

Reevaluating the effectiveness of fear appeals on purchase intentions for green products: The moderating effects of social value orientation

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ABSTRACT

This study addresses a crucial research gap by examining how Social Value Orientation (SVO) moderates the impact of various fear appeal messages on consumers' intentions to purchase sustainable products. Unlike most previous research that often treats fear appeals as a single construct, this study deconstructs them into distinct components-physical, social, economic, and self-esteem-to assess their nuanced effects. Additionally, while past studies have primarily relied on images or text, this research innovatively incorporates multisensory experiences to explore changes in consumer behavior. The results show that, compared to the effects of physical fear appeals, social, economic, and self-esteem fear appeals influence purchase intentions differently depending on personality traits. Specifically, egoistic personalities respond more to economic appeals, while altruistic personalities are more influenced by social and self-esteem appeals. These findings validate our hypotheses regarding SVO's moderating effects and offer theoretical insights for future research and practical recommendations for managers and marketers aiming to enhance consumer purchase intentions through effective fear appeal communications.

Keywords:

Fear appeal, Sustainable consumption, Social value orientation, Effective communication, Purchase intention.

1 | Introduction

While the United Nations' initiatives aim to achieve the Sustainable Development Goals (SDGs), providing a comprehensive roadmap for the holistic development of human society and the alleviation of escalating environmental challenges, the formidable task of implementing these ambitious goals is still in its early phases. Using goal 12, "Responsible Consumption and Production", from the SDGs as an illustration, sustainable consumption aims to ensure the satisfaction of current human needs while also meeting the requirements of future generations (World Commission on Environment and Development, 1987). Nevertheless, regardless of the progressive improvement in the innovation and production of eco-friendly products, along with an increased consumer willingness to purchase them, the market remains saturated with conventional or environmentally hazardous products due to significant variability in consumer acceptance of green products. (Carrington *et al.* 2010, 2014; Luchs *et al.* 2010; Olson, 2013; Hsu *et al.*, 2013; Pancer *et al.* 2017; Yan *et al.*, 2021). Consequently, the challenge of enhancing sustainable consumption more effectively is currently putting governments, business entities, researchers, and marketers to the test.

Fear appeal communications seek to influence individuals to modify risky behavior by detailing potential adverse consequences that may occur if they fail to adhere to the recommendations presented in the message (Mostafa, 2020). These appeals are frequently employed in advertisements designed to prevent future negative outcomes, given their immediate impact on consumer behavior. Common applications include healthcare, political, and information security

campaigns (e.g., Hastings *et al.*, 2004; Manyiwa & Brennan, 2012; Jeffrey & Thomson, 2019; Johnston *et al.*, 2015). Green advertisements that highlight a product's sustainable value play an essential role in marketing efforts (Shen *et al.*, 2020). Fear appeal advertisements influence consumer behavior by fostering concerns about the future and evoking guilt over environmental harm (Belz & Peattie, 2009). As emotional messaging is a key element of modern communication, leveraging fear can enhance the effectiveness of campaigns across various contexts (Nai & Maier, 2024; Benoit & Miller, 2022).

In the context of environmental issues, most consumers possess a basic understanding of sustainability topics, such as ecological degradation and global warming (Gifford & Nilsson, 2014). The direct threats to human life posed by extreme weather and food contamination resulting from environmental damage align with the core principles of fear-based appeals (Shin *et al.*, 2017). By emphasizing the severity of critical sustainability challenges like climate change and biodiversity loss, marketing strategies that evoke fear and guilt can effectively link sustainable products to consumers' functional, emotional, and experiential needs, thereby influencing their purchasing decisions (Kumar & Ghodeswar, 2015).

There have been numerous studies applying fear appeals on green marketing in recent years (e.g., Chen, 2016; Shen & Kim, 2022; Kaur *et al.*, 2021). Although those previous studies have demonstrated the effectiveness of fear appeals in influencing consumer behavior, they often treat fear appeals as a single construct or lack comprehensive comparisons between different types. Therefore, it is essential to

deconstruct fear appeals into distinct components to investigate the nuanced effects of various aspects, addressing research gaps and enabling more effective practical applications. Within research investigating the influence of fear appeal messages on the intention for green consumption, Yu and Lu (2023) build upon the work of Bartikowski *et al.* (2019), breaking down fear appeals into discrete components—physical, social, economic, and self-esteem. Their research delves into the nuanced impacts of these diverse aspects. This approach contrasts with previous studies, which predominantly treated fear appeal as a singular construct, neglecting its multifaceted nature (Yu & Lu, 2023). The research uncovers significant variations in purchase intention within the social and physical scenarios, economic and physical scenarios, and self-esteem-based and physical scenarios. It is noteworthy that though Yu and Lu's (2023) study contributes to the understanding of fear appeal by dissecting its multifaceted nature and reaffirms the impact of fear appeal messages on consumers' intentions to purchase sustainable products; however, there exist several limitations in that study that we can breakthrough to contribute to the research field of fear appeal on sustainability marketing further.

First, rather than relying solely on verbal communication as demonstrated by Yu and Lu (2023), audiovisual advertisements featuring moving or flashing elements prove effective in capturing viewers' attention towards targeted areas of the screen (Huang & Yang, 2012). Consequently, utilizing audiovisual media in fear-based advertisements should accelerate consumers' reaction speed and intensity, thereby enhancing the effectiveness of communication. Therefore, our research

plans to incorporate multisensory experiences, such as visual and auditory effects, to investigate the contemporary landscape of message transmission across diverse technological platforms (Moriarty *et al.*, 2012).

Secondly, Yu and Lu's (2023) exploration of moderating variables did not meet their expectations, prompting us to investigate other key factors that may influence how fear appeal messages affect consumers' green product purchase intentions. We plan to introduce Social Value Orientation (SVO) as a moderating variable. In the SVO framework, it is presumed that individuals differ in their motivations or objectives when assessing various distributions of resources between themselves and another individual. SVO has been observed to influence cognitive processes and explain behaviors across various interpersonal decision-making scenarios, notably within negotiation settings (De Dreu & Boles, 1998) and resource allocation dilemmas (Roch & Samuelson, 1997; Samuelson, 1993). Moreover, do Paço *et al.* (2019) highlight that altruistic behavior is positively linked to sustainable values, which enhance consumers' receptivity to green advertisements and influence their purchasing decisions, indicating that altruistic personalities hold significant potential for further exploration in green marketing. Similarly, Stern (2000) suggests that altruistic, biospheric, and egoistic values shape sustainable consumers' beliefs, which in turn influence their personal norms and ultimately their behavior. Altruistic and biospheric values are typically positively associated with sustainable consumption, whereas egoistic values tend to have the opposite effect. For instance, according to Bartikowski *et al.*'s (2019) classification of

fear appeal message types, if physical and self-esteem appeals are categorized as personal-level messages, and social and economic appeals as broader environmental-level messages, it can be inferred that altruistic individuals are more likely to respond to environmental-level messages, whereas egoistic individuals may be more responsive to personal-level messages.

It is important to highlight that these two SVO variables (i.e., altruism vs. egoism) have not been previously included as moderating variables in the literature on fear appeals in sustainable marketing. Hence, this study aims to investigate how Social Value Orientation (SVO) moderates the influence of different fear appeal message types on consumers' intention to purchase sustainable products. This endeavor addresses research gaps in fear appeal, ultimately promoting sustainable consumption and advancing sustainable development.

2 | Theoretical background and hypothesis development

2.1 Sustainable consumption and sustainable consumers

Sustainable consumption refers to a consumption model that balances the needs of current generations with the environmental well-being of future generations (Testa *et al.*, 2021). It promotes shared environmental responsibility among consumers and producers, raising awareness of the broader impacts of product and service choices on the environment, politics, and fairness. This encourages environmentally conscious decisions to mitigate production-related environmental issues (Connolly & Prothero, 2008; Nash, 2009). As sustainable

development becomes more prominent, consumer choices increasingly reflect social responsibility. In the late 1980s, eco-conscious consumers emerged in Western Europe and North America, motivated by global environmental challenges. These consumers prioritize not only product safety but also the broader effects of production processes and are willing to pay more for eco-friendly products. Their sustainable behaviors, such as choosing durable, high-quality, and eco-labeled products, aim to minimize resource and energy consumption, supporting sustainable development as a core objective (do Paço *et al.*, 2019).

When marketing strategies transition from a production-driven to a customer-focused approach, consumers gain greater involvement and influence in the decision-making process (Kaya & Duman, 2017). Consumers can impact producers by choosing or boycotting products according to their preferences, highlighting the importance of addressing consumer needs and promoting sustainable product choices. Stern (2000) identifies environmental forces, attitudes, habits, and personal capabilities as key factors influencing sustainable consumer behavior. Early research indicates that consumer actions are shaped by behavior types and product involvement (e.g., Black *et al.*, 1985; Cleveland *et al.*, 2005; Jansson *et al.*, 2010; Roberts & Bacon, 1997). Peattie (2010) emphasizes that economic, environmental, lifestyle, habitual, and spatial factors also play a role in shaping sustainable consumer decisions.

With the rapid growth of the internet, consumers can access a wide range of information through quickly disseminated messages. Among these, sustainable consumption is often categorized as planned behavior and rational decision-making (Kaya

& Duman, 2017). Many studies highlight the role of consumer environmental awareness and sustainable attitudes as key drivers of sustainable consumption (e.g., Chen *et al.*, 2017; Kumar & Ghodeswar, 2015; Schlegelmilch *et al.*, 1996). However, despite the positive influence of these factors, an intention-behavior gap remains, where consumers may express sustainable attitudes or intentions influenced by social norms, yet fail to act on them in actual consumption (Juvan & Dolnicar, 2014; Nguyen *et al.*, 2019; Terlau & Hirsch, 2015; Wiederhold & Martinez, 2018). As a result, individuals with positive sustainable attitudes may not always engage in sustainable consumption, while those without such attitudes may still adopt more sustainable patterns due to economic or personal factors. Furthermore, some studies suggest that focusing solely on sustainable consumers may create discrepancies between research outcomes and real-world behavior, as true sustainable consumption involves making choices between products with comparable attributes, rather than only considering aspects of sustainable attitudes (Kardash, 1974; Nguyen *et al.*, 2019; Peattie, 2001). Therefore, we define sustainable consumers as individuals who actively purchase or use sustainable products, aiming to reflect real-world behavior more accurately.

Furthermore, this study focuses on applying sustainable food as the basis for practical research. Sustainable food is often defined through a comprehensive approach, integrating economic, social, and environmental dimensions. Environmentally, it emphasizes minimizing harm to natural resources by reducing carbon and water footprints, preserving biodiversity, and addressing food waste. Economically, it supports stakeholders' viability, contributing

to stability and growth. Socially, it ensures fairness, promoting workers' rights, consumer health, and social justice. Research highlights the environmental dimension as a priority, particularly in production and processing, while consumers focus on environmental benefits, though cost and availability often hinder adoption (Genova & Allegretti, 2024). The reason we selected sustainable food as the focus of this study is its popularity and familiarity among consumers compared to other sustainable products.

2.2 Fear appeal communication

Fear is a powerful negative emotion that shapes how consumers process information and make decisions (Lee *et al.*, 2017). Fear appeals are particularly effective at swiftly influencing consumer behavior and are commonly used in advertisements addressing public health issues that pose direct threats to human well-being, such as anti-smoking campaigns (Manyiwa & Brennan, 2012), HIV prevention (LaTour & Pitts, 1989), and vaccination promotion (Carciooppolo *et al.*, 2017), with the aim of preventing future negative outcomes. Fear appeal communication seeks to evoke concern about one's physical or mental health, the health of others, or interpersonal relationships through text, images, or video, thereby triggering anxiety, fear, and tension. These messages typically include recommendations on how to effectively avoid such risks (Brooker Jr, 1981; Witte, 1992). As extreme weather and food contamination resulting from production and trade pose direct threats to human life, research on fear appeals has extended to environmental issues (e.g., Chen, 2016; Reser & Bradley, 2017; Shen & Kim, 2022) and is frequently used in sustainability campaigns.

For example, advertisements warning of rising sea levels or showing polar bears in distress not only highlight the urgency of environmental issues but also aim to instill fear in consumers, prompting more immediate changes in consumption habits. In the marketing of sustainable products, fear appeals have emerged as a central focus in numerous studies (e.g., Kaur *et al.*, 2021; Lee *et al.*, 2017; Pittman *et al.*, 2021; Shen & Kim, 2022; Shin *et al.*, 2017).

Witte (1992) developed the Extended Parallel Process Model (EPPM) to explain how fear appeals influence individuals by assessing the perceived threat and the effectiveness of the recommended solution. If the solution is seen as effective, it motivates action, leading to a positive attitude toward the product and an increased likelihood of purchase. Lee *et al.* (2017) compared fear appeals and hope appeals in green advertisements, further dividing them into global and local frameworks. Their study revealed that local framing often led to underestimation of the threat's severity due to familiarity or perceived solvability, reducing the effectiveness of fear appeals. In contrast, global framing heightened threat perception and was more effective in motivating behavioral intentions, showing that fear appeals are more impactful when environmental issues are presented as global challenges rather than local ones. Nevertheless, Shin *et al.* (2017) tested this model with LED light bulbs and found that while fear appeals significantly affected attitudes toward the advertisement and product, they did not significantly impact purchase intentions, and variations in message sources had no notable effect.

Bartikowski *et al.* (2019) conducted a content analysis of fear appeal advertisements in China, France, and Canada,

revealing that both the frequency of fear appeals and the types of products employing these strategies differed across countries. They further categorized fear appeal messages into four types: physical, social, economic, and self-esteem. The study highlighted that the effectiveness of each type of fear appeal also varied by region. Physical fear appeals, the most prevalent, focus on triggering fear by emphasizing individuals' vulnerability to health risks. Social fear appeals address concerns related to the environment, violations of laws or social norms, and ecological threats. Economic fear appeals, commonly used in insurance advertisements, emphasize worries about financial security, quality of life, and the broader economic context. Lastly, self-esteem fear appeals tap into concerns about social image and how individuals are perceived by others.

Based on Construal Level Theory, Yu and Lu (2023) highlighted that among the four types of fear appeal scenarios—physical, social, economic, and self-esteem—the physical scenario is the only one that directly affects the individual, making it a low-level event with a shorter psychological distance. In contrast, the other three appeal types—social, economic, and self-esteem—involve external factors and longer timeframes, categorizing them as high-level events with greater psychological distances. Consequently, message recipients tend to develop stronger perceptions and responses to higher-level content, as it is less susceptible to noise interference (Trope *et al.*, 2007). Based on these insights, Yu and Lu (2023) proposed the following three hypotheses, all of which were confirmed in their study:

H_{1a}: The effect of fear appeal on consumers' intention to purchase sustainable products is stronger in the social scenario than in the physical scenario.

H_{1b}: The effect of fear appeal on consumers' intention to purchase sustainable products is stronger in the economic scenario than in the physical scenario.

H_{1c}: The effect of fear appeal on consumers' intention to purchase sustainable products is stronger in the self-esteem-based scenario than in the physical scenario.

Though the research by Yu and Lu (2023) highlights notable distinctions in purchasing intentions, especially concerning various fear appeal types, they observed significant differences across social, economic, and self-esteem-based fear appeal scenarios compared to physical scenarios. However, their investigation into the moderating effect of different message focuses did not align with their initial predictions. Hence, our study endeavors to explore additional potential moderating variables that could influence the impact of various types of fear appeal on the purchase intention of green products, aiming to enrich the literature on fear appeal communication.

2.3 Social value orientation

Social Value Orientation (SVO) refers to an individual's stable preferences in resource allocation decisions (Van Lange *et al.*, 1997). Murphy *et al.* (2011) identified four main social value orientations: altruistic, prosocial, individualistic, and competitive. Altruistic and prosocial orientations are broadly categorized as altruistic personalities, while individualistic and competitive orientations are considered egoistic personalities. Historically, Van Lange *et al.*'s (1997) Triple Dominance Measure (TDM) has been used to assess these orientations, classifying respondents into prosocial, individualistic, or competitive categories based on their choices. The TDM is valued for its simplicity and efficiency, with adequate validity. However, it has a notable limitation in distinguishing between prosocial and altruistic tendencies (Murphy & Ackermann, 2014).

In contrast, Murphy *et al.* (2011) introduced the slider measure, which presents respondents with nine resource allocation options (secondary items) across six scenarios (primary items). This measure classifies individuals into four categories—altruistic, prosocial, individualistic, and competitive—by calculating the angle of their social value orientation. The slider measure not only maintains the simplicity of the TDM but also provides enhanced reliability and validity. It better captures the intensity of respondents' social value orientations, offering a significant advantage in empirical research over the TDM (Murphy & Ackermann, 2014). Figure 1 presents the six primary items of Murphy and Ackermann's (2014) Slider Measure.

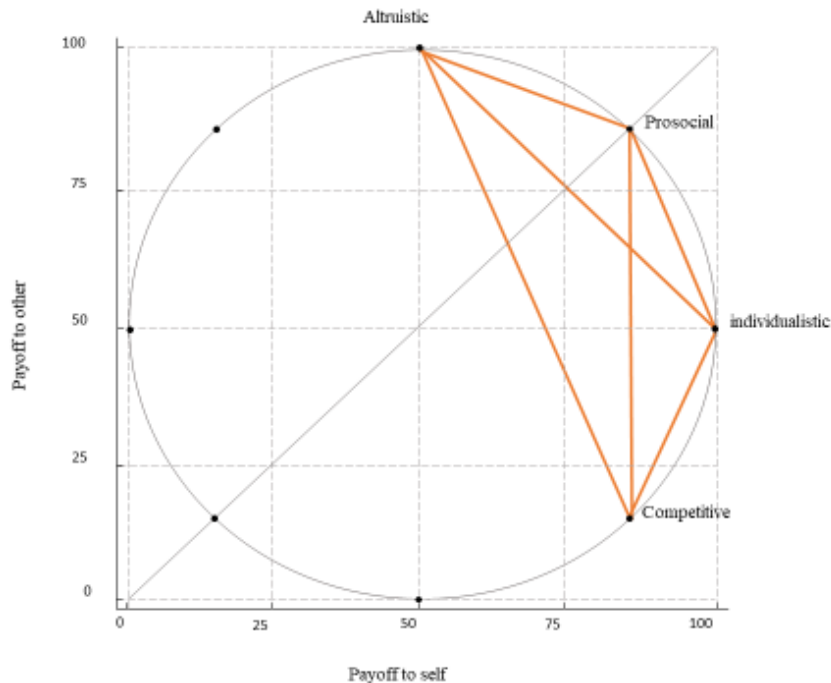


Figure 1 A graphical representation of the slider measure's six primary items (Murphy & Ackermann, 2014)

Once the decision-maker has selected their preferred payoff allocation for each of the six primary items, the SVO angle can be calculated as follows:

$$\text{SVO slider } \theta = \arctan \left[\frac{\sum(P_o - 50)}{\sum(P_s - 50)} \right]$$

where P_o represents the payoff allocated to the other person, while P_s represents the payoff allocated to the decision-maker. A value of 50 is subtracted from each allocation to shift the reference point of the ring (50, 50) to the origin of the Cartesian plane. This adjustment allows the inverse tangent of the ratio between P_s and P_o to yield a more interpretable index, where an individualistic orientation corresponds to an angle $\text{SVO}^\circ = 0$. A participant's calculated angle serves as a unidimensional, continuous measure of Social Value Orientation (SVO), with higher angles indicating greater concern for others' welfare. The scale ranges from a lower limit of -16.26° , which reflects perfect competitiveness, to an upper limit of 61.39° ,

Stern (2000) integrated the Theory of Basic Values (Schwartz, 1992) with the Norm Activation Model (Schwartz, 1977) to develop the Value-Belief-Norm Theory (VBN), which posits that personal norms shape individuals' willingness to engage in pro-environmental behaviors. VBN suggests that sustainable consumers' beliefs are influenced by both altruistic and egoistic values, affecting their norms and decision-making. Altruism, defined as voluntary actions aimed at benefiting others without seeking external rewards (Pfattheicher *et al.*, 2022), is frequently studied as a key factor in sustainable consumption (e.g., Maner & Gailliot, 2007; Waites *et al.*, 2020). Exploring the moderating effect of social value orientation on the impact of fear appeals on purchase intention is important because altruistic values are positively linked to sustainable behaviors, increasing receptiveness to green advertising, while egoistic values have the opposite effect (do

Paço *et al.*, 2019; Jansson *et al.*, 2010). By understanding these variations, we can better tailor fear appeals to align with consumers' social value orientations, ultimately enhancing their effectiveness in promoting sustainable behaviors. From a social cognitive perspective, differences in personality traits, such as altruism, likely result in varied responses to fear appeals, influencing purchase intentions (Mowen *et al.*, 2004; Witte & Allen, 2000).

Building on the fear appeal message types proposed by Bartikowski *et al.* (2019) and Yu and Lu (2023), we categorize physical and self-esteem appeals as individual-level messages, and social and economic appeals as environmental-level messages. Altruistic individuals are expected to respond more strongly to environmental-level messages, while egoistic individuals will likely react more to individual-level messages. This study introduces Social Value Orientation (SVO) as a moderating variable to explore how personality traits influence sustainable consumption. We further categorize fear appeals into "internal appeals" (i.e., personal financial concerns) and "external appeals" (i.e., social environment and self-image). We hypothesize that egoistic individuals will be more influenced by internal appeals due to their personal relevance, while altruistic individuals will respond more to external appeals. Consequently, we propose the following three hypotheses suggesting that the effect of

fear appeal message types on consumers' intention to purchase sustainable products will vary based on different personality traits (i.e., altruism vs. egoism).

H_{2a}: Social fear appeal has a stronger effect on consumers' intention to purchase sustainable products than physical fear appeal in the context of altruism compared with the effect observed in the context of egoism.

H_{2b}: Economic fear appeal has a stronger effect on consumers' intention to purchase sustainable products than physical fear appeal in the context of egoism compared with the effect observed in the context of altruism.

H_{2c}: Self-esteem-based fear appeal has a stronger effect on consumers' intention to purchase sustainable products than physical fear appeal in the context of altruism compared with the effect observed in the context of egoism.

Based on the hypotheses, we established the following research framework (Figure 2).

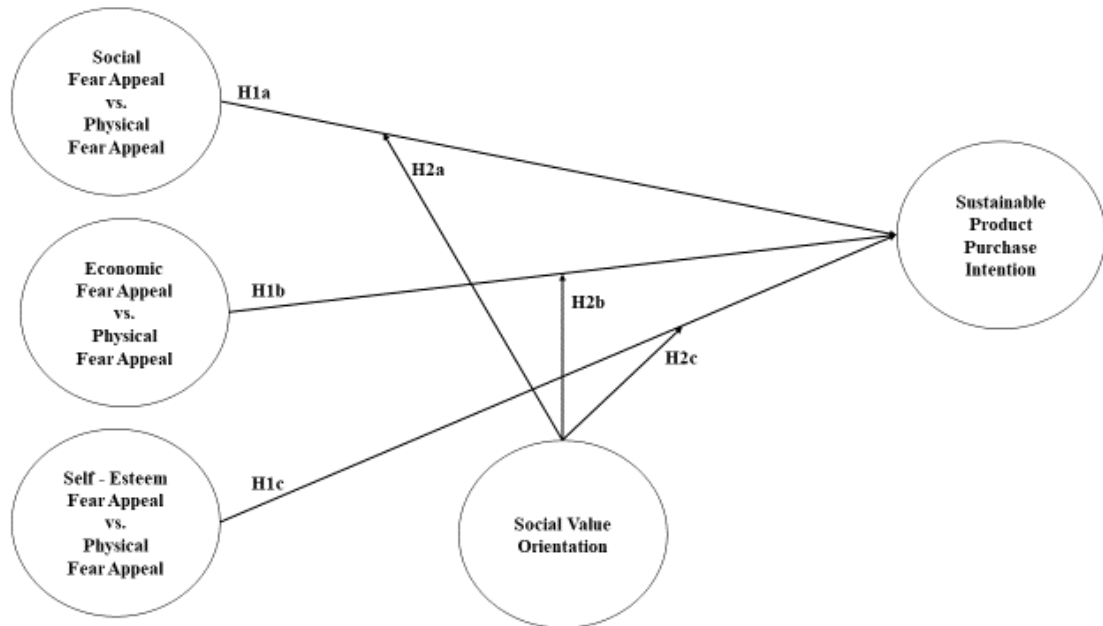


Figure 2 Research framework

3 | Method

3.1 Manipulations

This study adopted the classification method of Bartikowski *et al.* (2019) and integrated the physical, social, economic, and self-esteem-based fear appeal types and social value orientation to form four scenarios. Items on purchase intention and demographic information were incorporated into these four scenarios to generate four versions of the questionnaires, which were labeled A to D. The questionnaire is organized into four sections. In the first section, participants watch a video depicting one of four randomly assigned experimental scenarios. The second section assesses participants' purchase intentions for sustainable products after viewing the video and includes 4 questions. The third section examines participants' social value orientation with 6 questions. The final section gathers basic demographic information through 5 questions. In total, the questionnaire comprises 15 questions.

3.2 Scenario Content

This study focuses on the sustainable food industry for its empirical research, structuring the key scenario content around four types of fear appeals: physical, social, economic, and self-esteem-based. These fear appeals are conveyed through issues associated with non-sustainable food, such as environmental pollution, ecological damage, inhumane farming practices, and the exploitation of labor. Given the widespread availability of online video platforms where users can upload and interact with content, video sources vary greatly in length and quality. Teona *et al.* (2020) highlight that edited videos used in experimental settings can enhance participant engagement and significantly influence browsing behavior. Subtitles also help address challenges related to video length and participants' differing levels of information comprehension. For this study, video materials were sourced from platforms like YouTube and copyright-free platforms such as Pexels, serving as the

communication media. The content included news reports, documentaries, and illustrative images, which were edited to integrate visuals, audio, and text. These elements were combined to produce four experimental scenario videos (A, B, C, and D).

Specifically, the title of Scenario Video #A is: “Can You Hear the Earth’s Cry for Help?” The content emphasizes that many of the foods we consume daily are produced at the expense of the environment, such as burning rainforests to grow chocolate and other crops. Hence, the message delivered by this video represents the social type of fear appeal. For better understanding, the link to Video #A is as follows: <https://www.youtube.com/watch?v=IRQHV09MMYc>. The title of Scenario Video #B is: “Are You Concerned about What You Eat?” The content highlights that the food we consume daily may pose a threat to our health, such as toxic substances in food produced from polluted farmland and oceans. Therefore, the message delivered by this video represents the physical type of fear appeal. For better understanding, the link to Video #B is as follows: <https://www.youtube.com/watch?v=3Vvt1h0mUfY>. The title of Scenario Video #C is: “Are You Funding the Bloody Supply Chain? Dare You Deny It?” The content emphasizes that by carelessly choosing the sources of our food, we may become complicit in inhumane farming practices, unfair trade, or child labor exploitation, all of which can harm the development of the Third World and damage the planet's environment. Hence, the message delivered by this video represents the self-esteem-based type of fear appeal. For better understanding, the link to Video #C is as follows: <https://www.youtube.com/watch?v=Mg5fpTXJvFE>. The title of Scenario Video #D is:

“How Much Longer Can Your Homeland Endure?” The content highlights that overfishing and excessive land clearance are depleting resources and causing desertification, which leads to environmental changes and food security issues. Therefore, the message delivered by this video represents the economic type of fear appeal. For better understanding, the link to Video #D is as follows: <https://www.youtube.com/watch?v=oM1XKYytgM4>.

In addition, we considered that longer questionnaires could impose a greater response burden on participants, potentially leading to a lower response rate (Rolstad *et al.*, 2011). Moreover, past studies using video as a communication tool for fear appeals have predominantly used short videos under 90 seconds (e.g., Teona *et al.*, 2020; Jovanović *et al.*, 2017). Therefore, the length of the videos used in the experimental scenarios in this study was controlled between 60 and 90 seconds to achieve optimal experimental results. We also consulted Yu and Lu (2023) to conduct two fear perception tests, aiming to prevent the fear appeal in certain scenarios from being too diminished to yield meaningful experimental outcomes. The initial test gauged participants’ fear responses to the scenarios, while the subsequent test aimed to uncover any significant disparities in their fear perceptions. Following multiple tests and feedback, we confirmed that participants could no longer discern variations in fear levels immediately after exposure to fear-inducing video messages.

3.3 Measurement of variables

3.3.1 Purchase intention for

sustainable products

The purpose of assessing intention to purchase sustainable products was to gauge consumers' probability of buying such items. We used the food industry as an empirical research subject. In our questionnaire, the term "sustainable products" in relation to food specifically refers to items that have received either the Eco Label or Green Label certification. This encompasses a range of food items, such as those meeting fair trade standards, known for their environmental friendliness, organically produced foodstuffs, edibles free from harmful substances, and products supported by certified documentation of their production and marketing processes (Yu & Lu, 2023). For the questionnaire items, we referenced and modified items from Cronin Jr *et al.* (2000), Dodds *et al.* (1991), Yu and Lu (2023), Chan (2001) and Taylor and Todd (1995). The questionnaire utilized a 5-point Likert scale, encompassing options ranging from "Strongly Disagree" to "Strongly Agree."

3.3.2 Social value orientation

This study utilized Murphy *et al.* (2014)'s slider measurement method and its questionnaire to assess consumer's SVO. The questionnaire comprises six primary items and nine optional secondary items, each representing a continuum of own/other payoff allocations. Respondents select their preferred joint outcomes to distinguish four common SVO types: altruistic, prosocial, individualistic, and competitive. The SVO

angle is calculated using the following formula after selecting preferred allocations for each primary item to category (Murphy & Ackermann, 2014):

$$\text{SVO slider } \theta = \arctan \left[\frac{\sum(P_O - 50)}{\sum(P_S - 50)} \right]$$

since the purpose of this study is to distinguish between participants' egoistic and altruistic tendencies, we categorized them into two groups based on an SVO angle of 22.45°: altruistic personalities, characterized by altruistic and pro-social inclinations, and egoistic personalities, characterized by individualistic and competitive tendencies. This classification allows for a comprehensive investigation into how social value orientations influence the effect of fear appeals on consumers' intentions to purchase sustainable products.

3.4 Research participants and

sampling

This study investigates the impact of fear appeals on sustainable food marketing. Convenience sampling was used, with the survey link distributed through SurveyCake, a leading questionnaire platform in Taiwan, and relevant Facebook communities. There are four versions of the questionnaire, each representing a different experimental scenario, with participants randomly assigned to access the corresponding link. To prevent potential negative effects on minors, whose cognitive and emotional development is still ongoing (DeLisi *et al.*, 2019), the study targeted adults aged 18 and older, screening out minors in the pre-test phase. Data analysis is conducted using IBM SPSS Statistics 23 and SmartPLS 4 software.

The questionnaires were distributed between April and June 2023, resulting in a total of 625 questionnaires collected, of which 574 were valid responses. Among the respondents, 31.4% were male and 68.6% female. The majority fell within the 18-25 and 26-35 age ranges, while other age groups represented at least 9% of the total sample. Notably, over 80% of participants held a university degree or higher, reflecting a well-educated demographic that may be attributed to the widespread education in Taiwan.

physical and self-esteem scenarios ($p=0.013$). At a 0.1 significance level, there is also a notable difference between physical and economic scenarios ($p=0.077$). Thus, hypotheses H_{1a}, H_{1b}, and H_{1c} are all supported.

4 | Analysis and results

4.1 Testing the different effects of message types

The main objective of this study is to explore the moderating effects of SVO on how different types of fear appeal messages influence consumers' intention to purchase sustainable products. To achieve this, we first assessed the significance of differences in purchase intention between physical and other scenarios (i.e., H_{1a}, H_{1b}, H_{1c}). Independent samples t-tests, a standard method in experimental design, were used to test these hypotheses (Kim, 2014). The results, presented in Table 1, show significant differences in purchase intention at a 0.05 significance level between physical and social scenarios ($p=0.014$) and between

Table 1 Results of the t-test of consumers' purchase intentions in the physical scenarios compared with that in the other scenarios

Message type	LLCI	ULCI	t-value	<i>p</i>
Physical, Social	-0.494	-0.056	-2.471	0.014**
Physical, Economic	-0.366	0.019	-1.776	0.077*
Physical, Self-esteem	-0.487	-0.059	-2.511	0.013**

Note : LLCI = lower limit confident level; ULCI = upper limit confident level; *: $p<0.1$; **: $p<0.05$.

4.2 Testing the moderating effect of

SVO

Furthermore, we applied SPSS Process V4.3 to test hypotheses H_{2a}, H_{2b}, and H_{2c}. To determine if SVO moderates the effect of fear appeals on consumers' intentions to purchase sustainable products, we used the physical scenario as the basis of comparison and converted the social, economic, and self-esteem-based scenarios into three groups of dummy variables (T1, T2, and T3, respectively). In other words, T1, T2, and T3 were used collectively, not individually, to represent the four types of fear. The values assigned to the three dummies for physical, social, economic, and self-esteem fears are (0, 0, 0), (1, 0, 0), (0, 1, 0), and (0, 0, 1), respectively.

The moderated test was conducted to determine whether SVO influences the effect of differences between physical fears and other types of fears on purchase intentions. The model used to assess these moderating effects included variables such as T1, T2, T3, SVO, T1 × SVO, T2 × SVO, T3 × SVO, and control variables. The coefficients of the

three interaction terms represent the moderating effects. The results indicated that the Upper-limit Confidence Interval (ULCI) and Lower-Limit Confidence Interval (LLCI) for the coefficient of T1 × SVO did not include zero (ULCI = -0.029, LLCI = -0.793) and had a *p*-value of 0.035, signifying a significant moderating effect at the 0.05 significance level. Additionally, the ULCI and LLCI for the coefficients of T2 × SVO and T3 × SVO also did not include zero (ULCI = 1.390, LLCI = 0.723; ULCI = -0.050, LLCI = -0.786) and had *p*-values of 0.000 and 0.026, respectively. These statistical results validate the hypotheses that, at the 0.05 significance level, SVO moderates the impact of fear appeals on consumers' intentions to purchase sustainable products in the social, economic, and self-esteem-based scenarios compared to the physical scenario.

We conducted a deeper analysis to explore the moderating effects of various personality traits on the relationship between fear appeals and purchase intentions. The detailed statistical outcomes, including moderating effects and significance levels, are provided in Table 2 for further interpretation.

Table 2 Moderating effects of different personalities

X	Personality	Effect	t	p	LLCI	ULCI
T1 social	AP	0.302	2.728	0.007**	0.085	0.520
	EP	-0.109	-0.620	0.536	-0.455	0.237
T2 economic	AP	-0.161	-1.598	0.111	-0.359	0.037
	EP	0.896	5.851	0.000**	0.595	1.196
T3 self-esteem	AP	0.315	2.922	0.004**	0.103	0.527
	EP	-0.103	-0.609	0.543	-0.435	0.229

Note : AP = altruistic personality; EP = egoistic personality; **: *p*<0.05

In the social scenario of T1, $R^2 = 0.147$, with a p -value of 0.007 for altruistic personality and an effect size of 0.302, indicating a positive moderating effect of altruistic personality. In contrast, the p -value for egoistic personality is 0.536, showing no moderating effect. This means that, at a 0.05 significance level, social appeals have a greater impact on purchase intention compared to physical fear appeals when influenced by an altruistic personality, rather than an egoistic one.

In the economic scenario of T2, $R^2 = 0.207$, with a p -value of 0.111 for altruistic personality, indicating no moderating effect. In contrast, the p -value for egoistic personality is 0.000, with an effect size of 0.896, showing a significant positive moderating effect. Thus, at a 0.05 significance level, economic appeals have a greater impact on purchase intention compared to physical fear appeals when influenced by an egoistic personality rather than an altruistic one.

The results reveal that, compared to the effects of physical fear appeals, the impact of social, economic, and self-esteem appeals on purchase intentions varies with personality traits. Specifically, in the economic appeal scenario, an egoistic personality has a greater impact on purchase intention than an altruistic personality. In contrast, in the social and self-esteem scenarios, an altruistic personality has a stronger impact on purchase intention than an egoistic personality. These findings support hypotheses H_{2a}, H_{2b}, and H_{2c}.

5 | Conclusion and discussion

Based on the findings of this study, it is evident that the type of fear appeal message significantly influences consumers' intention to purchase sustainable food, aligning with

the conclusions of Yu and Lu (2023). Specifically, the intention to purchase sustainable food is lower in the physiological context compared to the social, economic, and self-esteem contexts. This suggests that different types of fear appeals in advertisements can have varying impacts on consumers' purchasing decisions. Furthermore, this study highlights the important role of consumer personality traits in shaping responses to fear appeal advertisements. Individuals with an egoistic personality, who focus on personal benefits, and those with an altruistic personality, who are more concerned with environmental and social responsibility, exhibit significant moderating effects on how fear appeals influence their purchase intentions. Additionally, the study categorizes fear appeals into intrinsic and extrinsic types, revealing that egoistic personalities have a stronger moderating effect on intrinsic appeals, while altruistic personalities are more influenced by extrinsic appeals.

Building on previous research, this study incorporates experimental designs that integrate psychological factors to expand the scope of green marketing. It also addresses several common biases in fear appeal marketing (Hastings *et al.*, 2004), including unclear fear appeal targets, homogeneous sample populations, and the limitations of laboratory settings that fail to account for real-world environmental influences. These refinements aim to provide more practical and comprehensive analyses. Moreover, unlike previous studies that predominantly used text or images as communication channels, this research adopts audio-visual media to enhance consumer response rates and intensify reactions, providing clearer insights into the tested effects.

A notable distinction in this study is the treatment of fear appeal as a multi-component construct, unlike previous studies that have treated it as a singular construct. Following Bartikowski *et al.* (2019) and Yu and Lu (2023), we reexamined and confirmed significant variations in purchase intentions across different scenarios. Our results strongly support the hypothesis that different message types influence consumers' intentions to purchase sustainable products. We found that messages focusing on social, economic, and self-esteem considerations were more effective than those based on physical fear appeal. However, no significant differences were observed among these three types of fear appeal messages.

Regarding the analysis of the moderating effect of Social Value Orientation (SVO), the results confirmed the hypothesis that consumers with different SVOs exhibit varying levels of intention to purchase sustainable food when exposed to the same fear appeal messages. Specifically, altruistic individuals show a greater moderating effect in response to external appeals (e.g., social-based and self-esteem-based) than egoistic individuals. Conversely, in the context of internal appeals (e.g., economic-based), egoistic individuals exhibit a greater moderating effect than altruistic individuals, as the fear target is more personally relevant to them.

5.1 Implications

The findings of this study have both theoretical and practical implications. Firstly, this study verified again that different types of fear appeal message indeed exerts an influence on consumers' purchase intentions to sustainable products. Hence, our research provides reliable assurance for managers

seeking to employ fear appeals communications differently. Secondly, this study utilized Social Value Orientation (SVO) as a moderating variable to examine the mechanisms of fear appeal messages, hypothesizing that personality traits would have varying moderating effects on different fear appeals. This hypothesis was supported. The findings not only confirm that altruistic and egoistic personalities are significant features worth exploring in green marketing but also expand the research on social value orientation in this field to new dimensions. More importantly, the results demonstrate that consumers with different personality traits exhibit varying levels of intention to purchase sustainable food when exposed to the same fear appeal messages. Consumers with egoistic personality traits are more likely to buy sustainable food in response to internal appeals, such as economic fear messages, compared to those with altruistic traits. In contrast, consumers with altruistic personality traits are more inclined to purchase sustainable food in response to external appeals, such as social and self-esteem fear messages, than those with egoistic traits. This knowledge helps in practical applications by evaluating consumer characteristics and customizing communication strategies to achieve the most effective communication outcomes for organizations.

Practically, companies specializing in organic or other sustainable foods, where the target audience is likely to be altruistic individuals with green consciousness, should use external fear appeals, such as social and self-esteem appeals. These can leverage the positive moderating effect of altruistic personalities to enhance consumers' intention to purchase sustainable products. Conversely, for companies whose products are less

directly related to sustainability or for startups introducing sustainable foods for the first time, the target audience may predominantly consist of egoistic individuals with less environmental awareness. In these cases, it is advisable to use economic fear appeals, which can take advantage of the positive moderating effect of egoistic personalities to increase consumers' intention to buy sustainable food.

Regarding the application of audio-visual materials in fear appeal communications, this research represents a pioneering effort by incorporating multisensory experiences to explore the modern landscape of message delivery across various technological platforms. This advancement enables more effective communication with recipients compared to traditional methods that relied solely on photos or text, as demonstrated in previous studies (e.g., Shin *et al.*, 2017; Shen and Kim, 2022; Yu & Lu, 2023). By leveraging multisensory stimuli, this approach aims to enhance engagement and impact, offering a richer and more immersive experience for the audience.

Additionally, this study introduced the SVO Slider Measure (Murphy *et al.*, 2011) for research on fear appeals, marking a departure from methods used in most previous studies for classifying social value orientation (Murphy & Ackermann, 2014). This approach not only validated the effectiveness of the SVO Slider Measure but also advanced the research on social value orientation in the context of green marketing.

5.2 Limitations and future research

Several limitations have been identified in this study. Firstly, when examining the moderating effect of SVO, this study

classified consumer personality traits into two major categories: egoistic and altruistic, rather than a more detailed classification into altruistic, prosocial, individualistic, and competitive. Therefore, we recommend that future research adopt this more detailed classification to explore the impact of SVO on fear appeal communication more thoroughly. Secondly, while using audio-visual materials as a communication medium can enhance the communication effects of the fear appeal message for consumers, this study collected samples via an online survey. Consequently, we are unable to confirm whether participants were influenced by their surrounding environment while viewing the experimental scenarios. Hence, we suggest arranging for participants to view the experimental scenarios in the same physical environment to eliminate potential environmental interferences and reduce biases in the research process if future research also intends to use audio-visual materials as a communication medium.

As global environmental challenges intensify, it is imperative for green marketers to adopt a more integrated approach, leveraging diverse sustainable marketing strategies and tools to address these pressing issues. By combining fear appeal communications with other green marketing techniques, they can play a crucial role in tackling the threats to ecosystems while simultaneously fostering economic growth. Drawing on past research, we strongly encourage further exploration and refinement of fear appeal strategies, ensuring their effective application as part of a broader, coordinated effort to promote sustainability and influence consumer behavior.

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重新評估恐懼訴求對綠色產品購買意願的有效性：社會價值取向的調節作用

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摘要

本研究藉由探討社會價值取向 (SVO) 如何調節各種恐懼訴求訊息對消費者購買永續產品意願的影響，填補了一個重要的研究缺口。與大多數將恐懼訴求視為單一構面的先前研究不同，本研究將其分解為四個不同的成分—身體、社會、經濟和自尊—以評估其細微的影響。此外，雖然過去的研究主要依賴圖像或文字，本研究創新性地融合了多感官體驗來探索消費者行為的變化。研究結果顯示，與身體恐懼訴求的效果相比，社會、經濟和自尊類型的恐懼訴求的影響因人格特質而異。具體而言，利己型個體對經濟訴求反應更強，而利他型個體則更易受社會和自尊訴求的影響。這些發現驗證了本研究關於 SVO 調節作用的假設，並為未來的研究提供了理論見解，也為經理人和行銷人員能夠經由有效的恐懼訴求的溝通，為提升消費者的購買意願提供了實務的建議。

關鍵字:

恐懼訴求、永續消費、社會價值取向、有效的溝通、購買意願