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Designing for value-behaviour consistency: ethical choice architecture to stimulate sustainable meat purchase

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ABSTRACT

Many of our daily behaviours, e.g., our choice for transportation and our consumption behaviours, need to change in the light of the pressing sustainability issues we are facing. Yet, while many people value the environment, they do not always engage in the behaviours that are in line with these values, representing the so-called 'value-action gap'. This paper argues that the value-action gap can to a large extent be explained by a choice architecture which promotes unsustainable behaviours. Therefore, we present a redesign of choice architecture in the context of meat consumption, to stimulate people to act in line with their values. Our experimental study shows that such a redesign leads to a significant increase in sustainable behaviour, without conflicting with people's values. This opens the discussion on how we design the architecture for such choices and adds granularity to the moral debate about nudging.

1. Introduction

We need to change our behaviour substantially in order to counteract many of the pressing issues we face today. Our modern lifestyle, characterised by the transportation modes we use, the food we eat, the clothes we buy and how we manage household chores, has been leading to plastic islands in the oceans, polluted air, soil degradation, the wrecking of natural habitats, threatening species that we depend on for our ecological resilience and carbon emissions leading to our pressing climate crisis (IPBES, 2019; IPCC, 2021). To reduce these problems, we need to change our behaviour; we need to use less energy, produce less waste, and consume more sustainably.

Our food system is one of the key areas in need of fundamental revision, as stressed in the United Nations' Sustainable Development Goals (United Nations, 2016). Meat consumption is an exceptionally large contributor to greenhouse gas emissions and a transition towards diets containing more sustainably sourced proteins is crucial (De Krom et al., 2020; Ministerie van Landbouw, 2020; Visschers and Siegrist, 2015; Weinrich, 2018). Conceptually, the necessity of such a sustainability driven transition is not difficult to argue for, especially since many people endorse biospheric values, which means they care for nature and the environment (Bouman et al., 2021; de Groot and Steg, 2008). In general, the stronger people's biospheric values, the more

likely they are to engage in pro-environmental behaviour. Nevertheless, people often do not act in line with their biospheric values. For example, despite having strong biospheric values, people may sometimes buy unsustainable meat products.

This incongruence between what people consider important and what actions they engage in is studied as the attitude-behaviour gap (Vermeir and Verbeke, 2006), the intention-behaviour gap (Carrington et al., 2010), or the value-action gap (Blake, 1999; Schanes et al., 2018). This gap is understood as the result of various potentially interacting factors, yet attempts to empirically study the gap and how to close it are scarce (Hassan et al., 2016; Thøgersen and Ölander, 2002).

Attitude, intention and values are bordering concepts, yet fundamentally differ from each other. Values are commonly referred to as "desirable transsituational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity" (Schwartz, 1994). The values one holds are therefore relevant in any behavioural context, unlike attitudes and intentions. People's values logically influence their attitude towards specific behaviour -considering it favourable or unfavourable- and their intention to act accordingly. In reality of course, people have multiple potentially competing values in any given situation. Hence, one's attitude towards a specific behaviour, combined with individual and situational factors such as multiple values, behavioural control and the subjective norm regarding

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that behaviour, together determine the person's intention to perform that behaviour (Carrington et al., 2010; Fishbein and Ajzen, 1975; Salmivaara et al., 2021; Vermeir and Verbeke, 2006). This study focuses on the relationship between values and behaviour, leaving attitude and intention out of scope.

This study proposes the idea that people may find it difficult to act in line with their values since the 'choice architecture', referring to the design of the environment in which these actions take place (Thaler and Sunstein, 2008), in fact fosters unsustainable behaviour. The research question of this study was 'Can a redesign of choice architecture close the value-action gap and facilitate more sustainable meat purchase?' As a result of a close collaboration between researchers from the fields of industrial design engineering and psychology, this study reports on the effect on sustainable meat purchase by 'Tomorrow's Menu',¹ a consumption platform exclusively designed for the experiment.

The rest of the paper is structured as follows. Section 2 describes the theoretical background for the study and presents two hypotheses. Section 3 provides a detailed description of Tomorrow's Menu, the design intervention used for the study, followed by the set-up of the research. Section 4 reports on the results of the study by providing descriptive statistics and the regression analyses. Section 5 is a discussion on the outcomes, the hypotheses, implications for practice, limitations of the study and future research. Section 6 concludes the study, followed by acknowledgements in Section 7 and appendices in Section 8.

2. Theoretical background

Biospheric values serve as guiding principles in one's life (Bouman et al., 2021; de Groot and Steg, 2008; Schwartz, 1992). People with strong biospheric values base their decisions to engage in particular actions on the consequences of their behaviour for nature and the environment and are more likely to have pro-environmental preferences and intentions, and thus act pro-environmentally (see Steg and de Groot, 2012 for a review). Biospheric values are shown to relate to a range of pro-environmental preferences and actions, including acceptability of climate change policies (Nilsson et al., 2004; Steg et al., 2011), sustainable consumption (Thøgersen and Ölander, 2002), environmental activism (Steg et al., 2011), pro-environmental behaviour (Schultz and Zelezny, 1998), preference for restaurants serving organic food (Steg et al., 2014), and donating money to an environmental rather than a humanitarian organisation (de Groot and Steg, 2008). In food purchase intention however, these values have shown to be less powerful in guiding behaviour (Asif et al., 2018). Hence, we speak of a value-action gap in this context.

As a strategy to close the value-action gap, behavioural interventions often provide information, assuming it will activate deliberate processing of information and stimulate adjacent sustainable behaviours when biospheric values are endorsed. However, increasing awareness about sustainability to stimulate matching behaviours has shown to have limited effect (Asif et al., 2018; Emberger-Klein and Menrad, 2018; Osbaldiston and Schott, 2012; Spaargaren et al., 2013). In the last decades, the role of unconscious processing in how people make choices has been argued to be larger than we often think (e.g. Bargh and Chartrand, 1999; Dijksterhuis et al., 2005; Kahneman, 2011). Many consumer behaviours are habitual, driven by unconscious processes, and as such, prone to bias and contextual priming (Tversky and Kahneman, 1974).

Recent studies into the value-action gap argue that it is key to include the 'situational context' as a variable that may influence this gap (Carrington et al., 2010; Sultan et al., 2020). These studies indicate that the value-action gap cannot be solely explained from a cognitive psychological perspective. The retail context and the way products are branded

may affect the extent to which consumers' biospheric values are salient and thereby influence whether consumers purchase products that are in line with these values. Hence, we need a better account of the contextual factors, e.g., brand image, the physical store, social surroundings, to explain more accurately why people who consider the environment important, do not act upon it. Specifically, we argue that in order to close the value-action-gap, interventions need to target both 'System 1' and 'System 2' thinking, a distinction of decision-making processes introduced by Stanovich and West in 2000. System 1 thinking is characterised by quick, automatic, associative and often habitual decision-making, where people rely on contextual cues and heuristics. System 2 thinking refers to analytical, rule-based and relatively slow decision-making, where people process information thoroughly and consciously (Kahneman, 2003; Stanovich and West, 2000).

In 2008, Thaler and Sunstein put forward the concept of 'nudges', referring to the settings surrounding our daily choices and how a setting could be altered to increase better choices from a health, sustainability or wellbeing perspective, without forbidding any options (Thaler and Sunstein, 2008). Nudges generally focus on what can be called 'the low hanging fruit' in our democratic and social welfare systems. These nudges are often not much more than a change of the logo, the adding of a sentence, or reordering of information, for instance to increase tax compliance (Antinyan and Asatryan, 2019) or improve healthcare services (Last et al., 2021). However, to study nudging more profoundly, the concept of 'choice architecture' which Thaler and Sunstein build upon is far more suitable. It allows us to consider multiple interacting contextual factors that steer consumer behaviour at once, like price promotion, choice overload, branding, product placement, and more. Reflecting upon a conventional retail context in which food purchases take place, i.e., the supermarket, several of such contextual factors explain why we argue the choice architecture is dominant in steering purchase choices by mainly engaging consumers' automatic System 1 thinking.

First, in driving our daily choices, including what we eat, our biospheric values are continuously in competition with other values relating to costs, enjoyment, and more (Renner et al., 2012; Salmivaara et al., 2021; Steptoe et al., 1995; Yamoah and Acquaye, 2019). For example, buying organic meat may benefit animal welfare, but is relatively expensive. Since the retail context is designed to promote products that are on discount, one's value for money is made more salient than one's value for the environment. On top of this, the effect of purchasing decisions on costs are directly experienced, while implications for the environment are indirect and intangible. Therefore, currently, the retail context may push biospheric values to the background and therefore people are less likely to act in line with their biospheric values.

Second, the moment of shopping and the corresponding mindset people are in at that moment can explain the influential role of System 1 thinking. Many people do groceries after a long day of work, or together with young children, and such situations indicate a low capacity to engage with deliberate decision-making processes (Baumeister, 2002; Muraven and Baumeister, 2000). Driven by automatic processes instead, people will be more affected by their social and physical environment (Bargh and Ferguson, 2000; Bargh, 2011). It exemplifies how consumers' System 2 type of decision-making gets overruled by their System 1 (Kahneman, 2003; Stanovich and West, 2000).

Third, our complex contemporary production and consumption systems with all the economic, social and environmental interdependencies they represent on a global scale, has made it difficult for consumers to understand what a sustainable choice entails (Weinrich, 2018). We have trouble discounting accurately in complex matters, such as sustainable food consumption, characterised by probable and delayed outcomes (Green and Myerson, 2004). Our limited rationality in this regard underscores the influential role of the environment in which we make our consumption choices. Hence, we need to consider the choice architecture (Thaler and Sunstein, 2008) of our consumption more profoundly in understanding how to transition to more sustainable

¹ Designed by Anna-Louisa Peeters and more elaborately explained by Tromp and Hekkert (2019).

lifestyles, while acknowledging the dominance of System 1 thinking (Stanovich and West, 2000) in a conventional retail context.

This study focuses on the role of Dutch consumers in the sustainability challenge surrounding meat consumption. While there is an increasing awareness among consumers that meat consumption is generally not sustainable, it is still the norm in the Netherlands to eat meat on a daily basis (Onwezen et al., 2019). While we know that many people endorse biospheric values (Bouman et al., 2021; de Groot and Steg, 2008), the majority of Dutch consumers does not behave accordingly in the context of meat consumption, providing evidence of a clear gap between values and behaviour (Bot and Keuchenius, 2018; Rood et al., 2014; van Rossum et al., 2011; RIVM, 2016). There is promising evidence that nudges in the retail environment towards sustainable choices can be effective, for instance in fostering the purchase of meat substitutes by presenting them more visibly and next to similar meat products in the butchery (Vandenbroele et al., 2021), engaging the System 1 decision-making process. However, to our knowledge there is no empirical evidence of interventions profoundly engaging both System 1 and System 2 thinking. This study presents the effort of unpacking the potential of engaging both decision-making processes through ethical choice architecture.

2.1. Systemic design intervention

In the current study, we introduce a systemic design intervention to foster the consumption of more sustainably sourced meat products, by closing the value-action gap of consumers. Specifically designed for this experiment, the design intervention intentionally engages both System 1 and System 2 decision-making processes (Stanovich and West, 2000).

Based on System 2 thinking, Tomorrow's Menu supports a well-considered decision around which meat products to purchase, by relocating this moment of choice from the retail context to consumers' living rooms. At home, people generally have more discretionary time than they do in a retail environment, which is associated with a significant reduction of the value-action gap (Chai et al., 2015). The platform offers consumers memberships to farm types which produce meat in a way that is in line with their personal values, by providing them with transparency around production circumstances so they understand what a sustainable purchase entails. As members, they pay a fixed price per kilo of meat to the corresponding farmers. At the retailer, consumers receive a significant discount on the meat products within their membership, supporting purchase decisions in accordance with their values. This nudge acknowledges the dominance of System 1 thinking in the retail context, where competing values are more salient, and the capacity to engage System 2 thinking is often low.

The platform and its effect on sustainable purchases as well as congruence between values and actions is studied in a web-based experiment. Based on the presented theoretical background and the absence of empirical evidence of meat consumption behavioural interventions which appeal to both System 1 and System 2 decision-making processes, the following hypothesis is formulated:

H1. Tomorrow's Menu increases sustainable meat purchase.

As many people value the biosphere (Wang et al., 2021), we expect the design intervention to help close the value-action gap as well. Based on this, the second hypothesis is formulated:

H2. Tomorrow's Menu facilitates meat consumers to act in line with their biospheric values.

3. Materials and methods

3.1. Tomorrow's Menu in detail

Tomorrow's Menu, from here on referred to as TM, aims at fostering the consumption of meat products which have been produced in a sustainable manner. Meat products are considered sustainable when their

production has limited or no negative consequences for public health, animal welfare and/or the climate.

TM is a platform which connects consumers to farmers directly, by offering three types of memberships that allow consumers to become a member of a particular farm type for a monthly fee. Choosing a membership implies a discount at the retailer for all the products that come from this particular farm type. The three farm types distinguished by TM all sustainably produce meat products, but vary in the degree of their effect on the sustainability aspects mentioned earlier. As sustainability is a highly complex and layered aspect of meat consumption, the meat products are categorized into these groups. This categorization implies a simplification of their actual impact on the multitude of sustainability dimensions, but is considered appropriate as it makes the complexity comprehensible for consumers (Fig. 1).

The three sustainable farm types have been named 'Aqua', 'Mint' and 'Lime'. These names were chosen to be as neutral as possible, so as not to influence consumers' reflection on their own values regarding the varying approaches to meat production of these farm types. The colour-themed names were considered appropriate, as they could correspond with a visual design and could thereby be easily recognizable in the retail environment as well, supporting consumers to behave in line with their values.

When visiting the website, consumers are offered a self-assessment, posing questions to understand their values and resulting in a suggestion for one of the three memberships. For each farm type the sustainability aspects of its farming principles are explained, allowing consumers to explore which membership resonates most with their personal values. Each membership comes with a different price per kilo of meat. The meat products are distinguishable on the shelves through product labelling corresponding with the farm types (Fig. 2). After being registered as a member you receive a membership card with which you can claim your discount at the retailer's cash register (Fig. 3). With a membership, the price to be paid at the retailer becomes similar to the price of the cheapest product in its category (i.e., a variable discount). As such, in this redesign of the choice architecture the role of monetary incentives to choose unsustainably in the context of the retailer is accounted for.

By allowing consumers to take a large part of their purchasing decision at a self-chosen moment at home, and by guiding (or nudging) the actual purchase at the retailer through recognizable labels on products for each farm type, people are expected to behave more in line with their values and choose more sustainable products than they would do in the current context of the retailer and without such a membership. As such, through a redesign of the choice architecture TM aims to close the value-action gap for consumers.

3.1.1. Web-based experiment

TM was tested with participants in a web-based experiment. The aim was to test the effect of TM on the meat purchase (hypothesis 1) as well as on the congruence between values and behaviour (hypothesis 2). This is visualized in the conceptual framework in Fig. 4. Regression analyses and a Chi square test were used to test the hypotheses.

The digital prototype of TM consisted of screenshots from the website, which were designed with Adobe Illustrator, and surveys set up in Qualtrics. The research materials can be found in appendices A-C. The regression analysis was executed in SPSS.

3.1.2. Participants and procedure

We invited people to participate in the online study via social media and e-mail. There were no selection criteria, as all Dutch consumers are within the target group of the study. Therefore, the intention was to reach as many people as possible and to have diversity across participants in terms of their age, background, level of education and place of residence. These background variables were integrated in the first survey.

The study was introduced as an experiment to study consumer

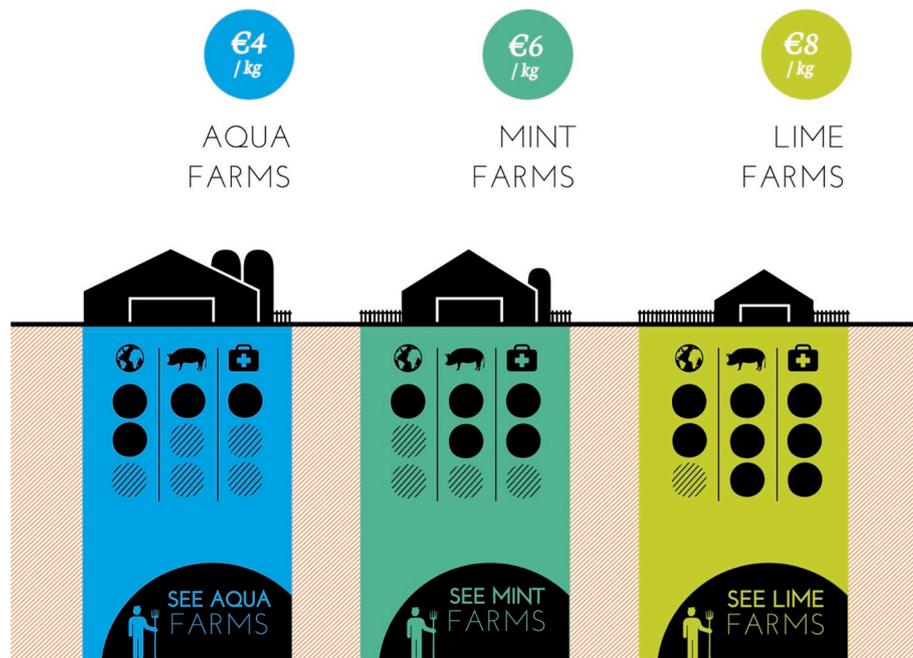


Fig. 1. The three memberships of Tomorrow’s Menu: Aqua, Mint and Lime. They vary in terms of their sustainability impact on the environment, animal welfare and public health. Lime products can be considered the most sustainably produced across all three sustainability pillars, followed by Mint and Aqua.

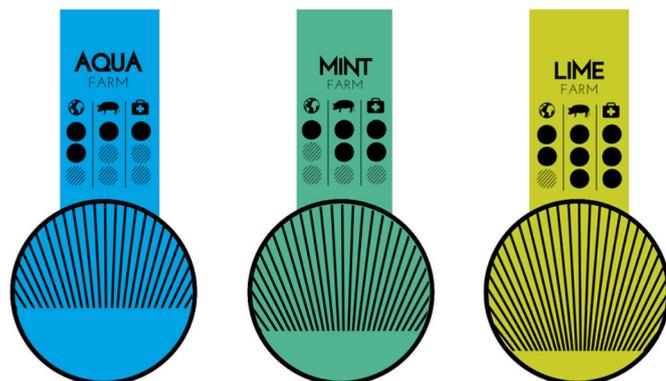


Fig. 2. Product labelling at the retailer for each membership.

behaviour. Participants were incentivized to complete the entire study with a chance to win 2 tickets to an amusement park or a museum. They were allowed to withdraw from the study at any moment without any consequences. The timeline of the study is shown in Fig. 5.

A power analysis assuming a medium effect size and a power of .80 showed that we needed 158 participants. In total 261 participants started to fill out the questionnaire at t0 of which 210 finished the questionnaire. Of these 210 participants, 131 started filling out the final questionnaire at t3 and 126 completed all the steps (52%). The profiles of the 126 participants were spread well in terms of gender (65% female and 35% male) and age (age ranged from 18 to 71, M = 35, SD = 14), yet almost all were relatively highly educated (39% finished a bachelor’s degree level, 50% a master’s degree, only 10% finished vocational training or lower) and lived in an urban environment (94%).

To randomize participants across conditions, they were sorted alphabetically and split into two groups: one TM group (67%) and one control group (33%). This unequal division was chosen for a research purpose beyond the scope of this study. Participants in the TM group were consulted three times over the course of three weeks, to engage with the platform and to complete a digital shopping assignment. The control group was consulted only once, with the shopping assignment.

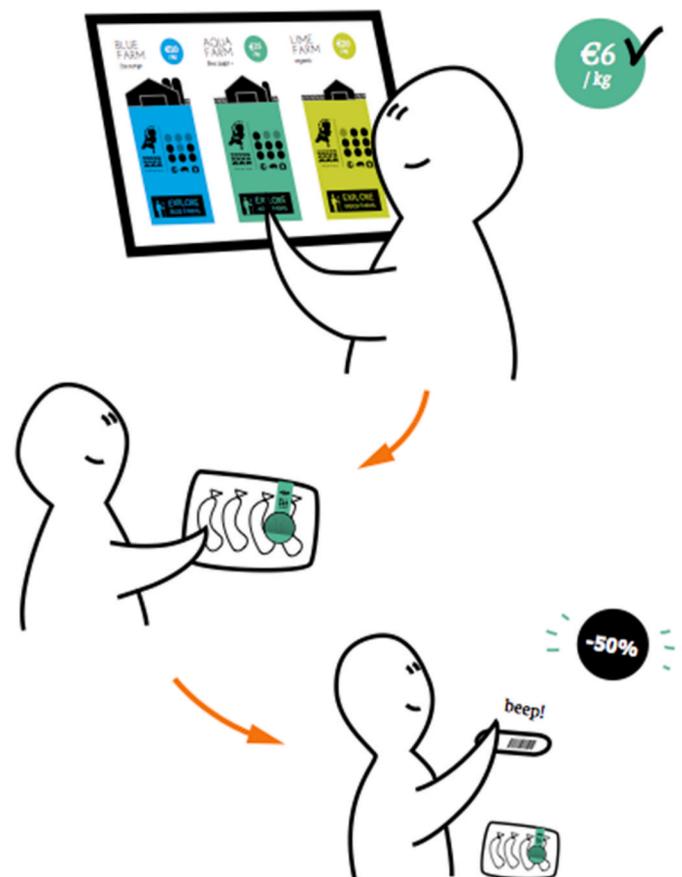


Fig. 3. The use of the Tomorrow’s Menu service: selecting a membership, purchasing a meat product from that farm type, and receiving a discount at the retailer’s cash register.

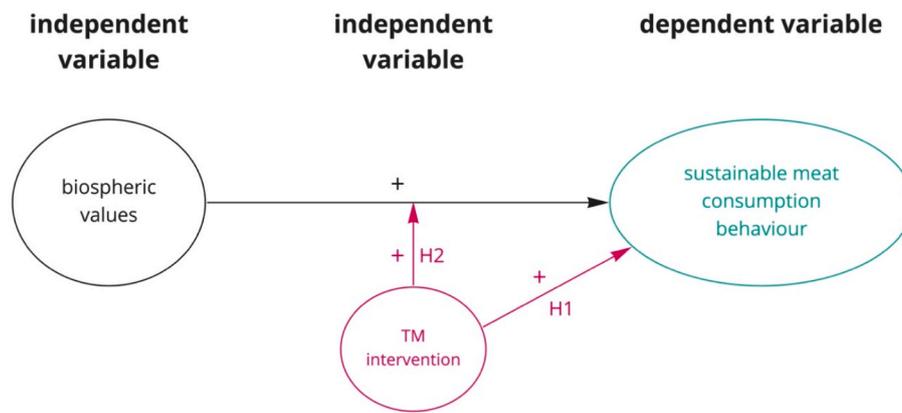


Fig. 4. Building blocks of the two hypotheses: TM will increase sustainable meat purchase (H1) and facilitate meat consumers to act in line with their biospheric values (H2).

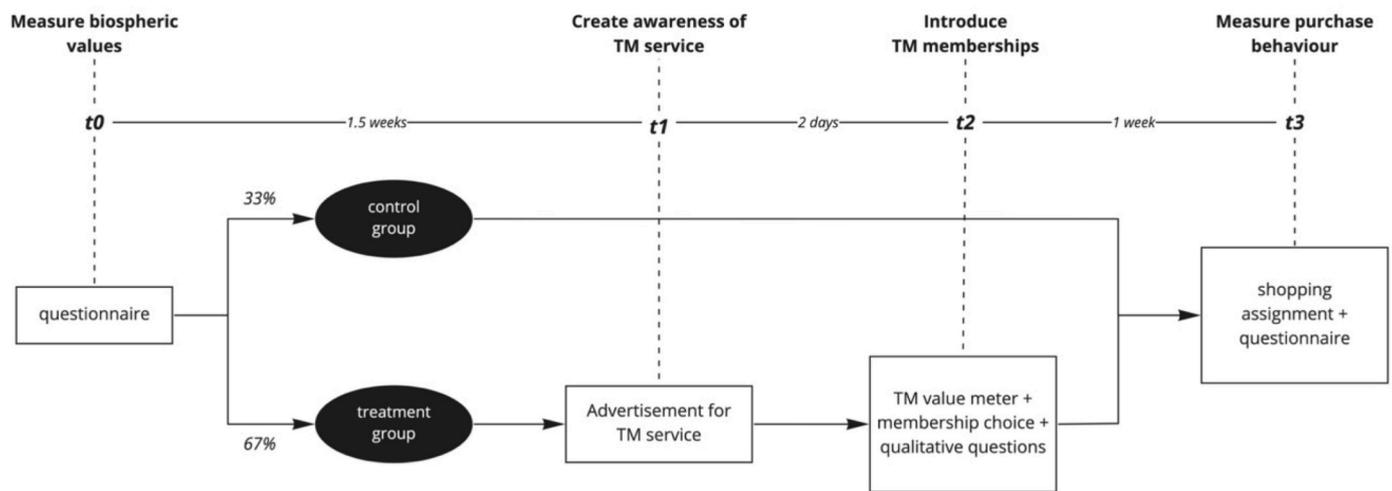


Fig. 5. The set-up of the study. The TM group was twice the size of the control group, since two versions of the advertisement at t1 were tested for purposes outside of this study. Since the effect of the two versions of the advertisement did not differ significantly from one another, both sub-groups in the TM group have been combined for this study.

When people were willing to take part in the study, they could click on a link that would directly lead them to the questionnaire of *t0*. They were asked for several personal details and an e-mail address for the next parts of the experiment to be sent to. They filled out 16 questions concerning their personal values. This questionnaire also contained questions on self-identities, but they are not used for the present study. To avoid the effects of priming, we left a certain amount of time in between each consultation. At *t1* (one and a half weeks after the first questionnaire) the TM group received a short video advertisement of TM to create awareness of the service. At *t2* (two days later) the same group was introduced to the online platform of TM, where they first had the opportunity to make their biospheric values salient through a ‘personal value meter’ (i.e. a self-assessment tool), which would help them identify their sustainability values and their relation with various farm types. Participants could freely choose a membership (‘Aqua’, ‘Mint’ or ‘Lime’) but were asked to do so only if they would also do this in real life. In the TM group, 77% was willing to purchase a membership at *t2*. In case they did not want a membership, they were asked why, which could provide insights about the quality of the design of TM. At *t3* (one week later), both the TM group and the control group received the shopping assignment in which they were asked to select products from the retailer. This questionnaire also contained questions on self-identities and other pro-environmental behaviour, which were not used for the present study.

3.1.3. Measures

3.1.3.1. *Biospheric values, t0*. Participants filled out a value questionnaire measuring their altruistic, egoistic, biospheric and hedonic values (Steg et al., 2014a,b). Participants rated the importance of each value as a guiding principle in their life on a Likert scale from -1 (‘opposed to my values’) to 7 (‘extremely important’). The biospheric value orientation was measured with four items (‘Respecting the Earth: harmony with other species’, ‘Unity with Nature: fitting into nature’, ‘Protecting the Environment: preserving nature’ and ‘Preventing Pollution: protecting natural resources’). The internal consistency of the biospheric value scale was 0.83 (M = 4.40, SD = 1.33).

3.1.3.2. *Meat purchase, t3*. In the final shopping assignment, participants were asked to imagine they would have guests over that evening, but still needed three products from the retailer: meat, chocolates and wine. In total they had 12.50 Euros to spend at the retailer on these products, minus a variable amount in the case they had chosen a membership at *t2*. There were four choices of meat the participants could choose from, which differed in price and impact on sustainability. One of the options was the cheapest and most unsustainable meat product. The other three options matched the different TM membership product categories (‘Aqua’, ‘Mint’ and ‘Lime’). For all participants each meat product is displayed with the label of the corresponding

membership as well as the discount that is given to their members. With the applied member discount, a TM meat product has the same price as the unsustainable meat product.

To make the choice more realistic and to force participants to make a trade off, they also had to spend their money on wine and chocolates (a higher price corresponding with a higher quality of the wine and chocolate). We measured whether people purchased the unsustainable meat product or one of the three sustainable options.

3.1.3.3. Sustainability and incongruence. The sustainability of the meat purchase is seen as a binary variable. Behaviour is considered incongruent when someone with biospheric values averaging 1 (“I find it important”) or higher purchases an unsustainable meat product from a ‘White farm’, or when someone with an average biospheric value of 0 (“I do not find it important”) or lower purchases a sustainable product from an ‘Aqua’, ‘Mint’ or ‘Lime’ farm. Incongruence indicates the presence of a value-action gap. In total 10 participants selected the unsustainable meat option (8%), while 116 participants chose one of the sustainable meat options (92%).

4. Results

4.1. Attrition analyses

Attrition analyses showed that participants who dropped out at *t3* did not differ from participants who only filled out the questionnaire at

t0 with regard to biospheric values ($t(208) = -1.24, p = .22$). Furthermore, we did not find differences between participants in the TM and control group at *t0* ($t(208) = -0.90, p = .37$). This suggests that random assignment to conditions was successful. We also did not find differences in biospheric values between the TM and control group at *t3* ($t(111) = -0.58, p = .56$), suggesting that participants who dropped out did not differ between the TM and control group.

4.2. Likelihood of choosing more sustainably

The chosen meat product significantly differs between participants from the TM group and control group ($\chi^2(1) = 11,49, p < .001, w = 0.30$). As can be seen in Fig. 6, participants in the TM group chose the unsustainable meat product significantly less (1%) than participants in the control group (18%), which supports our first hypothesis (*H1: Tomorrow’s Menu increases sustainable meat purchase*). There were no significant differences in choosing the sustainable meat option between the two different TM groups ($\chi^2(3) = 2,84, p = .42$): in the Aqua, Mint and Lime groups 0% chose the unsustainable meat option. Among the participants who did not choose a TM membership 5% chose the unsustainable meat option, but this was not significantly different between groups.

4.3. Congruence between values and behaviour

We conducted a logistic regression to test if TM strengthens the

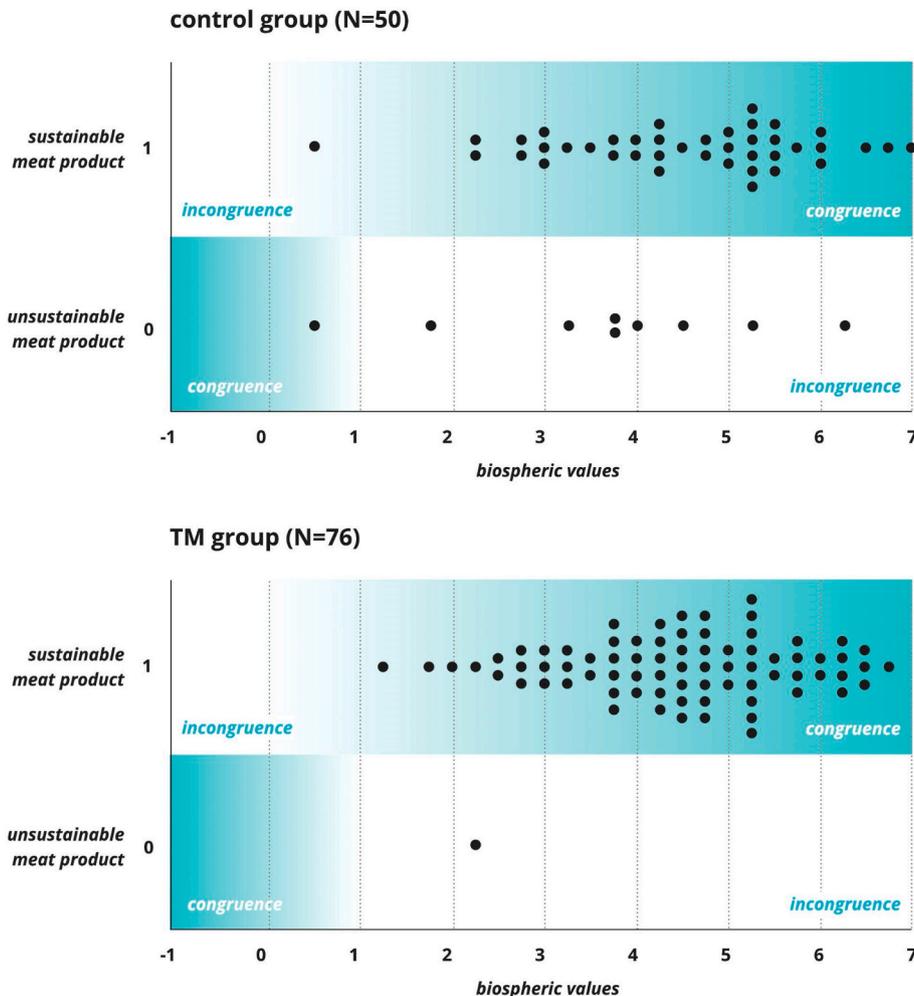


Fig. 6. Biospheric values and meat purchase of each participant in both groups. The coloured spaces represent congruence between values and consumption behaviour, while the white spaces represent the occurrence of a value-action gap.

relationship between biospheric values and meat purchase, closing the value-action gap. The likelihood ratio statistic is 52.19. Neither biospheric values ($B = 1.02, p = .09$), TM ($B = -0.95, p = .76$), nor their interaction ($B = 0.63, p = .29$) are significantly related to meat purchase when all variables are included in the model. Therefore, we did not find support for our second hypothesis (*H2: Tomorrow's Menu facilitates meat consumers to act in line with their biospheric values*).

We also tested the relationship between biospheric values and meat purchase, without controlling for TM. Logistic regression shows that people with stronger biospheric values are more likely to choose the sustainable meat option ($b = .50, p = .04$).

5. Discussion

The main aim of the study was to better understand how the choice architecture in a retail context can be redesigned to close the value-action gap, while fostering sustainable behaviour. Specifically, we aimed to test if choice architecture can strengthen the influence of biospheric values on meat purchase and thereby promote sustainable meat consumption.

The study has shown that TM increases sustainable purchasing of meat, confirming our first hypothesis (*H1: Tomorrow's Menu increases sustainable meat purchase*). We found that a change of the choice architecture can promote sustainable meat purchases. Our findings are in line with previous research which shows that changing the context can promote sustainable behaviour (Varotto and Spagnoli, 2017). Our intervention consisted of two parts, namely shifting the moment of choice and a cue to remind people of their choice at a later point in time. The moment of choice was placed outside of the retail environment and participants were asked to reflect on their values. That way, participants are less likely to be focused on costs, which is strongly emphasized in the retail context. Instead, by reflecting upon their values, people may be more likely to consider the environment when choosing a product. This part of the intervention was aimed at System 2 thinking (Stanovich and West, 2000). Furthermore, we provided participants who chose a TM membership with a cue at the retailer to remind them of their membership, which was aimed at System 1. We did not test the importance of the cue that targeted System 1; future research is needed to deepen our understanding of this component of the choice architecture.

The study also showed that the large majority of participants consider our natural resources and animal wellbeing to be important, which is in line with recent literature (Bouman et al., 2021; de Groot and Steg, 2008). However, the effect of TM on the congruence between values and behaviour was not significant, thereby not supporting our second hypothesis (*H2: Tomorrow's Menu facilitates meat consumers to act in line with their biospheric values*). We did not find that biospheric values were more strongly related to meat purchase when people were exposed to our intervention. Our findings suggest that asking people to reflect upon their values before choosing their product and reminding them of their choice in the supermarket does not make them act more in line with their biospheric values. These findings could be explained by the fact that there was not much of a value-behaviour gap in our sample.

Another explanation for the lack of significance of the effect of TM on value-behaviour congruence (*H2*), could be that TM's significant effect on consumption behaviour for people with high biospheric values is mediated by other factors that we did not measure, e.g., social norms or knowledge. By offering three kinds of memberships, we may have framed having a membership as 'the norm', and by communicating about the production principles of farmers, including images, we may have increased people's knowledge of meat production. These mediating factors could have affected meat purchase decisions. In line with previous studies that showed weak effects of values on behaviour (Thøgersen and Ölander, 2002) or stronger effects of other factors on behaviour (Carrington et al., 2010; Salmivaara et al., 2021; Vermeir and Verbeke, 2006), a "multi-layered, multi-factorial, approach" (Flynn et al. (2009) is needed to better understand the effect and mechanisms of

TM.

The use of nudges, including changing the choice architecture, to stimulate behaviours that impact people's "health, wealth, and happiness" positively (Thaler and Sunstein, 2008) has been contested from an ethical perspective (Mitchell, 2005; Veetil, 2011). Nudging implies an entity, i.e., a person or an institute, defines what is 'good' for people without having a mandate for it or asking for consent and as such, can become paternalistic. Our study sheds a different light on this discussion. First, we argue that conventional retail environments present a choice architecture in which it is difficult for people to act in line with what they consider important. In the current retail setting we (i.e., policy makers, system designers, retail designers, brand developers, etc.) have actually designed the context in which people are nudged to act unsustainably, installing and supporting the value-action gap. Second, we argue that we can redesign the choice architecture in a way that does justice to both what people value and how they are naturally inclined to act. Choice architecture can make people engage in deliberate processing, thereby making them reflect on their values and helping them understand sustainability aspects of the products they consider purchasing. Subsequently, the choice architecture can help them follow through and act more in line with what they find important. Indeed, we found that nobody with weak biospheric values bought sustainable meat. As such, we do not paternalize people by introducing TM; instead, we do justice to how people are while engaging them in complexity at the same time.

Regarding the complex societal transitions we need to engage in, it is our intention to open up the discussion on interdisciplinary and even transdisciplinary research based on our study. No single discipline can explain the complex matters we are facing today (e.g., social inequality, climate change, poverty, political indifference) and no single discipline is capable of 'solving' them. Our study has been an investigation into the complementary value of environmental psychological research and design research in studying the value-action gap. Whereas scholars in psychological research are often concerned with systematically unpacking phenomena through psychological variables and their relationships (e.g., value, attitude, intention, behaviour, norms, etc.), design researchers often take an integrative approach in understanding how to change a phenomenon, potentially building on a variety of theories, to then develop interventions to change the phenomena and test their effectiveness. Our study is an attempt to integrate disciplines to do more justice to the complexity of a phenomenon, i.e., the value-action gap in meat consumption, while making use of the strengths of both disciplines. These complementary strengths have generated novel insights into both our understanding of the value-action gap and our strategies to close it. Such collaborations are needed to learn how to better understand and deal with complex societal issues.

5.1. Implications for practice

This study shows it is worth looking at choice architecture in order to support people with their decision-making. Exemplified by TM, moving the product choice from the retail environment to a different spacial and temporal context, accompanied by a corresponding product membership, can promote sustainable choices. This choice architecture is applicable beyond meat consumption.

In the control group there were more people with strong biospheric values buying unsustainable meat products than in the TM group. This implies that the implementation of TM increased the predictability of consumer choices in the TM group, namely a larger part of the group chose a sustainable option. It could therefore be interesting for retailers to implement interventions with a similar choice architecture (not necessarily involving sustainability, but also other product characteristics) to support their business operations.

5.2. Limitations and future research

5.2.1. Limitations

Participants in this study were not representative of all Dutch consumers. While there was a spread in age and gender, almost all were relatively highly educated and lived in an urban environment. This may have influenced the results. The key limitation is that people included in this study generally scored high on biospheric values.

This study made use of an online, survey-based simulation. This controlled environment comes with the risk of participants potentially not answering in full honesty and does not include contextual factors from real-life shopping, such as having to pay actual money, being confronted with social norms and their past behaviours. Also, participants in the TM group were forced to consider the service of TM, i.e. they could not ignore it, while in the real world they could.

Next to the discussed factors surrounding individual consumers, such as their biospheric values, their understanding of the products they consider purchasing and choice architecture, consumer behaviour is also influenced by social practices (Reckwitz, 2002; Schatzki, 1996; Schatzki et al., 2001; Spaargaren, 2011). In decision-making, consumers act in accordance with collective routines, such as home cooking, grocery shopping and barbecuing. Collective values embedded within these social practices can conflict with consumers' personal values, subsequently influencing their behaviour in another direction. Social practices have not been considered in this study but do play a role in behaviour change and the adoption of behaviour change interventions.

5.2.2. Future research

Ruepert et al. (2017) have found that contextual factors may particularly promote sustainable choices among people with moderately strong biospheric values. To better understand the effectiveness of TM, we suggest a follow-up study with a more heterogeneous sample regarding people's biospheric values. Including a manipulation check by a repeated measure of these values, would allow for a mediation analysis. Also, we suggest including other measures like knowledge, past behaviour, and social norms. Further analysis of different consumer segments could shed an even more nuanced light on the effect of TM as well, since such segments have shown to be driven by different sets of values (de Boer et al., 2017; Flynn et al., 2009; Gonera et al., 2021).

Additionally, this study did not test the importance of the cue that TM memberships got in the retail environment (engaging System 1), to help them act in line with the values around meat production, which they had reflected upon earlier (engaging System 2). For a follow-up study we suggest an explicit focus on the System 1 and System 2 components of choice architecture, to better isolate their distinct functions in sustainable consumption behaviour and to further inform how to effectively design choice architecture.

A follow-up study with this particular intervention would also require the inclusion of scales to measure values which TM could compete with (e.g., hedonic values). From an ethical perspective, it would be important to measure whether people would engage in sustainable behaviours while having low biospheric values. A recent study by Babutsidze and Chai (2018) investigating the effect of social learning on closing the climate value-action gap, showed promising results regarding ethical nudging. They found that people with strong concerns for the environment were more likely to act in line with their values as a result of their intervention, while people who did not value the environment as much, were not 'tricked' into performing sustainable behaviour.

As this study exemplifies, future research focusing on the deliberate design of choice architecture fostering any kind of sustainable behaviour, would provide more integrated insights if it were approached in an interdisciplinary way.

6. Conclusions

The purpose of this study was to better understand whether an ethical redesign of choice architecture could facilitate more sustainable meat consumption and close the value-action gap. Following a web-based experiment consisting of surveys and a digital prototype of consumption platform Tomorrow's Menu, results confirm that a reconformation of the decision-making process can support consumers with moderate to high biospheric values in behaving more sustainably.

This study demonstrates the necessity to reconsider our environment and explore how we could redesign it to support and strengthen human moral decision-making in purchasing practices. People care for the environment and animal welfare, yet these values get overruled in high-pressure contexts like the supermarket. Rather than nudging people into morally superior decisions, this study supports the idea that it is possible to design a retail environment that does justice to both the values and the human tendencies of consumers. This study exemplifies that we can do so while still respecting human beings as moral decision-makers.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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