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How can food futures insight promote change in consumers' choices, are behavioural interventions (e.g. nudges) the answer?

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ABSTRACT

Many approaches (e.g., formal modelling, Futures Studies) taken to understanding global food futures tend to treat the consumer as an outcome of the global food system, rather than a central component of it. Nonetheless, in order to address some of the forecasted problems (e.g., sustainable consumption), it has been consumer attitudes and behaviours that have been the target for change; as we illustrate through case studies, this has generally been ineffective. To help understand this, we introduce psychological research on attitudes, preferences and choices around food which suggests that each are influenced by a multitude of dynamics. From this, we discuss further the implications of multi-valent influences on choice, lability vs. reactance, and the requirements of agency and control, for the relative prospects of 'softer' behavioural approaches (e.g., public campaigns, nudges) vs. 'hard' interventions (e.g., mandates, taxes, tariffs, subsidies) to substantively change consumer behaviour. We also make some concluding remarks regarding the value of psychology in Future Studies work.

1. Introduction

Approaches (such as formal modelling, Futures Studies) taken to map out the future food landscape often treat the consumer as an outcome of the global food system, rather than a central component of it. Nevertheless, in order to address some of the forecasted problems (e.g., sustainable consumption), it has been consumer attitudes and behaviours that have been the target for change. We present two case studies in order to illustrate the limits of behavioural change in consumer behaviour. From this we discuss several ways of answering the question: Why might this be the case? The main objective of the present article is to consider, from a psychological perspective, what might need to be taken into account to assess the relative prospects of 'softer' behavioural approaches (e.g., public campaigns, nudges) vs. 'hard' interventions (e.g., mandates, taxes, tariffs, subsidies) to substantively change consumer behaviour in line with sustainable consumption. In addition, the article concludes with a brief discussion on the value of psychology in Futures Studies.

1.1. Formal modelling approaches to food futures predictions

In order to help identify how to address some of the potential problems we face in the future regarding sustainability development goals such as food security and sustainability agriculture, there have been substantial efforts in forecasting the food futures landscape

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based on formal computational modelling methods. Here we present some of the key forecasts that have been made from these models.

Firstly, *the global population is estimated to increase*. The estimated steepness of the rise varies by estimate, from approximately 7.5 billion as it stands now, to between 8–8.5 billion by 2030, and 9–9.5 billion by 2050 (e.g., Maggio, Criekinge, & Malingreau, 2015). *Food prices are estimated to continue to increase from now until 2030*. The steepness of the increase varies by estimate, which is explained by the variation in the factors introduced into the models (Chakravorty, Hubert, Moreaux, & Nøstbakken, 2017). *Global obesity rates are estimated to increase from now until 2030*, again the acceleration varies by forecaster (e.g., Branca & Ellis, 2017). Food insecurity (which includes malnutrition and hunger) rates suggest that approximately *8–9% of the global population is estimated to be food insecure by 2030* (e.g. Pérez-Escamilla, 2017).

What role do consumer patterns of choice behaviour play in models that make these forecasts? The answer, in general, is very little. In most models used to carry out the aforementioned forecasts, the role of the consumer is typically identified as "household food access", "household income", and "food wastage by consumers" (e.g., Ambler-Edwards et al., 2009; Brown et al., 2017; Gustafson et al., 2016; Johnston, Fanzo, & Cogill, 2014), with few models considering the relevance of consumer eating patterns (e.g., Ambler-Edwards et al., 2009; Johnston et al., 2014), and only one considers the impact of intervening on consumer expectations to affect the global food chain (Ambler-Edwards et al., 2009). The upshot of this is that consumers' choices are generally treated as the outcome of forecasted changes in the food system, and not one of the intricate and pivotal causal factors that contribute to the forecasted outcomes (e.g., future prices, food securities, obesity levels). This is concerning: if potential changes in consumer decision-making are missing from formal models because they are impossible to quantify, and/or inherently unpredictable, or (worse still) simply not demonstrably an independent causal factor in historic data, then confidence that they can act as significant drivers of positive change may be peremptory.

1.2. Foresight study approaches to responding to food futures predictions

Along with formal models that are designed to help make forecasts about food futures, are other methodologies and approaches that serve a similar function, such as foresight studies. Foresight studies include a wide range of methods such as meta-reviews of academic literature on a particular topic (e.g., Foresight, 2011; European Commission – Standing Committee on Agricultural Research Foresight exercise (SCAR) Foresight 2011) as well as human data gathering procedures that involve scenario building. This is a method by which alternative future states of the world are constructed and discussed at focus groups/workshops/delphi methods with various types of experts (scientists, policy makers, industry people) (FSA Report, 2016; Maggio, Criekinge, Malingreau, 2015). In addition, foresight studies also encompass a combination of qualitative and quantitative methods that focus on participants' (members of the public) views, concerns and speculations around topics that require them to place themselves in future scenarios, as well as to help construct them.

For instance, when it comes to the application of foresight studies in the domain of food futures, major government reports (e.g., UK's Foresight (2011) report, European Commission – Standing Committee on Agricultural Research Foresight exercise (2011), EU Commission - JRC Science and policy - Maggio, Van Criekinge, and Malingreau, (2015)), use meta-reviews, or the Delphi method (expert opinion) to help identify, abstract from, and recommend plans of action in order to countermand various forecasted scenarios in the food futures domain. What is notable in these examples, is that the evidence base, typically focuses on the views of experts at the exclusion of the everyday consumer. In fact, with few exceptions (e.g., Judge & Wilson, 2015) Futures Studies in the domain of food futures are rarely participatory in nature (Bourgeois & Sette, 2017). In their review, Bourgeois and Sette (2017), they implicitly appeal to foresight researchers to incorporate psychological concepts into the process of scenario building, as well as when conducting priority setting with public participation in mind. In fact, in other academic literature the same calls for participation studies are actually made explicitly (Georghiou, & Cassingena, 2011; Hertzog et al, 2017; Ladu, & Quitzow, 2017; Maggio, Van Criekinge, Malingreau, 2016). In sum, with few exceptions (Georghiou & Cassingena, 2011; Judge & Wilson, 2015; Popper, 2009), the consumer is not considered as central to the process by which future scenarios are constructed, discussed, or evaluated.

Here as with the previous section, the role of the consumer is limited. Typically, the consumer is not invited to participate in foresight studies, and yet some of the key recommendations from foresight studies, that have underpinned policy reports, have been to implement behavioural change methods. Most of the policy reports mentioned in this section propose that public campaigns could help to inform and persuade consumers to shift their preferences towards sustainable foods. Along the lines of the recommendations included in the aforementioned reports, in the next section we present two examples of a behavioural change method that involved public campaigning designed to shift consumer behaviour in line with food alternatives that are more sustainable.

2. Behavioural change through public campaigns

Even though consumers are treated as the outcome of various complex global factors that impact the food chain, they are considered an access point to generate change in the direction of sustainable consumption. There have been a multitude of large scale 'soft' interventions (e.g., nudges) designed to intervene on consumers, some of which include public campaigns (e.g., Reisch, Eberle, & Lorek, 2013), which are designed to inform, and in turn, persuade the consumer to change their habits. We illustrate the outcome of two examples of this approach.

The UK 'Switch the Fish' campaign, launched in March 2014, aimed to encourage changes in consumption of seafood away from the top five most commonly bought items (e.g., salmon, cod, haddock, tuna and prawns) and towards less commonly consumed types of seafood. While awareness of sustainability issues relating to fish rose during the period of the campaign, this failed to significantly

impact consumption rates of the most popular seafood items between 2006–2016 (Seafood Industry UK report, 2013, 2016). This is in spite of the fact that approximately 70% of UK consumers express concern about sustainability in thinking about seafood consumption (Marine Steward council MSC consumer survey (2016)). A diverse range of reasons for resistance to change have been articulated (Nelson, 2012), some of which do not cohere well with reality, such as the assertion that price is a barrier to eating a more diverse range of seafood; in fact, many alternatives (e.g. a less commonly consumed fish such as Coley) are actually cheaper. That said, there was also no objective price factor pushing consumers away from the most popular options: from 2001 to 2017 the price of 1 kg Salmon fillet and 1Kg Cod fillet rose by approximately 4% in real terms (Office of National statistics, 2017), so prices were basically stable throughout this period.

Educational campaigns have been informing consumers about reducing their red meat consumption ("let's talk about meat" Eating better, 2014) for reasons of health as well as sustainability. In a recent report by the Food Standards Agency UK (FSA, 2017), of the 3000 consumers that were surveyed, many had reported that their red meat consumption had dropped significantly in the past two years. In actual fact, red meat consumption has stayed approximately the same within the period of 2001–2017 (e.g., Agriculture and Horticulture Development Board (AHDB) 2017). Again, from 2001 to 2017 price inflation of 1 kg UK minced beef, and 1Kg cuts of UK beef was also minimal in real terms, at approximately 0.3% over the period (Office of National statistics, 2017). Again, there is a mismatch between findings from public attitude surveys (indicating significant levels of awareness *and* need for action) and actual pricing and purchasing behaviour (again, relatively static).

2.1. Why wasn't there any effective behavioural change?

Policy makers might ask: *Why didn't the campaigns change behaviour given that public attitudes for sustainable consumption are positive?* In turn, it might be tempting for a policy maker to surmise that the public simply didn't pay attention to the public campaigns, and so they might turn to psychology to help develop better methods of presenting information that is more persuasive in encouraging behavioural change (e.g., Barr, 2003). A related question is: *Why is there an apparent mismatch between public attitudes (as revealed through public surveys) and public behaviour (as revealed through objective measures)*[1] *?* Here also it might be tempting to refer to psychology, and explain away this effect by claiming that the attitudes that people reveal in surveys towards sustainable consumption (and other related areas, animal welfare, and climate change) are the result of social desirability – people wanting to look like they have concerns that are valued socially, which explains why their consumption habits don't match what they have communicated their attitudes to be (e.g., Grimm, 2010). Alternatively, it might be tempting to refer to another psychological phenomenon, the 'attitude-behaviour' gap. This refers to often observed situations in which people mean to do one thing (attitude/intention) but end up doing another (behaviour) for whatever host of reasons, and as a result, mismatches occur between stated attitudes and actual observed behaviours (e.g., Vermeir & Verbeke, 2006).

The reasons offered for why 'soft' interventions, such as public campaigns, were not persuasive in motiving substantive change in behaviour are revealing, they essentially boil down to 'It isn't you (the public) – because you just didn't understand the message well enough, it's me, (the policy maker/psychologist/behavioural economist)' – so I need to make the message better. At the root of the explanations given for the failings of nudges is a rationalist view of behaviour, which assumes that if one knows the right levers and how to operate them, then it is possible to circumvent inattention, social desirability, and the attitude-behaviour-gap (for discussion see - Hibson, 2002; Murcott, 2019). In fact, this rationalist view is typical of the way psychologists, behavioural economists, and policy makers interpret the many examples of the limited effects of nudges used to encourage sustainable consumption (e.g., Filimonau, Lemmer, Marshall, & Bejjani, 2017; Lehner, Mont, & Heiskanen, 2016; Lombardini & Lankoski, 2013; Morris, Kirwan, & Lally, 2014; Spaargaren, Van Koppen, Janssen, Hendriksen, & Kolfschoten, 2013; Schubert, 2017; Whitley, Gunderson, & Charters, 2018).

An alternative approach, which can also be seen as preserving human rationality and dignity (Murcott, 2019), is to reconfigure the findings presented and consider several pragmatic factors. First, is that the way in which questions are framed, who articulates those questions, and the precise context in which they are couched all have an important impact on the way that the public respond to surveys (Osman, Fenton, Pilditch, Lagnado, & Neil, 2018). So, not all questions on the same topic are answered in the same way, even if in theory the questions are treated by social scientists in the same way. Therefore, because there is variability in responses by the methods used to probe for public opinion, this means that responses may not accurately reflect what opinions people have. The way in which people conceptualise issues that they are being asked about is context specific, and highly nuanced, because their experiences and understanding of an issue impacts different context of their life in different ways. If this isn't taken into account, then a generic question about a particular topic will gather a generic response, for which there should be no surprise that it doesn't correspond with an actual expression of behaviour observed in a specific context. Similarly, the way people make decisions is highly context specific, and may not necessarily mean that the same choice or action is taken or implemented consistently across contexts. Furthermore, asking people about matters that involve time scales far into the future, such as those discussed in the first section of this article, mean that while people care about the issues, it doesn't mean that they feel they are in a position to do anything meaningful to ameliorate those problems (Rees et al., 2018). Finally, and one of the most often neglected reasons is that attitudes,

[1] It is worth noting that mismatches between positive attitudes and actual behaviour around consumption habits of red meat are not unique to the UK. Similar mismatches have been reported in, for example, Brazil (OECD, 2019; Ritter, Borchardt, Vaccaro, Pereira, & Almeida, 2015), Sweden (Neuman & Yngve, 2018; Swedish Agricultural Board, 2017), Turkey (Aydogdu & Kucuk, 2018; OECD, 2019), and Vietnam (My, Rutsaert, Van Loo, & Verbeke, 2017; OECD, 2019).

preference and choices change over time, and the reasons that they are dynamic is that there are internal motives and incentives, as well as external factors which promote change, and over different time scales (Osman, 2014).

In the next section we focus specifically on the latter of these points, and propose that by understanding consumer cognition around food, we can consider how worthwhile it is to use soft interventions (e.g., public campaigns) rather than hard interventions (e.g., mandates, taxes) to change consumer behaviour in meaningful ways. We focus exclusively on cognitive factors governing attitudes, preferences and choice behaviour around food, though obviously there are sociological and cultural factors that also strongly influence our food behaviours (for review see Murcott, 2019), but this would require a whole other commentary to evaluate their significant role.

3. The dynamics of attitudes, preferences and choice behaviour

We and others (e.g. Gifford & Chen, 2017; Sobal, Bisogni, & Jastran, 2014) look to psychology as a means of offering insights into the factors that influence consumer cognition which help to understand why it is that public campaigns aimed at shifting attitudes (and in turn behaviour) have seen limited success. The following discussion helps to illustrate just how dynamic our attitudes, preferences and choice behaviour are, and how susceptible they are to a host of influences that prompt shifts in behaviour in the short and long term.

3.1. Attitudes

Overall, the public show considerable ambivalence about sustainability issues. There is *prima facie* attitudinal conviction when it comes to supporting improved animal welfare (De Backer & Hudders, 2015), scepticisms regarding bioengineering/technologies (Wunderlich & Gatto, 2016) genetically modified food, and strong regard for risk communication of food safety (Lofstedt, McLoughlin, & Osman, 2017). However, public attitudes are highly labile, and are extremely sensitive to the source of expertise that is communicating the issues (Barnes, Lucas, & Maio, 2016), such as the age, gender, political/religious alignments and social values of the sources. Attitudes are also sensitive to the measurement tools used to probe them (Feldman & Lynch, 1988; Osman et al., 2018; Powell, 2013; Maul, 2017) and vulnerable to failures in properly validating question items (Maul, 2017). This means that attitudes as revealed in public surveys only give a partial indication of the public's disposition towards a particular issue, which can change profoundly as a result of the way the issues are communicated and measured.

3.2. Preferences

Psychological research has shown that our food preferences can change over short time scales (across minutes) to longer time scales (days to months, or over years) depending on factors such as: odour (Marreiros & Ness, 2009; Ramaekers et al., 2016), marketing (Hawley et al., 2013), nutritional content information (Dixon et al., 2014), internal value systems (Lusk & Briggeman, 2009) and the social structures we engage in early in development and into our adult lives (Liberman, Woodward, Sullivan, & Kinzler, 2016). While these and other factors influence food preferences, changes in preferences, and when they have occurred, they may not necessarily be perceived or acknowledged by the individual consumer themselves. This perhaps helps to explain why actual changes to behaviour appear to be disconnected to attitudes towards changing behaviour.

3.3. Choice

There are a variety of models that have tried to synthesise the multiple factors that influence food choice behaviour and predict patterns of change (e.g., Symmank et al., 2017). The various factors that feed into these models include state dependency (which also includes emotional states as well as physiological states – i.e. how sated we are) (Gibson, 2006), age (Westenhoefer, 2005), cohabitation status (Kemmer, Anderson, & Marshall, 1998), employment/finances (Turrell, Hewitt, Patterson, Oldenburg, & Gould, 2002), physical environment (urban, rural) (Popkin, Duffey, & Gordon-Larsen, 2005), cooking skills (Caraher, Dixon, Lang, & Carr-Hill, 1999), and social and cultural norms (Higgs, 2015), to name but a few. Food choice behaviour is obviously not independent of food preferences and attitudes towards food issues, as well as the social and cultural factors that underpin our core value systems which guide what we do in each of the decision contexts we face.

4. Making behavioural change meaningful

Just as we have illustrated with the case studies around public campaigns, there is other similar work showing that many different "nudging" soft methods are unable to create positive reliable, maintainable, and generalizable behavioural change towards sustainable consumption (e.g., Filimonau, et al., 2017; Lehner et al., 2016; Lombardini & Lankoski, 2013; Morris, et al., 2014; Spaargaren et al., 2013; Schubert, 2017; Whitley, et al., 2018). One reason for the poor impact of soft interventions is that they don't account for the importance of the psychology of agency and control, and how this connects people's attitudes, preferences and choice behaviour to external events. This connection must be authentic: actions must be 'real' actions (not reflex reactions), and external "real" events must be detected (Osman, 2014). Thus, manipulations that promote or rely upon simple and quick and localised changes to consumer choice behaviour are less durable, or even counterproductive because they lead to uncertainty about the impact of changes in dietary habit. The claim we make here is that public campaigns, just like other "nudges", might fail because they are

highly localised (e.g., shifting from common to less commonly consumed types of seafood) which do not easily reveal the meaningful changes individual behavioural change would have on the environment; this limits the causal impact that they have. They also fail to provide a salient connection between consumers' actions and events around them, such as how their actions would translate into meaningful changes to sustainability in the short and long term; doing this would reduce uncertainty and increase personal agency around the impact of changes in their behaviour on the world around them. Moreover, they fail to build on personal motivating factors that consumers actually take into account (e.g., culture, personal values, social trends, pricing) when making their purchases (Hirschnitz-Garbers, Tan, Gradmann, & Srebotnjak, 2016). Without taking into account factors that reduce uncertainty and in turn promote agency and control, soft interventions are likely to have only limited impact on positive behavioural change towards sustainable consumption.

4.1. Price incentives and the framing of price-driven choices

Furthermore, another obviously important driver, and one not mentioned thus far, is the price of foodstuffs. A clear message from the macroeconomic literature summarized by Timmer (2017) is the centrality of food prices, as signals to producers, policy makers, regulators, and consumers, because choices taken by all these agents in response to food prices impact future market outcomes, and responses to market outcomes, which in turn impact food futures. Thus, typical hard regulatory instruments such as targeted taxation have been used to reduce consumption of alcohol, sugar ('sin taxes') and might serve as additions to soft interventions in steering consumer choice away from potentially-scarce foodstuffs; though as yet the effects of taxation on reducing consumption in these domains is mixed because of differences in responses by income bracket (e.g., Harding & Lovenheim, 2017). It is less clear that taxation should operate to limit demand for potentially-scarce but healthy foods, with such a strategy raising troubling issues relating to social justice (e.g. potential for increased malnutrition among infants in low-income households). There is some indication that subsidising healthy foods does result in positive behavioural change (Khan & Misra, 2016), and could, if adopted in tandem with public health campaigns, serve as strong signal to consumers of alternatives to potentially-scarce foodstuffs, though this has yet to be explored.

A future scenario in which prices for certain foods (driven by pre-emptive taxation or actual scarcity) increase at sufficient rate to 'force' change upon consumers is at least a serious possibility. In such a scenario, consumers will begin to adapt their choices, in order to maintain control of household expenditure. Thus, worthy of further investigation is the potential to 'help' provide consumers with resources for post-rationalisation, which they will likely employ to protect their sense of agency. For example, certain types of fish and red meat may become too expensive for growing numbers of households; ideological resources that allow consumers to re-imagine their change of diet as a voluntary one, driven by concern about sustainability or ethics, will help to make a virtue of necessity. We also suggest that another area that requires better understanding is how social agents (producers, advertisers, policy makers, regulators) are perceived/influenced/resisted by various consumer types, given that behavioural change methods are often implemented by these agents (Osman et al., 2018).

5. Conclusions

To re-cap the essential directions we have established from our presentation of psychological research into food choices is the following: We argue that reducing uncertainty and increasing agency and control are key to enabling consumers to make significant voluntary changes to their diet (Osman, 2010, 2014); this also helps to translate the idea of increasing empowerment of the consumer based on psychological insights that can inform modelling and foresight studies.

If, based on the forecasts of formal models, and the potential avenues to explore in response, based on foresight studies, a government wants to see significant reduction in consumption of a currently popular foodstuff, soft interventions such as public educational campaigns alone would be unlikely to have a lasting impact on real-world behaviour. This is for two reasons: firstly, our consumption habits are shaped by an extremely complex mesh of factors, that come through in our attitudes, preferences and choices. Many factors are highly durable because they constitute the (broadly-based and broadly reasonable) social and economic rationale for our current habits. At the same time, other factors (our ever-more-frequently-stimulated susceptibility to convenience, biases, economic incentives, etc.) regularly introduce a degree of instability, offering opportunities for nudgers and marketers, but weakening the durability of any interventions in these limited spaces where we are amenable to change. Secondly, and relatedly, we have argued that the dynamics of control, it's attendant requirements of agency, tolerably stable feedback connecting action to outcome, and the attendant phenomena of reactance and post-rationalisation, are a critical, and under-examined, set of structures within the causal mesh.

5.1. The value of psychology for foresight approaches to sustainable consumption

One challenge we have emphasised in this paper is the multivalence of influences on food choice. While we conclude by focusing on the theme of control, let us be clear: we do not think a psychologically reductive approach can effectively simplify this terrain; rather, there is a clear need to broaden horizons, accept multivalence, and continue to develop more sophisticated models and larger-scale, broader-based datasets. At the same time, we propose that the cognitive dynamics of psychological *control* must always be acknowledged. How should this be achieved? A more reflexive approach is needed to understanding influence and a more sensitive appreciation of the normative requirements and psychological dynamics of agency and control. Reflexivity is not only about acknowledging the ability of individual consumers to identify influencers' agendas and to reflect, evolve and adapt, 're-manipulating'

information intended to influence them (Foucault, 1982), but also an agenda for the foresight research community: to apply a greater measure of analysis to its' own frames, assumptions and incentives (Bourdieu & Wacquant, 1992), and to move to more sophisticated, sensitive and participatory research approaches. In relation to agency and control, the central challenge for today's forecasters is to integrate diverse streams of data and insight into predictive frameworks or scenario-maps that are able give individual consumers their causal 'due' – as embedded in the global food system - without assigning absolute mastery to either individuals *or* the agencies who influence them.

The change-oriented futures community has rightly been interested in the ways in which our psychological biases and heuristics might be usefully worked with, or worked around, in the cause of beneficial lifestyle change. However, bias-exploitation is only one part of the potential contribution of psychology to Futures Studies; a greater recognition of the normal powers and abilities of agents, and the dialectical relationships that these abilities enmesh us in, may be a more important direction in the years to come.

Lastly, in these days where "taking back control" has such great resonance as a political message, in various contexts worldwide, social scientists (futurists included) must confront the question of how control, agency and reactance as individual-level psychological mechanisms relate to apparently kindred phenomena enacted at group level, or mass level. We should certainly begin by acknowledging that the political channelling of the desire for control – asserting the rights, freedoms or empowerment of *particular individuals or groups* - has independent dynamics as political ideology, and cannot be understood merely as the aggregation of many individuals' control needs. This said, current political dynamics may well be better illuminated by understanding how control, as a psychological phenomenon, is something *we all need all the time*. Properly putting people, as choice-makers, into the picture - and exploring all the potential ramifications of this inclusion - represents an emerging agenda for futurists which is exciting, challenging and urgent.

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