

Exploring the Relationship between Consumer Knowledge and Skepticism towards Pro-Environmental Advertising: An Empirical Investigation

Jinhee Lee,* Hyuk Jun Cheong**

* School of Communication, Journalism, and Media, Central Michigan University, 1200 S Franklin Street, Mt Pleasant, MI 48859 USA

** Department of Media Communication, Inje University, 197, Inje-Ro, Gimhae-Si, Gyeongsangnam-Do, 50834 REPUBLIC OF KOREA

This study investigates the potential impact of consumer knowledge on inclination toward skepticism about pro-environmental advertising. Using the Persuasion Knowledge Model (PKM), the research explores the intricate interplay between three facets of consumer knowledge: persuasion, agent and topic knowledge, and consumer skepticism of pro-environmental advertising. The study also examines whether individuals' prior experience of pro-environmental advertising and eco-friendly products contribute to the development of the three dimensions of consumer knowledge. Researchers administered online surveys to a cohort of U.S. consumer panellists, and subsequently subjected the gathered data to structural equation modelling. The research found that consumers with a heightened acumen in persuasion, agent, and topic knowledge exhibit a notably diminished degree of skepticism toward pro-environmental advertising. Additionally, individuals' antecedent interactions with pro-environmental products enhance the depth of all three dimensions, whereas prior exposure to pro-environmental advertising appears predominantly to bolster persuasion knowledge alone.

Keywords: persuasion knowledge model, consumer knowledge, pro-environmental advertising, pro-environmental products, green advertising, advertising skepticism

Introduction

Consumer skepticism towards pro-environmental advertising poses a significant challenge to companies wishing to promote their environmentally friendly products, including energy-saving, non-toxic, recycling/recycled and reusable products (Chang, 2011; Gleim et al., 2013; Johnstone & Tan, 2015). This skepticism stems from consumers' doubts about the trustworthiness of pro-environmental advertising messages and their negative perception of advertisers' motives in creating such ads (Mohr et al., 1998; Obermiller & Spangenberg, 1998); and leads to negative attitudes toward the advertised products and advertising itself, as well as reduced purchase intentions (Chang, 2011; Chen & Leu, 2011; Ktisti et al., 2022).

Using the Persuasion Knowledge Model (PKM), previous studies have attempted to explain why consumers are skeptical about various types of advertising, including pro-environmental advertising. The PKM explains how consumers use their persuasion-related knowledge, including persuasion, agent and topic knowledge, to evaluate a persuasive message and decide whether to accept or resist it (Friestad & Wright, 1994; Jain & Purohit, 2022; Voorveld et al., 2023). Research has shown that high levels of persuasion knowledge enable consumers to recognise inappropriate advertising tactics, such as manipulation and deception, and to identify the selling purpose conveyed in advertising (Brinson et al., 2023; Costa Filho et al., 2023; Dahlén, 2005; Jain & Purohit, 2022; Scott et al., 2013). Consequently, consumers with a high level of persuasion knowledge tend to view advertising messages with skepticism, especially regarding advertisers' motives and the trustworthiness of the message (Brinson et al., 2023; Costa Filho et al., 2023; Li-Shia et al., 2023).

However, it is important to note that consumers' persuasion knowledge may also encompass positive aspects of advertising, such as providing useful information (Isaac & Grayson, 2017; 2020). Some research has shown that consumers with high levels of persuasion knowledge may respond more positively to attempts to persuade, recognising credible tactics and genuine motives, which can lead to more favourable attitudes and subsequent purchasing behaviour (Isaac & Grayson, 2017; 2020). Furthermore, a recent meta-analysis found that persuasion knowledge does not necessarily suppress or reduce the effects of attempts to persuade (Eisend & Tarrahi, 2022). Thus, a more nuanced approach to understanding persuasion knowledge in the context of pro-environmental advertising is required, one which considers consumers' awareness of the positive aspects of advertising, such as educating consumers and introducing new products, to better understand how positive persuasion knowledge can influence consumer skepticism.

The principal aim of this scholarly investigation is to introduce an innovative approach to the study of persuasion knowledge, with a particular emphasis on its connection to skepticism concerning advertising, specifically within the context of pro-environmental advertising. Furthermore, this study incorporates the two additional facets of consumer knowledge, as conceptualised by Friestad and Wright (1994), namely agent knowledge and topic knowledge. It is posited that consumers deploy all three dimensions of persuasion-related knowledge in their efforts to navigate the complexities of advertising messages. Additionally, this research seeks to delve into the impact of consumers' exposure to

pro-environmental advertising and their interactions with pro-environmental products at the levels of persuasion, agent and topic knowledge. It is noteworthy that these research domains have received relatively limited attention within the scholarly discourse, and the present investigation holds the potential to contribute substantial insights to the extant body of literature on the PKM and pro-environmental advertising.

In pursuit of these research objectives, the present study endeavours to investigate the following research questions:

RQ1: What is the influence of an individual's persuasion-related knowledge of pro-environmental advertising on their skepticism of pro-environmental advertising and products?

RQ2: How do pre-existing attitudes towards pro-environmental advertising or products affect an individual's agent, persuasion and topic knowledge of pro-environmental advertising?

Through its exploration of these research questions, this study may have both theoretical and practical implications. Firstly, the findings may enhance the existing literature on advertising effectiveness, brand attitudes and purchase intentions of pro-environmental products. Secondly, the results may also be useful to managers who are marketing pro-environmental products through advertising and other forms of marketing communication, including product placement and publicity, in their respective target markets. Moreover, the present research delves into the nuanced impact of individuals' heterogeneous degrees of persuasion knowledge on the reception and assimilation of persuasive messages. This inquiry is conducted through a meticulous examination of consumers' proclivity for accepting advertising, coupled with an intricate juxtaposition of the tenets of the PKM, alongside other foundational theoretical frameworks that underpin the domain of advertising acceptance. This distinctiveness not only demarcates the current research from extant investigations into pro-environmental advertising skepticism, but also imbues it with a palpable sense of novelty, thereby enriching the scholarly discourse within this field of study.

Consumer skepticism in pro-environmental advertising

The phenomenon of consumer skepticism in the context of pro-environmental advertising has garnered considerable scholarly attention in recent years. According to Mohr et al. (1998) and Obermiller & Spangenberg (1998), consumer skepticism is characterised by a lack of trust in the credibility of pro-environmental messages, coupled with negative perceptions of the underlying motives of advertisers. In this regard, consumers often harbour doubts about the accuracy of general environmental claims (such as *eco-friendly*) and question whether such claims truly reflect the environmental benefits of the advertised products (Gong & Wang, 2023; Gleim et al., 2013; Kang & Atkinson, 2021; Luo et al., 2020; Mayer et al., 1993). Moreover, consumers are wary of potentially misleading or false information in pro-environmental advertising, which may

lead them to overestimate the environmental benefits of the promoted brands (Gong & Wang, 2023; Ktisti et al., 2022; Newell & Goldsmith, 1998). This prevailing lack of confidence in the trustworthiness of advertising information contributes significantly to consumer skepticism of pro-environmental advertising.

Additionally, consumer skepticism extends to the underlying motives of companies engaging in pro-environmental advertising. As Romani et al. (2016) and Vries et al. (2015) note, the pro-environmental initiatives of companies may stem from either *self-serving motives* (such as profit maximisation) or *other-serving motives* (such as protecting the environment). However, some consumers perceive self-serving motives as the primary corporate objective, given that most companies seek to maintain their bottom line (Manuel et al., 2012; Yu, 2020). Thus, when companies highlight their other-serving motives in pro-environmental advertising, it can make some consumers uncomfortable, as they question whether the company is concealing its self-serving motives (Ktisti et al., 2022; Vries et al., 2015). This prevailing skepticism of the motives of companies in pro-environmental advertising adds to the negative perceptions of consumers and increases their distrust in pro-environmental advertising.

Consequently, consumer skepticism has a considerable impact on purchasing behaviour in the context of pro-environmental advertising. Chang (2011), Chen & Leu (2011), and Shrum et al. (1995) have found that high levels of consumer skepticism result in negative responses towards pro-environmental advertising, and this, in turn, leads to decreased purchasing behaviours. Consumers who exhibit high levels of skepticism are more likely to avoid pro-environmental advertising altogether, and even if they do encounter such advertising, they tend to have ambiguous attitudes towards pro-environmental products (Chang, 2011; Ktisti et al., 2022). Thus, high levels of skepticism among consumers have been found to reduce their willingness to purchase the advertised products (Kim et al., 2016; Kristi et al., 2022).

Regarding the question of who exhibits skepticism towards pro-environmental advertising, previous studies have utilised demographic, psychographic and behavioural factors for identification. For instance, Shrum et al. (1995) and Zinkhan and Carlson (1995) contended that consumers embracing pro-environmental products tend to be skeptical of pro-environmental advertising. This skepticism arises from their ability to discern misleading messages and uncover the hidden motives of advertisers based on their past experience of such products. On a different note, Yu (2020) suggested that men display more skepticism towards pro-environmental advertising compared to women. This difference is attributed to the psychological tendency of women to be more concerned about family and the environment. Similarly, Lee and Haley (2022) discovered that younger consumers exhibit higher levels of skepticism and more negative attitudes towards pro-environmental advertising than their older counterparts. This inclination is linked to the limited opportunities younger consumers have had to learn about the benefits of using pro-environmental products. In conclusion, consumer skepticism towards pro-environmental advertising varies depending on their demographics, psychographic characteristics and behaviours related to the consumption of pro-environmental products.

Skepticism towards advertising has also been a subject of rigorous examination from various theoretical perspectives. In the realm of conceptual dimensions, advertising skepticism is construed as an autonomous and multifaceted construct, exhibiting notable variability among individuals (Joireman et al., 2018; Obermiller & Spangenberg, 1998). This variability is contingent upon personal attributes, prominently including cynicism as a pivotal determinant. To elucidate, individuals harbouring a disposition characterised by heightened cynicism tend to manifest an elevated degree of skepticism towards the persuasive messages embedded within advertisements, in stark contrast to their less cynical counterparts (Mohr et al., 1998). This discernment extends to the context of green advertising, wherein individuals who display heightened environmental concern tend to exhibit a more skeptical stance towards commercial messages in general (do Paço & Reis, 2012; Mohr et al., 1998).

Personality traits also assume a significant role in shaping green advertising skepticism. Customers characterised by a proclivity for greater openness, defined as a propensity to embrace novel ideas and experiences, tend to exhibit a diminished degree of skepticism about advertisements in general (Srivastava et al., 2021). Moreover, individuals characterised by heightened levels of agreeableness, conscientiousness and openness demonstrate a reduced inclination towards skepticism in the context of green advertising and related products (Duong, 2022).

In addition to cynicism and personality traits, an individual's inclination towards advertising skepticism is influenced by their level of advertising literacy, which reflects their ability to critically analyse advertisements and discern their underlying motives and mechanisms (O'Donohoe & Tynan, 1998). This signifies that individuals possessing a heightened degree of advertising literacy tend to exhibit greater levels of skepticism towards advertising messages (Raziq et al., 2018; Shen et al., 2016). The impact of advertising literacy on advertising skepticism is particularly noteworthy, as the literature notes that consumers often grapple with the complexity of the green terminology that is often employed in environmentally friendly advertisements, including terms such as *biodegradable*, *carbon neutral* and *smart energy*, which are known to induce confusion among consumers (do Paço & Reis, 2012; Murphy et al., 2010).

Within the realm of attitudinal dimensions, advertising skepticism exerts a detrimental impact on the formation of positive consumer attitudes (Raziq et al., 2018). Specifically, harbouring doubts about the credibility of advertising messages leads consumers to perceive such messages as untrustworthy (Obermiller et al., 2005), ultimately prompting them to avoid advertising content (Baek & Morimoto, 2012). Raziq et al. (2018) establish that a negative association exists between skepticism towards advertising and consumers' attitudes towards brands. This association is mediated sequentially by variables such as brand image, the credibility of advertisements and consumers' attitudes towards advertisements. Furthermore, these attitudes towards the advertised brands, which evolve through this process, diminish customers' intentions to purchase the said brands (Chen & Leu, 2011; Joireman et al., 2018). This unfavourable pattern is particularly pronounced in the context of corporate social responsibility (CSR) campaigns, including green advertising initiatives (Yang & Hsu, 2017).

Unfavourable attitudes towards brands, stemming from customers' skepticism towards green advertising, may also be influenced by a multitude of factors. These factors encompass personal engagement with the issue of environmental protection (do Paço & Reis, 2012; Tee et al., 2022), prior experience of green products (DeLorme et al., 2009; Shrum et al., 1995), and pre-existing predispositions concerning environmental concerns (Sherif & Hovland, 1961). For example, individuals who demonstrate a heightened awareness of environmental issues and regularly engage in green consumer behaviour exhibit an enhanced ability to differentiate between brands that genuinely dedicate their efforts to environmental preservation by developing and marketing eco-friendly products and companies merely engaged in superficial *greenwashing* campaigns, which involve the dissemination of misleading or false environmental claims (Carlson et al., 1993). Furthermore, factors such as the perceived reputation of the company (Ho et al., 2017), the attractiveness and expertise of the advertising model (Anderson, 1971; Ohanian, 1990; 1991), and the framing of messages within advertisements (Yang & Hsu, 2017) also contribute significantly to the formulation of unfavourable brand attitudes within the context of green advertising skepticism.

The impact of consumer knowledge on skepticism towards pro-environmental advertising

Persuasion knowledge

Persuasion knowledge, referring to consumers' understanding of specific persuasive tactics, has been widely recognised as a critical factor in helping individuals detect and comprehend persuasive attempts in advertising (Jain & Purohit, 2022; Raska et al., 2015; Voorveld et al., 2023). Scholars have also acknowledged that individuals with higher levels of persuasion knowledge are better equipped to evaluate the appropriateness of advertising strategies and tactics compared to those with lower levels of such knowledge (Brinson et al., 2023; Costa Filho et al., 2023; Patwardhan & Patwardhan, 2016). For instance, individuals with higher persuasion knowledge can more effectively identify misleading or manipulative advertising messages and protect themselves against them (Friestad & Wright, 1994; Jain & Purohit, 2022; Li-Shia et al., 2023; Patwardhan & Patwardhan, 2016).

However, prior research has mainly focused on the role of persuasion knowledge in detecting inappropriate advertising tactics and its potentially negative effects (Rahman et al., 2015; Li-Shia et al., 2023). The PKM, on the other hand, emphasises that consumers' pre-existing knowledge of persuasion in general influences their decisions to accept or reject specific persuasive messages, including advertising (Friestad & Wright, 1994). This suggests that the impact of persuasion knowledge on consumer behaviour may vary depending on the type of advertising and the specific persuasion knowledge that consumers possess.

Recent studies have challenged the notion that persuasion knowledge leads to consumer skepticism of advertising, as the credibility of persuasive attempts can be enhanced when consumers perceive them as believable (Isaac & Grayson, 2017; 2020). Additionally, consumers may be more willing to purchase products promoted through advertorials, which provide necessary information, compared to traditional advertising, even when they recognise that both forms of communication are intended to sell (Attaran et al., 2015). Thus, the effect of persuasion knowledge on consumer skepticism of advertising is not a foregone conclusion.

In the context of pro-environmental advertising, the direction of persuasion knowledge, whether positive or negative, may play a critical role in shaping consumers' skepticism of such advertising. Specifically, consumers who possess positive persuasion knowledge may be less skeptical of pro-environmental advertising if they believe that such advertising provides useful information about the environmental benefits of the advertised product. Based on this reasoning, the following hypothesis is proposed:

H1: Positive persuasion knowledge of advertising reduces skepticism of pro-environmental advertising.

Agent knowledge

Research has highlighted the crucial role of agent knowledge in enabling consumers to identify the sponsors behind advertising messages and in understanding their motives (An & Stern, 2011; Matthes et al., 2007; Swaen et al., 2004). Consumers with higher levels of agent knowledge are better equipped to recognise commercial agendas, even when information is presented in non-commercial sources like word of mouth (Bambauer-Sachse & Mangold, 2013; Brinson et al., 2023; Campbell & Kirmani, 2000; Costa Filho et al., 2023). They can also easily decipher a company's motive behind advertising as primarily aimed at increasing sales of their products (An & Stern, 2011; Brinson et al., 2023; Costa Filho et al., 2023; Matthes et al., 2007).

In the case of pro-environmental advertising, consumers' agent knowledge can help them differentiate between two types of company motive: self-serving and other-serving (Romani et al., 2016; Vries et al., 2015). A company with self-serving motives is primarily focused on selling its pro-environmental products to increase its profits. On the other hand, a company with other-serving motives produces and promotes pro-environmental products not just to make a profit, but also to protect the environment and pursue public welfare (Romani et al., 2016; Vries et al., 2015).

These distinct company motives that consumers recognise through their agent knowledge can impact their skepticism of pro-environmental advertising. Consumers who have a better understanding of a company's self-serving motives for promoting pro-environmental products are more likely to be skeptical of the advertising messages. Conversely, consumers' perceptions of other-serving motives can reduce their skepticism of pro-environmental advertising. Research has shown that consumers who perceive a company's intrinsic motives, such as its genuine social concerns, are more likely to

respond positively to corporate social responsibility initiatives instead of being suspicious about such activity (Song et al., 2021). In other words, when consumers believe that a company's motives for promoting environmental protection through their products are genuine, they are less likely to doubt the reliability of the advertising information. Based on this, the following hypothesis was proposed:

H2: Positive agent knowledge decreases consumers' skepticism towards pro-environmental advertising.

Topic knowledge

Consumers' ability to comprehend and evaluate product information relies on their topic knowledge, which involves understanding the product attributes and functions, and determining the information's validity (Lorenzon & Russell, 2012; Sayal & Pant, 2022). In the case of pro-environmental advertising in particular, topic knowledge pertains to consumers' knowledge of pro-environmental products. Through their topic knowledge of pro-environmental products, consumers can assess the environmental benefits of the advertised products and make informed decisions (Sayal & Pant, 2022; Xie & Kronrod, 2013; Zabkar & Hosta, 2013). Despite being exposed to multiple advertisements for similar pro-environmental products, consumers with high topic knowledge are less likely to be confused by the choice and more confident in evaluating both the advertised products and the messages (Chan, 2000; Sun & Wang, 2020; Xie & Kronrod, 2013).

As such, consumers with high topic knowledge of pro-environmental products are less likely to be susceptible to manipulation or deception by companies and their pro-environmental advertising. Moreover, their extensive knowledge can reduce their skepticism towards pro-environmental advertising. Therefore, the following hypothesis is proposed:

H3: Consumers with high topic knowledge of pro-environmental products are less skeptical about pro-environmental advertising.

The role of previous experience of pro-environmental advertising and products

The theoretical framework of the PKM suggests that consumers' previous experience of advertising and the advertised brands enhance their persuasion, agent and topic knowledge (Friestad & Wright, 1994; Jung & Heo, 2019). Consumers who have greater exposure to a specific type of advertising, such as pro-environmental advertising, and have more experience of using the advertised products, tend to possess a higher level of knowledge about commonly utilised advertising appeals and strategies, sponsors and products (Friestad & Wright, 1994; Jung & Heo, 2019; Zarouali et al., 2021). For instance,

older children exhibit a more nuanced understanding of persuasive messages and agents than younger children, as they have had more opportunities to be exposed to advertising messages, use advertised brands, and evaluate whether these brands have lived up to the expectations derived from the advertising messages (Boush et al., 1994; Feick & Gierl, 1996; Mallinckrodt & Mizerski, 2007; van Reijmersdal & van Dam, 2020). Similarly, Jung and Heo (2019) found that individuals frequently exposed to native advertising on social media tend to have a better comprehension of various social media advertising tactics and recognise native advertising more than individuals with less exposure.

Moreover, consumers' exposure to pro-environmental advertising and their prior experience of pro-environmental products may contribute to their acquisition of sophisticated persuasion, agent and topic knowledge. Pro-environmental advertising disseminates information about the advertised brands, and their environmental benefits and sponsors in particular (Xie & Kronrod, 2013; Sayal & Pant, 2022; Zabkar & Hosta, 2013). In being exposed to pro-environmental advertising, consumers can gain more knowledge about how the products contribute to environmental protection (Sayal & Pant, 2022; Zabkar & Hosta, 2013). Furthermore, by obtaining such information from exposure to pro-environmental advertising, consumers can understand the role of pro-environmental advertising in delivering valuable information to consumers.

Additionally, pro-environmental advertising communicates the environmental advantages of using the advertised brands, and consumers perceive the sponsors' other-serving motives for environmental protection as sincere. In the context of corporate social responsibility, when corporate marketing communications primarily focus on social benefits rather than self-benefits, consumers recognise that the company mainly employs the marketing communication to benefit society (Song et al., 2021). Consequently, consumers perceive that the company and its marketing communications possess other-serving motives rather than self-serving motives.

Therefore, it is reasonable to propose that individuals frequently exposed to pro-environmental advertising are more likely to gain knowledge about the benefits of using pro-environmental products (i.e. topic knowledge), the roles of pro-environmental advertising (i.e. persuasion knowledge), and the advertisers' other-serving motives (i.e. agent knowledge). Based on this reasoning, the following hypotheses are posited:

H4: Exposure to pro-environmental advertising enhances a) persuasion knowledge, b) agent knowledge and c) topic knowledge about pro-environmental products.

Consumers' familiarity with pro-environmental products, such as recycled or recyclable products, can serve as a valuable educational tool, providing them with a clear understanding of how such products can benefit the environment. Keng et al. (2014) have identified three different means by which consumers acquire product knowledge: direct experience, indirect experience (e.g. advertising) and virtual experience, which they subsequently use to evaluate and compare different products. Thus, consumers' previous encounters with pro-environmental products can enhance their knowledge on this subject matter, enabling them to more accurately evaluate a product's environmental benefits and discern the company's underlying motivations.

In addition, the phenomenon of the PKM suggests that experienced consumers of pro-environmental products are particularly adept at recognising and interpreting the environmental benefits touted in advertising campaigns (Friestad & Wright, 1994). Expert consumers of a given product category are more likely to use intrinsic product information, such as characteristics, attributes and benefits in their decision-making process than novice consumers, while attaching less importance to extrinsic cues such as price, country of origin and advertising appeals (Chocarro et al., 2009; Hafer et al., 2018).

Therefore, it stands to reason that consumers’ previous experience of pro-environmental products can increase their persuasion, agent and topic knowledge. Based on the aforementioned literature, we propose the following hypotheses:

H5: Prior experience of pro-environmental products is positively associated with a) persuasion knowledge, b) agent knowledge and c) topic knowledge about pro-environmental products.

The present study’s proposed hypotheses and the expected interrelationships among the study variables are delineated and visually represented in Figure 1.

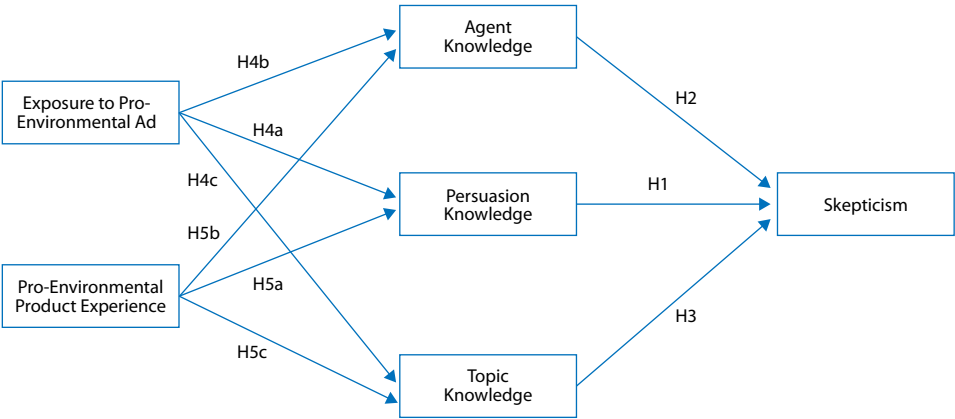


Figure 1:
Conceptual Constructs and Research Hypotheses
Source: Compiled by the authors.

Methods

Survey procedure and participants

To test the proposed hypotheses, a series of online surveys were administered to the participants. The surveys were designed to provide a clear definition and examples of pro-environmental advertising and products, which were intended to increase the

participants' comprehension of the context and the objectives of the study. The survey took approximately ten minutes to complete, and participants received monetary compensation for their participation. The recruitment of survey participants was carried out through Amazon Mechanical Turk (MTurk). Only individuals over the age of seventeen who resided in the United States were invited to participate in the surveys (N = 200). To ensure data quality, only those with a task acceptance rate exceeding 90% and who had previously completed more than one hundred tasks were recruited for the survey. Typically, researchers leverage the approval rates and completed assignments of MTurk workers as a means of identifying qualified survey participants and gathering data of high quality (Peer et al., 2014; Shank, 2016). The approval rate, representing the percentage of submitted assignments that have been accepted, encompasses the total count of approved assignments. Through the utilisation of two distinct qualifications, researchers can engage with MTurk workers who possess extensive experience and consistently deliver high-quality work. The targeting of individuals with an approval rate exceeding 90% and a track record of over 100 approved assignments is advised for optimal collection of high-quality data (Kim & Pittman, 2016; Mason & Suri, 2012). Additionally, the survey participants' location was restricted to the United States by employing MTurk qualification criteria. This ensured that only individuals residing within the U.S. could access the survey, preventing participation from those outside the country. The study participants comprised a heterogeneous sample with respect to demographic characteristics. Among the participants, 59.1% were female (N = 110) and 67.7% were Caucasian (N = 126). In terms of educational attainment, 55% of participants had completed a two-year college degree (N = 20), a four-year college degree (N = 71), or a master's degree (N = 20). The age of participants ranged from 18 to 70 years, with an average age of 37.93 (SD = 12.27). The participants' household income was evenly distributed, ranging from below \$20,000 to \$90,000 or above.

Measures

Exposure to pro-environmental advertising and products

To evaluate the research participants' exposure to pro-environmental advertising across various media, a scale item developed by Huh and Becker (2005) was employed. The scale item measured participants' exposure to pro-environmental advertising in five different advertising media, including television, magazines, newspapers, the internet and social media, and was rated on a seven-point Likert scale ranging from *never* to *very frequently* (Cronbach's alpha = .67).

The participants' experience of pro-environmental products were measured using a four-item scale developed by Matthes and Wonneberger (2014) to assess their preferences for purchasing and using such products. The scale items were also rated on a seven-point Likert scale, with responses ranging from *strongly disagree* to *strongly agree*. The internal consistency of the scale was assessed using Cronbach's alpha, and the calculated value was .84, indicating a high level of reliability.

Persuasion, agent and topic knowledge

The study employed adapted scale items from reputable sources to measure the research participants’ persuasion knowledge, agent knowledge and topic knowledge about pro-environmental advertising and products. To assess persuasion knowledge, the researchers adapted Evans and Hoy’s (2016) seven-point Likert scale items to the research context. The scale items were found to be reliable, with a Cronbach’s α value of .82. To measure agent knowledge, Gleim et al.’s (2013) seven-point Likert scale items was used, but the subscales were reverse-coded to ensure data quality. The Cronbach’s α value for this scale was found to be 0.80. To evaluate the research participants’ topic knowledge about pro-environmental products, three scales were adapted from Bian and Moutinho’s 2011 study. The Cronbach’s α value for this scale was found to be 0.83, indicating that the scale items were reliable.

Skepticism towards pro-environmental advertising

The level of respondents’ skepticism towards pro-environmental advertising was assessed using the nine scale items developed by Obermiller and Spangenberg (1998). The scale items were measured on seven-point Likert scales, ranging from 1 (strongly disagree) to 7 (strongly agree), and demonstrated high internal consistency (Cronbach’s $\alpha = 0.96$). Table 1 presents the complete list of the scale items employed in the study.

Table 1:
Variables and Measures

Variables	Scales
Exposure to pro-environmental advertising	<p>In the past 6 months, how often did you see, read, or hear any pro-environmental advertising via the following media? Please indicate 1 (Never) to 7 (Frequently)</p> <ul style="list-style-type: none">• TV• Magazines• Newspapers• The internet• Social media
Pro-environmental product experience	<ul style="list-style-type: none">• I make a special effort to buy products in biodegradable packages.• I would switch from my usual brands and buy environmentally safe cleaning products, even if I had to give up some cleaning effectiveness.• I have switched products for ecological reasons.• When I have a choice between two identical products, I purchase the one less harmful to the environment.

Persuasion knowledge	<ul style="list-style-type: none"> • Pro-environmental advertising provides information about pro-environmental products. • Pro-environmental advertising makes people like pro-environmental products. • Pro-environmental advertising lets people know more about pro-environmental products.
Agent knowledge	<ul style="list-style-type: none"> • A company that produces pro-environmental products can be depended on to do what is right. * • A company that produces pro-environmental products is competent. * • A company that produces pro-environmental products can be trusted at all times. *
Topic knowledge	<ul style="list-style-type: none"> • I can give people advice about different types of pro-environmental products. • I only need to gather very little information in order to purchase pro-environmental products. • I feel very confident about my ability to tell the difference in quality among pro-environmental products.
Skepticism of pro-environmental advertising	<ul style="list-style-type: none"> • I cannot depend on getting the truth in most pro-environmental advertising. • Pro-environmental advertising's aim is not to inform the consumer. • I believe pro-environment advertising is not informative. • Pro-environmental advertising is not generally truthful. • Pro-environmental advertising is not a reliable source of information. • Pro-environmental advertising is not truth well told. • In general, pro-environmental advertising does not present an accurate picture of the product being advertised. • I don't feel I've been accurately informed after viewing most advertisements. • Most advertising does not provide consumers with essential information.

Note: * Scale items measured reversely.

Source: Compiled by the authors.

Data analysis

Prior to testing the proposed hypotheses, descriptive statistics analysis was conducted with six constructs. The results of mean and standard deviation are the following: persuasion knowledge ($M = 5.09$, $SD = 0.96$), agent knowledge ($M = 4.37$, $SD = 1.29$), topic knowledge ($M = 3.97$, $SD = 1.28$), exposure to pro-environmental advertising ($M = 3.49$, $SD = 1.22$), pro-environmental product consumption ($M = 4.66$, $SD = 1.38$) and skepticism ($M = 3.37$, $SD = 1.29$). The average scores for the six constructs fell either at the midpoint or above it, indicating that participants' knowledge and consumption

levels surpass the average point on a 7-point scale. The standard deviation scores illustrated a positive distribution pattern for the six constructs.

Furthermore, a Pearson correlation analysis was conducted for the six constructs, revealing that 12 out of 15 correlations achieved statistical significance. The R scores ranged from -.68 to .48. Notably, the correlation between skepticism and other constructs exhibited negative values, consistent with findings from previous studies. These results indicate meaningful relationships among all six constructs. The internal consistency of the measurement constructs was assessed using Cronbach's alpha tests (refer to Table 2 for the results). Additionally, the validity of the constructs and associated measurement scales was confirmed using a Confirmatory Factor Analysis (CFA). The proposed hypotheses were then tested using structural equation modelling (SEM).

Table 2:
Mean, standard deviation and correlation

	<i>M</i>	<i>SD</i>	1	2	3	4	5	Cronbach's α
1. Persuasion knowledge	5.09	0.96						.82
2. Agent knowledge	4.37	1.29	.43**					.80
3. Topic knowledge	3.97	1.28	.23**	.28**				.83
4. Exposure to pro-environmental advertising	3.49	1.22	.19*	.04	.13			.67
5. Pro-environmental product consumption	4.66	1.38	.3**	.28**	.48**	.09		.84
6. Skepticism	3.37	1.29	-.54**	-.68**	-.33**	-.07	-.4**	.96

Note: * $p < .05$, ** $p < .001$

Source: Compiled by the authors.

Results

Confirmatory factor analysis

A CFA was performed to assess the adequacy of the scales in measuring the proposed constructs. The findings indicated a satisfactory fit ($\chi^2 = 604.927$, $df = 362$, $p < .001$; CFI = .93, GFI = .82, RMSEA = .060), signifying that the scales accurately measured and explained the proposed constructs. Furthermore, the researchers conducted a single-factor modelling ($\chi^2 = 1552.010$, $df = 377$, $p < .001$; CFI = .652, GFI = .59, RMSEA = .130) and compared its fit to that of CFA, which revealed that the latter provides a superior fit and that the constructs demonstrated significant discriminant validity. Given the sound

reliability and validity of the constructs and the measurement scales, SEM was utilised to analyse the survey data and verify the proposed hypotheses.

Hypotheses testing

In this study, the relationships between consumers' prior experience, consumer knowledge and skepticism of pro-environmental advertising were examined by employing SEM. The adequacy of the proposed model was tested by evaluating the fit of the model, which was found to be satisfactory ($\chi^2 = 633.100$, $df = 367$, $p < .001$; CFI = .92, GFI = .81, RMSEA = .063). This suggests that the model was appropriately designed, supported by theory, and empirically validated using the collected data at an acceptable level. The findings of the SEM are described in detail below.

Hypotheses 1, 2 and 3 were formulated to investigate the effects of persuasion, agent and topic knowledge on skepticism. The results indicate that consumers' persuasion knowledge negatively influenced their skepticism ($\beta = -.41$, $p < .01$). Consumers who believed that advertising provides information were less skeptical of pro-environmental advertising as opposed to those who viewed advertising as a tool to build brand image. In a similar vein, agent knowledge was found to reduce skepticism ($\beta = -.63$, $p < .01$). Consumers who believed that companies produce and promote pro-environmental products to protect the environment had lower levels of skepticism towards pro-environmental advertising promoting such products. Lastly, topic knowledge was found to have a negative relationship with skepticism ($\beta = -.13$, $p < .05$). Consumers who possessed topic knowledge of pro-environmental products were more confident in their ability to identify misleading advertising claims and, thus, were confident that such advertising could not manipulate their purchasing behaviours. These results provide support for Hypotheses 1, 2 and 3.

Hypothesis 4 proposed that exposure to pro-environmental advertising increases consumers' persuasion (H4a), agent (H4b) and topic knowledge (H4c). The results of SEM showed that consumers' exposure to pro-environmental advertising enhanced their persuasion knowledge ($\beta = .21$, $p < .05$) and topic knowledge ($\beta = .25$, $p < .01$). However, the relationship between exposure to pro-environmental advertising and agent knowledge was found to be non-significant ($\beta = .03$, $p > .05$). Consumers who were more exposed to pro-environmental advertising tended to be highly knowledgeable about the positive functions of pro-environmental advertising. However, exposure did not enable consumers to develop knowledge of advertisers' other-serving motives and pro-environmental products. Therefore, Hypothesis 4(a) and (c) were supported, whereas Hypothesis 4(b) was rejected.

Hypothesis 5 proposed that consumers' pro-environmental product experience is positively related to the three types of consumer knowledge, specifically persuasion (H5a), agent (H5b) and topic knowledge (H5c). The results of SEM showed that consumers' pro-environmental product experience increased their persuasion knowledge ($\beta = .22$, $p < .01$), agent knowledge ($\beta = .35$, $p < .01$) and topic knowledge ($\beta = .58$, $p < .01$). Consumers who had experience of buying pro-environmental products

demonstrated a better understanding of the products’ environmental benefits and believed that pro-environmental advertising promotes environmental benefits, as well as expresses companies’ other-serving motives. Therefore, Hypothesis 5(a), (b) and (c) were supported.

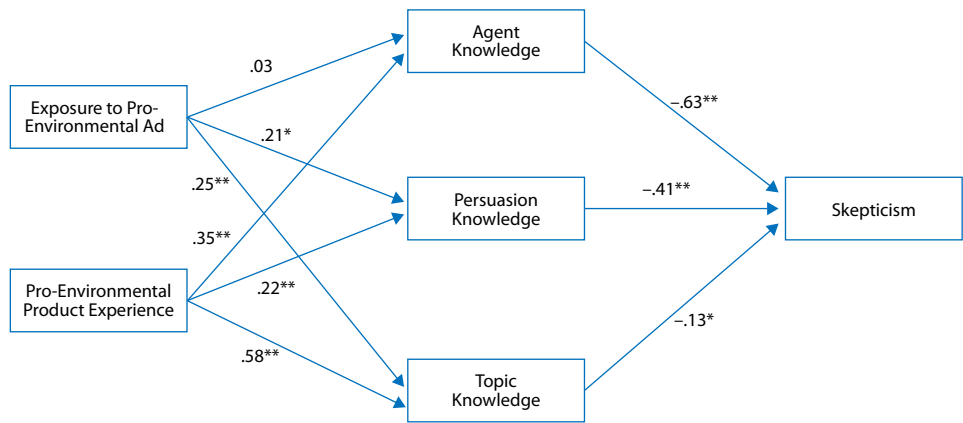


Figure 2:
Hypothesis-testing and SEM
Source: Compiled by the authors.

Discussions

In this research endeavour, the investigators embarked on an exploration of two distinct research inquiries, namely (RQ1) investigating the relationships between three distinct categories of persuasion knowledge, specifically persuasion knowledge, agent knowledge and topic knowledge, and consumers’ levels of skepticism toward pro-environmental advertising and the products being advertised. The second research question (RQ2) aimed to assess the extent to which pre-existing attitudes and knowledge, developed through exposure to pro-environmental advertising and experience of pro-environmental products, influence the structure of persuasion knowledge.

In the pursuit of these research questions, the investigators have unearthed several noteworthy findings. Firstly, the study underscores that all three forms of persuasion knowledge, encompassing persuasion knowledge, agent knowledge and topic knowledge, exert a negative influence on consumers’ skepticism towards pro-environmental advertising and the associated advertised products. This discovery aligns with previous research, which suggests that consumers’ possession of persuasion knowledge can enhance the credibility of persuasive messages, particularly when they are cognisant of the necessity for corporations to employ persuasive tactics convincingly (Isaac & Grayson, 2017). However, it is important to note that this finding diverges from prior research findings that posit a positive correlation between consumers’ level of persuasion

knowledge and skepticism towards advertising messages (Dahlén, 2005; Kirmani & Zhu, 2007; Su & Wayer, 2010). Given this discrepancy between the current research's findings and previous research, further investigations may be warranted to elucidate the intricate relationships between persuasion knowledge and skepticism of advertising messages.

Secondly, the present study illuminates that exposure to pro-environmental advertising and experience of pro-environmental products significantly impact all three facets of persuasion knowledge, with one notable exception: exposure to pro-environmental advertising has a limited impact on agent knowledge, specifically knowledge pertaining to advertisers. This finding contradicts the premise of the PKM, which posits that individuals accumulate structures of consumer knowledge through repeated exposure to persuasive communications, including advertisements (Friestad & Wright, 1994; Zabkar & Hosta, 2013). This result may be explained by the notion that consumers may struggle to comprehensively assess advertised products (i.e. the topic) and the companies marketing these products (i.e. the agent) without first-hand experience of the products themselves. The absence of this association warrants further scrutiny through future research, as it diverges from previous research on advertising exposure and its impact on brand attitudes, which suggests that an increased number of exposures to advertisements enhances viewers' knowledge and attitudes towards the advertised brands (Krugman, 1972; Vakratsas & Ambler, 1999).

Furthermore, the third finding of the present study underscores that prior experience of pro-environmental products significantly enhance all three subcategories of consumer knowledge, in contrast to the relationship between exposure to pro-environmental advertising and the three structures of consumer knowledge. It is posited that first-hand experiences may prove more effective in shaping knowledge than mere exposure to product descriptions and usage scenarios presented in advertisements. Certain product categories, particularly experience goods (i.e. goods that can be assessed through tactile and personal experiences), may necessitate hands-on engagement, rendering advertising exposure less effective in augmenting consumers' knowledge related to persuasion, agents and topics (Nelson, 1974). Future research endeavours may benefit from revisiting this research domain with different product classifications, such as search-experience goods (Nelson, 1974), as well as exploring the implications for high-low involvement products and think-feel products (Vaughn, 1980; 1986).

Managerial implications

This study yields practical implications of significance for marketing managers and advertising professionals invested in the promotion of pro-environmental products. First and foremost, it underscores the pivotal role of direct product experiences and interactions with the company in cultivating a more comprehensive understanding among consumers concerning the company, its products and the associated marketing messages. Consequently, marketing practitioners are advised to contemplate the implementation of sampling promotions or exclusive events that offer potential customers the opportunity to engage with the product firsthand. This proactive approach assumes particular

importance as it can effectively mitigate consumers' skepticism towards the company's endeavours to promote pro-environmental products, a critical facet for the efficacy of marketing communications.

Nevertheless, this study underscores the enduring significance of exposure to pro-environmental advertising. While direct product experience holds undeniable value, advertising campaigns serve as instrumental tools for building persuasion knowledge, ultimately contributing to a reduction in skepticism towards advertising. Moreover, consumers who exhibit lower levels of skepticism towards the objectives of pro-environmental advertising campaigns are more inclined to consider purchasing and experimenting with the products being promoted.

In terms of advertising media selection, the Pareto principle, also known as the 80/20 rule, comes into play, suggesting that advertising within media channels popular among environmentally conscious consumers, such as The Green Guide or the National Geographic Channel, proves highly effective. These media outlets attract a dedicated audience of pro-environmental product enthusiasts. However, alternative forms of marketing communications, such as public relations efforts (e.g. featuring a magazine article highlighting the company's environmental protection initiatives) and sponsorships (e.g. sponsoring events like "Tree Hugging Day" organised by organisations such as Greenpeace), can also serve as potent means of dismantling barriers to pro-environmental product purchases.

Lastly, the study underscores the potential efficacy of social media campaigns, particularly in capturing the attention of younger consumer segments like Generation Z and Millennials, who demonstrate heightened awareness of environmental concerns. When these individuals grasp the importance of environmental protection, they possess the capacity to evolve into loyal patrons of pro-environmental product brands. Therefore, advertising professionals are encouraged to strategically leverage social media platforms to effectively reach and engage with these environmentally conscious consumers.

Limitations and suggestions for future research

The current study is not without its limitations. Primarily, the study's focus on the general structure of consumer knowledge regarding pro-environmental products and advertising campaigns might have created some confusion among survey participants who lacked prior exposure to the real-world examples of pro-environmental brands and campaigns. The authors, however, attempted to mitigate this limitation by providing operational definitions of pro-environmental advertising and products and explaining fictitious examples to participants before administering survey questions. Future research should consider incorporating real-world examples of pro-environmental products and advertising campaigns to prevent such misunderstandings when designing survey instruments.

Moreover, the current study employed self-administered online surveys to measure participants' exposure to pro-environmental advertising and experience of green products. While self-reporting is a commonly used research method in various academic fields, it may not always provide accurate information on participants' perspectives, opinions, or behavioural patterns concerning social phenomena. The self-reporting method may be affected by social desirability bias or recall bias (Althubaiti, 2016; Coughlin, 1990; van de Mortel, 2008). To minimise these limitations, the present study administered anonymous online surveys, which could decrease social desirability bias, and only the research team had access to the survey data. Future research could consider using non-self-reporting research methods, such as field observation or experimental research, to explore consumers' perceptions of green advertising and their past experience of pro-environmental products.

An additional constraint inherent in this study pertains to its reliance on a sample size comprised of 200 survey respondents. This quantum of participants, while not inconsequential, raises salient concerns about the study's generalisability and the veracity of its conclusions, echoing the sentiments articulated by Memon et al. (2020). Moreover, it is worth noting that this sample size falls markedly short of the widely acknowledged minimum benchmark of 384 prescribed by Krejcie and Morgan (1970) for research inquiries targeting populations of 1,000,000 or more. Nevertheless, in the context of SEM research, this sample size of 200 may yet merit consideration, in alignment with the framework expounded upon by Kline (2005), which deems a sample size of 100 as small, while characterising a sample ranging from 100 to 200 as of medium magnitude. Furthermore, the spectrum of acceptable sample sizes, as posited by Roscoe (1975) in the realm of behavioural studies, spans from 30 to 500, lending some contextual latitude to the present situation (Memon et al., 2020). Nonetheless, it is imperative to underscore that, given the ambitious aspiration of this research to represent the entire global consumer population, a sample size of 200 could be viewed as comparatively modest. Finally, the data collection for the study was carried out via Amazon Mechanical Turk (MTurk), an online research platform that enables researchers to recruit participants for tasks requiring human intelligence (Buhrmester et al., 2011). Despite the advantages of MTurk, such as cost-effectiveness and speedy recruitment (Follmer et al., 2017; McDuffie, 2019), the quality of survey data generated through this platform may not always be of the best quality. MTurk workers may not represent the general population of the United States, as they tend to be more educated, younger, less religious and less politically diverse. Additionally, the platform may not be accessible to those who have limited access to computers or the internet. Most MTurk workers reside in the United States and India (Goodman et al., 2013; McDuffie, 2019; Paolacci & Chandler, 2014). Although the investigators of the current study recruited participants through the MTurk platform based on their ratings and geographic locations, the study's findings may not generalise to the entire population.

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