

The role of cultural values in the effectiveness of environmental NGO campaigns on sustainable meat consumption

Béatrice Parguel^{a,*}, Karine Charry^b, Gaëlle Pantin-Sohier^c, Fanny Thomas^c

^a University Paris Dauphine - PSL, DRM [M-Lab], UMR CNRS, 7088, Paris, France

^b LRIM, Université Catholique de Louvain, Mons, Belgium

^c Univ Angers, GRANEM, SFR CONFLUENCES, F-49000, Angers, France

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ABSTRACT

Food production, particularly meat consumption, poses severe environmental challenges, including greenhouse gas emissions, deforestation, water depletion, and nutrient runoff. Despite the urgency of reducing meat consumption, traditional norms and cultural values reinforce its centrality in Western diets, limiting the effectiveness of environmental campaigns. This study examines the underexplored role of individual cultural values in shaping responses to environmental NGO campaigns promoting sustainable meat consumption. Analyzing data from 514 respondents across five European countries with diverse national cultures, the research highlights the significant influence of three cultural values: power distance, masculinity, and uncertainty avoidance. These values were found to diminish the effectiveness of campaigns emphasizing environmental degradation and animal welfare. The findings contribute to the literature on sustainable food behaviors by underscoring the unique cultural dynamics involved in meat consumption at the individual level. Practical recommendations are offered to NGOs, policymakers, and managers for tailoring campaigns to address cultural nuances and drive sustainable dietary transitions.

1. Introduction

Food production exerts considerable environmental pressure, contributing notably to climate change, deforestation, water scarcity, and biodiversity loss (IPCC, 2019; Poore & Nemecek, 2018; Visschers & Siegrist, 2015). Meat consumption, in particular, has substantial environmental repercussions (Macdiarmid et al., 2016), whether we consider the livestock emission of methane (Clark et al., 2020; Cobiac & Scarborough, 2019), the extensive resources meat production requires (Leip et al., 2015; Schlink et al., 2010) and the consequences of substantial land use devoted to livestock food (Pendrill et al., 2019; Sakadevan & Nguyen, 2017; Scanes, 2018).

To mitigate these impacts, it is now evident that reducing meat consumption or choosing more sustainable meat is essential (Barrett, 2022; McMichael et al., 2007). Such efforts should primarily focus on Western countries, which appear as the biggest meat consumers in history. Per capita meat consumption is over 90 kg in North America and around or above 70 kg in Oceania and Europe (Wang & Scrimgeour, 2021). Unfortunately, awareness of the environmental impacts of meat

consumption remains limited in Western countries (Lea & Worsley, 2008; Macdiarmid et al., 2016; Tobler et al., 2011; Çoker et al., 2024), as do dietary changes. There, meat consumption continues to be perceived as “natural, necessary, nice, and normal” (Piazza et al., 2015, p. 116) and is also associated with social status and masculinity (Chiles & Fitzgerald, 2018). Considered an important part of food culture (de Boer & Aiking, 2022), which is mainly driven by personal norms and self-identity (Randall et al., 2024), it represents a deeply ingrained habit that is difficult to change (Rees et al., 2018).

Despite the urgency of reducing meat consumption, governments have not prioritized this issue (Laestadius et al., 2013; Resare Sahlin et al., 2020; Sievert et al., 2021), and global meat production continues to rise (FAO, 2024). Fortunately, an increasing number of Non-Governmental Organizations (NGOs) are delivering public messages encouraging a more sustainable consumption of meat, either by eating less meat or choosing more sustainable options (Laestadius et al., 2016). Prominent international NGOs addressing this issue include the World Wildlife Fund for nature, Greenpeace, and Friends of the Earth. Unsurprisingly, these organizations predominantly rely on

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* Corresponding author.

E-mail address: beatrice.parguel@dauphine.psl.eu (B. Parguel).

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environmental appeals (Palomo-Vélez et al., 2018) without much evidence of what specifically works where.

Food choices are deeply influenced by cultural factors and a country's culinary traditions may limit or even nullify the effectiveness of environmental appeals (Skelly & Ditlevsen, 2024; Çoker et al., 2024). Even when individuals recognize the urgency of climate change (Sabaté & Soret, 2014), reducing meat consumption may conflict with cultural imperatives (Oleschuk et al., 2019; Skelly & Ditlevsen, 2024). Consequently, a growing body of research is examining the influence of culture on the effectiveness of meat reduction campaigns at the national level (e.g., de Boer & Aiking, 2022; Oleschuk et al., 2019; Skelly & Ditlevsen, 2024). Yet, some studies suggest that culture should be assessed at the individual level rather than the national level (Chwiałkowska et al., 2020; Gohary et al., 2025; Sharma, 2010; Yoo & Shin, 2017). Indeed, being born and raised in the same country does not preclude individuals from developing personal values that shape how they assimilate their national culture (Chirkov et al., 2003; Gohary et al., 2025; Heydari et al., 2021). In terms of food choices, this means that while national cultures strongly influence dietary behaviors, individual cultural values play an equally significant role (Sabaté & Soret, 2014).

Interestingly, while Chwiałkowska et al. (2020) theoretically argue that collectivism, femininity, future orientation, and uncertainty avoidance are central pro-environmental cultural values that influence pro-environmental behaviors, Gohary et al. (2025) found that power distance plays a significant role in organic food consumption, with consumers scoring low on power distance exhibiting stronger environmental concerns, which in turn lead to a greater preference for organic products. These findings suggest that each specific sustainable behavior warrants detailed examination to determine which cultural values most strongly influence it. We further argue that sustainable meat consumption exhibits highly distinctive characteristics. In Western societies, meat consumption remains deeply ingrained in food culture (de Boer & Aiking, 2022) and serves many positive social symbols (Chiles & Fitzgerald, 2018). Unlike most sustainable behaviors, which are often supported by evolving social norms, meat consumption continues to be strongly reinforced by traditional norms (Cheah et al., 2020). This perspective has not been explored. We propose that the cultural values shaping sustainable meat consumption may differ significantly from those identified in prior research on other sustainable behaviors.

Consequently, the overarching aim of this research is to investigate the underexplored role of individual cultural values on the effectiveness of environmental NGO campaigns to improve meat consumption. To address these questions, we conducted a study involving 514 respondents. To ensure external validity, our study tested the influence of individual cultural values on the effectiveness of two types of environmental appeal (i.e., environment degradation and animal welfare) in five European countries which vary in terms of their national culture (i.e., Austria, Estonia, France, Portugal, Sweden). It shows that three individual cultural values, i.e., masculinity, power distance, and uncertainty avoidance, significantly impact the effectiveness of these campaigns. Specifically, when facing environmental NGO campaigns, individuals who prioritize these values are less likely to modify their meat consumption behaviors. In doing so, we make a significant and multifaceted contribution to both the literature on sustainable meat consumption and the broader understanding of how culture and cultural values shape consumer behavior. By providing novel insights into these areas, we offer actionable guidance for managers and policymakers to effectively target consumers and drive meaningful shifts toward more sustainable food choices, particularly in the context of meat consumption.

2. Conceptual framework

Culture is broadly defined as “the collective programming of the mind that distinguishes the members of one group or category of people from others” (Hofstede, 2011, p. 3). Hofstede (2001) further argues that

“societal cultures reside in (often unconscious) values, in the sense of broad tendencies to prefer certain states of affairs over others” (p. 5). He identifies six dimensions that differentiate national cultures: power distance, individualism, masculinity, uncertainty avoidance, long-term orientation, and indulgence. According to Hofstede, a country's national culture reflects the interplay of these six dimensions, with variations arising from specific nuances within each dimension. Yet, cultural values can vary within a single country (Gohary et al., 2025). As explained by Heydari et al. (2021, p. 2), “individual-level conceptualizations of Hofstede's cultural dimensions are personal cultural beliefs and values that are more or less over-learned and internalized by individuals from the dominant cultural values of their society.” Following, this research posits that examining these six dimensions, through a micro-perspective lens and at a consumer level, provides additional explanatory power for understanding the effectiveness of environmental NGO campaigns to reduce unsustainable meat consumption, beyond the influence of national culture as a collective construct. Accordingly, our conceptual framework considers the influence of each dimension individually at the personal level.

Power Distance (PD) refers to ‘the extent to which the less powerful members within a country expect and accept that power is distributed unequally’ (Hofstede et al., 2010, p. 61). Individuals scoring high on PD tend to accept hierarchical structures where power is unequally distributed, assigning greater authority to certain groups or institutions (Jakučionytė-Skodienė & Liobikienė, 2021). From an anthropocentric perspective, individuals scoring high on power distance are more likely to view the hierarchical relationship between humans and nature as justified (Weitzenfeld & Joy, 2014) and to prioritize humans over nature (Johansson-Stenman, 2018). Such lower sensitivity to environmental calls to protect nature from human exploitation would explain a lower preference for more sustainable consumption (Gohary et al., 2025). Furthermore, meat consumption continues to be regarded as a symbol of high social status in many societies (Lokuruka, 2006; Vranken et al., 2014), where it contributes to processes of social classification. This effect is likely to be particularly pronounced among individuals scoring high on PD, who may consume meat to facilitate social identification and affiliation. In addition, those individuals see that meat consumption is not only accepted (Sabaté & Soret, 2014) but is also deeply ingrained in the cultural fabric of many Western countries (de Boer & Aiking, 2022). As they tend to view institutions as unquestionable and immutable and take less responsibility for others (Winterich & Zhang, 2014), they are less likely to challenge prevailing norms and to advocate for innovative policies (Park et al., 2007). As such, they are also less likely to question the widespread acceptance of unrestricted meat consumption. From a communication perspective, high power distance individuals may be more accustomed to top-down communication and may expect directives from authoritative figures (Helpap, 2016). In contrast, individuals with a high power distance orientation may be less accustomed to bottom-up forms of communication, such as those used by NGOs that rely on supporters and volunteers to raise public concerns. Consequently, NGO campaigns that employ grassroots communication strategies may struggle to effectively engage these individuals. This may be particularly true for NGOs involved in environmental campaigns for reducing meat consumption, as high power distance individuals also want to preserve societal norms, which still consider meat consumption as “natural, necessary, nice, and normal” in Western countries (Piazza et al., 2015, p. 116). We therefore formulate H1 as follows:

H1. The effectiveness of environmental NGO campaigns to make meat consumption more sustainable will be lower among individuals who value PD.

Individualism (IDV) refers to the extent to which individuals prioritize the achievement of personal goals and interests (Sinha, 2014), placing greater emphasis on their own well-being and objectives, as well as those of their family, over the interests of the larger group (Cherry, 2010). Research suggests that individuals scoring high on IDV often

display a diminished concern for environmental issues (Pinto et al., 2011; Samarasinghe, 2012; Sarigöllü, 2009). Conversely, individuals at the collectivistic end of the spectrum tend to engage in stronger pro-environmental behaviors (Higuera-Castillo et al., 2019), particularly among those who are otherwise less environmentally conscious (Cho & Jung, 2023). Khara and colleagues (2021) propose that this may be because individuals from collectivist cultures are generally more prone to experiencing guilt when perceived as violating sacred social norms. The lower environmental consciousness of individuals scoring high versus low on IDV could explain their weaker response to campaigns aimed at promoting sustainable meat consumption. As an addition, individualism emphasizes self-expression and the desire to stand out, reflecting a strong sense of self (Oyserman et al., 2002). As a result, individuals scoring high on IDV tend to prioritize their own perspectives and goals over those of the group (Triandis, 1995), leading to two consequences. First, because they prioritize personal interests, they are less likely to adopt behaviors perceived as requiring significant sacrifices without clear personal benefits, such as reducing or modifying their meat consumption (De Dominicis et al., 2017). Second, their resistance to perceived restrictions on personal freedom, including those related to food choices, renders them less influenced by social norms (Heinrichs et al., 2006). In terms of communication, the desire to stand out may also drive them to seek and better respond to more individualized communication. Consequently, they would be less responsive to campaigns that seem to address all meat consumers as an undifferentiated target, especially those using moral arguments, such as environmental NGO campaigns advocating for sustainable meat consumption. We therefore formulate H2 as follows:

H2. The effectiveness of environmental NGO campaigns to make meat consumption more sustainable will be lower among individuals who value individualism.

Masculinity (MAS) refers to the extent to which individuals perceive their society as structured around distinct gendered roles. Meat consumption has long been associated with traditional masculine values, such as strength and power (Chiles & Fitzgerald, 2018; Love & Sulikowski, 2018), whereas vegetarianism is often perceived as feminine (Rozin et al., 2012; Ruby & Heine, 2011). The phrase “real men eat meat” (De Backer et al., 2020, p. 1) succinctly captures this cultural connection, illustrating why men, who perceive themselves as more masculine on a masculinity-femininity continuum, tend to consume more meat and are less willing to adopt a more sustainable diet (Keller & Siegrist, 2015; Rosenfeld, 2018). Building on this perspective, we argue that individuals who score high on MAS are less likely to recognize feminine traits (e.g., collaboration, empathy, environmental concern) as universal human qualities. This diminished recognition may reduce their propensity to view environmental protection as a shared collective priority. Feminine values would indeed strengthen the relationship between environmental concerns and pro-environmental actions (Chwialkowska et al., 2020), including the adoption of a more sustainable diet. In terms of communication, although direct studies linking masculinity to receptivity to NGO campaigns are limited, it can be inferred that in masculine cultures, where personal achievement is emphasized, individuals scoring high on masculinity will be less receptive to campaigns focusing on others’ welfare than those scoring high on femininity. Consequently, we hypothesize that individuals with higher MAS are less receptive to environmental NGO campaigns and formulate H3 as follows:

H3. The effectiveness of environmental NGO campaigns to make meat consumption more sustainable will be lower among individuals who value masculinity.

Uncertainty Avoidance (UA) refers to the extent to which members of a culture feel threatened by uncertain or unfamiliar situations. For individuals who score high on UA, changes in habits can feel unpredictable, uncomfortable, and therefore riskier (Jakućionytė-Skodienė &

Liobikienė, 2021; Money & Crotts, 2003). They tend to be less innovative and exhibit a strong preference for stability and routines (Jakućionytė-Skodienė & Liobikienė, 2021). In the context of food choices, particularly meat consumption in Western countries, these routines are supported by resistant habits, traditions, and norms (Velasco Vizcaíno & Pohlmann, 2025), hence deeply ingrained. Individual preferences for meat (Mensah et al., 2022; Piazza et al., 2015), social norms supporting meat consumption (Rubenstein et al., 2022), habits which refrain from trying new plant-based products (Rees et al., 2018), and prevailing food culture historically constructed around meat (de Boer & Aiking, 2022) serve as significant socio-cultural barriers to reducing meat consumption (Cheah et al., 2020; Macdiarmid et al., 2016). Dietary changes often require altering long-established habits, deviating from traditional norms, and exploring new and unfamiliar foods or practices. Therefore, although studies suggest that cultures characterized by high uncertainty avoidance are generally more willing to engage in initiatives that promote sustainability (Chwialkowska et al., 2020), we propose that the immediate aversion to uncertainty associated with experimenting with dietary changes will outweigh concerns about the uncertain future consequences of current behaviors on the environment. This is in line with Velasco Vizcaíno and Pohlmann (2025), who found, at the country level, that high uncertainty avoidance negatively affects consumers’ intentions to try insect-based products. Considered from a communication perspective, individuals scoring high on uncertainty avoidance prefer clear rules, concrete, detailed messages over abstract ones (Kim & Bae, 2016). They may be less receptive to environmental NGO campaigns as environmental appeals may be perceived as very abstract, as robustly shown by previous research that applied the psychological distance to the issue of climate change (Jones et al., 2017; McDonald et al., 2015; Spence et al., 2012). As a result, we hypothesize that individuals with higher levels of UA will be less receptive to environmental NGO campaigns aimed at promoting sustainable dietary habits, and formulate H4 as follows:

H4. The effectiveness of environmental NGO campaigns to make meat consumption more sustainable will be lower among individuals who value uncertainty avoidance.

Long-Term Orientation (LTO) refers to the cultural value that embraces a holistic perspective on time, appreciating both the past and the future rather than focusing solely on the immediate or short-term consequences of actions (Bearden et al., 2006) and is characterized by persistence and sustained efforts toward results (Hofstede, 2001). Accordingly, individuals with high LTO scores tend to view traditions as adaptable to changing societal and contextual conditions (Chun et al., 2021), whereas those with low LTO scores exhibit a stronger attachment to traditional practices and values (Guo et al., 2018). In Western countries, traditions still favor meat consumption (e.g., Chiles & Fitzgerald, 2018; de Boer & Aiking, 2022; Piazza et al., 2015). With only 14 % of the world’s population between 1961 and 2019, Western countries account for 38 % of cumulative global meat consumption over this period (Jia et al., 2023). Furthermore, meat consumption is expected to increase by 2100 in Western countries and to decrease in the East Asia and Pacific region (Jia et al., 2023), where meat consumption is around 30 kg per capita (Wang & Scrimgeour, 2021). Attachment to traditions and conservative values has been shown to reduce the likelihood of transitioning from meat to no-meat diets over time (Milfont et al., 2021; Sanchez-Sabate & Sabaté, 2019). Consequently, individuals scoring low on LTO are less likely to reduce their meat consumption. In contrast, individuals scoring high on LTO tend to place significant emphasis on the future, valuing long-term commitment and the ability to delay gratification (Hofstede & Minkov, 2010). This suggests that individuals scoring high on LTO are more likely to develop attitudes supportive of environmental protection (Gul, 2013; Samarasinghe, 2012; Sarigöllü, 2009) and pro-environmental behaviors (Saether et al., 2021). In terms of communication, the persistence and sustained efforts that characterize long-term oriented individuals (Hofstede, 2001) suggest a strong

appreciation for goal-directed behavior, an important component of persuasive messaging. When combined with their generally favorable attitude toward pro-environmental actions, communication strategies that emphasize long-term goals are likely to resonate strongly with individuals scoring high on long-term orientation. We therefore expect them to be more receptive to environmental NGO campaigns and formulate H5 as follows:

H5. The effectiveness of environmental NGO campaigns to make meat consumption more sustainable will be higher among individuals who value the long-term.

Indulgence Versus Restraint (IVR) refers to the extent to which a society permits or encourages the gratification of basic human drives related to enjoying life and having fun. This concept reflects a cultural inclination to prioritize leisure, pleasure, and the fulfillment of desires over strict social norms, self-restraint, and discipline. Indulgence is especially high in the Western countries (Heydari et al., 2021). Yet, protecting the environment often requires restraint and delaying immediate gratification in favor of long-term benefits. Promoting environmental sustainability indeed frequently necessitates postponing consumptive desires (Arbuthnott, 2010). Research consistently shows that people associate eating meat with pleasure (Macdiarmid et al., 2016) and perceive meat consumption as a more enjoyable experience compared to vegetarian or vegan foods (Corrin & Papadopoulos, 2017; Davis & Papies, 2022; Rosenfeld & Tomiyama, 2020). As a result, pleasure plays a crucial role in Western food choices (Franchi, 2012) and represents a significant barrier to dietary changes, contributing to the slow transition toward reducing meat consumption (Ford et al., 2023). Since pleasure holds greater importance for individuals who score high on IVR, they are less likely to practice restraint by giving up meat consumption. Their heightened responsiveness to immediate gratification and impulsive actions (Chowdhury & Mehjabeen, 2021) further indicates higher responsiveness to communication strategies and tactics emphasizing instant rewards (such as limited time offers), pleasure (such as sensory appeals), and enjoyment. This suggests less positive response to mass communication that stresses the need to consume more sustainable meat based on environmental arguments. Consequently, we anticipate that they will be less receptive to environmental NGO campaigns. This leads us to formulate H6 as follows:

H6. The effectiveness of environmental NGO campaigns to make meat consumption more sustainable will be lower among individuals who value indulgence.

Fig. 1 displays our conceptual framework.

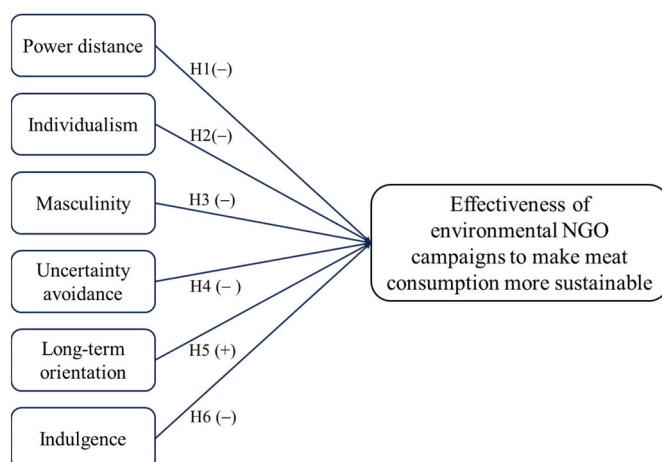


Fig. 1. Conceptual framework.

3. Method

To test the idea that the effectiveness of environmental NGO campaigns to reduce unsustainable meat consumption could vary depending on individual cultural values, we carried out a survey which was funded by the European branch of the World Wild Fund for Nature (WWF) as part of its mission to stop the degradation of the earth's natural environment and to build a future in which humans live in harmony with nature. As our research aimed at concretely informing WWF Europe about the effectiveness of its campaigns to encourage European consumers to eat less and/or better meat, we primarily sought to develop the external validity of our research by testing our conceptual model in five different European countries and by considering two different environmental appeals. The idea was not to compare the five countries, nor to compare the effectiveness of the two environmental appeals experimentally, but to diversify the data collection contexts to ensure that the findings can be generalized to a broader Western population and to different types of environmental appeals.

Environmental appeals. We selected two environmental appeals for this study. While we acknowledge that health-related appeals tend to be more familiar and personally relevant to most consumers (Myers et al., 2012), campaigns by environmental NGOs typically employ environmental appeals to promote more sustainable meat consumption. Specifically, we focused on the two environmental appeals most frequently used by such organizations: environmental degradation and animal welfare (Laestadius et al., 2016). Though some consumers may display a specific sensitivity to living beings, independently of any sensitivity to nature or perceptions of the risk associated with climate change (Eurobarometer, 2005), we chose them with the aim of replicating the test of our hypotheses. As illustrated by Fig. 2, to make them appear credible, the two environmental appeals were presented as a WWF brochure that discussed the impact of meat consumption. We took inspiration from real environmental NGO campaigns. In particular, and in line with the communication strategy used by several institutions and organizations to enhance the sustainability of diets in high-income regions (Resare Sahlin et al., 2020), we used a “less but better” meat message. As Laestadius and colleagues (2016) explain, environmental NGOs recognize the cultural importance of meat consumption in Western countries and therefore prefer to advocate for modest, socially acceptable reductions in meat intake rather than promoting complete meat-free diets.

Countries. The five European countries (i.e., Austria, Estonia, France, Portugal, Sweden) were selected based on two specific criteria. First, the involvement of local WWF offices in campaigns promoting more sustainable meat consumption. Second, the diversity of these countries across Hofstede's six dimensions of national culture, as measured using data from Hofstede's website (see Fig. 3). Indeed, in 2023, at the time of data collection, the power distance indices for these countries ranged from 11 (Austria) to 68 (France). Similarly, individualism scores ranged from 27 (Portugal) to 71 (France), masculinity scores from 5 (Sweden) to 79 (Austria), uncertainty avoidance scores from 29 (Sweden) to 99 (Portugal), long-term orientation scores from 28 (Portugal) to 82 (Estonia), and indulgence versus restraint (IVR) scores from 16 (Estonia) to 78 (Sweden).

Samples. We collected data online via local professional panel institutes. We made sure that all our respondents were non-veg*ans (i.e., non-vegetarians or non-vegans) and familiar with the WWF to control ex ante for the attitude towards the source of the campaign. In each country, respondents were randomly assigned to one or other of the two environmental appeals. After eliminating respondents who did not satisfy attention checks (i.e., “It is important that you pay attention to this study, please tick ‘strongly agree’”) or who were unable to identify that they had been exposed to an environmental appeal, the database included 514 participants (52.1 % female, average age = 42.7, SD = 13.3).

Measures. The survey was introduced as a study on consumers' eating



Fig. 2. Examples of the environmental appeal used in the survey.

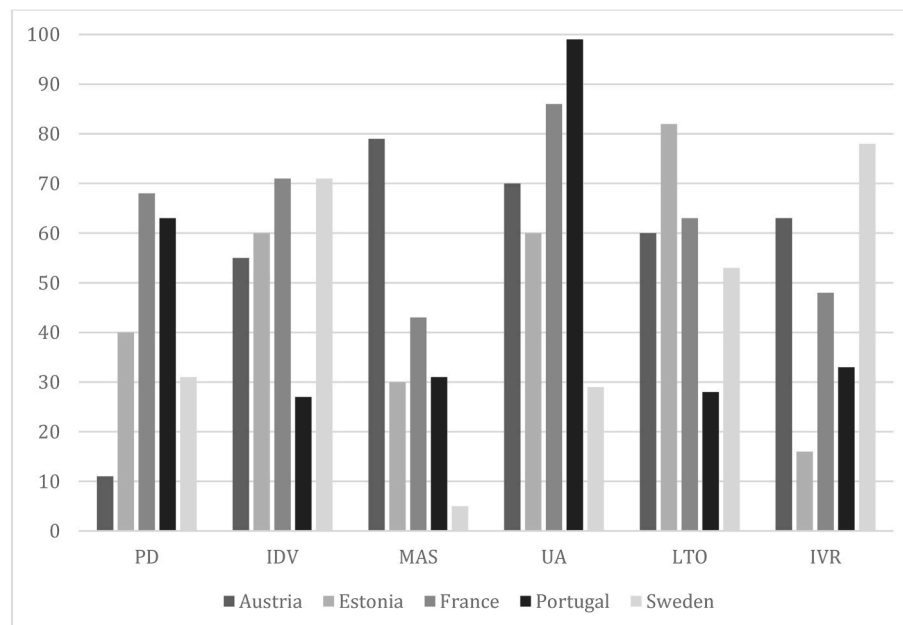


Fig. 3. Differences in national culture (source: www.hofstede-insights.com, 2023).

habits. After obtaining the participants' informed written consent and recording their age, gender, and weekly frequency of meat consumption expressed as the number of meals containing meat per week (max. 21) to be used as control variables, we invited them to carefully review a WWF brochure detailing the environmental impact of meat consumption.

Immediately following their exposure to the brochure, we assessed our dependent variable, i.e., participants' intention to reduce unsustainable meat consumption. This was done using an adapted version of [Marcus et al.'s \(1994\)](#) stages of change scale, tailored to address two specific objectives: the first one concerns people's intentions to adjust one's diet

to reduce overall meat consumption and the second one focusses on consuming better-quality meat. These two modest and socially acceptable objectives are in line with environmental NGOs practices (Laestadius et al., 2016; Resare Sahlin et al., 2020) and with our manipulation of environmental appeals (e.g., in Fig. 2, “*Minska att mindre men bättre kött*” means “Eat less, but better-quality meat” in Swedish). Specifically, for each of these two objectives, participants were asked to select the response that best described their stance on a 5-point scale, choosing from 1 = “I do not intend to start adapting my diet to eat better quality meat [less meat]”, which corresponds to the pre-contemplation stage, to 5 = “I adapted my diet to eat better quality meat [less meat] more than 6 months ago”, which corresponds to the maintenance stage. Our post-exposure DV, “individual intention to reduce unsustainable meat consumption”, is therefore measured as the average of participants’ intention to eat less meat and intention to eat better meat.

We then measured Hofstede’s cultural dimensions at the individual level using various scales. Specifically, three items from Yoo et al. (2011) were used to assess PD, IDV, MAS, UA, and LTO, while three items adapted from Heydari et al. (2021) were used to measure IVR. We finally measured environmental consciousness (ENV), health consciousness (HEALTH) and price consciousness (PRICE) to be used as additional control variables as previous literature shows their influence on the intention to reduce meat consumption (Cheah et al., 2020). ENV was assessed using five items from Lindeman and Väänänen (2000), HEALTH using three items from Yamim et al. (2020), and PRICE using three items from Sinha and Batra (1999). All items were evaluated on a 7-point Likert scale (from 1 = ‘strongly disagree’ to 7 = ‘strongly agree’). Table 1 displays the resulting descriptive statistics of each sub-sample.

As highlighted in previous literature, Hofstede’s cultural dimensions may exhibit significant correlations (e.g., Minkov, 2017; Pelau & Pop, 2018). Consequently, we conducted a factor analysis. The analysis indicated substantial cross-loadings for the LTO items, along with limited internal consistency, as reflected by low inter-item correlations (.116–.330) and a Cronbach’s alpha of .484. As a result, we decided to abandon H5 that proposed the influence of LTO on the effectiveness of environmental NGO campaigns on meat consumption reduction.¹ The analyses conducted to test the conceptual framework were based on the factors derived from the factor analysis.

To make sure the indicators for each remaining construct measure what they are intended to measure, tests for convergent and discriminant validity were conducted for both research studies. The squared value of the indicator loadings always exceeded 0.5, confirming indicator reliability. Internal consistency reliability was assessed using Jöreskog’s composite reliability (CR) and convergent validity using the average variance extracted (AVE). As displayed in Table 1, all the estimated indices were above the threshold of 0.6 for CR and 0.5 for AVE (Bagozzi & Yi, 1988). Finally, we tested the discriminant validity of the construct items by looking at the cross-loadings and found that all PLS item-to-construct loadings were greater than the cross-loadings (Gefen & Straub, 2005), and each correlation was lower than the square root of the AVEs of the two correlated variables (Fornell & Larcker, 1981). These tests confirmed discriminant validity.

4. Results

We first conducted an analysis of variance with the type of environmental appeal, the country, their interaction and the factors

¹ We conducted additional analyses by examining each of the three LTO items individually. When pooling data across the five countries, none of the items showed a significant correlation with the dependent variable. A significant effect was observed in only one case, i.e., for one item only in a single country. These findings provide strong evidence that the data we collected do not support Hypothesis H5.

representing the individual cultural values (i.e., PD, IDV, MAS, UA, IVR) as dependent variables, participants’ age, gender, meat consumption and the factors representing and individual consciousness (i.e., ENV, HEALTH, PRICE) as the covariates and stage of change as the dependent variable. This analysis of variance revealed a marginally significant interaction effect between the type of environmental appeal and the country ($F_{(4,493)} = 2.395, p = .050$). Exploring further this interaction effect using the same analysis of variance at the level of each country revealed a marginal difference in effectiveness between the two types of appeal in the case of a single country, Sweden. In Sweden, the appeal concerning environment degradation was marginally more effective than the appeal concerning animal welfare ($F_{(1,81)} = 3.850, p = .053$).

Considering that the only difference in effectiveness between environmental appeals is only marginal and observed in a single country, the linear regressions used to test the hypotheses of the conceptual model treat the type of environmental appeal and the country as independent variables, without accounting for their interaction effect. Table 2 displays the results (i.e., standardized coefficients and associated bilateral p-values) for four successive models: the baseline Model 1 that only include the type of environmental appeal and relevant covariates, Model 2 that adds countries as dummy variables to Model 1 (Sweden was chosen as the reference country as it was the only country to display a significant difference with another country, Austria), Model 3 and Model 4 that strictly test our hypotheses, including countries (Model 4) or not (Model 3) as dummy variables.

We first report the tests of our hypotheses. Whether we control for the countries (Model 4) or not (Model 3), only three of the five individual cultural values have a significant influence on respondents’ intention to reduce unsustainable meat consumption. Specifically, the more importance respondents place on power distance ($\beta = -.131, t = -3.419^{***}$), masculinity ($\beta = -.122, t = -3.168^{***}$) and uncertainty avoidance ($\beta = -.146, t = -3.820^{***}$), the less willing they are to change their diet to reduce the impact of their meat consumption. These results corroborate H1, H3 and H4. H2 on the influence of consumers’ individualism ($\beta = -.010, t = -.262$) and H5 on the influence of consumers’ indulgence ($\beta = -.018, t = -.464$) are not corroborated. As an additional result, we note that none of the five covariates considered interacts robustly with any of the five cultural values if we consider a Model 3 analysis.

As ancillary findings, the results for the baseline (Model 1) indicate that the type of environmental appeal does not significantly influence campaign effectiveness, nor does the consumer’s age. However, women responded significantly more positively ($\beta = .098, t = 2.456^{***}$). Additionally, consumers who ate less meat weekly ($\beta = -.240, t = -5.943^{***}$), those more concerned about the environment ($\beta = .270, t = 6.753^{***}$), and those more health-conscious ($\beta = .133, t = 3.361^{***}$) also responded more positively. Conversely, consumers less concerned about price showed a stronger positive response ($\beta = -.173, t = -4.310^{***}$). These findings remained consistent across subsequent Models 2, 3, and 4.

In Model 2, when countries are included as dummy variables in Model 1, the explanatory power increases significantly ($\Delta F_{BM1(4,502)} = 3.041^{***}$). Similarly, in Model 3, the addition of individual cultural values to the baseline model further enhances explanatory power ($\Delta F_{BM1(5,501)} = 7.239^{***}$), reinforcing the importance of culture in food consumption decisions. More interestingly, Model 4, which combines both countries and individual cultural values, shows greater explanatory power than Model 2 ($\Delta F_{Mod2(5,497)} = 5.541^{***}$), but not than Model 3 ($\Delta F_{Mod3(4,497)} = 1.052$). This suggests that incorporating a micro perspective (individual cultural values) into a macro perspective (countries) adds value, whereas a macro perspective does not significantly enhance a micro perspective.

5. Discussion

This study explored how consumers’ individual cultural values affect

Table 1

Reliability, validity and descriptive statistics per country (attitudes and values measured as the average of the items measured on scales from 1 to 7 and not using the factors involved in the subsequent analyses; meat consumption measured on a scale from 1 to 21).

	CR	AVE	Austria	Estonia	France	Portugal	Sweden
N			103	70	141	106	94
Intention to eat less and/or better meat			2.87	2.89	3.31	3.07	3.11
Age (M/SD)			43.4/14.2	41.1/14.6	41.6/12.1	40.6/12.0	47.4/13.7
Gender (% women)			50.5 %	52.9 %	53.9 %	63.2 %	38.3 %
Meat consumption			6.1	7.0	6.1	6.6	6.6
ENV	.93	.72	5.3	5.1	5.5	5.4	5.1
HEALTH	.93	.82	4.3	4.8	4.5	5.8	4.7
PRICE	.96	.88	4.7	5.2	5.2	5.2	4.3
PD	.90	.75	2.8	2.1	2.0	1.9	2.1
IDV	.93	.82	2.7	3.5	3.0	2.7	2.9
MAS	.91	.77	3.7	3.9	2.7	2.5	2.6
UA	.77	.53	5.3	5.3	5.7	5.7	5.4
IVR	.74	.50	4.9	5.0	4.9	4.6	4.6

Table 2

Effects of individual cultural values on the effectiveness of NGO campaigns to promote more sustainable meat consumption (bilateral tests).

	Baseline model 1		Model 2		Model 3		Model 4	
	$F_{(7,506)} = 21.488^{***}$		$\Delta F_{BM1(4,502)} = 3.041^{***}$		$\Delta F_{BM1(5,501)} = 7.239^{***}$		$\Delta F_{Mod2(5,497)} = 5.541^{***}$	
	adj $R^2 = .218$		adj $R^2 = .231$		adj $R^2 = .264$		$\Delta F_{Mod3(4,497)} = 1.052$	
	Std. β	p-value	Std. β	p-value	Std. β	p-value	Std. β	p-value
Appeal	.008	.843	-.001	.983	-.012	.752	-.017	.667
Age	.033	.422	.025	.544	.000	.994	-.004	.931
Gender	.098	.014	.100	.012	.073	.062	.081	.041
Meat cons.	-.240	<.001	-.242	<.001	-.232	<.001	-.233	<.001
ENV	.270	<.001	.267	<.001	.279	<.001	.276	<.001
HEALTH	.133	<.001	.130	<.001	.132	<.001	.131	<.001
PRICE	-.173	<.001	-.197	<.001	-.178	<.001	-.183	<.001
Austria			-.146	.005			-.090	.085
Estonia			-.077	.115			-.038	.455
France			-.020	.713			-.006	.914
Portugal			-.018	.741			-.039	.453
PD					-.131	.002	-.112	.006
IDV					-.010	.794	-.013	.745
MAS					-.122	<.001	-.109	.007
UA					-.146	<.001	-.143	<.001
IVR					-.018	.643	-.028	.474

the effectiveness of environmental NGO campaigns aimed at encouraging more sustainable meat consumption. A survey conducted across five European countries revealed that respondents who prioritize values such as power distance (those who tend to endorse hierarchical social structures), masculinity (those who perceive society as structured around gendered roles and who emphasize competition and achievement), and uncertainty avoidance (those who prefer clear rules and predictability over ambiguity or change) are less inclined to modify their diets to mitigate the environmental impact of meat consumption. Additionally, the findings demonstrate that individual cultural values offer greater explanatory power than national-level cultural factors. These insights provide valuable contributions with important theoretical and practical implications.

5.1. Theoretical contributions

In terms of our theoretical contributions, we make a significant and multifaceted contribution to both the literature on communication on sustainable meat consumption and the broader understanding of how culture and cultural values shape consumer behavior as a response to those communications. In this perspective, our theoretical contributions are four-fold.

First, our research highlights the individual cultural values that

significantly influence responses to environmental NGO campaigns, measured in terms of intentions to adjust one's meat consumption, thereby contributing to the literature on communication on sustainable meat consumption. We demonstrate in an original way that power distance, masculinity, and uncertainty avoidance negatively impact this response to communication. Regarding masculinity in particular, prior literature suggested that men consume more meat (e.g., Keller & Siegrist, 2015; Love & Sulikowski, 2018; Rosenfeld, 2018) and that individuals with a masculine identity, i.e., perceiving themselves, or believing they are perceived, as masculine or feminine on a single continuum, are less willing to adopt a vegetarian diet (e.g., Rosenfeld & Tomiyama, 2021). Our findings extend this by showing that perceiving one's society as inherently gendered, while controlling for gender, diminishes the intention to respond positively to a communication that encourages to adopt a more sustainable meat consumption pattern. Regarding power distance, we extend the pioneering findings of Gohary et al. (2025) on organic food consumption to the context of communication on sustainable meat consumption. From a broader perspective, this robustly demonstrates that consumers scoring low on PD are more responsive to campaigns promoting more sustainable food consumption behaviors, whether organic or not. Our research also demonstrates that consumers with high uncertainty avoidance scores are less inclined to alter their eating habits, offering new insights into the complexity of

these cultural dynamics in response to communication. Chwialkowska et al. (2020) indeed proposed that uncertainty avoidance would increase pro-environmental willingness, which we did not confirm. This is likely due, at least in part, to the perceived cost associated with behavioral change.

Second, our findings reveal that not all cultural dimensions influence communication effectiveness in the expected manner. While some results are consistent with existing literature on the relationship between cultural values and pro-environmental behaviors, examining their influence on responses to persuasive communication – particularly within the context of sustainable meat consumption – uncovered notable discrepancies. Surprisingly, individuals scoring high on individualism did not respond more negatively to our communication compared to those with collectivistic orientations. This may be because, valuing autonomy and self-direction, individualistic individuals are more receptive to ethical choices framed as personal responsibilities rather than collective obligations (Schwartz, 1992). Rather than impeding prosocial behavior, individualism may actually facilitate voluntary engagement in sustainability, particularly when aligned with innovation or expressions of identity (Triandis, 1995). This perspective could explain why individualism did not diminish intentions to adopt a more sustainable diet in our study. Furthermore, although indulgent individuals emphasize pleasure and freedom (Hofstede, 2011), they also tend to be more open to novel consumption patterns that serve as forms of self-expression. As noted by Steenkamp and De Jong (2010), individuals from indulgent cultures are more likely to embrace new and distinctive behaviors. Finally, contrary to expectations, individuals scoring high on LTO did not exhibit a more favorable response to sustainable meat messages. While LTO reflects future-oriented and adaptable thinking (Chun et al., 2021), it also favors gradual, systemic approaches over immediate personal change. Consequently, framing meat reduction as an urgent individual action may conflict with the strategic, long-term mindset characteristic of high-LTO individuals (Sun & Kim, 2024). This suggests that the relationship between cultural values and communication effectiveness is more nuanced than a straightforward alignment with pro-environmental behavior. These insights underscore the need to further explore how specific cultural dimensions interact with communication strategies in shaping audience responses. It is also worth highlighting that, to the best of our knowledge, this study is the first to examine the role of Hofstede's cultural values in sustainable consumption within a single research design. This comprehensive approach may partly explain the discrepancies observed in comparison to previous literature on cultural influences in pro-social behavior.

Third, our research deepens our understanding of the nuanced relationship between cultural values and pro-environmental behaviors in two ways. While prior research on individual cultural values has often treated sustainable behaviors as a uniform category (Chwialkowska et al., 2020), our findings underscore the specificity of sustainable meat consumption as a distinct area of inquiry. It is therefore crucial to examine pro-environmental behaviors individually, particularly in the context of meat consumption, which carries unique cultural and social significance. This is especially pertinent in Western societies, where meat consumption is deeply tied to notions of conviviality, strength, and social status (Chiles & Fitzgerald, 2018).

Fourth, this research addresses the limitations of previous studies on the impact of culture on consumers' pro-environmental behaviors that primarily examined culture at the cross-national level (e.g., Meza & Park, 2016; Oreg & Katz-Gerro, 2006; Seegebarth et al., 2016; Stolz et al., 2013). By adopting a micro-level perspective focused on individual consumers, we recognize the variability in the relative importance of cultural values within a single country, aligning with recent calls to prioritize specific cultural values over generalized national cultural constructs (e.g., Chwialkowska et al., 2020; Gohary et al., 2025). Building on the theoretical framework proposed by Chwialkowska et al. (2020), we empirically assess the impact of individual cultural values compared to national culture. Our data, collected across

five countries at both the individual and national levels, reveals two key findings: first, individual-level variables have greater explanatory power than macro-level, country-specific variables; second, including national-level data adds minimal explanatory value to models that already incorporate individual cultural values. In doing so, we expand upon the work of Gohary et al. (2025), whose research was limited to American data.

5.2. Practical implications

Our findings provide actionable recommendations for environmental NGOs aiming to reduce unsustainable meat consumption. These insights address the target audience for campaigns, the optimal framing of messages, and the most effective channels for dissemination.

Given the substantial environmental impact of food consumption behaviors, particularly meat consumption (IPCC, 2019; Macdiarmid et al., 2016; Poore & Nemecek, 2018; Visschers & Siegrist, 2015), it is critical for environmental NGOs to promote more sustainable dietary choices. This research identifies differential responses to the same communication strategy based on cultural values, which suggests that tailoring communication strategies to consumers' cultural values is essential for achieving effectiveness. Rather than using national boundaries as the primary criterion for targeting, NGOs should consider segmenting consumers based on cultural dimensions such as power distance, masculinity, and uncertainty avoidance. In the digital age, behavioral data enables precise targeting beyond national or cultural boundaries. On social media platforms, for instance, machine learning models can analyze users' interactions and content engagement (e.g., likes, comments, shares) to infer cultural values and dimensions such as power distance, masculinity, and uncertainty avoidance. This data-driven approach allows for more efficient targeting of individuals. However, we acknowledge that such technologies and/or competencies may not yet be fully accessible to NGOs. In the meantime, they could consider alternative strategies, such as partnering with influencers, who embody the cultural values and dimensions that are relevant for message effectiveness can further enhance outreach and engagement. In terms of uncertainty avoidance, influencers who highlight innovation, experimentation, and adaptability may be more effective than those who emphasize security and tradition. For low masculinity, influencers who emphasize community, family well-being, and social entrepreneurship are probably a good fit. Influencers that are relatable peers may be more engaging than authoritative figures as the latter represent a higher level of power distance. Last, purchase history of specific brands or interactions with organizations which are known for their non-hierarchical values, disruptive and experimental identities, or purchases of new brands may be used as cues to identify people to target. Buyers of such brands score probably lower on power distance and uncertainty avoidance, which makes them more receptive to environmental messages advocating for sustainable meat consumption. These approaches could enable NGOs to identify transnational consumer segments defined by shared cultural values, transcending country-level distinctions.

In addition to targeting strategies, NGOs should carefully frame their environmental messages. Since high levels of uncertainty avoidance can diminish message effectiveness, aligning with Oyserman's (2011) recommendations, campaigns should activate cultural values in ways that reduce uncertainty. Based on the Message Framing Theory (Tversky & Kahneman, 1981) and the Cognitive Appraisal Theory (Lazarus & Folkman, 1984), we suggest the use of positively framed messages that emphasize the ease and the environmental, economic, and health benefits of transitioning to a more sustainable diet, as such simplifying dietary changes even for individuals with higher levels of uncertainty avoidance. In contrast, negatively framed messages, which emphasize losses, anxiety, or uncertainty, should be avoided, as they may trigger adverse emotional responses. For instance, messages such as "You don't have to be a chef to eat sustainably. Ready-made options and easy recipes

make it quick and effortless” or “Small steps count: adding two meat-free per week is easy, affordable, better for your health and the planet” should be preferred to “Ignoring the impact of your everyday food choices contributes to health risks and climate change.” Providing practical, user-friendly tools, such as cooking guides, mobile applications, or educational videos, can help consumers integrate meat alternatives into their daily lives by enhancing individuals’ sense of self-efficacy (Bandura, 1977) and their confidence in their ability to cook without meat.

5.3. Limitations and future research

Our research provides valuable insights, but it is not without limitations, which future studies could address. First, while our insights offer a strong foundation for understanding consumer response to environmental NGO campaigns, they could be further enriched by integrating additional theoretical perspectives. For example, the Value-Belief-Norm model (Stern et al., 1999) suggests that personal norms can be activated to drive behavioral change, including environmentally significant actions (e.g., Carfora et al., 2020; Van der Werff & Steg, 2015). Building on our findings, future research could incorporate these theories into their conceptual frameworks. A second limitation concerns the relatively small size of some sub-samples, which in certain countries dropped to 70 participants. Although regression analyses can be performed with smaller samples and our analyses are ran on the global sample of 514 participants, reduced sub-sample sizes may limit the statistical power of the analyses and the generalizability of the findings. Caution is therefore warranted when interpreting results at the level of each country. Third, while we focused on two different environmental appeals, further research could explore the integration of health-related appeals. Given the dual importance of environmental sustainability and personal health in influencing dietary choices (Cheah et al., 2020), future studies could examine how health appeals interact and resonate across different cultural contexts and consumer segments (Palomo-Vélez et al., 2018). For instance, individualists may respond better to personal health appeals than to environmental ones (“your body, your future”). For high masculinity individuals, health appeals framed around strength, performance, or success may be more effective at reducing meat consumption than environmental ones (e.g., “To achieve the peak physical performance of Djokovic, reduce your meat consumption”). Fourth, NGO identities are often shaped by the intensity and framing of their messages. While we adopted a moderate and positive framing, further exploring how message framing and intensity influence the impact of cultural values could enable more tailored communication strategies that better align with both audience profiles and NGO identities. Finally, our research treated meat consumption as a general category, without distinguishing between types of meat such as red meat, poultry, or processed meat. However, consumer attitudes and behaviors may differ significantly depending on the type of meat, influenced by factors such as perceived environmental impact, health concerns, and cultural preferences (Tilman & Clark, 2014). Future investigations could delve into these distinctions, tailoring communication strategies to specific meat categories. Addressing these limitations would enhance the cultural, thematic, and categorical breadth of research on promoting sustainable dietary practices.

CRedit authorship contribution statement

Béatrice Parguel: Writing – original draft, Visualization, Validation, Software, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Karine Charry:** Writing – original draft, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization. **Gaëlle Pantin-Sohier:** Validation, Methodology, Funding acquisition, Conceptualization. **Fanny Thomas:** Validation, Methodology, Funding acquisition, Conceptualization.

Ethical statement

This manuscript complies with the ethical standards of *Appetite*.

The data was collected as part of a research collaboration with the WWF. All the protocol of the research was validated by the WWF in accordance with their ethical standards. Our protocol also complies with the deontological requirements of our universities.

The data was collected through professional panel institutes that comply with ESOMAR ethical standards.

It is an original work; it has not been published previously and is not currently under review at another journal.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT in order to improve their manuscript language and readability. After using this tool, the authors reviewed and edited the content as needed. They take full responsibility for the content of the publication.

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Declaration of competing interest

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Appendix 1. Measurement scales

Power distance (Yoo et al., 2011)

- People in higher positions should make most decisions without consulting people in lower positions.
- People in higher positions should avoid social interaction with people in lower positions.
- People in lower positions should not disagree with decisions by people in higher positions.

Individualism (Yoo et al., 2011)

- Individuals should sacrifice self-interest for the group.
- Group welfare is more important than individual rewards.
- Group success is more important than individual success.

Masculinity/femininity (Yoo et al., 2011)

- It is more important for men to have a professional career than it is for women.
- Men usually solve problems with logical analysis; women usually solve problems with intuition.
- Solving difficult problems usually requires an active, forcible approach, which is typical of men.

Uncertainty avoidance (Yoo et al., 2011)

- It is important to always know what I’m expected to do.
- It is important to closely follow rules.
- I do not like when things change.

Long-term orientation (Yoo et al., 2011)

- Personal steadiness and stability are important.
- Long-term planning is more important than short-term planning.
- Individuals should give up today's fun for success in the future.

Indulgence (Heydari et al., 2021)

- There should not be any limits on individuals' enjoyment.
- The gratification of desires should not be delayed.
- Societies should value relatively free time to have fun.

Environmental consciousness (Lindeman & Väänänen, 2000)

It is important that the food I eat on a typical day:

- Has been produced in a way that animals have not experienced pain.
- Has been produced in a way that animals' rights have been respected.
- Environmental Protection Has been prepared in an environmentally friendly way.
- Has been produced in a way which has not shaken the balance of nature.
- Is packaged in an environmentally friendly way.

Price consciousness (Sinha & Batra, 1999)

- I tend to buy the cheapest products that will fit my needs.
- Price is the most important factor when I am choosing products
- When shopping, I look for the cheapest products available.

Health consciousness (Yamim et al., 2020)

- I reflect about my health a lot.
- I'm very self-conscious about my health.
- I am constantly examining my health.

Intention to eat less and/or better meat (Marcus et al., 1994)

- "I do not intend to start adapting my diet to eat less [better quality] meat"
- "I have not started to adapt my diet to eat less [better quality] meat, but I am thinking to do it in the next 6 months"
- "I sometimes adapt my diet to eat less [better quality] meat, but not regularly"
- "I've been trying to adapt my diet to eat less [better quality] meat, but I have only begun doing so within the last 6 months"
- "I adapted my diet to eat less [better quality] meat more than 6 months ago"

Data availability

Data will be made available on request.

References

- Arbuthnott, K. D. (2010). Taking the long view: Environmental sustainability and delay of gratification. *Analyses of Social Issues and Public Policy*, 10(1), 4–22.
- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74–94.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215.
- Barrett, B. (2022). Health and sustainability co-benefits of eating behaviors: Towards a science of dietary eco-wellness. *Preventive Medicine Reports*, 28, Article 101878.
- Bearden, W. O., Money, R. B., & Nevins, J. L. (2006). A measure of long-term orientation: Development and validation. *Journal of the Academy of Marketing Science*, 34(3), 456–467.
- Carfora, V., Conner, M., Caso, D., & Catellani, P. (2020). Rational and moral motives to reduce red and processed meat consumption. *Journal of Applied Social Psychology*, 50 (12), 744–755.
- Cheah, I., Shimul, A. S., Liang, J., & Phau, I. (2020). Drivers and barriers toward reducing meat consumption. *Appetite*, 149, Article 104636.
- Cherry, K. (2010). *The Everything Psychology Book: Explore the human psyche and understand why we do the things we do*. Simon and Schuster.
- Chiles, R. M., & Fitzgerald, A. J. (2018). Why is meat so important in western history and culture? A genealogical critique of biophysical and political-economic explanations. *Agriculture and Human Values*, 35, 1–17.
- Chirkov, V., Ryan, R. M., Kim, Y., & Kaplan, U. (2003). Differentiating autonomy from individualism and independence: A self-determination theory perspective on internalization of cultural orientations and well-being. *Journal of Personality and Social Psychology*, 84(1), 97–110.
- Cho, S. Y., & Jung, J. (2023). Effects of individualism, collectivism, materialism, and willingness to pay for environmental protection on environmental consciousness and pro-environmental consumption behavior in Korea. *Sustainability*, 15(9), 7596.
- Chowdhury, F., & Mehjabeen, M. (2021). The impact of culture on impulse buying behavior in Bangladesh. *Journal of Management & Marketing Review*, 6(1), 73–85.
- Chun, D., Zhang, Z., Cohen, E., Florea, L., & Genc, O. F. (2021). Long-term orientation and the passage of time: Is it time to revisit Hofstede's cultural dimensions? *International Journal of Cross Cultural Management*, 21(2), 353–371.
- Chwialkowska, A., Bhatti, W. A., & Glowik, M. (2020). The influence of cultural values on pro-environmental behavior. *Journal of Cleaner Production*, 268, Article 122305.
- Clark, M. A., Domingo, N. G., Colgan, K., Thakrar, S. K., Tilman, D., Lynch, J., ... Hill, J. D. (2020). Global food system emissions could preclude achieving the 1.5 and 2 C climate change targets. *Science*, 370(6517), 705–708.
- Cobiac, L. J., & Scarborough, P. (2019). Modelling the health co-benefits of sustainable diets in the UK, France, Finland, Italy and Sweden. *European Journal of Clinical Nutrition*, 73(4), 624–633.
- Coker, E. N., Pechey, R., & Jebb, S. A. (2024). Ethnic differences in meat consumption attitudes, norms and behaviors: A survey of white, south asian and black ethnic groups in the UK. *Appetite*, 198, Article 107359.
- Corrin, T., & Papadopoulos, A. (2017). Understanding the attitudes and perceptions of vegetarian and plant-based diets to shape future health promotion programs. *Appetite*, 109, 40–47.
- Davis, T., & Papies, E. K. (2022). Pleasure vs. identity: More eating simulation language in meat posts than plant-based posts on social media# foodtalk. *Appetite*, 175, Article 106024.
- De Backer, C., Erreygers, S., De Cort, C., Vandermoere, F., Dhoest, A., Vrinten, J., & Van Bauwel, S. (2020). Meat and masculinities. Can differences in masculinity predict meat consumption, intentions to reduce meat and attitudes towards vegetarians? *Appetite*, 147, Article 104559.
- de Boer, J., & Aiking, H. (2022). How meat reduction differs from other personal climate actions: Distinct concerns and cultural barriers among EU consumers. *Food Quality and Preference*, 101, Article 104646.
- De Dominicis, S., Schultz, P. W., & Bonaiuto, M. (2017). Protecting the environment for self-interested reasons: Altruism is not the only pathway to sustainability. *Frontiers in Psychology*, 8, 1065.
- Eurobarometer, S. (2005). *Social values, science and technology. Special Report*, 225.
- FAO. (2024). *Meat market review: Overview of global meat market in 2023*. Rome.
- Ford, H., Gould, J., Danner, L., Bastian, S. E., & Yang, Q. (2023). "I guess it's quite trendy": A qualitative insight into young meat-eaters' sustainable food consumption habits and perceptions towards current and future protein alternatives. *Appetite*, 190, Article 107025.
- Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research*, 18(3), 382–388.
- Franchi, M. (2012). Food choice: Beyond the chemical content. *International Journal of Food Sciences & Nutrition*, 63(sup. 1), 17–28.
- Gefen, D., & Straub, D. (2005). A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. *Communications of the Association for Information Systems*, 16(1), 5.
- Gohary, A., Madani, F., Lie, D. S., & Chan, E. Y. (2025). Does rejecting inequality enhance green consumption? The effect of power distance belief on organic food consumption. *Appetite*, 206, Article 107764.
- Gul, M. (2013). Long-term orientation, perceived consumer effectiveness, and environmentally conscious consumer behavior: The case of Turkey. *International Journal of Marketing Studies*, 5(5), 24.
- Guo, Q., Liu, Z., Li, X., & Qiao, X. (2018). Indulgence and long term orientation influence prosocial behavior at national level. *Frontiers in Psychology*, 9, 1798.
- Heinrichs, N., Rapee, R. M., Alden, L. A., Bögels, S., Hofmann, S. G., Oh, K. J., & Sakano, Y. (2006). Cultural differences in perceived social norms and social anxiety. *Behaviour Research and Therapy*, 44(8), 1187–1197.
- Helpap, S. (2016). The impact of power distance orientation on recipients' reactions to participatory versus programmatic change communication. *The Journal of Applied Behavioral Science*, 52(1), 5–34.
- Heydari, A., Laroche, M., Paulin, M., & Richard, M. O. (2021). Hofstede's individual-level indulgence dimension: Scale development and validation. *Journal of Retailing and Consumer Services*, 62, Article 102640.
- Higuera-Castillo, E., Liébana-Cabanillas, F. J., Muñoz-Leiva, F., & Molinillo, S. (2019). The role of collectivism in modeling the adoption of renewable energies: A cross-cultural approach. *International journal of Environmental Science and Technology*, 16 (4), 2143–2160.
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. Thousand Oaks, CA: Sage.
- Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture*, 2(1), 8.

- Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind* (3rd ed.). McGraw-Hill.
- Hofstede, G., & Minkov, M. (2010). Long- versus short-term orientation: New perspectives. *Asia Pacific Business Review*, 16(4), 493–504.
- IPCC. (2019). Summary for policymakers. In *Climate change and land: An IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*.
- Jakučionytė-Skodiėnė, M., & Liobikienė, G. (2021). Climate change concern, personal responsibility and actions related to climate change mitigation in EU countries: Cross-cultural analysis. *Journal of Cleaner Production*, 281, Article 125189.
- Jia, J., Dawson, T. P., Wu, F., Han, Q., & Cui, X. (2023). Global meat demand projection: Quo Vadimus? *Journal of Cleaner Production*, 429, Article 139460.
- Johansson-Stenman, O. (2018). Animal welfare and social decisions: Is it time to take Bentham seriously? *Ecological Economics*, 145, 90–103.
- Jones, C., Hine, D. W., & Marks, A. D. (2017). The future is now: Reducing psychological distance to increase public engagement with climate change. *Risk Analysis*, 37(2), 331–341.
- Keller, C., & Siegrist, M. (2015). Does personality influence eating styles and food choices? Direct and indirect effects. *Appetite*, 84, 128–138.
- Khara, T., Riedy, C., & Ruby, M. B. (2021). A cross cultural meat paradox: A qualitative study of Australia and India. *Appetite*, 164, Article 105227.
- Kim, S., & Bae, J. (2016). Cross-cultural differences in concrete and abstract corporate social responsibility (CSR) campaigns: Perceived message clarity and perceived CSR as mediators. *International Journal of Corporate Social Responsibility*, 1, 1–14.
- Laestadius, L. I., Neff, R. A., Barry, C. L., & Frattaroli, S. (2013). Meat consumption and climate change: The role of non-governmental organizations. *Climatic Change*, 120, 25–38.
- Laestadius, L. I., Neff, R. A., Barry, C. L., & Frattaroli, S. (2016). No meat, less meat, or better meat: Understanding NGO messaging choices intended to alter meat consumption in light of climate change. *Environmental Communication*, 10(1), 84–103.
- Lazarus, R., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer publishing company.
- Lea, E., & Worsley, A. (2008). Australian consumers' food-related environmental beliefs and behaviours. *Appetite*, 50(2–3), 207–214.
- Leip, A., Billen, G., Garnier, J., Grizzetti, B., Lassaletta, L., Reis, S., et al. (2015). Impacts of European livestock production: Nitrogen, sulphur, phosphorus and greenhouse gas emissions, land-use, water eutrophication and biodiversity. *Environmental Research Letters*, 10(11), Article 115004.
- Lindeman, M., & Väänänen, M. (2000). Measurement of ethical food choice motives. *Appetite*, 34(1), 55–59.
- Lokuruka, M. N. (2006). Meat is the meal and status is by meat: Recognition of rank, wealth, and respect through meat in Turkana culture. *Food and Foodways*, 14(3–4), 201–229.
- Love, H. J., & Sulikowski, D. (2018). Of meat and men: Sex differences in implicit and explicit attitudes toward meat. *Frontiers in Psychology*, 9, 559.
- Macdiarmid, J. I., Douglas, F., & Campbell, J. (2016). Eating like there's no tomorrow: Public awareness of the environmental impact of food and reluctance to eat less meat as part of a sustainable diet. *Appetite*, 96, 487–493.
- Marcus, B. H., Pinto, B. M., Simkin, L. R., Audrain, J. E., & Taylor, E. R. (1994). Application of theoretical models to exercise behavior among employed women. *American Journal of Health Promotion*, 9(1), 49–55.
- McDonald, R. I., Chai, H. Y., & Newell, B. R. (2015). Personal experience and the 'psychological distance' of climate change: An integrative review. *Journal of Environmental Psychology*, 44, 109–118.
- McMichael, A. J., Powles, J. W., Butler, C. D., & Uauy, R. (2007). Food, livestock production, energy, climate change, and health. *The Lancet*, 370(9594), 1253–1263.
- Mensah, D. O., Mintah, F. O., Oteng, S. A., Lillywhite, R., & Oyebo, O. (2022). 'We're meat, so we need to eat meat to be who we are': Understanding motivations that increase or reduce meat consumption among emerging adults in the University of Ghana food environment. *Meat Science*, 193, Article 108927.
- Meza, X. V., & Park, H. W. (2016). Organic products in Mexico and South Korea on twitter. *Journal of Business Ethics*, 135, 587–603.
- Milfont, T. L., Satherley, N., Osborne, D., Wilson, M. S., & Sibley, C. G. (2021). To meat, or not to meat: A longitudinal investigation of transitioning to and from plant-based diets. *Appetite*, 166, Article 105584.
- Minkov, M. (2017). A revision of Hofstede's model of national culture: Old evidence and new data from 56 countries. *Cross Cultural & Strategic Management*, 25(2), 231–256.
- Money, R. B., & Crofts, J. C. (2003). The effect of uncertainty avoidance on information search, planning, and purchases of international travel vacations. *Tourism Management*, 24(2), 191–202.
- Myers, T. A., Nisbet, M. C., Maibach, E. W., & Leiserowitz, A. A. (2012). A public health frame arouses hopeful emotions about climate change: A letter. *Climatic Change*, 113, 1105–1112.
- Oleschuk, M., Johnston, J., & Baumann, S. (2019). Maintaining meat: Cultural repertoires and the meat paradox in a diverse sociocultural context. In *Sociological forum* (Vol. 34, pp. 337–360), 2.
- Oreg, S., & Katz-Gerro, T. (2006). Predicting proenvironmental behavior cross-nationally: Values, the theory of planned behavior, and value-belief-norm theory. *Environment and Behavior*, 38(4), 462–483.
- Oyserman, D. (2011). Culture as situated cognition: Cultural mindsets, cultural fluency, and meaning making. *European Review of Social Psychology*, 22(1), 164–214.
- Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, 128, 3–72.
- Palomo-Vélez, G., Tybur, J. M., & Van Vugt, M. (2018). Unsustainable, unhealthy, or disgusting? Comparing different persuasive messages against meat consumption. *Journal of Environmental Psychology*, 58, 63–71.
- Park, H., Russell, C., & Lee, J. (2007). National culture and environmental sustainability: A cross-national analysis. *Journal of Economics and Finance*, 31(1), 104–121.
- Pelau, C., & Pop, N. A. (2018). Implications for the energy policy derived from the relation between the cultural dimensions of Hofstede's model and the consumption of renewable energies. *Energy Policy*, 118, 160–168.
- Pendrill, F., Persson, U. M., Godar, J., Kastner, T., Moran, D., Schmidt, S., & Wood, R. (2019). Agricultural and forestry trade drives large share of tropical deforestation emissions. *Global Environmental Change*, 56, 1–10.
- Piazza, J., Ruby, M. B., Loughnan, S., Luong, M., Kulik, J., Watkins, H. M., & Seigerman, M. (2015). Rationalizing meat consumption. The 4Ns. *Appetite*, 91, 114–128.
- Pinto, D. C., Nique, W. M., da S, A. E., & Herter, M. M. (2011). Green consumer values: How do personal values influence environmentally responsible water consumption? *International Journal of Consumer Studies*, 35, 122–131.
- Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360(6392), 987–992.
- Randall, T., Cousins, A. L., Neilson, L., Price, M., Hardman, C. A., & Wilkinson, L. L. (2024). Sustainable food consumption across western and non-western cultures: A scoping review considering the theory of planned behaviour. *Food Quality and Preference*, 114, Article 105086.
- Rees, J. H., Bamberg, S., Jäger, A., Victor, L., Bergmeyer, M., & Friese, M. (2018). Breaking the habit: On the highly habitualized nature of meat consumption and implementation intentions as one effective way of reducing it. *Basic and Applied Social Psychology*, 40(3), 136–147.
- Resare Sahlin, K., Röss, E., & Gordon, L. J. (2020). 'Less but better' meat is a sustainability message in need of clarity. *Nature Food*, 1(9), 520–522.
- Rosenfeld, D. L. (2018). The psychology of vegetarianism: Recent advances and future directions. *Appetite*, 131, 125–138.
- Rosenfeld, D. L., & Tomiyama, A. J. (2020). Taste and health concerns trump anticipated stigma as barriers to vegetarianism. *Appetite*, 144, Article 104469.
- Rosenfeld, D. L., & Tomiyama, A. J. (2021). Gender differences in meat consumption and openness to vegetarianism. *Appetite*, 166, Article 105475.
- Rozin, P., Hormes, J. M., Faith, M. S., & Wansink, B. (2012). Is meat male? A quantitative multimethod framework to establish metaphoric relationships. *Journal of Consumer Research*, 39(3), 629–643.
- Rubenstein, S. A., Vartanian, L. R., Herman, C. P., & Polivy, J. (2022). Influence of social-normative information on the modeling of food-related decisions. *Appetite*, 176, Article 106095.
- Ruby, M. B., & Heine, S. J. (2011). Meat, morals, and masculinity. *Appetite*, 56(2), 447–450.
- Sabaté, J., & Soret, S. (2014). Sustainability of plant-based diets: Back to the future. *The American Journal of Clinical Nutrition*, 100, 476S–482S.
- Saether, E. A., Eide, A. E., & Bjørgum, Ø. (2021). Sustainability among Norwegian maritime firms: Green strategy and innovation as mediators of long-term orientation and emission reduction. *Business Strategy and the Environment*, 30(5), 2382–2395.
- Sakadevan, K., & Nguyen, M. L. (2017). Livestock production and its impact on nutrient pollution and greenhouse gas emissions. *Advances in Agronomy*, 141, 147–184.
- Samarasinghe, R. (2012). The influence of cultural values and environmental attitudes on green consumer behaviour. *The Journal of Behavioral Science*, 7(1), 83–98.
- Sanchez-Sabaté, R., & Sabaté, J. (2019). Consumer attitudes towards environmental concerns of meat consumption: A systematic review. *International Journal of Environmental Research and Public Health*, 16(7), 1220.
- Sarigollü, E. (2009). A cross-country exploration of environmental attitudes. *Environment and Behavior*, 41(3), 365–386.
- Scanes, C. G. (2018). Impact of agricultural animals on the environment. In *Animals and human society* (pp. 427–449). Academic Press.
- Schlink, A. C., Nguyen, M. L., & Viljoen, G. J. (2010). Water requirements for livestock production: A global perspective. *Rev. Sci. Tech.*, 29(3), 603–619.
- Schwartz, S. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 25, pp. 1–65). Academic Press.
- Seegerbarth, B., Behrens, S. H., Klarmann, C., Hennigs, N., & Scribner, L. L. (2016). Customer value perception of organic food: Cultural differences and cross-national segments. *British Food Journal*, 118(2), 396–411.
- Sharma, P. (2010). Measuring personal cultural orientations: Scale development and validation. *Journal of the Academy of Marketing Science*, 38, 787–806.
- Sievert, K., Lawrence, M., Parker, C., & Baker, P. (2021). Understanding the political challenge of red and processed meat reduction for healthy and sustainable food systems: A narrative review of the literature. *International Journal of Health Policy and Management*, 10(12), 793.
- Sinha, J. B. (2014). Vol. 27. *Psycho-social analysis of the Indian mindset*. New Delhi, India: Springer.
- Sinha, I., & Batra, R. (1999). The effect of consumer price consciousness on private label purchase. *International Journal of Research in Marketing*, 16(3), 237–251.
- Skelly, T. A., & Ditlevsen, K. (2024). Bad avocados, culinary standards, and knowable knowledge. Culturally appropriate rejections of meat reduction. *Journal of Consumer Culture*, 24(2–3), 252–272.
- Spence, A., Poortinga, W., & Pidgeon, N. (2012). The psychological distance of climate change. *Risk Analysis: International Journal*, 32(6), 957–972.
- Steenkamp, J.-B. E. M., & De Jong, M. G. (2010). A global investigation into the constellation of consumer attitudes toward global and local products. *Journal of Marketing*, 74(6), 18–40.

- Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review*, 81–97.
- Stolz, J., Molina, H., Ramírez, J., & Mohr, N. (2013). Consumers' perception of the environmental performance in retail stores: An analysis of the German and the Spanish consumer. *International Journal of Consumer Studies*, 37(4), 394–399.
- Sun, B. L., & Kim, W. G. (2024). Exploring the influence of cultural values on green purchasing and its consequence. *Journal of Vacation Marketing*, Article 13567667241270790.
- Tilman, D., & Clark, M. (2014). Global diets link environmental sustainability and human health. *Nature*, 515(7528), 518–522.
- Tobler, C., Visschers, V. H., & Siegrist, M. (2011). Eating green. Consumers' willingness to adopt ecological food consumption behaviors. *Appetite*, 57(3), 674–682.
- Triandis, H. C. (1995). *Individualism and collectivism*. Boulder, CO: Westview Press.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453–458.
- Van der Werff, E., & Steg, L. (2015). One model to predict them all: Predicting energy behaviours with the norm activation model. *Energy Research & Social Science*, 6, 8–14.
- Velasco Vizcaíno, F., & Pohlmann, A. (2025). Unpalatable solutions: Consumer resistance towards Insect-Based foods is moderated by uncertainty avoidance. *Psychology and Marketing*, 42(2), 615–633.
- Visschers, V. H., & Siegrist, M. (2015). Does better for the environment mean less tasty? Offering more climate-friendly meals is good for the environment and customer satisfaction. *Appetite*, 95, 475–483.
- Vranken, L., Avermaete, T., Petalios, D., & Mathijs, E. (2014). Curbing global meat consumption: Emerging evidence of a second nutrition transition. *Environmental Science & Policy*, 39, 95–106.
- Wang, O., & Scrimgeour, F. (2021). Willingness to adopt a more plant-based diet in China and New Zealand: Applying the theories of planned behaviour, meat attachment and food choice motives. *Food Quality and Preference*, 93, Article 104294.
- Weitzenfeld, A., & Joy, M. (2014). An overview of anthropocentrism, humanism, and speciesism in critical animal theory. *Counterpoints*, 448, 3–27.
- Winterich, K. P., & Zhang, Y. (2014). Accepting inequality deters responsibility: How power distance decreases charitable behavior. *Journal of Consumer Research*, 41(2), 274–293.
- Yamim, A. P., Mai, R., & Werle, C. O. (2020). Make it hot? How food temperature (mis) guides product judgments. *Journal of Consumer Research*, 47(4), 523–543.
- Yoo, B., Donthu, N., & Lenartowicz, T. (2011). Measuring Hofstede's five dimensions of cultural values at the individual level: Development and validation of CVSCALE. *Journal of International Consumer Marketing*, 23(3–4), 193–210.
- Yoo, B., & Shin, G. (2017). Invariant effect of individual cultural orientations: An application of CVSCALE. *International Marketing Review*, 34(6), 735–759.