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Examining green purchasing. The role of environmental concerns, perceptions on climate change, preferences for EU integration, and media exposure

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Factors impacting green consumption studied in the literature include 1) economic incentives and possibilities, 2) socio-dem1ographic segmentation, 3) values, emotions and personal responsibilities, 4) information including education and mass media, 5) factors related to the locality of the respondents and the lifestyles. While the effects of environmental concerns and perceptions of climate change or green purchasing are well established, the impacts of preferences for EU integration and media exposure are less clear. The article examines the effects of environmental concerns, perceptions of climate change, trust in EU policies, and media exposition on green purchasing employing a representative sample of 904 respondents (aged 15–95 years, M ± SD: 47.74 ± 17.66; 51.40% women, 19.40% with higher education) in the Czech Republic. Methodologically we rely on principal component analysis, correlations, and a set of ordinal regression analyses. The results suggest that 1) the public perceives the agendas of environment protection and climate change as two different agendas. 2) environment protection attitudes and climate concerns, the acceptance of EU integration positively predict green consumption. 3) the impact of the media exposition proved controversial: printed media and online discussion forums and blogs positively predicted green purchasing, while exposition to online social networks negatively impacted purchasing of organic food; 4) the frequency of watching TV negatively predicted purchasing of environmentally friendly products. We suggest that the advertisements emphasizing low prices may reduce willingness to pay a price premium for green products. It implies that more efforts need to be made on TV and social networks to increase public awareness of green consumption.

KEYWORDS

environment, consumption, organic food, local food, EU, politics, public perceptions, climate change

1 Introduction

Green purchasing is an important part of environmental sustainability and responsible stewardship of resources. It involves the acquisition of goods and services that are environmentally friendly and reduces the negative impacts of production, use and disposal. Green purchasing can help reduce environmental pollution, conserve natural

resources, reduce energy and water use, reduce waste and reduce the environmental costs of production, transportation, and disposal.

Factors affecting green consumption have been a long subject of research. The early literature on green consumption presented the term in the context of "societal marketing," which addressed environmental questions (Fisk, 1974; Henion and Kinnear, 1976) and studied economic incentives and socio-demographic segmentation. Later on, individual values, emotions and attitudes proved to be more important. Environmental attitudes, knowledge and personal responsibilities showed to have positive effects on green consumption in some cases but not in others. Dominant social paradigms (e.g., consumerism), individual and collective norms, and habits, such as the perception that green products are luxuriously expensive and insufficient or incorrect information, may reduce green consumption.

All these factors are affected by the agenda presented in the mass media and discussion platforms, which may, if effective, create group norms and affect intentions and actual behavior (Moore and Moschis, 1983; Willnat and Weaver, 2018; Chen et al., 2019).

In Europe, green consumption is a subject of a number of political initiatives on the level of the EU and single countries. The EU is considered a global leader in environmental and climate change politics (Skovgaard, 2014; Fischer and Geden, 2015); green procurement is an essential part of public and private consumption policies (Calabro, 2007). These initiatives are not always accepted positively by the local population, which may affect the willingness to purchase green products. In the Czech Republic, environmentally charged EU policies traditionally evoke controversy, as they negatively affect coal-producing regions, limit the supply of cheap but environmentally damaging products, and incorporate environmental externalities into the product prices. The EU Environmental policies damaged the economies of the poor coal-producing regions and created an aversion in part of the population to EU integration (Cabelkova et al., 2020; 2022).

Environment protection requires relevant knowledge transferred to the general public through school education or various types of mass media (traditional, online, social). In this field, research on the media's role in different sustainable actions is still largely missing (Chen et al., 2019).

This paper aims to study the role of environmental attitudes, perceptions on climate change, attitudes to the EU, and media exposure in predicting environmentally responsible consumption in the Czech Republic. We distinguish three types of "green" commodities: organic food, local food, and environmentally friendly products. Methodologically we rely on Principal Component Analysis (PCA), correlation, and ordinal regression analyses applied to a representative sample of 904 respondents (aged 15–95 years, M ± SD: 47.74 ± 17.66; 51.40% women, 19.40% with higher education) in the Czech Republic to reach the following research objectives:

1. The literature suggests that environmental concerns and attitudes may increase green purchases. However, the effect does not always manifest itself as economic and normative factors may play a bigger role. For example, green products may be considered luxuriously expensive, and the norm is not to buy them. The paper aims statistically examine the effect of environmental concerns and attitudes on green purchasing.
2. One of the more recent environmental concerns relates to climate change. While in general, it presents a sub-set of environmental changes, it is often communicated as a separate category. This paper aims to study 1) whether the concerns about climate change are disconnected from environmental concerns in the minds of the representative sample (via factor analysis) or belong to the same factor. 2) The paper aims to test the relation between the concerns with climate change and green purchasing.
3. Enhancing green consumption is one of the priorities of the European Union, manifested in several legislative documents and overall communication. However, the green agenda produces certain controversies, especially in the coal-producing regions, and may not always be viewed positively. This paper aims to test whether the acceptance of EU integration positively predicts green purchasing
4. Mass media is one of the important factors affecting the level of information, but also the group norms and attitudes. Ideally, we suggest that mass media positively affect green consumption. This paper aims to test whether the exposition to mass media (TV, printed media, online news social networks, online discussions and blogs, social networks, and offline discussions) is related to green purchasing and if yes, whether this is a positive or negative association.

The paper is structured as follows. The first section briefly reviews the literature on green purchasing and provides the literature review on the factors affecting green consumption. The following sections discuss the role of preferences for environment protection, climate change, EU policies, and the mass media related to green purchasing and the relevant agendas in European contexts. Then, we describe the model, data, and methods. The results, discussion and conclusions close the paper.

2 Green purchasing

Green purchasing (GP) refers to 1) purchasing environmentally friendly products, which are usually recycled and bring benefits to the environment, and 2) avoiding products that harm the environment (Chan, 2001; Mostafa, 2007; Steg and Vlek, 2009). In this regard, GP should be distinguished from sustainable purchasing, which, besides environmental sustainability, accounts for economic, social, health, and other sustainability aspects (Miemczyk et al., 2012).

While the definition of green products is relatively simple in practice, there is still a certain controversy about which products can be classified as green (Huijbregts et al., 2008; Hanafiah et al., 2012; Mancini et al., 2016) since many environmental externalities cannot be directly measured. Nevertheless, green marketing utilizes the green phenomenon to propagate some products as "green" via various "green" certificates and labels (Boström and Klintman, 2008; Schwartz et al., 2020). Besides the products themselves, a number of certificates and labels are employed to indicate the use of eco-friendly or recycled materials in production or packaging, sustainable agrarian practices, or responsible animal handling (eco-labeling, Dhir et al., 2021; Anuar et al., 2020).

Though green- and eco-labeling and environmental concerns are on the rise, the actual purchase of green products still falls behind (Rizqiyana and Wahyono, 2020; Wojnarowska et al., 2021). The intention to purchase green often is not followed by the action.

Hughner et al. (2007) showed that though 67% of consumers reported a positive attitude to organic food products, only 4% purchased those products. The discrepancy between the positive attitude and actual green purchases is widely reported in the literature as ["green purchasing inconsistency" or "green attitude-behavior gap" (Joshi and Rahman, 2015; Wang et al., 2019a; Witek, 2019)]. The following section presents the factors affecting green consumption and green purchasing *per se*.

3 The factors affecting green purchasing. Literature review

Green purchasing belongs to a more general category of green consumption. The concept of green consumption first emerged in the 1970s in the United States, alongside the development of "societal marketing," which addressed environmental questions. Fisk's Theory of Responsible Consumption (Fisk, 1974), Henion and Kinnear's Ecological Marketing (Henion and Kinnear, 1976), and Kardash's Ecologically Concerned Consumer (Kardash, 1974) all contributed to categorizing green consumption. Initially, research focused on energy use, pollution connected to the automobile, oil, and chemical industries, as well as consumer reactions to advertising and labeling (Henion and Kinnear, 1976; Kilbourne and Beckmann, 1998; Peattie, 2010). Later, the studies concentrated more on green purchases of food products and environmentally friendly products.

The literature on factors affecting green consumption aimed at defining factors that might help to increase green consumption. Obviously, the factors in question reflected the dominant social and economic paradigms of a particular period and social context. The early literature concentrated on economic incentives and financial possibilities of households, socio-demographic characteristics, and environmental knowledge (Peattie, 2010). The proponents of economic rationality viewed green consumption as primarily affected by economic factors and suggested that government policy must provide primarily economic incentives (Bartelings and Sterner, 1999; Eriksson, 2004; Jackson, 2005; Wang et al., 2021; Shen and Wang, 2022). This approach is still used, for example, in waste management, where the households are incentivized to sort communal waste by making the disposal of sorted waste free of change. The economic literature also suggests that more affluent households produce a larger environmental footprint but can afford to purchase "greener" goods (Cymru, 2002; Lenzen and Murray, 2003; Huang, et al., 2022). Thus, income rise may increase green consumption.

Socio-demographic aspects as predictors of green consumption were originally important primarily from the point of view of market segmentation according to sex, age, presence and number of children, educational level, and socioeconomic class (Laroche, et al. (2001); Robinson and Smith (2002); Jenkins, et al. (2003). Yet, they are still frequently included in empirical analyses, often as control variables (Walia et al., 2020)

The impact of environmental knowledge in supporting green consumption is not uniform. The straightforward conclusion that providing more information about the environment increases green consumption was supported by some studies (Bartkus et al., 1999) but not the others (Davies, et al., 2002; Pedersen and Neergaard, 2006; Rustam, et al., 2020). Besides price ("green" goods are still more expensive, making them difficult to afford), the green attitude-behavior gap seems to play a role here (Joshi and Rahman, 2015; Wang et al., 2019b; Witek, 2019).

While the early studies studied primarily economic, demographic, or knowledge factors, the later research proved that attitudes and values are often more important predictors of green consumption than rational choices. (Han, et al., 2007; Carrus et al., 2008; Peattie, 2010; Wang, et al., 2019a). The values are a broad category. One stream of research concentrated on the existing models of values. For example, Schwartz's value model or altruist values were shown to be related to pro-environmental behavior. However, other studies report the opposite—pro-environmental values increase product reuse and waste-minimization intentions and behaviors but not recycling (Barr, 2007), or pro-environmental values increase the intention to recycle and conserve water but not to buy organic food or avoid leaving appliances on standby (Lyndhurst, 2004). The other studies report that environmental attitudes, environmental knowledge, subjective norms, perceived behavioral control, conditional value, and emotional value have a positive effect on green purchase intentions (Nekmahmud, et al., 2022a)

The lower expected effect of pro-environmental values on pro-environmental behavior was explained by the particularities playing more important role (Barr, 2007) or by the impact of economic incentives (Bartelings and Sterner, 1999; Eriksson, 2004; Jackson, 2005; Wang et al., 2021; Shen and Wang, 2022) and the green attitude-behavior gap (Joshi and Rahman, 2015; Wang et al., 2019a; Witek, 2019). The dominant social paradigm (DSP) and cultural/ethnic group norms may reduce the role of the value factors above (Kilbourne, et al., 2002; Johnson et al., 2004; Halder, et al., 2020; Fischer, et al., 2021). For example, consumerism reduces willingness to engage in green consumption (Kilbourne and Polonsky, 2005; Fischer, et al., 2021). Consumption is then viewed as a social process in social, political, and historical contexts, and conditions of lives and lifestyles bear immense importance. All these factors affect green consumption (Connolly and Prothero, 2003; Moisander, 2007; Beatson, et al., 2020; Fischer, et al., 2021). The (pro) environmental behavior may also belong to social norms. For example, recycling may be adopted because it is perceived as normal, Barr (2007), or the existing prices may represent the norm, and greener products represent an expensive luxury (Krystallis and Chryssohoidis, 2005). Similarly, pro-social behavior is showed to influence pro-environmental behavior (Ramkissoon, 2023).

Values can be effective in the case the consumer feels that a change in his behavior can produce a significant change in the environmental outcome, or, oppositely, the current state of the environment is partly caused by his behavior. Understanding personal responsibilities for both causing and solving environmental problems and believing that the action they take can have a meaningful impact was shown to be a significant predictor of pro-environmental behavior (Gupta and Ogden 2009; Yue et al. (2020).

The spatial dimension (local, urban/rural, regional, and national) is the next dimension of factors affecting pro-environmental behavior (Peattie, 2010). The urban and rural differ in waste infrastructure (Munksgaard, et al., 2000), style of housing, agricultural systems, and specific mix of energy sources (Hines and Peattie, 2006), and people's behavior (Tang, et al., 2022). We can expect different economic incentives in pro-environmental behavior, different local culture and style of life and habits

(Empacher and Götz, 2004; Leiserowitz, et al., 2010; Vita, et al., 2019; ElHaffar, et al., 2020; Samkange et al., 2021).

All the perceptions, values and knowledge can be impacted by the mass-media and education. The impact of mass media on pro-environmental values and pro-environmental behavior was shown to be a significant one (Haron et al., 2005; Jain, et al., 2020; Wagdi, et al., 2022). Especially video content that is largely based on emotions has a particular influence on pro-environmental attitudes (Ramkissoon, and Smith, 2014). Social media, as a special case of the mass media, were shown to have a significant positive effect on green consumption intentions promoting attitude, subjective norms, and green thinking via social media marketing (Nekmahmud, et al., 2022b). However, the media is such a complex phenomenon that much of the research on the media's role in different sustainable actions is still largely missing (Chen et al., 2019).

This paper contributes to the research on the factors affecting green consumption by studying the effect of values and attitudes related to climate change, environment protection, personal possibility to affect environmental outcomes such as climate change, and the sufficiency of information about environmental protection. We add political attitudes such as trust in the European Union and the perceived reasonability of EU integration. In addition, we add more comprehensive research on the effect of media exposure (TV, printed media, radio, internet news, discussions and blogs, social networks, and offline discussions), socio-demographic indicators including sex, gender, education, the standard of living, and town size. The following sections will describe more closely relevant agendas and the existing literature.

4 The factors affecting green consumption studied in this paper. The relevant agendas and literature and hypothesis development

4.1 The agenda of climate change

The climate change agenda is largely related to global warming production, among other extreme weather events. However, personal experience with extreme weather phenomena such as hurricanes and storms is rare, and overall observable temperature increase is not always associated with global warming. Thus, the information about climate change largely depends on the mass-media presentation (Anderson, 2011; Ryghaug et al., 2011), though the scope and frequency of presentation of climate-related agenda in different countries fluctuate (Schmidt et al., 2013). In the extreme case, public opinion can be understood as just a simple reflection of the extent and prominence of media coverage (the agenda-setting hypothesis, McCombs and Valenzuela, 2020; Dumitrescu and Mughan, 2010; the quantity coverage theory; Mazur, 2009).

The agenda of climate change, as presented in media, suffered considerable changes with the change of the media itself. The diminishing role of specialist reporters and the emergence of online news media and niche sites specializing in climate journalism accompanied by the shift of roles of journalism from "gatekeeping" to "curating" roles plus the change of journalist sources from elite scientists to a broader range of stakeholders led to a strong and rising influence of the interests of stakeholders to climate journalism (Schäfer and Painter, 2021). The engagement of stakeholders presenting their interests in the media led to overrepresentation of climate change issues compared to the general agenda of environment protection (Legagneux et al., 2018).

The media agenda formation is shown to produce significant polarization of the climate-related agenda (Li, et al., 2013; Matakos, et al., 2017; Gubanov and Petrov, 2019). Facing perceived scientific uncertainty about climate change, the media norms eventually helped the climate-skeptic opinions to become a relevant part of the climate discourse. The internet-based social networks can exacerbate the effect of opinion polarization. The pre-defined computer algorithms are likely to diminish the exposure frequency of the content, presenting alternative ideas (Pearce et al., 2019).

Social networks, open forums, and internet-based discussion platforms are the other frequent source of climate change attitudes (Williams et al., 2015; Pearce et al., 2019), where all kinds of influencers and celebrities can shape public opinion (ibid., Anderson, 2011)

In the Czech Republic, the discussion on climate change in mass media is rather scarce in most cases, presented according to the mainstream viewpoint as global warming of anthropogenic origin (Trunečková, 2015; Navrátilová, 2021; Cabelkova et al., 2022). The appeal to fight climate change via the adoption of climate-conscious behavioral patterns was also dominant (ibid.). On the other hand, in the context of economically important areas (such as coal mining), the climate effects of fossil fuels were effectively missing (Lehotský et al., 2019; Černý and Ocelík, 2020; Cabelkova et al., 2022).

In any case, the methods to fight climate change are presented primarily as the reduction of greenhouse gas emissions via green consumption, green housing, and green travel (Alfredsson, 2004).

From the discussion above and in line with literature survey two hypotheses can be made:

Hypothesis 1: Concerns with climate change positively predict green consumption.

Hypothesis 2: The impact of the media on green consumption may vary according to the type of the media as some types produce significant polarization of opinions.

4.2 The agenda of environmental protection

Though measures combatting climate change is one of the forms of environmental protection, the media presentations of the two substantially differ. While the dangers of climate change are often distant and not primarily visible in the Czech Republic, environmental degradation is more often experienced already (Hůnová, 2020). The health effects of contaminated food, smog, frequently appearing in the cities, and changes in biodiversity in ecosystems are experienced directly. In the Czech Republic, the agenda and environmental effects of coal mining and processing are directly visible to the general public in exposed regions (Lehotský and Černík, 2019).

So, contrary to climate change agenda, general environment protection attitudes are more related to personal experience (positive or negative) and less affected by the media. If fact, the agenda of environment protection might be perceived as a completely different agenda from the agenda of climate change. Thus we can formulate the following research question:

Q1. Values related to climate change and environment protection represent two separate sets of values belonging to two factors.

We do not formulate this as hypotheses since it is not directly testable, though we will apply exploratory factor analysis to research it.

Hypothesis 3: The concerns with environment protection positively predict green consumption.

4.3 The role of preferences for EU integration. The specifics of the Czech Republic

The EU policies that are relevant to consumers' sustainable choices can be divided into two categories: product legislation and waste legislation. Product legislation includes environmental product requirements, information and labeling requirements, rules on product guarantees, and climate legislation (Sajn, 2020). Waste legislation makes it easier to waste recycling. Though in general, these policies are beneficial for the environment, in the Czech Republic they aroused certain controversy, as they affected the economic choices of coal-producing regions, limited the supply of cheap but environmentally damaging products, and in general, incorporated the environmental externalities into the product prices (Cabelkova et al., 2020; 2022). Thus, the trust in the EU and the public attitudes to environmental and economic EU policies were compromised in affected regions.

Being as it is, we hypothesize, that:

Hypothesis 4: Positive attitudes to European integration and policies with respect to environment and economic development positively predict green consumption.

4.4 The role of the media

Media play an essential role in disseminating information, thus influencing people's knowledge, awareness, attitudes, and socioeconomic choices (Madajewicz et al., 2007; Jalan & Somanathan, 2008). Media usage and browsing significantly affect sustainable purchasing (Zafar, et al., 2021). The impact of the media on environmentally responsible attitudes and behaviors varies according to the type of media and the agenda the media presents (Cabelkova et al., 2020; 2022).

We hypothesize that:

Hypothesis 5: Exposition to the mass media predicts green consumption. The type of the association depends on the media.

5 Materials and method

5.1 The model

The model is built according to the principles of the general behavioral change model (Hungerford and Volk, 1990; Boudreau, 2010) applied to environmentally responsible behavior (Figure 1).

The knowledge part is impacted by the education level and the sources of information about the social life. Awareness and attitudes are then represented by the awareness and concerns with the environment and climate change, satisfaction with the current state, and sufficient information about environmental protection. As environmental protection was one of the topics that proliferated on the level of EU policies, we include the indicators of trust and attitude to EU policies. Finally, we also control for socio-demographic variables. The resulting model and hypotheses are presented in Figure 2.

5.2 The data

The data were collected in July 2021 via a survey entitled Our society (Naše společnost) conducted by the Czech Institute of Sociology. A total of 904 respondents (aged 15–95 years, M ± SD: 47.74 ± 17.66; 51.40% women, 19.40% with higher education) answered the questions in the questionnaire voluntarily and anonymously under the supervision of 139 experienced interviewers. Methodologically the method of interviewing can be classified as structured interviews. As the quality of the filled-out questionnaires was considered very good, all the questionnaires were included in the data sample. All participants were Czech native speakers living in the Czech Republic. The method of sampling relied on representative sampling with quotes. The quotes included the geographical position, age, gender, and education of the respondents. According to quotes, the data sample is representative of the Czech Republic. The data were kindly provided by the Czech Social Science Data Archive (Sociologický ústav., Akademie věd ČR. 2021).

5.3 The indicators

5.3.1 Green purchasing

The indicators of green purchasing include the frequency of purchasing organic food, local food, and environmentally friendly products. The exact wording of the questions and the distribution of the respondents are presented in Table 1.

The least frequent green purchasing is reported in the cases of buying organic food (22.30% report buying it always or often, and 28.40% of the respondents report never buying them). On the other side, the Czech population showed to be environmentally conscious in purchasing locally produced food, where 58.20% of the respondents reported buying it always or often (Table 1).

5.3.2 Perceptions on the environment, climate change, attitude to EU policies

The exact wording of the questions and the distribution of the respondents are presented in Table 2.

The majority of the respondents perceive environmental protection as urgent or rather urgent (78.3%), although most of the respondents are very or rather satisfied with the state of the environment in their neighborhood (75.9%, Table 2). Approximately half of the respondents are worried or rather worried about climate change (53.9%), and are rather optimistic about the ability of people to affect climate change if they change their current behavior (69.2%, Table 2).

However, society is polarized regarding the environmental and economic effects of European integration and trust in the European Union. Approximately a third of the respondents (33.8% in

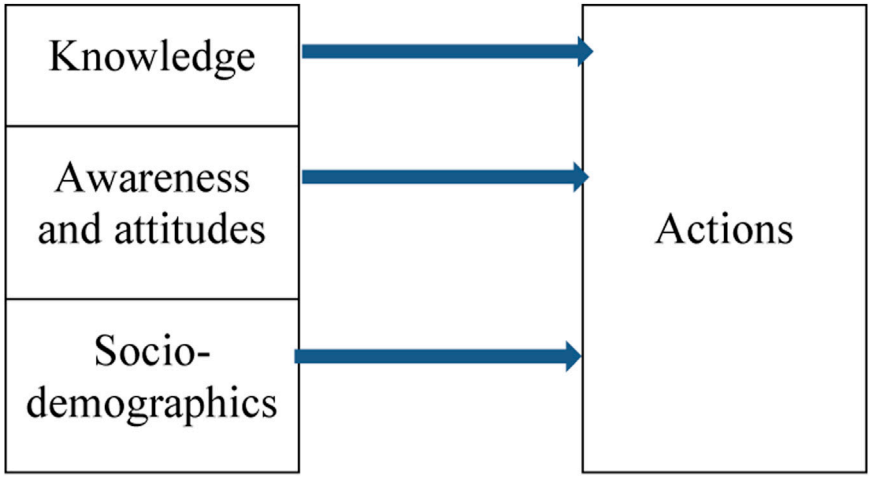

FIGURE 1
Behavioural change model. Source: modified from Boudreau, 2010; Hungerford and Volk, 1990.

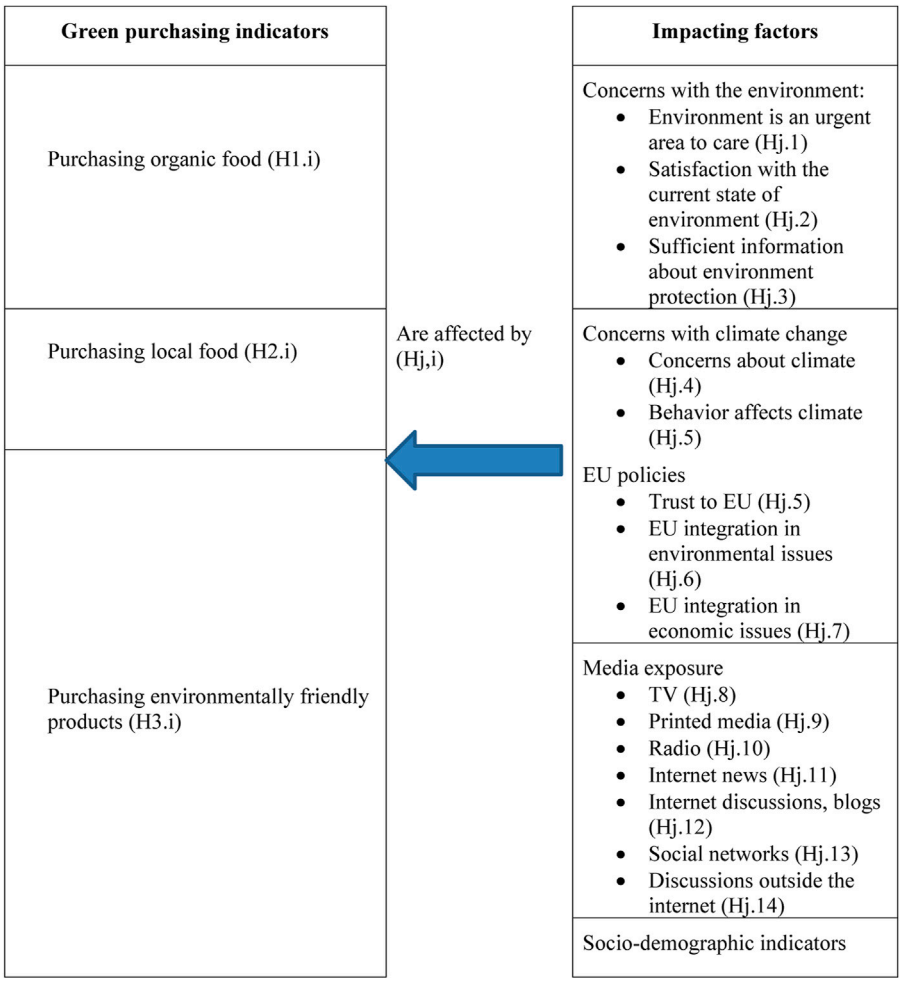

FIGURE 2
The model and hypotheses (Hj.i). Scholars have highlighted that lack of information might prevent consumers from buying sustainable products as it impacts individuals at multiple psychological levels (Cerri et al., 2018; Testa et al., 2015).

TABLE 1 Environmental consumption indicators. The exact wording of the questions and the distribution of the respondents (%).

As far as your household is concerned, you	Always	Often	Rarely	Never	N/A
Purchasing decisions					
- buy organic food	3.10	19.20	45.00	28.40	4.30
- buy locally-produced food	8.10	50.10	30.10	7.50	4.20
- when buying products, you are guided by whether they are environmentally friendly	7.00	23.80	32.20	26.80	10.20

Source: own computations based on representative raw data from Sociologický ústav. Akademie věd ČR. (2021).

TABLE 2 Perceptions on the environment, climate change, EU. The distribution of the respondents (%).

How urgent do you think it is to address the following areas in the Czech Republic this year: Environment protection				
Not urgent at all	Rather urgent	Very urgent	N/A	
19.8	48.8	29.5	1.9	
How satisfied are you with the environment in the place where you live?				
Very satisfied	Rather satisfied	Rather dissatisfied	Very dissatisfied	N/A
19.7	56.2	18.8	4.6	0.7
Do you have enough information about how to be environmentally friendly?				
Definitely enough	Rather enough	Rather not enough	Definitely not enough	N/A
15.3	52.2	22.9	4.0	5.6
How worried are you about the impacts of climate change?				
Very worried	Rather worried	Rather not worried	Not worried at all	N/A
13.2	40.7	26.2	9.2	10.7
Do you think that if people changed their current behavior, they could change the current climate change?				
Could stop it completely	Could slow it down	Could not affect the climate change	N/A	
5.9	63.3	15.0	15.8	
In your opinion, is European integration beneficial or harmful in these areas: economy				
Definitely beneficial	Rather beneficial	Rather harmful	Definitely harmful	N/A
11.7	44.0	26.2	7.6	10.5
In your opinion, is European integration beneficial or harmful in these areas: environment				
Definitely beneficial	Rather beneficial	Rather harmful	Definitely harmful	N/A
12.2	46.2	20.0	6.4	15.2
Please tell me, how much do you trust the European Union				
Definitely trust	Rather trust	Rather distrust	Definitely distrust	N/A
5.2	45.5	27.2	15.4	6.7

Source: own computations based on representative raw data from Sociologický ústav Akademie věd ČR. (2021).

economic policies and 26.4% in environmental policies) believe that EU integration is harmful to the Czech Republic. 42.6% of the respondent reported some level of distrust to the EU.

5.3.3 Media exposure

The distribution of the respondents on media exposure and the exact wording of the questions are presented in Table 3

Most TV is still frequently used media, while the second place is occupied by radio and online news. Printed newspapers and magazines and offline discussions are relatively rarely used sources of information (Table 3). Social networks are very respondent-specific and rarely used 40.9% of the respondents never use them.

5.3.4 Socio-demographic characteristics

We control for the standard of living (very good 8.8%, rather good 45.7%, neither good nor bad 35.2%, rather bad 8.6%, very bad 1.2%), gender (51.4% women), age (aged 15–95 years, M ±

TABLE 3 Media exposure. The distribution of the respondents (%).

How often do you follow social life on	At least 1x a day, %	Several times a week, %	1x a week, %	Less than 1x a week, %	Never, %	N/A, %
TV	42.1	33.8	10.3	7.3	5.9	0.6
Printed newspapers, magazines	7.2	18.3	23.0	24.2	26.7	0.6
Radio	19.1	28.4	16.7	14.3	20.6	0.9
Online news servers	19.6	29.1	15.8	12.9	22.0	0.6
Social networks	14.2	18.7	11.0	14.2	40.9	1.0
Offline discussion	7.1	24.8	21.8	20.9	24.1	1.3

Source: own computations based on representative raw data from Sociologický ústav. Akademie věd ČR. (2021).

SD: 47.74 ± 17.66) education (19.40% with higher education), political orientation (1 left–11 right, M ± SD: 6.56 ± 2.27), subjective town size (21.5% big city, 3.4% suburb of big city, 26.7% average town, 24.7% small town, 8.9% big village, 14.3% small village).

6 The method

Methodologically we rely on Principal component analysis to study the structure of attitudes to environmental protection and climate change. Namely, we are interested in whether the agendas of environmental protection and climate change represent one or two different agendas in the minds of the representative sample of the population in the Czech Republic. In theory, the agenda of climate change represents a subset of the agenda of environmental protection. However, the literature review suggested that according to the media presentation and the non-availability of personal experience, they may present two different agendas.

Second, we conduct ordinal regression analyses to test the factors associated with environmentally conscious behavior according to the scheme presented in Supplementary Appendix S1 (Table 1A); Formula 1.

$$\begin{aligned} Behavior_i = logit\,(a_0 &+ a_{1-3}Environment + a_{4,5}Climate + a_{6-8}EU \\ &+ a_{9-15}Info + a_{16}Standart + a_{17}Gender + a_{18}Age \\ &+ a_{19}Political\,orientation + a_{20-22}Education \\ &+ a_{23-27}Town\,size + e \end{aligned} \tag{1}$$

Where

Behavior$_i$–stands for the frequency of conducting environmentally conscious activities consequently (buy organic food, buy locally produced food, when buying products you are guided by whether they are environmentally friendly, hand in, sort your hazardous waste, sort your regular waste, limit car journeys to protect the environment, save energy and water to protect the environment, for the distribution of the respondents see Table 1)

Environment–three variables capturing environment protection attitudes, namely: 1) the extent the environment protection is urgent, 2) the level of satisfaction with the environment in the locality of the respondent, 3) the extent the respondent has sufficient information about how to behave in an environmentally friendly way (for the distribution of the respondents see Table 2)

Climate–stands for two variables reflecting concerns about the effects of climate change and whether the respondents believe that people's behavior can change climate change (for the distribution of the respondents, see Table 2)

EU–stands for the three variables reflecting the attitude to EU policies: whether European integration in the fields of economy and environment is beneficial or harmful, and the extent to which the respondents trust the EU.

Info–stands for the six variables reflecting the frequency the respondents follow social life in the following media: TV, printed newspapers and magazines, radio, online news serves, social networks, and offline discussions (for the distribution of the respondents, see Table 3).

Standard–subjective standard of living of the respondents (very good to very bad, five-point scale).

Gender and Age–stands for the gender and age of the respondents.

Political orientation–political orientation (left-right, eleven-point scale).

Education–education dummies (primary, secondary w/o state exam, secondary with state exam, higher; higher education is reference variable).

Town size–dummies for subjective town size (big city, suburb of big city, average town, small town, big village, small village).

The bivariate correlations between the variables above are presented in Supplementary Appendix S1.

7 Results and discussion

7.1 Results

Before conducting ordinal regression, we run principal components analysis for the indicators of concerns with the environment and climate to study the internal structure represented by components.

TABLE 4 The Principal Component Analysis of concerns with the environment and climate change. Rotated component matrix.

	Component	
	1	2
Behavior affects climate	**0.786**	−0.006
Concerns about climate change	**0.743**	−0.221
Satisfaction with the environment in locality of residence	−0.105	**0.780**
Urgent areas - environment	−0.215	**0.608**
Enough info about environment	0.372	**0.487**

Bold values in highlite the variables belonging to particular components in Principal Component Analysis.

TABLE 5 The Principal Component Analysis of concerns with the environment and climate change. Total variance explained.

Component	Rotation sums of squared loadings		
	Total	% of variance	Cumulative %
1	1,365	27.3	27.3
2	1,264	25,278	52,579

Extraction Method: Principal Component Analysis.

7.1.1 Concerns with the environment and climate change. The principal component analysis

As environmental protection and climate change largely represent different agendas in the media, we conducted correlation analysis and Principal component analysis for the indicators of environmental concerns and the concerns with climate change.

The Principal Component Analysis of climate change indicators and environmental concerns are presented in Tables 4, 5. An Eigenvalue of 1 or higher determined the number of factors extracted. The Bartlett test of sphericity with a Chi-Square value 163.50 ($p < 0.001$) and Kaiser-Meyer-Olkin Measure of sampling adequacy was equal to 0.550 (> 0.5), suggests that the data are suitable to identify factor dimensions.

The results suggest that perceptions of climate change and environmental concerns present two largely independent categories (slight correlation was reported only in the case of concerns about climate change on the one hand and satisfaction with the environment of the respondent in the locality where he lives and perception that environment is an urgent issue, see Supplementary Appendix S2).

The correlation matrix of environmentally conscious behavior and concerns about the environment and climate change is presented in Supplementary Appendix S2.

The results of ordinal regression (logit) according to Formula 1 are presented in Table 6

Table 7 summarizes the results presented in Table 6.

Environment protection attitudes predicted a higher frequency of purchasing local products and environmentally friendly products (Table 7). However, environmental protection indicators were not associated with purchasing of organic food. Concerns about climate change predicted higher purchasing of organic food and environmentally friendly products but were unrelated to purchasing local food. On the other hand, the perception that behavior can affect climate predicted higher purchasing of local food (Table 7).

The positive attitude to EU integration predicted higher purchasing of organic food and environmentally friendly products but was unrelated to local food purchasing. Right-wing political orientation predicted higher values in all three indicators of green consumption.

The impact of the exposition to the media provided a controversial picture as printed media and online discussion forums and blogs predicted higher purchasing of organic food and environmentally friendly products. In contrast, exposure to social media negatively impacted organic food purchasing. However, the frequent use of social networks positively predicted purchasing of local food. Surprisingly, frequent exposition to TV negatively predicted purchasing of environmentally friendly products.

Age, gender, and education were also associated with green purchasing. Women engaged more in environmentally conscious purchasing than men. Higher-educated respondents purchased more organic and local food. Age was related to lower organic food purchasing. People living in small villages purchase more organic food than those living in other settlements.

7.2 Discussion

The literature suggested six major factors impacting environmentally conscious consumption—1) economic incentives and possibilities, 2) socio-demographic segmentation, 3) values emotions and personal responsibilities, 4) sources and sufficiency of information, including education and mass media, 5) factors related to locality of the respondents including lifestyles (Peattie, 2010). Empirical studies report that some of the factors contradict each other, making the effects unpredictable. This study researched the effects of the environment- and climate-related values, political preferences, economic position (measured by the standard of living), information (whether the respondent has enough information about the environment, education, exposition to mass-media), and socio-demographic values.

The results of the principal component analysis suggest that the population considers the agendas of climate change and environmental protection as two different agendas. While environmental degradation is evident to the public, the disadvantages of climate change are less direct. Moreover, the presentation of climate change in the media results in polarization of opinions both on the existence and long-lasting nature of climate change and on the negative effects of climate change (Li, et al., 2013; Matakos, et al., 2017; Gubanov and Petrov, 2019). Some people believe climate change presents more advantages than disadvantages in the Czech Republic as temperature increase may reduce the necessity to heat houses in winter and possibly allow to collect two harvests per year (Cabelkova et al., 2022).

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TABLE 6 Environmentally conscious purchasing as predicted by environment protection, concerns about climate change, EU policies, exposition to media, and socio-demographics. Results of ordinal regression analysis.

	Buys organic food		Buys local food		Buys environmentally friendly products	
	Estimate	Sig	Estimate	Sig	Estimate	Sig
Threshold = 1	0.631	0.483	−0.209	0.821	−0.75	0.387
Threshold = 2	**3.1*****	**<0.001**	**3.262****	**<0.001**	1.349	0.117
Threshold = 3	**5.654*****	**<0.001**	**5.787****	**<0.001**	**3.168*****	**<0.001**
Environment protection						
Urgent areas - environment	−0.005	0.960	**−0.235***	**0.031**	**−0.243***	**0.011**
Satisfaction with the environment	−0.131	0.303	**0.383****	**0.004**	0.209	0.098
Enough info about environment	−0.034	0.784	**0.261***	**0.046**	**0.269***	**0.030**
Concerns about climate change						
Behaviour affects climate	0.056	0.770	**0.449***	**0.023**	0.063	0.738
Concerns about climate	**0.467*****	**<0.001**	0.076	0.532	**0.516*****	**<0.001**
EU policies						
EU integration, environment	**0.298***	**0.024**	0.019	0.891	**0.283***	**0.031**
EU integration, economy	0.031	0.815	−0.016	0.910	−0.122	0.356
Trust to EU	0.137	0.292	0.026	0.849	−0.087	0.490
Political orientation (left-right)	**−0.143*****	**<0.001**	**−0.149*****	**<0.001**	**−0.112****	**0.005**
Exposition to media						
TV	−0.182	0.052	−0.118	0.229	**−0.244****	**0.008**
Printed media	**0.226****	**0.005**	0.067	0.416	0.120	0.130
Radio	−0.004	0.958	0.056	0.441	−0.022	0.754
Online news	0.018	0.826	0.108	0.202	−0.054	0.502
Online discussions, blogs	**0.209***	**0.014**	0.052	0.565	**0.252****	**0.003**
Social networks	**−0.166***	**0.036**	**0.005***	**0.951**	−0.042	0.587
Offline discussions	0.106	0.169	−0.018	0.820	0.055	0.468
Socio-demographics						
Standard of living	0.034	0.770	0.127	0.293	0.036	0.749
Gender (men)	**0.371***	**0.038**	**0.381***	**0.041**	**0.479****	**0.007**
Age	**0.022*****	**<0.001**	0.001	0.846	−0.004	0.586
Education						
Basic	**0.779***	**0.027**	**0.821***	**0.023**	−0.024	0.944
Secondary w/o state exam	**0.733****	**0.004**	**0.687***	**0.011**	0.048	0.847
Secondary with state exam	**0.567***	**0.016**	0.393	0.120	0.139	0.547
Subjective town size						
Large City	**0.919****	**0.003**	**0.712***	**0.027**	0.061	0.841
Large city suburb	0.495	0.347	**−1.450****	**0.008**	−0.842	0.107
Average town	**0.672***	**0.022**	−0.273	0.374	−0.258	0.369

(Continued on following page)

TABLE 6 (*Continued*) Environmentally conscious purchasing as predicted by environment protection, concerns about climate change, EU policies, exposition to media, and socio-demographics. Results of ordinal regression analysis.

	Buys organic food		Buys local food		Buys environmentally friendly products	
	Estimate	Sig	Estimate	Sig	Estimate	Sig
Small town	**0.571***	**0.049**	−0.401	0.192	−0.214	0.454
Big village	0.612	0.100	−0.275	0.484	−0.095	0.799
N	531		531		505	
Sig		<0.001		<0.001		<0.001
Pseudo R-Square						
Cox and Snell	0.232		0.176		0.161	
Nagelkerke	0.257		0.201		0.175	
McFadden	0.113		0.093		0.069	

Link function: Logit., reference variables: women, higher education, small village. *** significant at the 0.001 level (2-tailed). ** significant at the 0.01 level (2-tailed). * significant at the 0.05 level (2-tailed). Source: own computations based on data (Sociologický ústav. Akademie věd ČR. 2021).
Bold values in highlight statistically significant values.

In general, the interest of Czech respondents in climate change issues is rather low. Only 20% of the respondents reported that they were interested or rather interested (ibid.). Despite the little interest, 86% of the respondents believe the change is happening (the climate has changed during the last 100 years, ibid.)

The difference in environmental protection and climate change agendas was most reflected in the frequency of buying organic food. Surprisingly, the propensity to purchase organic food was predicted by concerns with climate change but was unrelated to all three indicators of environmental protection. The organically managed farms were previously shown to mitigate climate change through the reduction of N2O emissions from soils (the potential was reported to be about 20% of emissions, Scialabba and Müller-Lindenlauf, 2010) and carbon sequestration [the potential is about 40%–72% of the world's current annual agricultural greenhouse gas (GHG) emissions, ibid.]. On the other hand, the yields from organic farming proved to be lower, and if the whole cycle of production is taken into account, the benefits of organic farming from the reduction of GHG emissions are not that certain.

The lack of association between indicators of environmental protection and the frequency of purchasing organic food is intriguing, as, previously, the association was rather supported by the literature (Janssen, 2018; for the review, see Suciu et al., 2019). We can hypothesize that previous authors included climate change in the definition of environmental concerns.

The perception of EU integration positively predicted purchasing organic food and environmentally friendly products. The EU organic certificates and Ecolabelling may play a large role. However, local food purchasing was not associated with EU policies, possibly reflecting the lack of visibility of EU policies.

The role of mass media in environmentally conscious purchasing proved to be very controversial. Larger exposure to printed media, online discussions, and blogs positively predicted purchasing organic food and environmentally friendly products. The exposure to social networks reduced buying organic food, and surprisingly, exposure to TV reduced purchasing environmentally friendly products.

The role of social networks needs more attention as exposure to this media negatively affected buying organic food and sorting common waste, though it positively predicted purchasing local food. The propensity of social networks to form information bubbles may create these phenomena, which need to be studied.

The negative effect of TV on purchasing environmentally friendly products needs to be studied from the traditional journalistic point of view. The presentation of the environmental agenda is subject to numerous biases starting from the topic, through the way of presentation, and ending with conclusions and socially desirable outcomes. From this point of view, it is even more alarming that the media negatively affect environmentally conscious behavior. We can hypothesize that there might be certain self-selection. In many cases, people most exposed to TV have it as a background to other activities rather than actively watching. Thus, the sole fact of exposition might define the group as people working with the information differently, which may also correlate with a lack of environmental concern. TV exposure as a factor of self-selection needs to be analyzed. We also suggest that TV advertisements often emphasize low price rather than environmental benefits, making consumers more price sensitive and less willing to pay a premium for green products.

The positive effect of right-wing political orientation on environmentally conscious purchasing, similar to the attitude to EU integration, presents the political aspect of the environmental efforts.

8 Conclusion

Green purchases are indispensable for environmental protection and combatting climate change. The relevant information is, in most

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TABLE 7 Predicting environmentally conscious consumption. Results of ordinal regression analyses. Statistically significant associations on conventional levels (5%, 1%, and 0.1%). Brief summary.

	Frequency of purchasing of		
	Organic food	Local food	Environmentally friendly products
Environment protection			
Urgent areas - environment		+	+
Satisfaction with the environment		+	
Enough info about environment		+	+
Concerns about climate change			
Behavior affects climate		+	
Concerns about climate	+		+
EU policies and political orientation			
EU integration, environment	+		+
EU integration, economy			
Trust to EU			
Political orientation (left-right)	+ (right)	+ (right)	+ (right)
Exposition to media			
TV			-
Printed media	+		
Radio			
Online news			
Online discussions, blogs	+		+
Social networks	-	+	
Offline discussions			
Socio-demographics			
Standard of living			
Gender (women)	+	+	+
Age	-		
Education			
Basic	-	-	
Secondary w/o state exam	-	-	
Secondary with state exam	-		
Town size			
Large City	-	-	
Large city suburb		+	
Average town	-		
Small town	-		

Note: + denotes positive association, - denotes negative association. The signs of the associations might be different from the signs of coefficients presented in tables 6 and 7 as they reflect the encoding of the variables. Reference variables: men, higher education, small village. The exact wording of the associations depicted in the table is presented in Appendix 3.

cases, distributed to the general public via education, mass media, green marketing, certification, and labeling. In Europe, the EU plays a major role in determining environmental policies and the provision of relevant certificates.

The existing literature established that attitudes to environmental protection and climate change, among other factors such as values, beliefs, lifestyles, and orientations, significantly affect the propensity of the population for green purchasing (Wijekoon and Sabri, 2021), though certain green attitude-behavior gap (Wang, et al., 2019b; Witek, 2019), limits the applicability of these findings. On the other hand, the intention to purchase and the purchase itself are shown to be driven by the same determinants (Janssen, 2018). In this field, research on the media's role in green purchases is still largely missing (Chen et al., 2019).

This paper studied the effects of attitudes to environmental protection, climate change concerns, and EU integration, and mass media (traditional and new ones) on the reported frequency of green purchases of households. Predictably, environmental attitudes and climate concerns positively predicted green purchases. The EU integration was the most important in the sense of environmental integration.

However, the most problematic effects were shown on the side of mass media as the exposure to TV and social networks diminished green purchasing. We suggest that information bubbles that polarize opinions (most frequent in social networks) cause this unfortunate outcome (see also Pearce et al., 2019). Besides the content, the negative effect of TV might be caused by significant self-selection or inappropriate advertisement that primarily emphasize the price Both of these effects need to be studied. In any case, more efforts must be made by the TV and social networks to increase the population's awareness on green products.

The impact of the paper is twofold. First, the paper contributes to the empirical literature on green consumption by analyzing value, information, and media factors affecting green consumption. Second, the paper poses significant problems to policymakers and media experts. As exposition to TV and social networks was shown to diminish green consumption, policymakers and journalists need to concentrate on these two media channels to reverse the unfavorable trends. Especially video-content, so vital for green consumption intentions (Ramkissoon and Smith, 2014), should be analyzed and modified accordingly in these two media outlets.

Limitations and suggestions for further research

The biggest limitation of this research is the discrepancy between the positive attitude and actual green purchases ('green purchasing inconsistency' or 'green attitude-behavior gap, Witek, 2019; Wang et al., 2019b; Joshi and Rahman, 2015). However, this problem is partially reduced by the fact that the questions in the questionnaire were formulated as the frequency of actual purchasing rather than the intention to purchase. Moreover, the intention to purchase and the purchase itself are shown to be driven by the same determinants (Janssen, 2018).

The impact of the mass media (online and offline) on environmentally conscious consumption showed the biggest controversy, which needs to be studied further. TV and Social networks proved to reduce several indicators of environmentally conscious consumption. We suggest that the nature of these effects is twofold and may not necessarily be related to the content. First, the frequent use of both media implies certain self-selection. Second, especially in the case of social networks, the role of information bubbles and polarizations needs to be studied. In the case of TV, we can hypothesize that many of the respondents, who report watching TV on a daily basis, use TV programs as a background to their daily activities. The emotional need of this background may define the group.

On the other hand, there might be a considerable percentage of people watching TV news on a daily basis. Given the existence of alternative news sources, this group also may share certain characteristics that distinguish them from others and define the negative association between the frequency of watching and environmentally conscious behavior.

The other avenue for further research may lie in the area of political preferences. The role of political orientation and the perception of EU integration proved to be significant factors for purchasing decisions but not for saving resources or waste management. These effects need to be explained

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found here: Sociologický ústav. Akademie věd ČR. 2021. Centrum pro výzkum veřejného mínění. Naše společnost 2021—červenec [datový soubor] [online]. Ver. 1.0. Praha: Český sociálněvědní datový archiv, 2021 [Accesed 27.10.2022]. DOI 10.14473/V2107 https://archiv.soc.cas.cz/cz/#utm_source=firmy.cz&utm_medium=ppd&utm_campaign=firmy.cz-2200848.

Ethics statement

The studies involving human participants were reviewed and approved by Ethics committee of the Czech University of Life Sciences. The patients/participants provided their written informed consent to participate in this study.

Author contributions

Conceptualization, IC, and LS; methodology, IC; data curation, MH; writing—original draft preparation, MH and DB; writing—review and editing, MH, LS, IC, DB, and PP; supervision, LS; project administration, LS; funding acquisition, LS. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fenvs.2023.1130533/full#supplementary-material

References

Alfredsson, E. C. (2004). Green" consumption—No solution for climate change. *Energy* 29 (4), 513–524. doi:10.1016/j.energy.2003.10.013

Anderson, A. (2011). Sources, media, and modes of climate change communication: The role of celebrities. *Wiley Interdiscip. Rev. Clim. change* 2 (4), 535–546. doi:10.1002/wcc.119

Anuar, M. M., Omar, K., Ahmed, Z. U., Saputra, J., and Yaakop, A. Y. (2020). Drivers of green consumption behaviour and their implications for management. *Pol. J. Manag. Stud.* 21, 71–86. doi:10.17512/pjms.2020.21.1.06

Barr, S. (2007). Factors influencing environmental attitudes and behaviors: A UK case study of household waste management. *Environ. Behav.* 39 (4), 435–473. doi:10.1177/0013916505283421

Bartelings, H., and Sterner, T. (1999). Household waste management in a Swedish municipality: Determinants of waste disposal, recycling and composting. *Environ. Resour. Econ.* 13, 473–491. doi:10.1023/a:1008214417099

Bartkus, K. R., Hartman, C. L., and Howell, R. D. (1999). The measurement of consumer environmental knowledge: Revisions and extensions. *J. Soc. Behav. Personality* 14 (1), 129.

Beatson, A., Gottlieb, U., and Pleming, K. (2020). Green consumption practices for sustainability: An exploration through social practice theory. *J. Soc. Mark.* 10 (2), 197–213. doi:10.1108/jsocm-07-2019-0102

Boström, M., and Klintman, M. (2008). *Eco-standards, product labelling and green consumerism*. Basingstoke, UK: Palgrave Macmillan.

Boudreau, G. (2010). Behavioural change in environmental education. *J Environ Sci. Public Health* 1 (2), 120–133. doi:10.1080/09500693.2011.584079

Cabelkova, I., Smutka, L., and Strielkowski, W. (2022). Public support for sustainable development and environmental policy: A case of the Czech republic. *Sustain. Dev.* 30 (1), 110–126. doi:10.1002/sd.2232

Cabelkova, I., Strielkowski, W., Firsova, I., and Korovushkina, M. (2020). Public acceptance of renewable energy sources: A case study from the Czech republic. *Energies* 13 (7), 1742. doi:10.3390/en13071742

Calabro, G. (2007). The EU-policy of promoting green purchases: The role of ecological labelling. *Forum Ware Int.* 1, 1–7.

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

Černý, O., and Ocelík, P. (2020). Incumbents' strategies in media coverage: A case of the Czech coal policy. *Polit. Gov.* 8 (2), 272–285. doi:10.17645/pag.v8i2.2610

Cerri, J., Testa, F., and Rizzi, F. (2018). The more I care, the less I will listen to you: How information, environmental concern and ethical production influence consumers' attitudes and the purchasing of sustainable products. *J. Clean. Prod.* 175, 343–353. doi:10.1016/j.jclepro.2017.12.054

Chen, Y., Ghosh, M., Liu, Y., and Zhao, L. (2019). Media coverage of climate change and sustainable product consumption: Evidence from the hybrid vehicle market. *J. Mark. Res.* 56 (6), 995–1011. doi:10.1177/0022243719865898

Colbry, S., Bienenstock, J., and Smith, M. (2017). The impact of a community garden on fruit and vegetable consumption: A pilot study. *J. Hunger Environ. Nutr.* 12 (1), 116–123.

Connolly, J., and Prothero, A. (2003). Sustainable consumption: Consumption, consumers and the commodity discourse. *Consum. Mark. Cult.* 6 (4), 275–291. doi:10.1080/1025386032000168311

Cymru, W. W. F. (2002). *The footprint of wales*. Cardiff, UK: A Report to the Welsh Assembly Government WWF Cymru.

Davies, J., Foxall, G. R., and Pallister, J. (2002). Beyond the intention–behaviour mythology: An integrated model of recycling. *Mark. theory* 2 (1), 29–113. doi:10.1177/1470593102002001645

Dhir, A., Sadiq, M., Talwar, S., Sakashita, M., and Kaur, P. (2021). Why do retail consumers buy green apparel? A knowledge-attitude-behaviour-context perspective. *J. Retail. Consumer Serv.* 59, 102398. doi:10.1016/j.jretconser.2020.102398

Dumitrescu, D., and Mughan, A. (2010). "Mass media and democratic politics," in *Handbook of politics* (New York, NY, USA: Springer), 477–491.

ElHaffar, G., Durif, F., and Dubé, L. (2020). Towards closing the attitude-intention-behavior gap in green consumption: A narrative review of the literature and an overview of future research directions. *J. Clean. Prod.* 275, 122556. doi:10.1016/j.jclepro.2020.122556

Empacher, C., and Götz, K. (2004). "10. Lifestyle approaches as a sustainable consumption policy–a German example," in *The ecological economics of consumption*. Editors L. A. Reisch and I. Røpke (Cheltenham, UK: Elgar), 190–206.

Eriksson, C. (2004). Can green consumerism replace environmental regulation?—A differentiated-products example. *Resour. energy Econ.* 26 (3), 281–293. doi:10.1016/j.reseneeco.2003.10.001

Fischer, D., Reinermann, J. L., Mandujano, G. G., DesRoches, C. T., Diddi, S., and Vergragt, P. J. (2021). Sustainable consumption communication: A review of an emerging field of research. *J. Clean. Prod.* 300, 126880. doi:10.1016/j.jclepro.2021.126880

Fischer, S., and Geden, O. (2015). The changing role of international negotiations in EU climate policy. *Int. Spectator* 50 (1), 1–7. doi:10.1080/03932729.2015.998440

Fisk, G. (1974). *Marketing and the ecological crisis*. New York, NY, USA: Harper and Row.

Gubanov, D., and Petrov, I. "Multidimensional model of opinion polarization in social networks," in Proceedings of the 2019 Twelfth International Conference" Management of large-scale system development, Moscow, Russia, October 2019 (IEEE), 1–4.

Gupta, S., and Ogden, D. T. (2009). To buy or not to buy? A social dilemma perspective on green buying. *J. consumer Mark.* 26 (6), 376–391. doi:10.1108/07363760910988201

Halder, P., Hansen, E. N., Kangas, J., and Laukkanen, T. (2020). How national culture and ethics matter in consumers' green consumption values. *J. Clean. Prod.* 265, 121754. doi:10.1016/j.jclepro.2020.121754

Han, S., Lerner, J. S., and Keltner, D. (2007). Feelings and consumer decision making: The appraisal-tendency framework. *J. consumer Psychol.* 17 (3), 158–168. doi:10.1016/s1057-7408(07)70023-2

Hanafiah, M. M., Hendriks, A. J., and Huijbregts, M. A. (2012). Comparing the ecological footprint with the biodiversity footprint of products. *J. Clean. Prod.* 37, 107–114. doi:10.1016/j.jclepro.2012.06.016

Haron, S. A., Paim, L., and Yahaya, N. (2005). Towards sustainable consumption: An examination of environmental knowledge among Malaysians. *Int. J. Consumer Stud.* 29 (5), 426–436. doi:10.1111/j.1470-6431.2005.00460.x

Henion, K. E., and Kinnear, T. C. (1976). *Ecological marketing*. Chicago, IL, USA: Am. Mark. Assoc.

Hines, F., and Peattie, K. (2006). *Critical review of data for environmental impacts of household activities: Executive summary report*. Cardiff, UK: BRASS Res. Cent.

Huang, H., Long, R., Chen, H., Li, Q., Wu, M., and Gan, X. (2022). Knowledge domain and research progress in green consumption: A phase upgrade study. *Environ. Sci. Pollut. Res.* 29 (26), 38797–38824. doi:10.1007/s11356-022-19200-3

Hughner, R. S., McDonagh, P., Prothero, A., Shultz, C. J., and Stanton, J. (2007). Who are organic food consumers? A compilation and review of why people purchase organic food. Journal of consumer behaviour. *Int. Res. Rev.* 6 (2-3), 94–110. doi:10.1002/cb.210

Huijbregts, M. A., Hellweg, S., Frischknecht, R., Hungerbühler, K., and Hendriks, A. J. (2008). Ecological footprint accounting in the life cycle assessment of products. *Ecol. Econ.* 64 (4), 798–807. doi:10.1016/j.ecolecon.2007.04.017

Hungerford, H. R., and Volk, T. L. (1990). Changing learner behavior through environmental education. *J. Environ. Educ.* 21 (3), 8–21. doi:10.1080/00958964.1990.10753743

Hůnová, I. (2020). Ambient air quality in the Czech republic: Past and present. *Atmosphere* 11 (2), 214. doi:10.3390/atmos11020214

Jackson, T. (2005). Motivating sustainable consumption. *Sustain. Dev. Res. Netw.* 29 (1), 30–40.

Jain, V. K., Gupta, A., Tyagi, V., and Verma, H. (2020). Social media and green consumption behavior of millennials. *J. Content, Community Commun.* 10 (6), 221–230. doi:10.31620/JCCC.06.20/16

Jalan, J., and Somanathan, E. (2008). The importance of being informed: Experimental evidence on demand for environmental quality. *J. Dev. Econ.* 87 (1), 14–28. doi:10.1016/j.jdeveco.2007.10.002

Janssen, M. (2018). Determinants of organic food purchases: Evidence from household panel data. *Food Qual. Prefer.* 68, 19–28. doi:10.1016/j.foodqual.2018.02.002

Jenkins, R. R., Martinez, S. A., Palmer, K., and Podolsky, M. J. (2003). The determinants of household recycling: A material-specific analysis of recycling program features and unit pricing. *J. Environ. Econ. Manag.* 45 (2), 294–318. doi:10.1016/s0095-0696(02)00054-2

Johnson, C. Y., Bowker, J. M., and Cordell, H. K. (2004). Ethnic variation in environmental belief and behavior: An examination of the new ecological paradigm in a social psychological context. *Environ. Behav.* 36 (2), 157–186. doi:10.1177/0013916503251478

Joshi, Y., and Rahman, Z. (2015). Factors affecting green purchase behaviour and future research directions. *Int. Strateg. Manag. Rev.* 3 (1-2), 128–143. doi:10.1016/j.ism.2015.04.001

Kardash, W. J. (1974). *Ecological marketing*. Chicago, IL, USA: American Marketing Association, 5–10.Corporate responsibility and the quality of life: Developing the ecologically concerned consumer

Kilbourne, W. E., and Beckmann, S. C. (1998). Review and critical assessment of research on marketing and the environment. *J. Mark. Manag.* 14 (6), 513–532. doi:10.1362/026725798784867716

Kilbourne, W. E., Beckmann, S. C., and Thelen, E. (2002). The role of the dominant social paradigm in environmental attitudes: A multinational examination. *J. Bus. Res.* 55 (3), 193–204. doi:10.1016/s0148-2963(00)00141-7

Kilbourne, W. E., and Polonsky, M. J. (2005). Environmental attitudes and their relation to the dominant social paradigm among University students in New Zealand and Australia. *Australas. Mark. J.* 13 (2), 37–48. doi:10.1016/s1441-3582(05)70076-8

Krystallis, A., and Chryssohoidis, G. (2005). Consumers' willingness to pay for organic food: Factors that affect it and variation per organic product type. *Br. food J.* 107 (5), 320–343. doi:10.1108/00070700510596901

Laroche, M., Bergeron, J., and Barbaro-Forleo, G. (2001). Targeting consumers who are willing to pay more for environmentally friendly products. *J. consumer Mark.* 18, 503–520. doi:10.1108/eum0000000006155

Legagneux, P., Casajus, N., Cazelles, K., Chevallier, C., Chevrinais, M., Guéry, L., et al. (2018). Our house is burning: Discrepancy in climate change vs. biodiversity coverage in the media as compared to scientific literature. *Front. Ecol. Evol.* 5, 175. doi:10.3389/fevo.2017.00175

Lehotský, L., and Černík, M. (2019). Brown coal mining in the Czech Republic–lessons on the coal phase-out. *Int. Issues Slovak Foreign Policy Aff.* 28 (3/4), 45–63.

Lehotský, L., Černoch, F., Osička, J., and Ocelík, P. (2019). When climate change is missing: Media discourse on coal mining in the Czech Republic. *Energy Policy* 129, 774–786. doi:10.1016/j.enpol.2019.02.065

Leiserowitz, A., Maibach, E., and Roser-Renouf, C. (2010). *Americans' actions to conserve energy, reduce waste, and limit global warming: January 2010*. New Haven, CA, USA: Yale University and George Mason University. Yale Project on Climate Change.

Lenzen, M., and Murray, S. A. (2003). The ecological footprint–issues and trends. *ISA Res. Pap.* 1 (3).

Li, L., Scaglione, A., Swami, A., and Zhao, Q. (2013). Consensus, polarization and clustering of opinions in social networks. *IEEE J. Sel. Areas Commun.* 31 (6), 1072–1083. doi:10.1109/jsac.2013.130609

Lyndhurst, B. (2004). *Bad habits and hard choices: In search of sustainable lifestyles*. London, UK: Brook Lyndhurst.

Madajewicz, M., Pfaff, A., Van Geen, A., Graziano, J., Hussein, I., Momotaj, H., et al. (2007). Can information alone change behavior? Response to arsenic contamination of groundwater in Bangladesh. *J. Dev. Econ.* 84 (2), 731–754. doi:10.1016/j.jdeveco.2006.12.002

Mancini, M. S., Galli, A., Niccolucci, V., Lin, D., Bastianoni, S., Wackernagel, M., et al. (2016). Ecological footprint: Refining the carbon footprint calculation. *Ecol. Indic.* 61, 390–403. doi:10.1016/j.ecolind.2015.09.040

Matakos, A., Terzi, E., and Tsaparas, P. (2017). Measuring and moderating opinion polarization in social networks. *Data Min. Knowl. Discov.* 31 (5), 1480–1505. doi:10.1007/s10618-017-0527-9

Mazur, A. (2009). American generation of environmental warnings: Avian influenza and global warming. *Hum. Ecol. Rev.* 16 (1), 17–26.

McCombs, M., and Valenzuela, S. (2020). *Setting the agenda: Mass media and public opinion*. New York, NY, USA: John Wiley and Sons.

Miemczyk, J., Johnsen, T. E., and Macquet, M. (2012). Sustainable purchasing and supply management: A structured literature review of definitions and measures at the dyad, chain and network levels. *Supply Chain Manag.* 17 (5), 478–496. doi:10.1108/13598541211258564

Moisander, J. (2007). Motivational complexity of green consumerism. *Int. J. consumer Stud.* 31 (4), 404–409. doi:10.1111/j.1470-6431.2007.00586.x

Moore, R. L., and Moschis, G. P. (1983). Role of mass media and the family in development of consumption norms. *Journal. Q.* 60 (1), 67–73. doi:10.1177/107769908306000111

Mostafa, M. M. (2007). Gender differences in Egyptian consumers' green purchase behaviour: The effects of environmental knowledge, concern and attitude. *Int. J. consumer Stud.* 31 (3), 220–229. doi:10.1111/j.1470-6431.2006.00523.x

Munksgaard, J., Pedersen, K. A., and Wien, M. (2000). Impact of household consumption on CO2 emissions. *Energy Econ.* 22 (4), 423–440. doi:10.1016/s0140-9883(99)00033-x

Nair, S. R., and Little, V. J. (2016). Context, culture and green consumption: A new framework. *J. Int. consumer Mark.* 28 (3), 169–184. doi:10.1080/08961530.2016.1165025

Navrátilová, B. (2021). Pět klimatických scénářů: Zemi čekají nenávratné změny, pouze jeden může naplnit Pařížskou dohodu. Irozhlas. Praha 19:00 10. https://www.irozhlas.cz/veda-technologie/priroda/ipcc-osn-panel-klimaticka-zmena-globalni-oteplovani-emise-sklenikove-plyny_2108101900_ban Accesed 25.10.2022.

Nekmahmud, M., Naz, F., Ramkissoon, H., and Fekete-Farkas, M. (2022b). Transforming consumers' intention to purchase green products: Role of social media. *Technol. Forecast. Soc. Change* 185, 122067. doi:10.1016/j.techfore.2022.122067

Nekmahmud, M., Ramkissoon, H., and Fekete-Farkas, M. (2022a). Green purchase and sustainable consumption: A comparative study between European and non-European tourists. *Tour. Manag. Perspect.* 43, 100980. doi:10.1016/j.tmp.2022.100980

Pearce, W., Niederer, S., Özkula, S. M., and Sánchez Querubín, N. (2019). The social media life of climate change: Platforms, publics, and future imaginaries. *Wiley Interdiscip. Rev. Clim. change* 10 (2), e569. doi:10.1002/wcc.569

Peattie, K. (2010). Green consumption: Behavior and norms. *Annu. Rev. Environ. Resour.* 35, 195–228. doi:10.1146/annurev-environ-032609-094328

Pedersen, E. R., and Neergaard, P. (2006). Caveat emptor–let the buyer beware! Environmental labelling and the limitations of 'green'consumerism. *Bus. strategy Environ.* 15 (1), 15–29. doi:10.1002/bse.434

Ramkissoon, H. (2023). Perceived social impacts of tourism and quality-of-life: A new conceptual model. *J. Sustain. Tour.* 31 (2), 442–459. doi:10.1080/09669582.2020.1858091

Ramkissoon, H. R., and Smith, L. D. G. (2014). The relationship between environmental worldviews, emotions and personal efficacy in climate change. *Int. J. Arts Sci.* 7 (1), 93.

Rizqiyana, I., and Wahyono, W. (2020). The influence of eco-brand, eco-labelling and environmental advertisement on consumer purchasing behavior through Brand image. *Manag. Analysis J.* 9 (2), 211–220. doi:10.15294/maj.v9i2.28510

Robinson, R., and Smith, C. (2002). Psychosocial and demographic variables associated with consumer intention to purchase sustainably produced foods as defined by the Midwest Food Alliance. *J. Nutr. Educ. Behav.* 34 (6), 316–325. doi:10.1016/s1499-4046(06)60114-0

Rustam, A., Wang, Y., and Zameer, H. (2020). Environmental awareness, firm sustainability exposure and green consumption behaviors. *J. Clean. Prod.* 268, 122016. doi:10.1016/j.jclepro.2020.122016

Ryghaug, M., Holtan Sørensen, K., and Næss, R. (2011). Making sense of global warming: Norwegians appropriating knowledge of anthropogenic climate change. *Public Underst. Sci.* 20 (6), 778–795. doi:10.1177/0963662510362657

Sajn, Nikolina (2020). Sustainable consumption: Helping consumers make eco-friendly choices. EPRS. https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/659295/EPRS_BRI(2020)659295_EN.pdf.

Samkange, F., Ramkissoon, H., Chipumuro, J., Wanyama, H., and Chawla, G. (2021). Innovative and sustainable food production and food consumption entrepreneurship: A conceptual recipe for delivering development success in south Africa. *Sustainability* 13 (19), 11049. doi:10.3390/su131911049

Schäfer, M. S., and Painter, J. (2021). Climate journalism in a changing media ecosystem: Assessing the production of climate change-related news around the world. *Wiley Interdiscip. Rev. Clim. Change* 12 (1), e675. doi:10.1002/wcc.675

Schmidt, A., Ivanova, A., and Schäfer, M. S. (2013). Media attention for climate change around the world: A comparative analysis of newspaper coverage in 27 countries. *Glob. Environ. Change* 23 (5), 1233–1248. doi:10.1016/j.gloenvcha.2013.07.020

Schwartz, D., Loewenstein, G., and Agüero-Gaete, L. (2020). Encouraging pro-environmental behaviour through green identity labelling. *Nat. Sustain.* 3 (9), 746–752. doi:10.1038/s41893-020-0543-4

Scialabba, N. E. H., and Müller-Lindenlauf, M. (2010). Organic agriculture and climate change. *Renew. Agric. food Syst.* 25 (2), 158–169. doi:10.1017/s1742170510000116

Shen, M., and Wang, J. (2022). The impact of pro-environmental awareness components on green consumption behavior: The moderation effect of consumer perceived cost, policy incentives, and face culture. *Front. Psychol.* 13, 580823. doi:10.3389/fpsyg.2022.580823

Skovgaard, J. (2014). EU climate policy after the crisis. *Environ. Polit.* 23 (1), 1–17. doi:10.1080/09644016.2013.818304

Smith, M., Colbry, S., and Bienenstock, J. (2017). The impact of a community garden on fruit and vegetable intake: A randomized controlled trial. *Prev. Med. Rep.* 5, 136–141.

Steg, L., and Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *J. Environ. Psychol.* 29 (3), 309–317. doi:10.1016/j.jenvp.2008.10.004

Stern, D. I., and Kaufmann, R. K. (2014). Anthropogenic and natural causes of climate change. *Clim. change* 122 (1), 257–269. doi:10.1007/s10584-013-1007-x

Suciu, N. A., Ferrari, F., and Trevisan, M. (2019). Organic and conventional food: Comparison and future research. *Trends Food Sci. Technol.* 84, 49–51. doi:10.1016/j.tifs.2018.12.008

Tang, C., Han, Y., and Ng, P. (2022). Green consumption intention and behavior of tourists in urban and rural destinations. *J. Environ. Plan. Manag.*, 1–25. doi:10.1080/09640568.2022.2061927

Testa, F., Iraldo, F., Vaccari, A., and Ferrari, E. (2015). Why eco-labels can be effective marketing tools: Evidence from a study on Italian consumers. *Bus. Strategy Environ.* 24 (4), 252–265. doi:10.1002/bse.1821

Trunečková, D. (2015). *Reprezentace problému klimatických změn v tištěných médiích. (Representation of the problem of climate change in the print media)*. Prague, Czec: Charles University.

ústav, Sociologický, and Akademie věd, Č. R. (2021). *Centrum pro výzkum veřejného mínění. Naše společnost 2021 - červenec [datový soubor] [online]. Ver. 1.0*. Praha, Czech: Český sociálněvědní datový archiv. doi:10.14473/V2107

Van Dam, Y. K., and Apeldoorn, P. A. (1996). Sustainable marketing. *J. macromarketing* 16 (2), 45–56. doi:10.1177/027614679601600204

Van Huis, A., Van Itterbeeck, J., Klunder, H., Mertens, E., Halloran, A., Muir, G., et al. (2013). *Edible Insects: Future prospects for food and feed security*. Rome: Food and Agriculture Organization of the United Nations.

Vita, G., Lundström, J. R., Hertwich, E. G., Quist, J., Ivanova, D., Stadler, K., et al. (2019). The environmental impact of green consumption and sufficiency lifestyles scenarios in Europe: Connecting local sustainability visions to global consequences. *Ecol. Econ.* 164, 106322. doi:10.1016/j.ecolecon.2019.05.002

Wagdi, O., Afify, A. S., and Habib, A. F. (2022). The impact of social media marketing activities on green consumption intention: Evidence from emerging countries. *Entrepreneursh. Sustain. Issues* 10 (1), 158–174. doi:10.9770/jesi.2022.10.1(8)

Walia, S. B., Kumar, H., and Negi, N. (2020). Impact of socio-demographics on consumers' attitude and purchase intention towards 'eco-friendly'products. *Int. J. Technol. Manag. Sustain. Dev.* 19 (3), 361–371. doi:10.1386/tmsd_00031_1

Wang, J., Shen, M., and Chu, M. (2021). Why is green consumption easier said than done? Exploring the green consumption attitude-intention gap in China with behavioral reasoning theory. *Clean. Responsible Consum.* 2, 100015. doi:10.1016/j.clrc.2021.100015

Wang, L., Zhang, G., Shi, P., Lu, X., and Song, F. (2019a). Influence of awe on green consumption: The mediating effect of psychological ownership. *Front. Psychol.* 10, 2484. doi:10.3389/fpsyg.2019.02484

Wang, Y., Li, Y., Zhang, J., and Su, X. (2019b). How impacting factors affect Chinese green purchasing behavior based on Fuzzy Cognitive Maps. *J. Clean. Prod.* 240, 118199. doi:10.1016/j.jclepro.2019.118199

Wijekoon, R., and Sabri, M. F. (2021). Determinants that influence green product purchase intention and behavior: A literature review and guiding framework. *Sustainability* 13 (11), 6219. doi:10.3390/su13116219

Williams, H. T., McMurray, J. R., Kurz, T., and Lambert, F. H. (2015). Network analysis reveals open forums and echo chambers in social media discussions of climate change. *Glob. Environ. change* 32, 126–138. doi:10.1016/j.gloenvcha.2015.03.006

Willnat, L., and Weaver, D. H. (2018). Social media and US journalists: Uses and perceived effects on perceived norms and values. *Digit. Journal.* 6 (7), 889–909. doi:10.1080/21670811.2018.1495570

Witek, L. (2019). Attitude-behaviour gap among Polish consumers regarding green purchases. *Visegrad J. Bioeconomy Sustain. Dev.* 8 (1), 31–36. doi:10.2478/vjbsd-2019-0006

Wojnarowska, M., Sołtysik, M., and Prusak, A. (2021). Impact of eco-labelling on the implementation of sustainable production and consumption. *Environ. Impact Assess. Rev.* 86, 106505. doi:10.1016/j.eiar.2020.106505

Yue, B., Sheng, G., She, S., and Xu, J. (2020). Impact of consumer environmental responsibility on green consumption behavior in China: The role of environmental concern and price sensitivity. *Sustainability* 12 (5), 2074. doi:10.3390/su12052074

Zafar, A. U., Shen, J., Ashfaq, M., and Shahzad, M. (2021). Social media and sustainable purchasing attitude: Role of trust in social media and environmental effectiveness. *J. Retail. Consumer Serv.* 63, 102751. doi:10.1016/j.jretconser.2021.102751