the 'New' behavioural economists have concentrated on the significance of heuristics that people in general seem, by nature, to be genetically programmed to use. This paved the way to the design of policies that might be universally applicable because they took account of how particular heuristics that are part of human nature would, if triggered, produce predictable forms of behaviour (cf. Ariely, 2008; Thaler & Sunstein, 2008). By contrast, the 'institutionalist', Veblen-influenced part of the 'Evolutionary' group focused on the significance of ways of operating that people absorb socially (without necessarily realizing that this is happening; see Hodgson, 2003). The 'Old' approach was different again,

with more of a tendency to emphasize the extent to which decision-makers experimented with operating systems that they constructed personally, that included experiments with mutable, peripheral decision rules (such as sets of targets that might be adjusted in the light of experience) that were viewed as consistent with sets of core principles and beliefs about the kind of person they are and what they should value (as in Earl, 1986). The latter could pertain to, say, whether they will ultimately be happier from pursuing a life that is more comfortable or more exciting, more altruistic and/or environmentally sustainable rather than self-centred and so on.

HC1c. New rules are created by modifying and/or splicing existing rules.

HC1d. Considerations regarding the adoption of new rules and abandonment of existing rules can only be made via the rules of the systems that people are already using, so changes are only possible if they are not at odds with the dominant rules of these systems.

HC1e. Creating and changing rules requires costs (mental energy, at the very least) to be incurred, as does the use of existing rules.

HC1f. If systems become more structurally complex as they evolve, rather than taking decomposable/modular forms, they will become both increasingly challenging to operate due the collateral impacts of applying rules and increasingly difficult to change on a piecemeal basis.

The systems thinking that HC1c–HC1f embody stretches from Smith's (1980) analysis of the history of astronomy (in which he argues that the Ptolemaic view was eventually abandoned because the succession of modifications that were made to accommodate new data made it overly cumbersome to use), via the analysis of cognitive change offered by Kelly (1955) in his 'psychology of personal constructs', the work of Simon (1962, 1969) on the architecture of complexity and the writings of Koestler (1975) on creativity, through to the application of thermodynamic principles to the functioning of the brain by the eminent neuroscientist Friston (2010). It should be noted that HC1e provides a basis for understanding loss aversion and the endowment effect: adjusting to losing things or foregoing cherished product features involves the cognitive costs of changing what one is, as a rule, going to expect in that area, while new benefits that cannot be attained without incurring such losses/cognitive costs may be tempered because one has to 'get use to them' by creating new mental connections pertaining to them.

2.1 | 'Do' and 'do not' implications of HC1a–HC1f for researchers

PH1a. The analytical and empirical focus of economists (and other researchers who need to understand change in

socio-economic systems) should be on the processes by which new rules are created and how rules function in competitive selection processes to 'rule out' the continued use of existing rules and admit ('rule in') rules that have not been employed hitherto by members of the population of decision-makers.

NH1a. Do not theorize 'as if' people have 'given preferences' and 'as if' adjustments to changed conditions occur all at the same time, as this can be highly misleading in a world in which new rules spread socially in a manner akin to the spread of contagious diseases, driving evolving adoption and usage trajectories of products through time.

PH1b. Take a pluralistic view of consumers and seek to identify groups of consumers with similar repertoires of operating rules.

NH1b. Do not theorize in terms of socially isolated 'representative agents', as social network effects may be significant and individuals who behave in similar ways can be doing so by applying different rules, from different sources.

PH1c. Do study how rules spread in socio-cultural systems, how some people within particular social settings evolve to become nonconformists whereas others operate as 'social dopes' (cf. Garfinkel, 1967; Koppl & Whitman, 2004), and what determines differences in 'docility' in organizations (Simon, 1947) and other situations involving pressures to comply with other agents.

NH1c. When analysing changing patterns of demand, do not take a reductionist approach in which 'the whole is merely the sum of the parts' or focus primarily on relative prices changes as drivers of changes in market share.

PH1d. In seeking to understand changing patterns of demand, be mindful of the connective contexts in which products are used and purchased, along with the complementarities between them.

PH1e. Do study when and how people seek to cope with problem-solving challenges by outsourcing their decision-making in part (as with the notion of 'market-assisted choices' introduced in Earl et al., 2017) or in their entirety (as discussed in relation to the 'market for preferences' by Earl & Potts, 2004) to market institutions such as product review and comparison websites, staff in retail outlets, consultants and social network members who are viewed as having relevant expertise.

PH1f. Do study how consumers and organizations attempt to cope with problems and reduce the risk of further problems by

outsourcing or internalizing activities, mindful of differences between themselves and other parties in terms of capabilities and access to relevant information (see, respectively, Richardson, 1972, and Williamson, 1975, 1985 in relation to such choices by firms and other organizations, and the application of these works by Peng (2013), to consumer behaviour in the context of housing renovation activities).

PH1g. Do consider using multi-agent simulation modelling, graph theory, and techniques of network analysis to analyse how economic systems and patterns of consumer behaviour evolve.

3 | DECISION-MAKING SHOULD BE VIEWED AS FOCUSED ON ADDRESSING GOAL-RELATED PROBLEMS RATHER THAN IN TERMS OF UTILITY MAXIMIZATION

HC2. Human action is problem-driven, focused on addressing actual or expected failures to meet needs and goals, and on acquiring knowledge and building systems aimed at ensuring that one will be able to cope with shocks and be in control rather than at the mercy of events.

This way of thinking about human action is conducive to focusing economic analysis on a wider range of challenges than simply that of allocating resources subject to a finite budget constraint. It does not preclude analysing choices of pleasurable activities, but it does encourage us to recognize that they, too, are associated with problems of various kinds—consider, for example, the challenge of keeping up with what entertainment opportunities are going to be available and the downside implications of taking advantage of them, including the time taken up from dealing with challenges elsewhere in one's life. A problem-focused view is conducive to considering the reasons why people run into problems, such as:

- deficient foresight
- information and/or knowledge gaps or information overload when choosing
- dysfunctional heuristics
- social coordination failures
- the introduction of new products that raise questions about whether one should continue to accept the limitations of what one already has.

Such a view is also conducive to studying the kinds of effective and dysfunctional behaviour styles that may result from concerns about being in control rather than at the mercy of events. Viewing choice in terms of the pursuit of 'utility' subject to a budget constraint is not conducive to such concerns and it leads to an undue focus on the significance of changes in relative prices or incomes as initiators of changes in behaviour.

3.1 | 'Do' and 'do not' implications of HC2 for researchers

- NH2a.** Do not view decision-making with a focus on reactive behaviour aimed at dealing optimally with 'shocks' that have occurred, for this diverts attention from understanding how problems arise in the ordinary business of everyday life and hence from designing policies to promote proactive behaviour to prevent problems in future.
- NH2b.** Do not simply view 'shocks' as being associated with unexpected changes in the external environment, for the surprises that decision-makers experience may be of their own making.
- NH2c.** Do not assume that the problem-solving aspects of everyday life should be ignored on the basis that people will learn from their mistakes and thereby enjoy lives that are free of nasty surprises in the long run: inherent knowledge gaps and ongoing flux in their external environments may preclude the formation of rational expectations, as may dysfunctional rules that they use to make sense of their experiences, form expectations and judge when and how they need to change their rules for viewing the world.
- PH2a.** If you need a unifying view of human motivation for analysing behaviour that is focused on solving and obviating problems, consider following Kelly (1955) and viewing humans as being driven by a desire to grow or at least prevent attrition in their capacities to predict and control events. Such a view of human action is, as Kelly noticed, tantamount to viewing people 'as if' they are scientists, rather than pleasure seekers.
- NH2d.** Do not focus only on behaviour that would be expected to result from cool-headed deliberation and mindful consideration of costs and benefits of alternative courses of action, as this is likely to be impeded where decision-makers (a) perceive problems that call into question their core notions and do not have readily computable solutions, (b) have decided to 'go with the flow' (as, say, when partying) or (c) end up immersed in the 'flow' of what they are doing due to their intrinsic motivation.
- PH2b.** Do study the impact of dread and anxiety on decision-making, as these emotions may be associated with expectations about upcoming problems and difficulties of keeping one's life under control.
- PH2c.** Take account of the impacts that opportunities to become able to spend time imagining being in a state where problems have been eliminated (i.e. opportunities to engage in 'savouring') have on the timing of commitments to products for future delivery, and on the kinds of products that are chosen.
- PH2d.** Do study the impact that emotions associated with falsified expectations and loss of control (such as guilt, hostility, and rage) have on behaviour.
- PH2e.** Do seek to understand how decision-makers unintentionally generate problems for themselves and/or for others. As you do so, be mindful that attempts to solve problems will not always solve the problems for which they were intended to be solutions and may have unintended problematic consequences.
- PH2f.** Do study how the human imagination works, its limits, and why people differ in their imaginative capacities, for failures of the imagination may be a key source of unwelcome surprises (Shackle, 1979) and missed opportunities—especially in affluent and/or time-rich societies where the capacity to imagine how to occupy one's time may be a key determinant of wellbeing (cf. Keynes, 1930).
- PH2g.** Do study how wellbeing is affected by differences in ways (i.e. the rules, heuristics and routine) that people use to determine when and how to engage in critical thinking.
- PH2h.** Those who study decision-making with a view to designing policies should think of themselves partly as decision therapists whose mission is to facilitate the development and dissemination of better problem-solving and problem-avoiding skills within the wider population. In Simon's (1976) terms, they should seek to discover context-specific and generic forms of 'appropriate deliberation' to facilitate 'procedurally rational' choices.
- PH2i.** Those who study decision-making should be mindful that, like those whom they seek to analyse, they may be afflicted by hindsight bias when they are called upon to judge the quality of decisions that people have been observed to make, whose outcomes have been problematic. In making such assessments, be mindful of what would have constituted 'appropriate deliberation' at the time the choices were made, given what was knowable at that time.

4 | THE CHARACTERISTICS OF PROBLEMS AND SOLUTIONS ARE NOT SELF-EVIDENT; CHARACTERIZATION IS AN ACTIVE PROCESS OF MAKING CONNECTIONS

- HC3a.** Decision-makers assess rival products in terms of their respective characteristics/attributes or proxies thereof.
- HC3b.** Although 'new' products may have novel features rather than offering established features more cheaply or in novel mixes, they ultimately serve as means to established psychological and physiological ends.

HC3c. When reflecting about how their lives are going and deliberating about potential solutions to problems, people think in terms of means–end chains in which they categorize things or events as sets of features/attributes/characteristics and what these imply for their abilities to meet their goals.

Conventional economic approaches to consumer behaviour have largely failed to take their theorizing from the goods space to the attributes/characteristic space approaches of Lancaster (1966) and Ironmonger (1972) that provided ways of envisaging how consumers choose among new products without having to develop new preference systems. However, the means–end chain view of problem-solving activities takes a concern with product features to multiple levels. It is drawn from the work of scholars such as Gutman (1982) and Laaksonen (1994) in marketing and from the work of Earl (1986) in the ‘Old’/‘Evolutionary’ behavioural vein. The ‘chain’ aspect envisages that people do not simply see the features of products as direct sources of ‘utility’ or ‘disutility’ but are instead mindful of how a particular feature may have a variety of implications for them (e.g. having a ‘large’ car may be viewed as implying greater difficulty in parking, a more comfortable ride and so on), each of which they view as having further layers of implications (e.g. difficulty in parking may result in the owner of a large car expecting to be at bigger risk of being late for appointments or of damaging the car, or other vehicles, when parking). However, diverse surface-level features may ultimately have implications about the consumer’s ability to meet similar ends, such as to achieve a particular level of social standing, reduce risks to personal safety, avoid embarrassment and loss of control, and engage in self-actualization. Applying this principle thus entail a deeper and policy-informing analysis of consumer behaviour that attempts to get to the bottom of (i.e. ‘the real reasons’) why consumers find products/activities alluring or seek to avoid them. The means–end chain approach thereby promotes a focus on the underlying drivers of non-price competition and of the nature of the benefits and costs that may come from implementing public policies. Such a focus is less likely if we simply view all product characteristics as direct sources of ‘utility’ or ‘disutility’.

Means–end chains and their connective relationships can be readily identified in applied research with the aid of repertory grid technique (Kelly, 1955) and construct laddering and implication grid analysis (Hinkle, 2010) from personal construct psychology. These tools enable us to study how product attributes/characteristics matter to consumers in terms more specific than ‘because they yield utility’. These methods are simple to implement. We ask consumers to compare and contrast rival products or activities, taking three at a time, from a set of around 10, until they have thought aloud about all the possible three-element subsets. As they do this, they reveal the surface-level axes in terms of which they view these products. We then ask them which pole they prefer on each axis, and why. In their answers they reveal a deeper set of axes, and we repeat the process, this time with respect to the latter axes, which yields an even deeper set, taking us closer to the root cause of what it is in this area that, as a rule, attracts or repels the subjects. Typically, after no more than five

or six rounds of this ‘laddering’ process, subjects get to the stage where all they can say is, in effect, ‘I can’t say why I prefer this pole of this axis; I just do, period’. The preferred poles of such axes are the ‘ends’ of means–end chains.

HC3d. Stimuli pertaining to potential problems and solutions do not speak for themselves; their meanings are subjective constructs in the minds of decision-makers.

HC3e. To classify incoming stimuli, people use rules-based inductive and deductive methods.

HC3f. People may differ in how they interpret stimuli because they form interpretations based on different sets of experiences and different rules, including different rules about gathering further information for making assessments and different rules for judging the credibility of potential sources of information and knowledge.

HC3g. Some of the knowledge that people use when making assessments and/or carrying out tasks has a ‘tacit’ form, that is, it is not something that they can readily articulate.

Inductive methods of cognition work by attempting to find patterns in streams of stimuli that match template rules that we have used previously to categorize things that we have encountered. For example, one template rule that we use may be that ‘if it has feathers, a long neck, short tail, waddles and quacks, it is a duck’. For any such template, each of the component dimensions itself is categorized in terms of a template that defines what it ‘is like’: for example, we may use the rule that ‘waddling’ is ‘walking with short steps and a clumsy swaying motion’, and view ‘short’ as like previous thing classified that way and unlike those classified as ‘long’ in that kind of context and so on. This view of cognition is offered in Hayek’s (1952) book *The Sensory Order* and Kelly’s (1955) *Psychology of Personal Constructs*, both of which have been employed in ‘Evolutionary’ and ‘Old’ behavioural economics. Hayek emphasizes how memories are stored as patterns of neural connections that to a greater or lesser degree will match those fired up when we construct a pattern from the individual stimuli that we have encountered. Kelly’s perspective lacks the neurological layer of Hayek’s remarkable analysis (which includes thinking that anticipates modern ideas on brain plasticity) but Kelly’s message is otherwise similar: people may usefully be viewed as categorizing and/or characterizing events by considering what they ‘are like’ in the sense of the extent to which they appear to replicate events that they have previously construed in terms of particular construct axes. Creative connection-making is a key aspect of the processes that Hayek and Kelly envisage, for in the presence of novel stimuli it may be possible to make a much better fit by combining elements from existing templates in a novel classifying rule that is incorporate into one’s repertoire for future use.

Hayek argued his perspective with reference to what happens when we attempt to makes sense of Roman mosaics. Our interest is

not in the individual tesserae but in what kinds of patterns we can find among the tesserae—just as nowadays, when looking at a computer screen or television, it is patterns of pixels, not individual pixels, that are of interest to us. Multiple templates may come to mind as candidates for characterizing what we may be looking at, so we may need to draw upon other rules to arbitrate between conflicting possibilities or attach probabilities to them: for example, we may have no doubt that we are looking at a water bird of some kind, and may have ruled out a grebe or a loon (if these came to mind as candidates) because it does not have their kinds of legs and poor walking capacities, yet we may not be sure whether it is a duck or a goose. The heuristics emphasized in Kahneman et al. (1982), such as ‘representativeness’, are relevant for understanding what humans do when deciding how well particular candidate conjectures match up with incoming stimuli. However, we would be wise also to consider what lessons there may be from earlier contributions such as Keynes’s (1921) *Treatise on Probability*, with its emphasis on the role of the ‘weight of evidence’ when inductive probability judgements are being made.

This template-fitting view of how people size things up does not apply merely to situations in which we consciously consider whether particular patterns can be found in the stimuli that we are assessing. It also provides a means of understanding unconscious processes whereby people can merely report that they ‘sensed’ or ‘knew intuitively’ what kind of situation they were in and what kind of action would be needed. This is the realm of the idea of tacit knowledge that Nelson and Winter (1982) introduced to evolutionary economists via the work of Polanyi (1962, 1967) and applied to the challenges involved in attempts at inter- or intra-organizational transfers of technologies. Their point was that operating rules may be problematic to put into words and getting the ‘knack’ for performing a particular task is often a matter of ‘learning by doing’. Relatedly, Simon and Chase (1973) and Chase & Simon (1973) and Kahneman (2011) have viewed the remarkable opportunity- and hazard-recognition capacities of experts such as chess masters and leaders of firefighting teams as being based on patterns that their associative memories have stored from years of previous experience. HC3g admits this subconscious rule-related aspect of behaviour into the realm of consumer behaviour, too. The tacit dimension may be significant when, for example, consumers start getting a ‘sense’ that something is ‘not right’ about how an encounter with a supplier is going, as well as in relation to the consumer’s self-knowledge about why he or she really wants a particular product.

Rule-based inductive methods of sizing up situations are complemented (to a rather limited degree, according to Loasby, 2001) by deductive thinking that is also based on rules, such as rules of logic that we use (rather as in the manner of the fictional detective Sherlock Holmes) to eliminate some candidate conjectures. Given how we have characterized some things via the Hayek/Kelly template-fitting process, we may be able to infer that, logically, other things are ruled out or ruled in as possibilities. Shackle’s (1969) ‘potential surprise’ view of judgement in the face of uncertainty centres on such

reasoning processes: if we cannot come up with any reasons to doubt that a particular possibility could eventuate, we will expect to be astonished if it does take place, whereas there is potential for us to be surprised if we can imagine other events that could stop the event from happening.

4.1 | ‘Do’ and ‘do not’ implications of HC3a–HC3g for researchers

NH3a. Do not assume that all decision-makers think in the same way, believe the same things or that they think as economists think and form ‘rational expectations’.

PH3a. Seek to understand how people differ from each other (and, in some cases, from you and your colleagues) in how they view products, means–end chains and the world in general.

NH3b. Do not dismiss the idea of studying those who believe ‘fake news’, ‘conspiracy theories’ and suchlike on the basis that such people will ultimately fall foul of evolutionary selection processes; their behaviour may have significant consequences and impose costs on those who have less dysfunctional ways of making judgements.

PH3b. If you wish to understand how people identify and/or characterize problems and potential solutions or opportunities in a particular context, you should ask them to tell you (ideally through multiple research methods).

PH3c. Be mindful that, though convenient for use with large samples, the questions that you include in questionnaires will be affected by your own ways of looking at the world and may thus miss issues of significance to your respondents. There is less risk of this if you (also) employ more open-ended research tools such as focus groups, repertory grid and construct laddering techniques (Hinkle, 2010; Kelly, 1955), or verbal protocol analysis (Ericsson & Simon, 1993).

PH3d. Use your own introspection (better still, the diverse introspection of members of your research team) and/or anecdotes and reflections by bloggers, journalists, novelists (see Earl, 2011) and others about the area of interest as seed ideas for designing systematic studies of how people make their judgements (such as studies that involve the use of computer-based experiments) in contexts of interest.

NH3c. If engaging in introspection about consumer behaviour, do not presume that your way of making judgements is representative of the population at large or that it is necessarily superior to ways used by those who are less prosperous than you.

PH3e. Take seriously the role of tacit knowledge in decision-making and behaviour more generally; if subjects speak of knowing something ‘intuitively’ or acting based on ‘gut feeling’, seek to understand this in terms of their tacit knowledge and the workings of their associative memories.

5 | EXCEPT WHERE CONSTRAINED BY LACK OF IMAGINATION, HUMAN DECISION-MAKING USUALLY NECESSITATES THE USE OF STOPPING RULES AND SHORTCUTS TO PREVENT DECISION PARALYSIS OR DYSFUNCTIONAL DELAYS IN CHOOSING

HC4a. Most of the problems of everyday life are open-ended. As such, they entail infinite regress problems of choices about choices. Closing off the latter requires, sooner or later, the use of non-negotiable ‘hard-core’/foundational operating principles.

When orthodox economists speak of the ‘problem of choice’ they present consumers as solving, in the best way that it can be solved, the problem of being unable to consume everything. They model consumers ‘as if’ they work out which feasible bundle of goods, services and activities maximizes expected utility in terms of a system of preferences. The economists typically set up the ‘problem’ as if it is closed by assuming that the decision-maker has a ‘given’ convex set of preferences, a fully specified budget constraint, a set of expectations, and that the set of options is already known. To accommodate situations where the decision-maker does not initially know what the set of available options is, the problem of discovering (some of) them is typically presented as entailing a prior choice of how, and how long, to search that is similarly set up as a closed problem—in this case, a problem of choosing the optimal search strategy from a pre-specified list of possible search strategies, about whose prospective marginal costs and prospective marginal payoffs the decision-maker is presumed already to have a set of expectations. Much experimental research on choice likewise focuses on how subjects chose when presented with problems—for example, lotteries framed in particular ways—that are closed. Those who learn this kind of economics are, in turn, usually assessed in terms of their capacities to solve stylized deterministic optimization problems.

In real-world situations in which problems and potential solutions must be identified and assessed, it is the decision-makers themselves who turn problem-solving into a closed, computable activity. They do this by applying stopping rules to deal with the set of prior problems that the conventional analysis assumes out of the way in the process of specifying the choice problem. The origins and forms of these stopping rules is an issue of interest within the ‘ONE behavioural’ approach. The need for such rules arises in four major areas.

First, let us return to the Hayek/Kelly perspective on what is entailed in sizing up what kind of problem one has, if any, and how to categorize prospective courses of action. A key issue here is that

people have enormous ranges of events stored in their memories and have the potential to create many new templates from them, rather as thousands of words can be put together from an alphabet (cf. Shackle, 1979). Given this, evolutionary fitness demands that the candidate templates for characterizing events that might be problems or potential solutions do not ‘come to mind’ either all at once or in a random sequence. The former would cause information-processing overload and making calm reflection and a timely assessment impossible, while the latter could result in dangerously long delays before the consideration of candidate conjectures whose templates match up well with patterns in incoming stimuli. By way of clarifying the latter, note that when we are, say, characterizing a car salesperson, it may not help if we first consider whether they are like ‘a summer’s day’ (cf. Shakespeare’s Sonnet 18) or ‘a cream doughnut’ (cf. Monty Python’s Oscar Wilde sketch) instead of ‘shifty rather than sincere’.

For human perception to work in a seamless manner that makes it possible to take decisions promptly, the brain needs to be able operate systematically. It appears to do this in three ways: (i) by construing events via a process that involves rule-based hierarchical decomposition, whereby they set things in context before attempting to pin down more precisely what they are by trying templates that it rules as appropriate to that context; (ii) by calling up possible templates based on both how recently they have been activated in the context in question and their cumulative activation to date (as argued by Hayek, 1952, and complemented by ‘New’ behavioural thinking in relation to notions of ‘salience’ and ‘anchoring’); and (iii) by employing satisficing rules as stopping devices if a good enough match with a template can be found, rather than attempting to find the optimal interpretation of incoming stimuli in all the detail that might be possible.

Shackle’s view of expectation formation, mentioned in the previous section, similarly needs a closure mechanism, even to yield expectations that entail a range of possibilities with attached degrees of disbelief or probability rather than a single-line verdict that admits no alternative outcome possibilities. Here, the problem is that event-blocking events could themselves be blocked by other events and so on, ad infinitum. Reaching any verdict on how seriously to take a possibility is made possible by limits to our capacities to imagine possibilities. Sometimes, for example, we may see a particular event as perfectly possible because we fail to acknowledge that we may have failed to think of something that could stop it from happening. But if we acknowledge that we may have failed to consider something that could be significant, ‘wracking our brains’ for things that we may have missed could result in decision paralysis if we lack some kind of stopping rule. We also need a stopping rule if we have imagined a large set of possibilities, for in this case finite short-term memory capacity may make it difficult to avoid repeatedly getting lost in the fog of uncertainty if we persist in trying to use logic to take account of chains of event-enabling and event-blocking possibilities. Rules that limit how far people go in attempting to whittle away uncertainty may sometimes result in individuals getting into difficulties due to being over-confident. But what is problematic for an

individual may benefit humans as a species insofar as unsuccessful experiments contribute to the growth of knowledge about the bounds of possibility.

When people attempt to construe whether they have a problem and, if so, what kind, they face the same challenge that scientists face when dealing with anomalies, namely, the Duhem–Quine problem (Duhem, 1906; Quine, 1951): they cannot assess whether a hypothesis is mistaken unless they take other propositions ‘as if’ they are true, as things they ‘know’, despite being unable to test the latter without taking other propositions to be true. The way out of this morass is to apply rules to define the foundations on which they (whether they are consumers, scientists or other decision-makers) build their beliefs and expectations. These operating principles are arbitrary, but they are necessary to avoid decision paralysis and make progress (see also Loasby, 2000).

Second, note that to discern the existence of problems that need to be addressed, decision-makers need to address the problem of dividing their attention between doing what they previously decided to do and scanning for problems. If their attention allocation processes are not ultimately underpinned by an automatic (rule-based) process, they will run into the infinite regress of trying to decide how much attention they should give to the question of how much attention they should give to scanning for problems (Berger, 1989). Such automated processes may be embedded in neurological systems that are triggered by the crossing of sensory threshold or detection of specific types of incoming stimuli amid those they are gathering while doing what they have previously decided to do. But the rule-based systems by which attention get managed can also result from people (acting individually or in organizations) using hierarchical systems for making and changing rules that operate rather like constitutional systems of nation states. So, for example, one’s routine for identifying problems with household stocks of grocery items may be to check the pantry and fridge-freezer every Thursday evening, with a view to stocking up where necessary the following day, while an organization such as a university may have a system of routine departmental reviews every 7 years. Unless routines for identifying problems are triggered, attention is devoted to doing things rather than looking for potential problems in specific areas. So long as such routines generate satisfactory outcomes, these routines do not themselves get questioned.

Third, infinite regress problems must be eliminated when searching for potential solutions to problems, for choices must be made about how to search and the duration of the search but the possible ways of searching have themselves to be discovered, assessed and selected. When we embark on a search, we do so by applying rules and routines that we chose previously via other rules; we do not agonize over, say, which web-browser and which search engine we should use each time we use the Internet, and we use rules to decide whether to begin searching with an internet search engine rather than, say, social network contacts in the context in question. It is only after such routines have closed the ‘how to search’ problem that we then proceed to the ‘shall I keep searching’ issue that is the focus of the orthodox analysis of ‘optimal’ search (e.g. Stigler, 1961). In

practice, however, search may be halted by rules other than the presumed rule that one should ‘keep searching until the marginal cost of search exceeds the marginal expected value of searching’. For example, the stopping rule might be a satisficing rule (e.g. stop searching once we discover something that seems, in terms of our evaluative rules, to offer enough potential to meet a set of performance criteria) or some other rule, such as ‘choose the cheapest of three quotations from suppliers that seem, in terms of a set of judgmental rules, to be trustworthy’.

Finally, there is the infinite regress problem whose solution requires people to have rules that kick in to make them feel that some things matter more than others, thereby making it possible to rank alternatives or categorize them as ‘acceptable’ or ‘unacceptable’ based on how they seem likely to serve as means to particular ends. Here, the issue is that there are many systems of rules available for assigning values, so decision-makers need to choose a valuation system before they can choose what to do. To prevent decision paralysis and move forward, it is necessary to have a system of foundational valuation rules to resolve such questions, at least for now. Such a system could be a set of criteria ranked in order of importance or assigned relative weight. For example, our foundational principles may require, say, that an acceptable valuation system (in effect, a life philosophy) is cognitively simple (enough) to employ, seems to have a good enough chance of being applicable to any issue we can imagine encountering, and will not allow us to do things that unduly jeopardise our personal survival or result in us being ostracized from social systems that might otherwise have provided us with means of support, and so on.

HC4b. Humans use hierarchically organized systems of simplifying rules (including heuristics and routines) that enable them to make many choices without needing to refer to their foundational rules.

HC4c. The rules that people have in their repertoires of ways of coping with life’s challenges differ in their effectiveness on a scale that runs from ‘fast and frugal’ to ‘dysfunctional’, though even the latter kinds of rules may have been fitness-enhancing at the time they were originally adopted.

The first of these two propositions can be found the early work in psychology that influenced Veblen’s ‘Evolutionary’ perspective (see Twomey, 1998), while the second brings together ‘Old’ and ‘New’ behavioural views of heuristics. Unlike the ‘foundational’ rules that are necessary to close problems that would otherwise be intrinsically non-computable, simplifying heuristics and cognitive devices such as the use of hierarchical decomposition are means to ensure that limited short-term memory and finite information processing capacity do not render timely solutions impossible to arrive at in situations where there are many issues and options to consider. Note the parallel here with the way that hierarchical rule systems function in organizations, with most decisions being arrived at by those to who authority has been delegated instead of all decisions being taken by the head of the

organization. Some of these rules will have a contingent dimension and be brought into play as cognitive load increases (e.g. shortlisting rules) or as other rules fail to generate solutions (e.g. tie-breaker rules).

Knowledge of the ultimate foundations of a person's way of choosing may not be necessary in all cases where we want to understand their choices, for these foundations may have been able to select a life philosophy that in turn provides a basis for ranking alternatives (or simply determining when a satisfactory option has been found), either directly or via having selected systems of valuation rules to operate at higher levels in more precisely defined contexts. However, understanding the foundational principles may be vital if the value system cannot resolve what to do or admits a course of action that clashes with core foundations. Here, the mind may operate rather like a multi-tiered judicial system. To the extent that valuation systems are chosen via core principles, they may be open to change—as, for example, when someone decides to become (or cease being) a 'greenie' or a 'Trump supporter'—and such changes may (like constitutional changes in nation states) entail path-dependent processes that can only be understood via knowledge of the layered structures by which people make their judgements.

This multi-level, adaptive view of values is very different from that offered in conventional economics. There, analysis usually works at a single level. When, occasionally, it is framed in terms of multi-level 'utility trees' (as in Strotz, 1957), this is to take account of the various levels of abstraction at which shoppers may divide up their budgets and does not involve 'preferences about preferences'. Though not usually characterized as rules, the continuous, transitive convex preference systems assumed (via the core principles of the orthodox research programme) in models of 'rational choice' can be viewed as complex rules that are presumed to cover all possibilities by specifying whether any combination of goods is to be viewed as more/less/equally preferable to any other combination. The conventional view of preferences is essentially normative, rather than one derived via empirical studies. Given the potential evolutionary benefits of non-selfish behaviour (see Simon, 2005) and of not being prepared to jeopardize the ability to satisfy basic survival needs, there is a case for doubting that the rules that people use for ranking alternatives conform with the presumptions of rational choice theory. Instead, they could entail maxims such as 'do unto others as you would have them do unto you' and hierarchically structured sets of needs, as postulated by Maslow (1970).

HC4d. Systems of operating rules evolve through time but at any point in time new elements will only be admitted if core elements/foundational principles in these systems deem them admissible.

HC4e. The ultimate determinants of the rules that people use are their genetically inherited neurological processes.

HC4f. Human brains display plasticity, since 'what comes to mind' is a function of both the cumulative and recent frequencies of activation of templates for making characterizations in a particular context.

Although behaviour is underpinned by some biological 'givens', HC4d–HC4f as a group allow for individuals to evolve in highly path-dependent ways: repeated exposure to particular kinds of stimuli can result in people developing more rigid ways operating (if the stimuli are 'normal') or new ways of operating (if the stimuli clash with established norms). In the latter situation, more frequent activation of neural circuitry associated with the newer operating principles may drive a path-dependent myelination process that increases the chances of the new ways being first to come to mind. As a result, previously dominant operating principles that in the past would have reined in particular ways of thinking and forms of behaviour may gradually be crowded out of use. Clearly, there is potential for brainwashing to be engineered by those who shape the stimuli that people receive. Note, too, that limited cognitive capacity can prevent the mind from seeing the wider implications of accepting new principles in terms of the cognitive structures and associated ways of life that may then be built by applying them.

5.1 | 'Do' and 'do not' implications of HC4a–HC4f for researchers

NH4a. Do not assume away things that decision-makers have to do to be able to tackle open-ended problems, for their 'ways' of addressing these issues are likely to affect what they choose to do.

PH4a. Do study not merely the forms but also the origins, selection and abandonment of the (sets of) rules that decision-makers use to manage their attention, undertake search, characterize things, activities and events and make value judgements.

PH4b. Be mindful of whether the rules that you identify would have had fitness-enhancing properties at the time they were originally adopted, and whether such properties continue to apply even if the rules appear to have dysfunctional aspects.

NH4b. Do not automatically assume that decision rules, heuristics or routines are dysfunctional even if they clash with the presumptions of rational choice theory and/or involve focusing and/or editing processes that set aside information and conjectures that, in principle, might have been taken account of when choosing.

PH4c. Be open to using relevant insights from neuroscience and neuroeconomic research.

PH4d. Be mindful that the reasons given by research subjects for resisting particular changes of behaviour may not be their 'real' reasons but may merely be manifestations of processes for reducing cognitive dissonance to avoid the cognitive costs of changing how, as a rule, they view parts of the world (see Earl, 1992).

NH4c. When assessing the impacts of policy measures on welfare, do not ignore the capacity of people to change their ways of thinking and scope for using policies to foster such changes.

6 | PEOPLE ARE NOT ALWAYS OPEN TO COMPENSATION-BASED INDUCEMENTS TO CHANGE THEIR BEHAVIOUR, FOR SOME CHANGES MAY CONFLICT WITH THEIR OPERATING RULES REGARDLESS OF THE COMPENSATION THAT WOULD ACCOMPANY THESE CHANGES

HC5a. The goals and needs that people are trying to meet cannot all be traded off against each other in terms of the utility that comes from meeting them and the disutility that comes from the extent to which they are not met.

HC5b. Basic survival needs are hierarchically ordered via inherited physiological programming.

HC5c. The cognitive challenges of trading-off the significance of sets of implications of choices that pertain to different sets of goals and needs favour hierarchical prioritization and giving 'sequential attention to goals' (Cyert & March, 1963) rather than 'value integration' (Steinbruner, 1974) where choices are viewed as having complex patterns of implications.

HC5d. Cognitive simplification often entails the use of hierarchical decomposition strategies (to limit the sizes of sets whose elements need to be compared) and non-compensatory decision rules (that work in a filtering manner and obviate the need to compute overall values for rival strategies).

HC5e. Price-insensitive behaviour can result from people using alternatives to compensatory decision-making, such as imitative behaviour, using brands as proxies for quality, and using filtering or checklist-based decision rules that focus on non-price performance.

With its 'everyone has their price' presumption that substitution can always be induced, sooner or later, via progressively changing relative prices, the conventional economist's view seems to be at odds with familiar instances of people appearing to have visceral reactions (such as disgust) to some things or, less emotionally, saying that 'I don't like/do X.', or being irresistibly drawn to some forms of action seemingly regardless of the latter's price. The 'ONE behavioural' approach takes such phenomena seriously rather than ignoring them or viewing them as oddities. HC5a–HC5d imply that breaks in chains of substitution are to be expected; indeed, some actions may be 'unthinkable' in terms of some ways of looking at the world, some features or shortcomings of products will be deemed to be 'deal-breakers', and some consumers will view some

products or activities as things that they simply 'do not like' or (because they appear to be at odds with principles used for defining personal identity) as 'not me'.

6.1 | 'Do' and 'do not' implications of HC5a–HC5e for researchers and policymakers

NH5a. If decision-makers assigns a 'high degree of importance' or 'high priority' to a product or characteristic, do not view this as necessarily the same as having a 'high weight' in an additive sense, as it may be something that they view as a vital component or prerequisite for the functioning of a system or a 'must-have' means of eliminating a problem.

NH5b. If people say they purchased something because it 'ticked all the boxes' or had a 'unique selling point', do not presume they would have been open to alternatives that failed to do this, had the latter been cheaper.

PH5a. Be open to the possibility that the rules that people use in trying to cope with the challenges of everyday life may operate in intolerant ways.

PH5b. Be alert to the implications of non-compensatory decision-rules when designing incentives-based policies, for there may be potential to design cheaper or more effective policies based instead on eliminating 'deal-breaker' problems.

PH5c. Be alert to the implications of non-compensatory decision rules when working with additive econometric models (e.g. hedonic regressions) and techniques such as cost–benefit analysis.

PH5d. Be mindful that even if the 'final' choice is made by trading off product attributes or using a 'choose the cheapest' tie-breaker rule, the decision process may have employed non-compensatory rules in an initial shortlisting process.

7 | THE BEHAVIOUR OF CONSUMERS CAN BE PREDICTED, AT LEAST PROBABILISTICALLY, IF THEIR OPERATING RULES CAN BE UNCOVERED

HC6a. Behaviour is to some degree predictable because it is rule-based and because people use their operating rules systematically in an 'if-then' manner rather than incoherently or randomly.

HC6b. Personal repertoires of rules often include alternative rules that could be applied in a given context, each of which has a path-dependent probability of coming to mind, arresting the decision-maker's attention, and being applied.

HC6c. At the level of the individual, each choice is cue-dependent, so seemingly trivial cues can have significant impacts on behaviour.

These propositions accommodate the 'New' behavioural perspective regarding scope for manipulating behaviour via strategies aimed at triggering heuristics that are part of human nature (as in Ariely, 2008 and Thaler & Sunstein, 2008), but they go much further and are not wedded to the orthodox 'rational' choice reference point. Heiner (1983) has argued that behaviour is only predictable insofar as people treat events that are singular occurrences 'as if' they are members of categories rather than attempting to analyse them in all their singularity. In other words, predictable choices are those arrived at by applying stereotyping rules and escaping the cognitive challenges of engaging in detailed analysis. His thinking complements the thinking of Hayek (1952) and Kelly (1955) outlined in Section 3 above. However, their work brings important caveats. First, in Hayek's analysis the brain is viewed as generating what I have called 'candidate conjectures' as a probabilistic function of how often a set of neural connections has been activated, both recently and cumulatively. Over time, a person may display an evolving track record for the relative frequencies with which he or she deploys particular rules in a particular context, leading to a predictable mix of behaviour, even though individual actions may only seem to a degree likely to occur. Second, note that Kelly emphasizes that when a person acts in a way that seems to lack consistency at a surface level, there may be method rather than madness deeper down in that person's repertoire: behaviour that appear out of character compared with what is normally observed may signify responses to core principles being called into question.

Some significant ideas relating to the rather contingent nature of rule-based behaviour include the contention that brand loyalty is typically polygamous (Ehrenberg & Scriven, 1999), the view, in institutional economics, of habits as dispositions or propensities to engage in particular forms of behaviour (Twomey, 1999), and the 'elimination by aspects' model of decision-making (Tversky, 1972) in which decision criteria are not ranked in a priority order but differ in their probabilities of coming to mind and being applied in a discriminating way.

In addition to adding weight to PH1g (cf. the case for agent-based modelling set out by Twomey & Cadman, 2002), HC6a–HC6c lead to the following heuristics for researchers:

PH6a. Do study the track records of consumers in terms of their propensities to apply particular rules in particular kinds of contexts. As you do so, consider scope for adapting techniques that psychologists use when assisting police services in 'profiling' suspects.

PH6b. Do study the track records of consumers in terms of what they have purchased in particular contexts and the order in which they have adopted innovations and, as their real incomes have risen, luxury products (cf. the pioneering work of Paroush, 1965, and Pyatt, 1964), as the distribution of propensities to use particular rules may result in predictable sequences in the uptake of such products by different groups of consumers.

NH6a. Do not expect to predict the behaviour of consumers when they have ruled that it is OK to suspend their usual operating rules to engage in 'playful' activities and/or 'go with the flow'; such decisions could result in them behaving 'out of character' until their core principles kick in to bring such episodes to a close.

8 | CONCLUDING DISCUSSION

The multi-level rules-based view of human action presented in this article offers a unifying perspective on the diverse ways in which people may make their decisions in different problem-solving contexts. It accommodates behaviour that involves in-depth deliberation about how a variety of alternatives might serve as means to multiple ends, just as readily as it accommodates highly simplified ways of choosing, such as following what most people do in the context in question or choosing based on brands. But it implies that, if we wish to predict behaviour, we need to know the kinds of rules that people use and the relative popularity of these rules. This is no small task given that the rules people employ are elements in their operating systems and may need to be viewed mindful that some rules have the capacity to over-rule others. But we have a wide range of empirical techniques for uncovering the rules that people use, such as asking them directly 'how' they make particular kinds of choices, using process-tracing methods such as verbal protocol analysis, or designing computer lab experiments to enable inferences to be drawn about how frequently particular types of rules are used.

In the absence of statistical knowledge of the distribution of rules that people use, we can at least consider the different policy implications of rules that seem, via introspection, anecdotes, product reviews and so on, to be plausible for the context in question. For example, in relation to the barriers to adoption that a new product could run into, we may consider potential for consumers' characterization rules to lead them to view it differently from how the producer hopes it will be viewed, and we can consider what kinds of rules consumers might feel they would have to break if they were to adopt it, along with what kinds of new rules its marketing campaign might be able to supply to facilitate its adoption and what their chances of being deemed admissible might be.

Looking at how markets function from the 'ONE behavioural' perspective offers a much richer vision of the economic coordination problem than is offered in orthodox economics. Achieving coordination is not primarily a matter of getting the right vector of relative prices to clear all markets, for choices depend on the rules that people use to define problems, discover options, identify non-price characteristics of interest and assess and take account of differences between options in terms of these characteristics. The rules that they use regarding whether they see themselves as loyal customers in a good-will relationship with a supplier may be significant, too, along with rules that lead them to use social networks and market institutions to facilitate their choices. Price may not figure at all in a person's failure to buy a product, for he or she may simply fail to discover it via the search rules they employ or may rule it out because of specific

shortcomings that are not found in rival products; if price does play a role, it may entail the use of rules that work as filters (as with a 'price range'), as proxies for quality or to break a tie, rather than in a process of assessing overall value for money.

Recognizing the diversity of sources of rules that people use to make problem-solving choices presents opportunities for synergistic combinations of the research traditions brought together in the 'ONE behavioural' approach and for new kinds of research and policy designs. For example, educative policies that aim to enhance consumer welfare can be viewed in terms of the provision of rules for people to upload to 'boost' their repertoires of ways of making decisions and over-rules dysfunctional heuristics that they have inherited genetically or acquired socially. By contrast, focusing on just one of the existing varieties of behavioural economics can result in blinkered analysis. For example, if we focus on how people are 'predictable irrational' by nature, we will expect people to succumb to 'sunk cost bias', treat the past as if it has a present value, and engage in escalation of commitment when outcomes are disappointing. We may fail to note that social wisdom may work against this via maxims such as 'There's no point in crying over spilt milk' and 'Don't pour good money after bad'—which begs the question of what determines whether and where people will use effective socially acquired rules instead of dysfunctional heuristics that they have inherited.

By presenting the 'ONE behavioural' approach as a Lakatosian scientific research programme, I hope not merely to leave readers with a picture of its core principles but also with an appreciation that the 'ONE behavioural' view of consumer behaviour has much in common with Lakatos's view of how scientists behave. Both are rule-based views, and both imply that life may be problematic for those who seek to operate via rules that conflict with those employed by a dominant group unless that group's underlying principles embrace pragmatism and pluralism.

Such principles have not been part of orthodox economics in recent decades, with the view increasingly being that if contributions that claim to be 'economics' do not involve formal models based on optimization, they should not be characterized as 'economics.' In this environment, practitioners of 'Old' and 'Evolutionary' approaches to behavioural economics had a hard time getting traction with their ideas or getting career advancement if they stayed in schools of economics. By contrast, the 'New' behavioural economists were able to thrive by keeping orthodox notions of rationality as their reference point when talking about 'biases' and by using an evidence-based approach that ensured they were taken seriously (for if the mainstream ignored empirical results, they would have trouble viewing and portraying themselves as scientists). They probably operated like this because they were largely ignorant of the 'Old' and 'Evolutionary' strands of behavioural economics, rather than because keeping the orthodox reference point was a means to pursuing a kind of 'Trojan horse' strategy. Either way, having gained entry to the citadel, they have potential to achieve much more if they increasingly incorporate 'Old' and 'Evolutionary' ideas to produce a more radical approach. Those in the 'Old' and 'Evolutionary' camps can help in this process by becoming more open to using elements from the 'New' approach that do not have to be thought of as

departures from what an idealized 'rational' economic agent supposedly ought to do. Their joint mission needs to be to bring about a shift in focus to procedural rationality,—in other words, to effective ways of taking decisions in real-world situations involving open-ended problems, and on how to foster the uptake of these 'ways' among those who otherwise will achieve needlessly low levels of wellbeing.

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The author declares that he is free of any actual or potential conflicts of interest in relation to this article.

DATA AVAILABILITY STATEMENT

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