Investigating Environmentally Sustainable Consumption: A Diary Study of Home-Based Consumption Behaviors

Abstract

This study analyzes three environmentally sustainable household consumption behaviors (optimizing the use of domestic water, minimizing food waste, and minimizing plastic packaging usage) through the model of goal-directed behavior. The findings show that attitudes, subjective norms, perceived behavioral control, anticipated emotions, and habits are all significant predictors of the desire to adopt sustainable consumption behaviors, which directly fosters the intention to adopt these behaviors. Intention–behavior links were unique for each behavior; minimizing plastic packaging usage was the most difficult behavior to implement. This study offers useful insights into people's sustainable consumption goals and their intentions to adopt responsible consumption behaviors. A generalizable model of environmentally sustainable household behaviors that considers the three behaviors simultaneously is presented. This study suggests that business and policy strategies that could successfully promote sustainability in the household might proceed by, for example, empowering consumers or changing their habits.

Keywords: environmentally sustainable consumption behavior, food waste, domestic water consumption, plastic packaging consumption, model of goal-directed behavior

Introduction

The behaviors enacted by individuals within their households are the main contributors to the environmental challenges the world is currently facing (Organisation for Economic Co-operation and Development [OECD], 2011; UK Office for National Statistics, 2021). In particular, household consumption practices regarding food disposal, water consumption, and plastic packaging disposal have the highest carbon footprints (e.g., EPA, 2016; Gourmelon, 2015; Stenmarck et al., 2016; Wunder, 2019). Therefore, a comprehensive investigation that accounts for the role played by these everyday behaviors is required to achieve an in-depth understanding of sustainable consumption practices and develop effective interventions aimed at curbing these practices' negative effects on the environment. To achieve this goal, we applied the model of goal-directed behavior (MGB; Perugini & Bagozzi, 2001) to test the predictive power of motivational and affective processes and the habitual nature of these practices and understand household sustainable consumption. Therefore, our work seeks to provide a more accurate picture of home-based environmentally friendly behaviors while accounting for the peculiarities of three different household practices. This study surpasses previous attempts to explain sustainable consumption that have considered single behaviors in isolation (e.g., Rhein & Schmid, 2020; Wakefield & Axon, 2020) or that have neglected the role of desire as an individual personal motivation to behave a certain way or to reach a goal (e.g., Bissing-Olson et al., 2016; Tanner & Wölfing, 2003).

We focused on food disposal, water consumption, and plastic packaging disposal because these behaviors share some significant features. First, minimizing wasteful behaviors can effectively reduce the strain that individual consumption habits have on the environment (OECD, 2011). Second, consumers control their actions related to food waste, plastic packaging usage, and water consumption; therefore, they can change these actions. Third,

consumers engage in these behaviors singly, unlike behaviors where other people in the household contribute to overall consumption levels (e.g., energy consumption). Furthermore, to some extent, these behaviors are interrelated: for example, most wasted food products (e.g., fruits and vegetables) are packaged in single-use plastic (WRAP, 2022). This means that food waste, water consumption, and plastic consumption practices, as well as their underlying mechanisms, cannot be comprehended when they are considered in isolation.

We argue that the MGB is appropriate to comprehensively predict sustainable household behaviors for several reasons. First, developing sustainable behaviors requires considerable effort to overcome the inconvenience often associated with curbing habitual unsustainable behaviors within the household (Thøgersen, 2000) and, thereby, changing lifestyles (Thøgersen, 2005). Consequently, home-based sustainable actions are inherently goal-directed and deliberate (Thøgersen, 2000). Second, household behaviors occur frequently in the same settings and, therefore, tend to be difficult to change (Kurz et al., 2015). Moreover, unsustainable practices can be considered repetitive (e.g., Cappellini & Parsons, 2012; Hebrok & Heindenstrøm, 2019; Spurling et al., 2013), and they ultimately create waste (Peter & Honea, 2012). This means that the role played by the repetitiveness and frequency of past behaviors cannot be overlooked. Third, prior research has extensively demonstrated that beyond the deliberate processing involved when considering sustainable behavior changes (Peter & Honea, 2012), the emotional experience of the process serves as an impetus for the behavior (Passyn & Sujan, 2006). In particular, the anticipated emotions that enable the prediction of the emotional consequences of different actions (Graham-Rowe et al., 2015; Sirieix et al., 2017; Zeelenberg et al., 2000) are essential to defining consumers' likelihood of engaging in sustainable behaviors within the household.

Altogether, this evidence suggests the appropriateness of MGB to model the habitual nature of home-based sustainable behaviors, as well as the volitional and emotional

components underpinning their peculiarities. By applying this model to three behavioral domains simultaneously, this analysis facilitates a more accurate, generalizable, and reliable predictive model of environmentally relevant household behaviors. Furthermore, we propose a more parsimonious version of the MGB, including an overall measure of past behavior, which we term "habits." We conceptualize this measure in line with the existing literature on the role of habits in the enactment of pro-environmental behaviors and as a construct that summarizes these behaviors as prompted by environmental cues and regularly recurring in stable contexts, such as the household (MacInnes et al., 2022; Verplanken & Roy, 2016; Verplanken & Whitmarsh, 2021). We argue that this adaptation more precisely represents of practices enacted daily by consumers. Finally, we employ a novel diary-based technique to measure behavior at a later time than the behavioral antecedents factored into our model, thus overcoming the limitations of the survey-based measures adopted in prior research (Carrus et al., 2008; Passafaro et al., 2014).

Overall, by investigating the psychological underpinnings of three sustainable household behaviors through the adaptation of the MGB, this work defines guidelines for the development of interventions to foster consumers' sustainable behavior. In this sense, this research contributes to the literature on testing marketing interventions developed to promote environmentally conscious behaviors within households or organizations (e.g., Bandyopadhyay et al., 2021; Smith and O'Sullivan, 2021). Our results suggest practical ways for both companies and policymakers to develop messages and interventions to promote household sustainable behaviors. Furthermore, the implications of this study extend to an organizational context, as our findings could provide useful insights into promoting sustainable work practices and choices within companies and other institutions. Finally, we contributed to and extended the existing research that tested the predictive ability of the MGB

through qualitative methods (Schuster et al., 2013; 2015) and neglected to test for the effect of intentions on behavior (e.g., Carrus et al., 2008; Choe et al., 2020; Passafaro et al., 2014).

2. Theoretical background: Explaining home-based sustainable behaviors through the MGB

Household sustainable behaviors "occur frequently and recurrently in unvarying settings" and "tend to be ingrained and difficult to change" (Kurz et al., 2015, p. 114). Recent research has highlighted the key roles these behaviors play in consumers' everyday lives and underlined the need to consider them as *practices* (e.g., Cappellini and Parsons, 2012; Hebrok and Heindenstrøm, 2019; Spurling et al., 2013). In line with this perspective, the frequency of performing the behavior in the past is an important predictor of sustainable behavior (Kurz et al., 2015; Carrus et al., 2008). Furthermore, a consumer-centric approach to sustainability should focus on "fostering consumer behavior that tempers overconsumption and repetitive consumption that, despite convenience, creates waste" (Peter and Honea, 2012, p. 269; Sheth et al., 2011). We agree with this view and argue that the repetitiveness of a behavior is an important predictor of household sustainable behaviors; neglecting repetitiveness would limit the predictive ability of theoretical models developed to explain environmentally conscious behaviors.

Furthermore, the existing literature on sustainable consumption has underlined the volitional component that is required for changes to reduce repetitive wasteful behaviors to be enacted (Peter and Honea, 2012), conceptualizing this as a deliberation process (Escadas et al., 2019) comprising several stages (Peter and Honea, 2012). This concurs with research highlighting the need for consumers to have a specific goal in mind to overcome the inconvenience that is often associated with curbing habitual unsustainable behaviors within the household (Thøgersen, 2000), and, thereby, change their lifestyles (Thøgersen, 2005).

Therefore, sustainable behaviors and, especially, practices that are enacted every day within the household can be considered inherently goal-directed.

However, despite the key role played by cognitive processing when a person is considering a behavior change (Peter and Honea, 2012), the affective and emotional experience involved in this process serves as the impetus for behaviors (Passyn and Sujan, 2006). The literature has extensively shown that emotions are critical when investigating the antecedents of sustainable household behaviors (e.g., Bissing-Olson et al., 2016). For example, the desire to avoid experiencing negative emotions is an important determinant of consumers' intentions to reduce food waste and their likelihood of engaging in that behavior (e.g., Attiq et al., 2021; Graham-Rowe et al., 2015; Han & Hyun, 2017; Russell et al., 2017; Sirieix et al., 2017). Similarly, prior research empirically supports the association between positive and negative emotions and engagement in pro-environmental behaviors, such as water conservation (Bissing-Olson et al., 2016; Han & Hyun, 2017), and plastic use reduction (Bissing-Olson et al., 2016; Peter & Honea, 2012; Zwicker et al., 2020). Consequently, messages intended to foster behavioral change in terms of everyday plastic consumption are more effective when they leverage the affective component of these behaviors (Peter and Honea, 2012). Similarly, emotional framing is a useful tool for designing advertising messages to encourage consumers to reduce their plastic consumption (Septianto and Lee, 2020). Thus, the anticipated emotions that enable people to predict the emotional consequences of different actions before enacting them (Zeelenberg et al., 2000) appear to be important determinants of consumers' likelihood to engage in sustainable behaviors within the household.

Altogether, this evidence suggests the importance of accounting for the habitual nature of home-based sustainable behaviors, as well as the volitional and emotional components underpinning their peculiarities. However, attempts in the existing research to

consider the role of past behavior (e.g., Foroughi et al., 2022) or the effects of emotions on consumers' intentions and behaviors (e.g., Graham-Rowe et al., 2015; Stancu et al., 2016), have considered these factors in isolation, overlooking their joint role in consumers' sustainable practices. Furthermore, the literature has largely conceptualized sustainable behaviors as moral behaviors and, therefore, focused on moral emotions, such as pride and guilt (e.g., Shimul & Cheah, 2023; Stefan et al., 2013; Talwar et al., 2022). This reflects the overall tendency of the prior literature to largely neglect the goal-directed and volitional nature of sustainable behaviors, thus failing to consider the role that the desire to engage in a behavior plays in determining consumers' actions.

Therefore, a reliable model of home-based sustainable behaviors must simultaneously account for these different factors and peculiarities when predicting consumers' intention to engage in and actual enactment of sustainable household behaviors. Therefore, to provide an accurate picture of home-based sustainable behaviors, we adapted and applied the MGB (Perugini and Bagozzi, 2001) to three behaviors that consumers habitually engage in at home.

We argue that this model is appropriate because it accounts for the volitional, emotional, and habitual characteristics of the home-based sustainable behaviors outlined above. However, we propose an adaptation of the MGB consistent with considering these behaviors as actions and practices that consumers enact every day. As a result, we argue in support of a single measure of habits that captures the recurring and repetitive nature of the behaviors under investigation. In this sense, we argue to exclude the recency of past behavior as the distinction between past behaviors' frequency and recency loses meaning in the context of daily actions, such as the minimization of food waste, plastic usage, and water consumption. This allowed us to investigate the influence of the habitual aspects of decision-making, which further helps to explain the development of desire, intentions to act, and, finally, enacted behaviors. Therefore, our adapted version of the MGB connects all elements

of the model that affect the behavior in pursuit of the goal and, ideally, the behavior itself (Perugini and Conner, 2000).

Furthermore, we employ a novel diary-based technique to measure behavior at a later point than the behavioral antecedents accounted in our model, thus overcoming the limitations of the survey-based measures adopted by prior research (Carrus et al., 2008; Passafaro et al., 2014). Figure 1 shows the hypothesized model.

3. Materials and methods

3.1 Procedures

To assess the conceptual model proposed, we conducted a study with a convenience sample of Italian consumers. We developed a two-step data collection design. First, the respondents completed a paper-based questionnaire measuring the relevant variables. Then, after about one month, respondents recorded their domestic consumption over a week in a daily paper diary. Using one month between the two steps minimizes possible biases of consumption estimates due to a temporally close collection of diaries and questionnaires. This mixed, sequential research design (Creswell, 2009) has been usefully applied in prior studies (Barone et al. 2019; Camp and Lawrence, 2019; Russell et al., 2017) and its potential acknowledged (Williams et al. 2020) in the context of sustainable consumption behaviors.

In the instructions provided at the beginning of the study, we defined environmentally sustainable household consumption behaviors, asking participants to refer to the following:

> A household consumption pattern can be defined as sustainable when the quality of life benefits AND the environmental costs of this consumption pattern are balanced, so that the quality of life of present generations is guaranteed as well as that of future generations (e.g., consuming water and food without wasting them allows you to get what you need without wasting natural resources; minimizing plastic packaging use

and extending their life through reusing them can significantly lessen the connected environmental costs).

To obtain a measure of actual consumption behaviors, we asked each participant to fill out a diary with information on three different household consumption behaviors and provided precise instructions about how to complete the diary. Participants were asked to record all of their domestic behaviors related to water consumption, plastic packaging use, and food waste, according to the guidelines in the diary. They were told to consider all of the relevant behaviors in the domestic context even when indirectly managed (e.g., if someone else in the household did the respondent's laundry or dishwasher, they were required to note these consumptions in the diary). We asked respondents to be as accurate as possible in entering all of the relevant behaviors and giving all the details requested. To measure the amount of food wasted, participants were asked to record all of the food and drink they threw away as waste during the day, using the same materials as in Romani et al. (2018). For water consumption, respondents recorded their domestic daily use of water for various purposes by recording how many times they performed the following actions each day: brushing teeth (tap switched off or tap left running), washing hands and face, showering, bathing, flushing toilets, washing clothes in the washing machine or by hand, washing dishes in the dishwasher or the sink. To measure the usage of plastic packaging, we asked respondents to record all of the plastic packaging materials used (by type and amount) each day. A monetary reward was provided to respondents who completed the study as a thank-you for their time. Participants were entitled to the monetary reward after both the questionnaire and the diary had been correctly completed and returned (i.e., the univocal identification code was reported in both the research materials). The reward favored respondents' participation in both steps of the

study (dropout rate: 3%), enabling the correct development of the research design[1]. Information from the diaries was recorded in a database and all of the quantities were converted into units of weight (grams or centiliters).

4.2 Participants

In total, 322 people living in diverse cities in Italy were contacted individually. The data were collected through convenience sampling with the help of research assistants who contacted possible participants. Of the invited participants, 25 declined to participate and 8 either did not deliver the materials or delivered incomplete materials at the end of the project. Therefore, the study included a final convenience sample of 289 adults in household units, which exceeds the minimum standards for sample size and model identification (Kline, 2015; MacCallum et al., 1996) and aligns with the suggestion of using an observation-to-latent-variable ratio of 20:1 (Hair et al., 2018). All participants were provided with informed consent forms stating the ethical procedures involved in the study. All of the respondents also received a communication explaining the aim of the study and three subsequent visits to their homes. During the first visit, trained researchers delivered the questionnaire and assisted respondents in completing it in case of doubts; during the second visit, researchers delivered the diary and explained how to complete it; and during the last visit, they collected the

[1] In the research material instructions, we specified that accepting to participate in the research indicated that each respondent understood that their questionnaire and diary needed to be matched. Therefore, each respondent was assigned an identification code (printed on the questionnaire) that had to be recorded in the diary as well. This allowed us to match the research materials. We also explained the measures we had taken to avoid ethical issues during the study: (a) The respondents' anonymity was guaranteed; respondents cannot be identified by this research and all of their responses have been kept confidential, used for research purposes only, and collected in aggregate form only; (b) we also guaranteed that the respondents would not be contacted by others as a result of the information they provided for this study. Finally, we provided them with specific email addresses to contact if they needed more information.

diaries. Sociodemographically, the sample was 57.2% women; average age 42 years (SD = 14.58); and 19.4% undergraduate or higher educated respondents, followed by respondents with a high school education (52.5%) or less (28.1%).

4.3 Measures

Step 1 of the study measured the relevant variables for the model. The items were developed according to the guidelines for correctly measuring this type of construct (Fishbein and Ajzen, 2011; Perugini and Bagozzi, 2001) and measured on 7-point scales. Table 1 details the items used and the sources for each dimension.

— Table 1 here —

In Step 2 of the study, data on three specific environmentally sustainable household behaviors were collected to be explained through the proposed adapted version of the MGB, thus strengthening the study's scope and dependability. Inspired by previous research (e.g., Romani et al., 2018), we used a daily diary to record consumers' actual behaviors and asked each respondent to record in a one-week, daily diary: (1) the exact weight or conventional measures (which were indicated at the beginning of the diary for uniformity among respondents; e.g., handful, cup, or spoon) of food and drink wasted during the day; (2) the domestic daily use of water for the purposes detailed in the diary (e.g., bathing or flushing toilets); (3) the type and amount of plastic packaging materials consumed domestically (e.g., how many 1.5-liter plastic bottles were used). When the data were entered into a database, the quantities were converted into grams (for food waste and plastic packaging consumed) and centiliters (for water consumed). The conversion of each activity into grams or centiliters was performed for all respondents using the same parameters to ensure the uniformity and reliability of the measures[2]. Descriptive statistics showed that, on average, respondents

[2] Food waste was entered according to the exact weight reported by respondents when available, or by converting the conventional measures into grams (e.g., a handful: 40 grams; a cup: 195 grams; a spoon: 15

consumed almost 800 liters of water, more than 900 grams of plastic packaging, and wasted more than 600 grams of food weekly (Table 2)[3].

5. Results

The dependent variables were standardized for use in the analyses. The measures were first validated, and the scales had adequate internal reliability (see Table 2). A confirmatory factor analysis (CFA) was run using structural equation modeling (Lisrel 8.80). The models' fit was good (Bagozzi and Yi, 2012): χ^2 (179) = 263.60, p = .00; CFI = 0.99; NNFI = 0.98; RMSEA = 0.04; SRMR = 0.03. All factor loadings were high and significant, and the average

grams), which were estimated based on this online source: https://www.ilgiornaledelcibo.it/cambio-tra-volume-e-peso-in-cucina-la-tabella/. Each of the water-related activities detailed in the questionnaire corresponds to a specific amount of water equivalent to the estimated average amount of water consumed by those activities. The average amount of water for each activity was estimated based on this online source: https://www.watercalculator.org/footprint/indoor-water-use-at-home/, which was developed by GRACE Communications Foundation, a nonprofit organization that developed the Water Footprint Calculator. The plastic packaging consumption was converted into grams based on several online sources (e.g., www.quantopesa.it) which helped to identify the conversion standards that were used for all respondents (e.g., a 1.5-litre bottle: 40 grams; a plastic plate: 13 grams).

[3] These results align with the official statistics about individual consumption in Italy. The water used in Italy per capita averages approximately 150 cubic meters per inhabitant per day (www.istat.it). The water consumption measured in this study is lower than the official estimate, but it is reliable as, in the weekly diaries collected, respondents were asked to keep note of only specific frequent consumptions but not an exhaustive list of water usage (for example, respondents did not record the amount of water used for cooking). The per capita consumption of plastic packaging is estimated between 35/kg (Eurostat, 2016) and 70/kg (WWF, 2019) per year, or approximately 1 kg per person per week, as the consumption measured shows. Finally, the amount of food wasted per capita in Italy has been estimated at approximately 27.5/kg per year (Reduce Project, 2020), which corresponds to 530 grams per week, as the amount measured in the study suggests.

variances extracted (AVE) were above the threshold of 0.50 for each dimension (Hair et al., 2018).

— Table 2 here —

To check for possible method biases, we applied various procedural remedies, such as protecting respondents' anonymity to reduce their apprehension and make them less likely to edit their responses to be more socially desirable or consistent with their perception of the researcher's desired results (Podsakoff et al., 2003). Simultaneously, common method variance (CMV) was assessed by controlling for the effects of an unmeasured latent method factor (Podsakoff et al., 2003). We added a new first-order factor to the CFA model explaining all of our measures (χ^2 (224) = 652.22; CFI = 0.93; NNFI = 0.91; RMSEA = 0.08; SRMR = 0.08). All loadings of the measures of the theoretical latent variables remained positive, significant (*p*-values <0.001), and stronger than the loadings of the same measures on the common method factor. Therefore, CMV was not a major problem in our model.

Then, we tested the proposed model using structural equation modeling (Lisrel 8.80). The model showed an excellent fit (χ^2(226) = 337.92, p = .00; CFI = 0.98; NNFI = 0.98; RMSEA = 0.04; SRMR = 0.05). As previous research has highlighted the existence of potentially relevant intention–behavior gaps when environmental consumption is investigated, emphasizing the importance of considering the intention–behavior links (e.g., Carrington et al., 2010; McDonagh and Prothero, 2014), we focused on the relationships between intentions and the three specific environmentally sustainable household consumption behaviors. All three relationships were statistically significant and relevant; the stronger the intention to adopt environmentally sustainable household consumption behaviors, the less food wasted, water used, and plastic packaging consumed.

To test for potential differences in the strength of the links between intentions and the three behaviors, we ran a series of chi-squared tests. First, we compared the model without

constraints with one where the three parameters connecting intentions and actual behaviors were fixed to be equal ($\chi^2(228) = 345.30$). The χ^2 test comparing the two models was significant ($\Delta \chi^2(2) = 7.38$, $p < 0.05$), therefore, the model with more freely estimated parameters fit the data better than the alternative model (Bollen, 1989). Then, we ran partial comparisons considering two parameters at a time. The results of the χ^2 test comparing the model without constraints and the model with parameters making intentions, water consumption, and plastic packaging consumption equal ($\chi^2(227) = 345.2$) are significant ($\Delta \chi^2(1) = 7.37$, $p < 0.05$), as well as those for the model in which the two parameters "intentions–food waste consumption" and "intentions–plastic packaging consumption" are fixed to be equal ($\chi^2(227) = 368.07$; $\Delta \chi^2(1) = 30.15$, $p < 0.05$]. Conversely, the model in which the parameters connecting intentions, water consumption, and food waste are fixed equal ($\chi^2(227) = 340.09$) was superior; the χ^2 test results were not significant ($\Delta \chi^2(1) = 2.17$, $p > 0.05$). The two relationships "intentions–water consumption" and "intentions–food waste" are equal and stronger than the intentions–plastic packaging consumption link[4]. The results are illustrated in Figure 2.

— Figure 2 here —

[4] A comparison between the adapted MGB proposed and the TPB model ($\chi^2(60) = 101.24$, $p = .00$; CFI = 0.98; NNFI = 0.97; RMSEA = 0.05; SRMR = 0.05) in terms of predictive power was also run. The comparison resulted in testing the differences in the variance explained for intentions and, subsequently, for behaviors, for TPB and the adapted MGB. Considering the difference in layers between the TPB and the adapted MGB, the comparison is best understood as more than a mere formal comparison of the variance explained (Richetin et al., 2008); only a comparison that also considers the different numbers of antecedents is conceivable. The adapted MGB predicted intentions ($R^2 = 0.30$) better than the TPB did ($R^2 = 0.18$), especially considering the fewer direct antecedents of intentions in the MGB. The proposed model predicted behaviors similarly to TPB; food waste was better predicted by the adapted MGB (R^2 food waste MGB = .38; R^2 food waste TPB = .34). Therefore, we can conclude that the proposed MGB offers better predictive power than the TPB.

6. Discussion

By adapting the MGB to account for the specificities of the investigated behaviors, we provide a more accurate picture of the sustainable household practices enacted by consumers in their everyday lives. Specifically, we examine the habitual and goal-directed nature of these behaviors from a motivational and affective perspective, considering the roles of habits and anticipated, goal-directed positive and negative emotions. In this sense, we consider variables neglected by prior studies on this topic (e.g., Graham-Rowe et al., 2015) and add to the research investigating the role of goals in shaping intentions to act. We thereby challenge the perspective that intentions are the only proximal antecedent of behavior (e.g., Perugini & Bagozzi, 2001; Richetin et al., 2011).

Specifically, this study supports a connection between an individual's positive appraisal of environmentally sustainable domestic consumption behaviors and their desire to act accordingly, aligning with prior contributions that have applied the MGB to sustainable behaviors (e.g., Carrus et al., 2008; Song et al., 2012). Meanwhile, the effect of perceived social pressure (subjective norms) reveals that people's desire to consume sustainably is affected by others' opinions and people seek the approval of significant others. Thus, while prior research has extensively documented the role that subjective norms play in defining attitudes (Minton et al., 2018), intentions to engage (e.g., Khan et al., 2019; Russell et al., 2017; Stefan et al., 2013), and sustainable behaviors (e.g., Kang et al., 2017), our findings show that the desire to enact these practices cannot be overlooked in predictive models of household sustainable consumption behaviors.

More importantly, perceived behavioral control and the anticipated positive emotions associated with goal achievement have stronger influences on an individual's desire than their attitudes and subjective norms. This finding further affirms the goal-directed nature and the

need to include *desire* when predicting consumers' sustainable behaviors. It simultaneously stresses the need for investigations of household sustainable consumption to focus on the role that emotions related to goal achievement play, rather than on the moral emotions explored in previous work (e.g., Shimul & Cheah, 2023; Stefan et al., 2013; Talwar et al., 2022). In this sense, our work highlights the volitional nature of sustainable household behaviors and suggests that policy interventions intended to promote these practices should revolve around empowering consumers and helping them develop a strong intent to engage in such practices. For example, technology in the form of apps that inspire consumers, make them excited to set and maintain sustainable behavior goals (e.g., reducing food waste), and elicit feelings of control over their actions could be successful in directing individuals toward more environmentally friendly home-based practices.

Conversely, the anticipated negative emotions of goal failure only marginally affect desire. The differences may reflect the context examined (Perugini & Bagozzi, 2001) and the meaning of anticipated emotions for approach and avoidance goals (Higgins, 1996).

Our study also shows that habits positively affect an individual's desire to adopt environmentally sustainable domestic consumption behaviors. This finding contributes to research into the role of these behaviors as practices that are enacted every day in the household and are, consequently, difficult to change (e.g., Cappellini & Parsons, 2012; Hebrok & Heindenstrøm, 2019; Kurz et al., 2015). This finding suggests that acting to break consumers' habits could succeed in promoting sustainable consumption inside the home. In particular, as the habitual nature of these actions is triggered by stable contexts and unchanged cues, our study suggests that changing the home environment could help to promote positive household behaviors. While changes in the physical environment have already been recommended to address environmental issues in out-of-home contexts, such as canteens and restaurants (e.g., Nielsen et al., 2017), our findings suggest that a similar

approach could be a key element to drive individuals to pursue their sustainability goals. For example, policymakers could invest in the development of guidelines to provide suggestions on how to improve the home environment to reduce food waste, water consumption, and plastic packaging usage. In particular, local authorities could be key actors in the promotion of such behaviors in their communities as they can develop campaigns aimed at changing habits that could more easily reach consumers and trigger them to implement the needed changes in their homes.

Finally, by providing evidence that the desire to behave sustainably inside the household drives intentions to act accordingly, our results align with research arguing that limited resources and competing goals constrain consumers' efforts to pursue sustainable goals and change their lifestyles (Thøgersen, 2005). That is, this work acknowledges and provides evidence that while many people express the desire to act sustainably, in practice, they can struggle to do so.

Overall, our research shows that the MGB is suitable for predicting environmentally relevant, home-based consumption behaviors by simultaneously considering three behavioral domains in one framework. Our study, therefore, provides a more generalized picture of the factors influencing individuals' efforts to act sustainably within their homes than prior work focusing only on isolated behaviors (Carrus et al., 2008; Passafaro et al., 2014). More importantly, we employed a two-stage data collection process in which the components of the MGB and the enacted behaviors were measured at two different points, one month apart. This technique overcomes the limitations of measures based on a single self-reported questionnaire. Finally, our results demonstrate that the three specific environmentally sustainable consumption behaviors studied are strongly predicted by intentions to act. In this sense, our study answers Hassan et al.'s (2016) call for further evidence to quantify this relationship in ethical consumption.

From a practical perspective, our work provides useful insights into motivation strategies and the development of effective interventions to promote consumers' environmentally sustainable behaviors. For example, our results suggest that appealing to consumers' anticipated emotions related to goal achievement might overcome their reluctance to engage in sustainable behaviors and increase their feelings of agency and empowerment (White et al., 2019). As recent research (Grappi et al., 2024) has suggested, our results also suggest that marketers and practitioners should consider using messages that positively depict sustainable consumption and the positive emotions of enacting related behaviors instead of focusing on negative messages related to the non-adoption of such behaviors (e.g., pollution). People Tree, the London-based sustainable and fair-trade brand whose declared aim is to produce "fashion that's good for the planet," and Levi's, which promoted sustainable consumption behaviors with campaigns based on positive feelings (e.g., the "Do good, Feel good" campaign), are examples of brands that promote sustainable consumption behaviors by leveraging positive feelings in line with the understanding that adopting this approach could also encourage sustainable household consumption practices.

Furthermore, this research implies that targeting and reinforcing goal desires that are strictly connected to intentions is a relevant addition to the strategies developed to increase people's intentions and, consequently, their behaviors. In this sense, acknowledging the goal-directed nature of these behaviors in messaging might be effective, such as leveraging consumers' motivation to engage in a behavior while underlining how such motivation ultimately leads to goal achievement. IKEA's "Sustainable everyday" campaign, which encourages consumers to be environmentally conscious by showing them how to achieve more sustainable homes, helps people feel empowered to live more sustainably.

Our results regarding the effect of subjective norms on desires suggest that creating environments where sustainable behaviors are applauded and unsustainable behaviors are

strongly criticized enables consumers to engage in the sociality of environmentally sustainable consumption. This presents strategic opportunities for companies to play a key role in promoting sustainable consumption practices. For example, the Comfort detergent brand campaign of an exchange shop hosted in partnership with Elle, Cosmopolitan, and Oxfam helped raise awareness of the importance of buying second-hand and recycled clothing, increasing the social acceptance and popularity of these practices. Visitors were able to exchange an item of their clothing with one donated by one of the campaign partners and share the experience with other consumers. Such strategies could also be extended from the household to the organizational context, as companies and institutions could develop interventions to promote employees' sustainable work practices by leveraging how much such practices are acceptable for both top management and peers. Similarly, companies and academic institutions could develop interventions and display messages in environments where employees' and students' behaviors are relatively public (e.g., in canteens), leveraging individuals' subjective norms to increase their desire to make more sustainable choices. Future research could further test these insights.

6.1. Limitations and future research

Although this study provides interesting insights, several limitations and, hence, opportunities for future research should be mentioned. First, our results showed that habits can foster desires but fail to directly affect intentions. While we measured this dimension following the guidelines in the literature and consistent with previous studies that adopted the MGB, we acknowledge that self-reported measures are limited in this context. To overcome this methodological issue, future research could consider a longitudinal approach to track and measure real past behavior over time (e.g., twelve months); this would provide a more accurate measure of past behavior, whose effect could then be compared to current desires, intentions, and behaviors.

Similarly, our results show that habits directly and significantly affect only food waste minimization, but not plastic packaging usage or water consumption. In this sense, these results align with prior research showing that habits and past behavior might be insufficient to predict current behavior (e.g., Aitken et al., 1994); however, they contrast with other contributions affirming that the habitual nature of these practices should be accommodated in predictive models of behavior (e.g., Gregory & Di Leo, 2003; Raimondo et al., 2022). These conflicting findings suggest that other factors might affect the relationship between past behavior and current behavior (e.g., individual characteristics or situational factors). Therefore, future research could extend the MGB by adding new variables to confirm, extend, or reverse our findings in this arena.

Second, self-reported data were used and some error is, therefore, likely in the behaviors recorded. While we acknowledge that self-reported data is highly appropriate for self-regulation by consumers who set personal goals and control their behavior, future research could employ more sophisticated methods of measuring behavior that might provide an even more reliable and accurate account of the extent to which individuals engage in sustainable behaviors within their households. For example, recent research has used scanner panel data to track and match products that were bought in stores but wasted at home (van Lin et al., 2023). Future research could use similar methods to track both food waste and plastic packaging consumption in the home. To measure the actual consumption of water inside the household, future research could use data from smart meters installed inside respondents' houses and cross-check the results with factors such as the number and habits of people living in the unit to derive an accurate measure of how much water is used per capita. Alternatively, apps are available on the market, such as EyeOnWater, the Food Waste Tracker App from Mitre, and My Little Plastic Footprint, that respondents could use in future studies to record their actual food waste, water consumption, and plastic packaging usage.

Furthermore, participants' willingness to download the app could be used as a proxy for their intention to engage in the investigated behavior, providing an alternative measure that surpasses simple self-reported intentions.

Third, the data for this study were gathered from single sources. Future research could monitor environmentally sustainable household behaviors using various sources to acquire the most accurate indication of behaviors in practice. The collection of this data could be aided by technology, for example, apps similar to the aforementioned ones that could be seamlessly integrated into consumers' everyday lives. Other sources could include observation through the collection of store receipts and consumers' trash, which could be matched to identify the volume of products consumed and wasted.

References

Aitken, C. K., McMahon, T. A., Wearing, A. J., & Finlayson, B. L. (1994). Residential water use: Predicting and reducing consumption 1. *Journal of Applied Social Psychology*, *24*(2), 136-158. https://doi.org/10.1111/j.1559-1816.1994.tb00562.x

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Attiq, S., Habib, M. D., Kaur, P., Hasni, M. J. S., & Dhir, A. (2021). Drivers of food waste reduction behaviour in the household context. *Food Quality and Preference*, *94*, 104300. https://doi.org/10.1016/j.foodqual.2021.104300

Bandyopadhyay, A., Septianto, F., & Nallaperuma, K. (2021). How scolding can encourage consumer engagement with plastic waste issue? The moderating role of consumers' mindset. *Journal of Retailing and Consumer Services*, *62*, 102671. https://doi.org/10.1016/j.jretconser.2021.102671

Bagozzi, R. P., & Yi, Y. (2012). Specification, evaluation, and interpretation of structural equation models. *Journal of the Academy of Marketing Science*, 40, 8-34.https://doi.org/10.1007/s11747-011-0278-x

Barone, A. M., Grappi, S., & Romani, S. (2019). The road to food waste is paved with good intentions: When consumers' goals inhibit the minimization of household food waste. *Resources, Conservation & Recycling*, *149*, 97–105. https://doi.org/10.1016/j.resconrec.2019.05.037

Bissing-Olson, M. J., Fielding, K. S., & Iyer, A. (2016). Experiences of pride, not guilt, predict pro-environmental behavior when pro-environmental descriptive norms are more positive. *Journal of Environmental Psychology*, 45, 145-153. https://doi.org/10.1016/j.jenvp.2016.01.001

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.

Camp, B., & Lawrence, N. S. (2019). Giving pork the chop: Response inhibition training to reduce meat intake. *Appetite*, 141, 104315. https://doi.org/10.1016/j.appet.2019.06.007

Cappellini, B., & Parsons, E. (2012). Sharing the meal: Food consumption and family identity. In *Research in consumer behavior*. Emerald Group Publishing Limited.

Carrington, M. J., Neville, B. A., & Whitwell, G. J. (2010). Why ethical consumers don't walk their talk: Towards a framework for understanding the gap between the ethical purchase intentions and actual buying behaviour of ethically minded consumers. *Journal of business ethics*, *97*, 139-158. https://doi.org/10.1007/s10551-010-0501-6

Carrus, G., Passafaro, P., & Bonnes, M. (2008). Emotions, habits and rational choices in ecological behaviours: The case of recycling and use of public transportation. *Journal of Environmental Psychology*, *28*(1), 51–62. https://doi.org/10.1016/j.jenvp.2007.09.003

Choe, Y., Kim, H., & Cho, I. (2020). Role of patriotism in explaining event attendance intention and media consumption intention: The case of Rio 2016. *Current issues in tourism*, *23*(5), 523-529.https://doi.org/10.1080/13683500.2019.1579173

Creswell, J. W. (2009). *Research Design: Qualitative, quantitative and mixed methods approaches* (3rd ed.). Sage.

EPA - Environmental Protection Agency (2016). *How we use water*. https://www.epa.gov/watersense/how-we-use-water

Escadas, M., Jalali, M. S., & Farhangmehr, M. (2019). Why bad feelings predict good behaviours: The role of positive and negative anticipated emotions on consumer ethical decision making. *Business Ethics: A European Review*, 28(4), 529-545. https://doi.org/10.1111/beer.12237

Fishbein, M., & Ajzen, I. (2011). *Predicting and changing behavior: The reasoned action approach*. Taylor & Francis

Foroughi, B., Arjuna, N., Iranmanesh, M., Kumar, K. M., Tseng, M. L., & Leung, N. (2022). Determinants of hotel guests' pro-environmental behaviour: Past behaviour as moderator. *International Journal of Hospitality Management, 102*, 103167. https://doi.org/10.1016/j.ijhm.2022.103167

Fry, M. L., Drennan, J., Previte, J., White, A., & Tjondronegoro, D. (2014). The role of desire in understanding intentions to drink responsibly: An application of the model of goal-directed behaviour. *Journal of Marketing Management*, *30*(5-6), 551-570. https://doi.org/10.1080/0267257X.2013.875931

Gourmelon, G. (2015). *Global plastic production rises, recycling lags—New Worldwatch Institute analysis explores trends in global plastic consumption and recycling*. Worldwatch Institute.

Graham-Rowe, E., Jessop, D. C., & Sparks, P. (2015). "Predicting household food waste reduction using an extended theory of planned behavior", *Resources, Conservation & Recycling*, *101*, 194–202. https://doi.org/10.1016/j.resconrec.2015.05.020

Grappi, S., Bergianti, F., Gabrielli, V., & Baghi, I. (2024). The effect of message framing on young adult consumers' sustainable fashion consumption: The role of anticipated emotions and perceived ethicality. *Journal of Business Research, 170, 114341*. https://doi.org/10.1016/j.jbusres.2023.114341

Gregory, G. D., & Leo, M. D. (2003). Repeated behavior and environmental psychology: the role of personal involvement and habit formation in explaining water consumption 1. *Journal of Applied Social Psychology*, 33(6), 1261-1296. https://doi.org/10.1111/j.1559-1816.2003.tb01949.x

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate data analysis* (8th ed.). Cengage.

Han, H., & Hyun, S. S. (2017). Fostering customers' pro-environmental behavior at a museum. *Journal of Sustainable Tourism*, *25*(9), 1240-1256. https://doi.org/10.1080/09669582.2016.1259318

Hassan, L. M., Shiu, E., & Shaw, D. (2016). Who says there is an intention–behaviour gap? Assessing the empirical evidence of an intention–behaviour gap in ethical consumption. *Journal of Business Ethics*, *136*(2), 219–236. https://doi.org/10.1007/s10551-014-2440-0

Hebrok, M., & Heidenstrøm, N. (2019). Contextualising food waste prevention—Decisive moments within everyday practices. *Journal of Cleaner Production*, *210*, 1435–1448. https://doi.org/10.1016/j.jclepro.2018.11.141

Higgins, E. T. (1996). Ideals, oughts, and regulatory focus: Affect and motivation from distinct pains and pleasures. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 91–114). Guilford Press.

Kang, J., Grable, K., Hustvedt, G., & Ahn, M. (2017). Sustainable water consumption: The perspective of Hispanic consumers. *Journal of Environmental Psychology*, *50*, 94-103. https://doi.org/10.1016/j.jenvp.2017.02.005

Khan, F., Ahmed, W., & Najmi, A. (2019). Understanding consumers' behavior intentions towards dealing with the plastic waste: Perspective of a developing country. *Resources, Conservation and Recycling*, *142*, 49-58. https://doi.org/10.1016/j.resconrec.2018.11.020

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. Guilford publications.

Kurz, T., Gardner, B., Verplanken, B., & Abraham, C. (2015). Habitual behaviors or patterns of practice? Explaining and changing repetitive climate-relevant actions. *Wiley Interdisciplinary Reviews: Climate Change*, *6*(1), 113–128. https://doi.org/10.1002/wcc.327

Leone, L., Perugini, M., & Ercolani, A. P. (2004). Studying, practicing, and mastering: A test of the model of goal-directed behavior (MGB) in the software learning domain. *Journal of applied social psychology*, *34*(9), 1945-1973. https://doi.org/10.1111/j.1559-1816.2004.tb02594.x

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structural modeling. *Psychological Methods*, *1*(2), 130–149. https://doi.apa.org/doi/10.1037/1082-989X.1.2.130.

MacInnes, S., Grün, B., & Dolnicar, S. (2022). Habit drives sustainable tourist behaviour. *Annals of Tourism Research*, *92*, 103329. https://doi.org/10.1016/j.annals.2021.103329

McDonagh, P., & Prothero, A. (2014). Sustainability marketing research: Past, present and future. *Journal of Marketing Management*, 30(11-12), 1186-1219. https://doi.org/10.1080/0267257X.2014.943263

Minton, E. A., Spielmann, N., Kahle, L. R., & Kim, C. H. (2018). The subjective norms of sustainable consumption: A cross-cultural exploration. *Journal of Business Research*, *82*, 400-408. https://doi.org/10.1016/j.jbusres.2016.12.031

Nielsen, A. S. E., Sand, H., Sørensen, P., Knutsson, M., Martinsson, P., Persson, E., & Wollbrant, C. (2017). *Nudging and pro-environmental behaviour*. Nordisk Ministerråd. http://dx.doi.org/10.6027/TN2016-553

OECD - Organisation for Economic Co-operation and Development (2011). *Greening household behaviour: The role of public policy*. OECD Publishing.

Passafaro, P., Rimano, A., Piccini, M. P., Metastasio, R., Gambardella, V., Gullace, G., & Lettieri, C. (2014). The bicycle and the city: Desires and emotions versus attitudes, habits and norms. *Journal of Environmental Psychology*, *38*, 76–83. https://doi.org/10.1016/j.jenvp.2013.12.011

Passyn, K., & Sujan, M. (2006). Self-accountability emotions and fear appeals: Motivating behavior. *Journal of Consumer Research*, *32*(4), 583–589. https://doi.org/10.1086/500488

Perugini, M. & Bagozzi, R. P. (2001). The role of desires and anticipated emotions in goal-directed behaviours: Broadening and deepening the theory of planned behavior. *British Journal of Social Psychology*, *40*, 79–98. https://doi.org/10.1348/014466601164704

Perugini, M., & Conner, M. (2000). Predicting and understanding behavioral volitions: The interplay between goals and behaviors. *European Journal of Social Psychology*, *30*(5), 705-731. https://doi.org/10.1002/1099-0992(200009/10)30:5%3C705::AID-EJSP18%3E3.0.CO;2-%23

Peter, P. C., & Honea, H. (2012). Targeting social messages with emotions of change: The call for optimism. *Journal of Public Policy & Marketing*, *31*(2), 269–283. https://doi.org/10.1509/jppm.11.098

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, *88*(5), 879. https://doi.org/10.1037/0021-9010.88.5.879

Raimondo, M., Hamam, M., D'Amico, M., & Caracciolo, F. (2022). Plastic-free behavior of millennials: An application of the theory of planned behavior on drinking choices. *Waste Management*, *138*, 253-261. https://doi.org/10.1016/j.wasman.2021.12.004

Rhein, S., & Schmid, M. (2020). Consumers' awareness of plastic packaging: More than just environmental concerns. *Resources, Conservation and Recycling*, 162, 105063. https://doi.org/10.1016/j.resconrec.2020.105063

Richetin, J., Perugini, M., Adjali, I., & Hurling, R. (2008). Comparing leading theoretical models of behavioral predictions and post-behavior evaluations. *Psychology & Marketing*, *25*(12), 1131-1150. https://doi.org/10.1002/mar.20257

Richetin, J., Conner, M., & Perugini, M. (2011). Not doing is not the opposite of doing: Implications for attitudinal models of behavioral prediction. *Personality and Social Psychology Bulletin*, 37, 40–54. https://doi.org/10.1177/0146167210390522

Romani, S., Grappi, S., Bagozzi, R. P., & Barone, A. M. (2018). Domestic food practices: A study of food management behaviors and the role of food preparation planning in reducing waste. *Appetite*, *121*(1), 215–227. https://doi.org/10.1016/j.appet.2017.11.093

Russell, S. V., Young, C. W., Unsworth, K. L., & Robinson, C. (2017). Bringing habits and emotions into food waste behaviour. *Resources, Conservation and Recycling*, *125*, 107-114. https://doi.org/10.1016/j.resconrec.2017.06.007

Schuster, L., Drennan, J., & N. Lings, I. (2013). Consumer acceptance of m-wellbeing services: A social marketing perspective. *European Journal of Marketing*, *47*(9), 1439-1457. https://doi.org/10.1108/EJM-10-2011-0556

Schuster, L., Proudfoot, J. and Drennan, J. (2015), "Understanding consumer loyalty to technology-based self-services with credence qualities", *Journal of Services Marketing*, Vol. 29 No. 6/7, pp. 522–532. https://doi.org/10.1108/JSM-01-2015-0021

Septianto, F., & Lee, M. S. (2020). Emotional responses to plastic waste: Matching image and message framing in encouraging consumers to reduce plastic consumption. *Australasian Marketing Journal (AMJ)*, 28(1), 18-29. https://doi.org/10.1016/j.ausmj.2019.09.002

Sheth, J. N., Sethia, N. K., & Srinivas, S. (2011). Mindful consumption: A customer-centric approach to sustainability. *Journal of the Academy of Marketing Science*, *39*, 21-39. https://doi.org/10.1007/s11747-010-0216-3

Shimul, A. S., & Cheah, I. (2023). Consumers' preference for eco-friendly packaged products: pride vs guilt appeal. *Marketing Intelligence & Planning*, *41*(2), 186-198. https://doi.org/10.1108/MIP-05-2022-0197

Shiu, E. M., Hassan, L. M., Thomson, J. A., & Shaw, D. (2007). An Empirical Examination of the Extended Model of Goal-Directed Behaviour: Assessing the Role of Behavioural Desire, in *E-European Advances in Consumer Research* Volume 8, eds. Borghini, S., McGrath, M. A., & Duluth, C. O. MN: Association for Consumer Research, Pages: 66-71. https://www.acrwebsite.org/volumes/13878/eacr/vol8/E-08

Sirieix, L., Lála, J., & Kocmanová, K. (2017). Understanding the antecedents of consumers' attitudes towards doggy bags in restaurants: Concern about food waste, culture, norms and emotions. *Journal of Retailing and Consumer Services*, *34*, 153–158. https://doi.org/10.1016/j.jretconser.2016.10.004

Smith, A. M., & O'Sullivan, T. (2012). Environmentally responsible behaviour in the workplace: An internal social marketing approach. *Journal of Marketing Management*, 28(3-4), 469-493. https://doi.org/10.1080/0267257X.2012.658837

Song, H. J., Lee, C. K., Kang, S. K., & Boo, S. J. (2012). The effect of environmentally friendly perceptions on festival visitors' decision-making process using an extended model of goal-directed behavior. *Tourism Management*, *33*(6), 1417-1428. https://doi.org/10.1016/j.tourman.2012.01.004

Spurling, N., McMeekin, A., Shove, E., Southerton, D., & Welch, D. (2013). *Interventions in practice: Re-framing policy approaches to consumer behaviour.* University of Manchester, Sustainable Practices Research Group.

Stancu, V., Haugaard, P., & Lähteenmäki, L. (2016). Determinants of consumer food waste behaviour: Two routes to food waste. *Appetite*, *96*, 7-17. https://doi.org/10.1016/j.appet.2015.08.025

Stefan, V., van Herpen, E., Tudoran, A. A., & Lähteenmäki, L. (2013). Avoiding food waste by Romanian consumers: The importance of planning and shopping routines. *Food quality and preference*, *28*(1), 375-381. https://doi.org/10.1016/j.foodqual.2012.11.001

Stenmarck, Â., Jensen, C., Quested, T., Moates, G., Buksti, M., Cseh, B., ... & Östergren, K. (2016). *Estimates of European food waste levels*. IVL Swedish Environmental Research Institute.

Talwar, S., Kaur, P., Kumar, S., Salo, J., & Dhir, A. (2022). The balancing act: How do moral norms and anticipated pride drive food waste/reduction behaviour?. *Journal of Retailing and Consumer Services*, *66*, 102901. https://doi.org/10.1016/j.jretconser.2021.102901

Tanner, C., & Wölfing Kast, S. (2003). Promoting sustainable consumption: Determinants of green purchases by Swiss consumers. *Psychology & marketing*, *20*(10), 883-902. https://doi.org/10.1002/mar.10101

Thøgersen, J. (2000). Psychological determinants of paying attention to eco-labels in purchase decisions: Model development and multinational validation. *Journal of Consumer Policy*, *23*(3), 285–313. https://doi.org/10.1023/A:1007122319675

Thøgersen, J. (2005). How may consumer policy empower consumers for sustainable lifestyles? *Journal of Consumer Policy*, *28*(2), 143–177. https://doi.org/10.1007/s10603-005-2982-8

UK Office for National Statistics (2021). *A review of household behaviour in relation to food waste, recycling, energy use and air travel.* https://www.ons.gov.uk/economy/environmentalaccounts/articles/areviewofhouseholdbehaviourinrelationtofoodwasterecyclingenergyuseandairtravel/2021-11-01

van Lin, A., Aydinli, A., Bertini, M., Van Herpen, E., & Von Schuckmann, J. (2023). Does cash really mean trash? An empirical investigation into the effect of retailer price promotions on household food waste. *Journal of Consumer Research*, *50*(4), 663-682. https://doi.org/10.1093/jcr/ucad018

Verplanken, B., & Roy, D. (2016). Empowering interventions to promote sustainable lifestyles: Testing the habit discontinuity hypothesis in a field experiment. *Journal of environmental psychology*, *45*, 127-134. https://doi.org/10.1016/j.jenvp.2015.11.008

Verplanken, B., & Whitmarsh, L. (2021). Habit and climate change. *Current Opinion in Behavioral Sciences*, *42*, 42-46. https://doi.org/10.1016/j.cobeha.2021.02.020

Wakefield, A., & Axon, S. (2020). "I'ma bit of a waster": Identifying the enablers of, and barriers to, sustainable food waste practices. *Journal of Cleaner Production*, *275*, 122803. https://doi.org/10.1016/j.jclepro.2020.122803

White, K., Habib, R., & Hardisty, D. J. (2019). How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. *Journal of Marketing*, *83*(3), 22-49. https://doi.org/10.1177/0022242919825649

Williams, H., Lindström, A., Trischler, J., Wikström, F., & Rowe, Z. (2020). Avoiding food becoming waste in households–The role of packaging in consumers' practices across different food categories. *Journal of Cleaner Production*, *265*, 121775. https://doi.org/10.1016/j.jclepro.2020.121775

WRAP. (2022). *Reducing household food waste and plastic packaging*. https://wrap.org.uk/sites/default/files/2022-02/WRAP-Reducing-household-food-waste-and-plastic-packaging-Summary.pdf

Wunder, S. V., Van Herpen, E., McFarland, K., Ritter, A., van Geffen, L., Stenmarck, Å., & Hulten, J. (2019). Policies against consumer food waste. Policy options for behaviour change including public campaigns. REFRESH Deliverable 3.4.

Zeelenberg, M., Van Dijk, W. W., Manstead, A. S., & vanr de Pligt, J. (2000). On bad decisions and disconfirmed expectancies: The psychology of regret and disappointment. *Cognition & Emotion*, *14*(4), 521–541. https://doi.org/10.1080/026999300402781

Zwicker, M. V., Nohlen, H. U., Dalege, J., Gruter, G. J. M., & van Harreveld, F. (2020). Applying an attitude network approach to consumer behaviour towards plastic. *Journal of Environmental Psychology*, 69, 101433. https://psycnet.apa.org/doi/10.1016/j.jenvp.2020.101433

Table 1. Step 1: Measurement items of the relevant variables of the model

Variable	Items	Source
Attitudes	(1) Bad, (7) Good (1) Negative, (7) Positive (1) Worthless, (7) Worthwhile	Ajzen (1991)
Positive anticipated emotions	How much would you feel **inspired** if you succeeded in achieving the goal of consuming in an environmentally sustainable way in the following weeks? (1) = Not at all (7) = Very much How much would you feel **enthusiastic** if you succeeded in achieving the goal of consuming in an environmentally sustainable way in the following weeks? (1) = Not at all (7) = Very much How much would you feel **excited** if you succeeded in achieving the goal of consuming in an environmentally sustainable way in the following weeks? (1) = Not at all (7) = Very much	Perugini and Bagozzi (2001)
Negative anticipated emotions	How much would you feel **distressed** if you did not succeed in achieving the goal of consuming in an environmentally sustainable way in the following weeks? (1) = Not at all (7) = Very much How much would you feel **upset** if you did not succeed in achieving the goal of consuming in an environmentally sustainable way in the following weeks? (1) = Not at all (7) = Very much How much would you feel **disappointed** if you did not succeed in achieving the goal of consuming in an environmentally sustainable way in the following weeks? (1) = Not at all (7) = Very much	Perugini and Bagozzi (2001)
Subjective norms	If I adopt environmentally sustainable household consumption behaviors in the following weeks, people who are important to me would… (1) = Completely disapprove, (7) = Completely approve Most people who are important to me think that adopting environmentally sustainable household consumption behaviors in the following weeks is… (1) = Very undesirable, (7) = Very desirable	Barone et al. (2019)
Perceived behavioral control	How much control do you perceive you have over whether you adopt environmentally sustainable household consumption behaviors in the following weeks? (1) = Very little control, (7) = A great deal of control How difficult would it be for you to adopt environmentally sustainable household consumption behaviors in the following weeks? (1) = Very difficult; (7) = Very easy	Barone et al. (2019)
Habits	How often did you adopt environmentally sustainable household consumption behaviors during the past year? (1) = Very rarely (7) = Very often	Perugini and Bagozzi (2001)
Desires	My desire for adopting environmentally sustainable household consumption behaviors in the following weeks can be described as… (1) = Very weak, (7) = Very strong I desire to adopt environmentally sustainable household consumption behaviors in the following weeks. (1) = Not at all (7) = Very much I want to adopt environmentally sustainable household consumption behaviors in the following weeks. (1) = Not at all (7) = Very much	Perugini and Bagozzi (2001)
Intentions	I intend to adopt environmentally sustainable household consumption behaviors in the following weeks. (1) = Very unlikely, (7) = Very likely How likely are you to adopt environmentally sustainable household consumption behaviors in the following weeks? (1) = Very unlikely, (7) = Very likely My intention to adopt environmentally sustainable household consumption behaviors in the following weeks is… (1) = Very weak, (7) = Very strong	Ajzen (1991)

Table 2. Means, standard deviations, correlations, and reliability[a]

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Attitudes	6.43	0.82	0.84										
2. Positive anticipated emotions	4.68	1.74	0.24**	0.66									
3. Negative anticipated emotions	3.12	1.41	0.15*	0.37**	0.84								
4. Subjective norms	3.56	1.47	0.12	0.30**	0.36**	0.70							
5. Perceived behavioral control	4.86	1.06	0.17**	0.26**	0.17**	0.45**	0.69						
6. Habits	4.93	1.45	0.07	0.18**	0.25**	0.41**	0.59**	-					
7. Desires	5.03	1.21	0.31**	0.43**	0.42**	0.52**	0.60**	0.47**	0.92				
8. Intentions	4.99	1.47	0.14**	0.17**	0.26**	0.29**	0.23**	0.21**	0.37**	0.76			
9. Water consumption (data collected through the daily diary)	79586 cl	32107 cl	-0.18**	-0.05	-0.11	-0.21**	-0.10	-0.16**	-0.22**	-0.52**	-		
10. Plastic packaging consumption (data collected through the daily diary)	904 gr	735 gr	-0.12*	-0.14*	-0.15*	-0.16**	-0.10	-0.15*	-0.23**	-0.37**	0.27**	-	
11. Food waste (data collected through the daily diary)	621 gr	310 gr	0.03	-0.13*	-0.10	-0.26**	-0.15**	-0.24**	-0.25**	-0.46**	0.45**	0.28**	-

[a] Reliability indexes are on the diagonal. Asterisks indicate the following: *p <.05, **p <.01.

Figure 1. Conceptual model

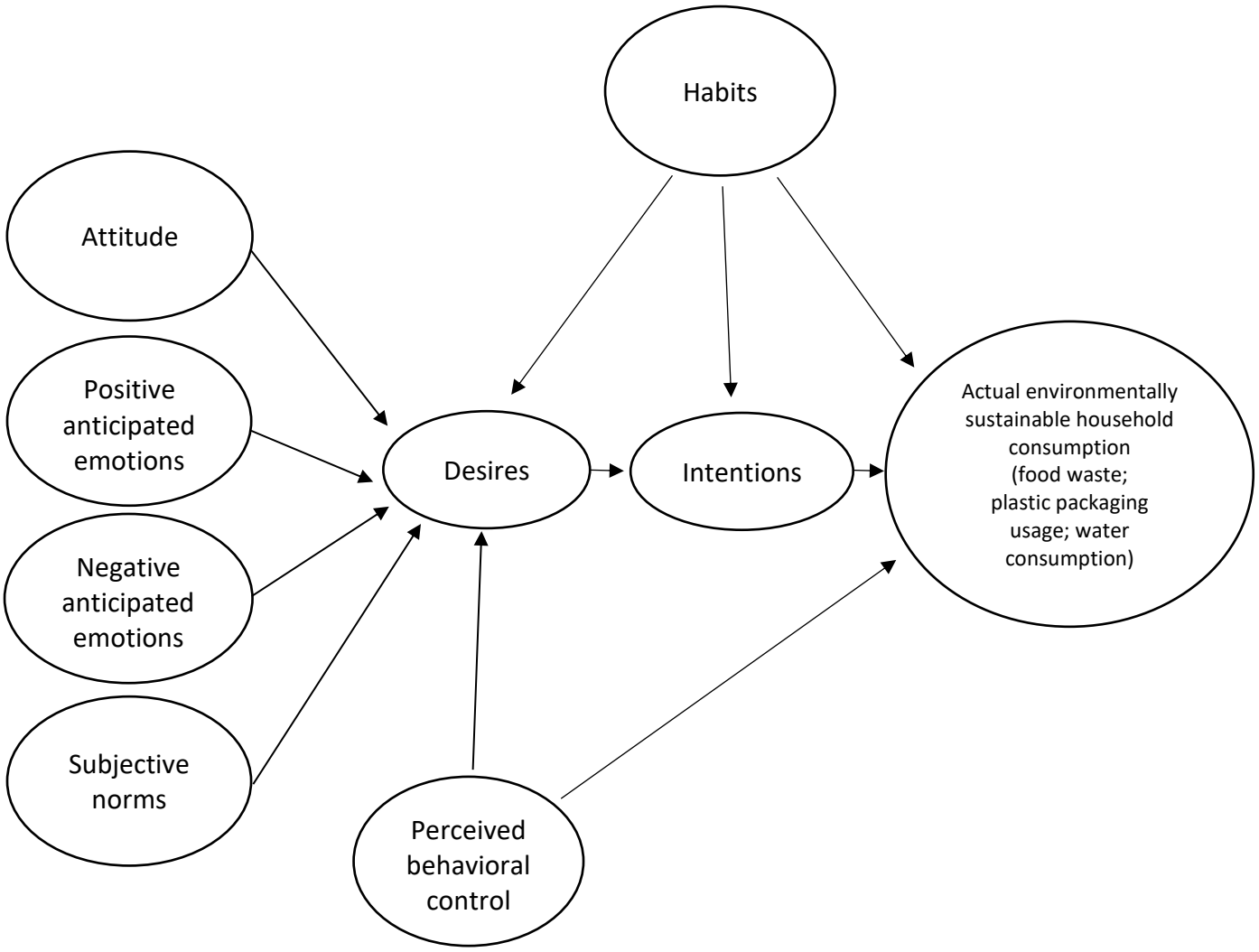
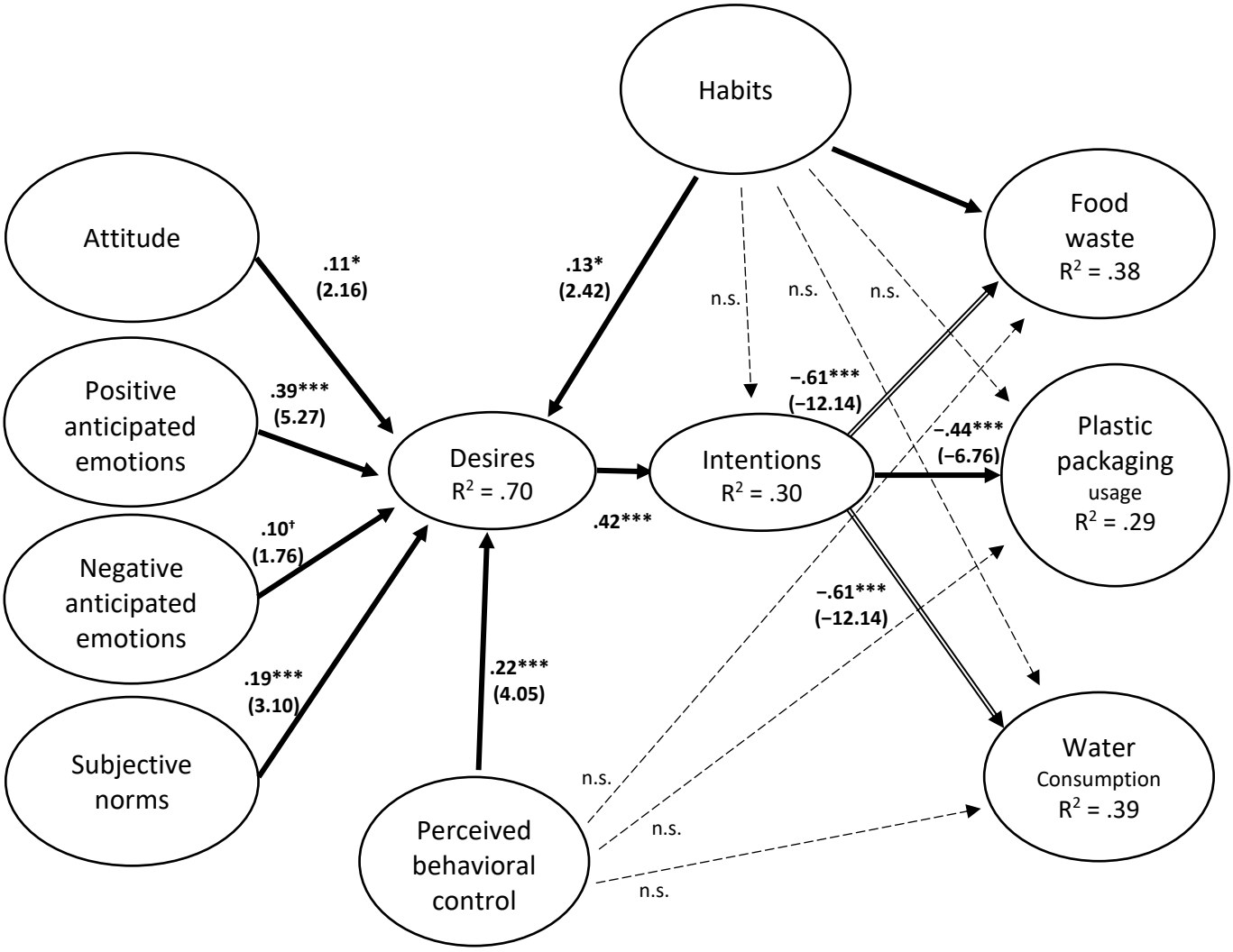


Figure 2. Results



Standardized effect (*t*-value). Statistically significant links are shown in bold. Equal parameters are identified with a double-line arrow. Asterisks indicate the following: †p <.10; *p < .05; **p < .01; ***p < .001; n.s. = Not significant.