

RESEARCH ARTICLE

Do you believe it? Green advertising skepticism and perceived value in buying electric vehicles

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Abstract

The transportation sector's substantial greenhouse gas emissions necessitate solutions that promote sustainability. One potential approach is the higher adoption of electric vehicles (EVs). This study aims to empirically investigate the determinants of customers' intentions to adopt EVs, with a strong focus on the concept of green value. Framed in adaption-innovation theory and based on the customer perceived value model, this research analyses the influence of emotion, price, quality, social, green value and green advertising skepticism on purchase intention and customer engagement. Employing a PLS approach to fit the conceptual model to data obtained from an online survey of potential customers in Germany, Spain, and Chile ($N = 791$), we found evidence of a substantial and significant impact of green advertising skepticism on purchase intention and green perceived value. Notably, the social value of electric vehicles is the most crucial driver of customers' buying intention and is more important than price and green perceived value.

KEYWORDS

adaption-innovation theory, customer engagement, electric vehicles, green ads skepticism, PERVAL

1 | INTRODUCTION

Addressing climate change puts an impetus on reducing greenhouse gas emissions (Sharma et al., 2021). Electric vehicles (EVs) are a green technology supporting the decarbonization of the transportation sector (Ruoso & Ribeiro, 2022) and a higher share of EVs is crucial to reducing direct air pollution and emissions (Bastida-Molina et al., 2022; Zhang et al., 2022). In addition to improving public transport, many countries expect EVs as the main future of individual mobility (Xu et al., 2020). A decade after their introduction to the mass vehicle market, however, EVs still face significant market barriers, such as an inadequate charging infrastructure (Globisch

et al., 2019; Higuera-Castillo, Kalinic, et al., 2020; Lane & Potter, 2007) and a lack of widespread acceptance. A sound understanding of customers' preferences and underlying values will contribute to addressing the remaining market barriers (Weiss et al., 2019) and its adoption is currently still to be developed (Singh et al., 2023).

Several recent studies have investigated EV adoption intentions from the individual perspective on factors impacting when buying automobiles (Brinkmann & Bhatisevi, 2021; Habich-Sobiegalla et al., 2018; Higuera-Castillo, Liébana-Cabanillas, et al., 2019; Sun et al., 2022). However, previous research draws upon heterogeneous samples of individuals facing the purchasing process, but customers' behaviors have been examined without regard to the differences

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distinguishing innovators from adopters. The need for tackling this research gap arises from the fact that despite massive advertising measures of EV vendors combined with governmental and administrative interventions EV adoption remains slow in Spain and Chile, although it is faster in Germany. Therefore, the study focuses on innovators. According to Ahmadi and Khoshnevisan (2022), the environmental advantages of EVs are proven and widely documented, but customers may disagree. Framed in Kirton's (1976) adaption-innovation theory (KAI) this study aims to reveal innovators' reasoning of rejecting EVs. Notably, the KAI framework has been introduced before the rise and prominence of green value in scholarly adaption research. Consequently, we enrich the KAI framework with Huang and Darmayanti's (2014) green advertising skepticism (GAS) construct and Sweeney and Soutar's (2001) emotional value facilitated by the automotive.

The present study makes several contributions: (1) it examines customers' adoption behavior from the perspective of KAI, which describes a basic personality dimension that influences individual decision-making. KAI identifies two profiles: adopter and innovator. The present research focuses exclusively on innovators, as they will be the first to buy the new product (EVs). It is the first research to study this group specifically; (2) this is the first paper to examine the effect of green advertising skepticism on EV adoption behavior. Although green advertising skepticism has been studied as an antecedent in the adoption of green products, it has never been examined in the context of EVs; (3) this research considers EV adoption behavior on the basis of perceived value; and (4) it studies adoption behavior in a global sample, allowing for more valid extrapolation of the results worldwide. Studies already exist of purchase intentions for EVs in Germany (Degirmenci & Breitner, 2017), Spain (Higuera-Castillo et al., 2021), and Chile (Girard et al., 2019). However, no previous research considers customers' purchase intentions from the broader perspective of KAI.

In short, the adoption of EVs is still slow in most countries despite the efforts made by public administration, private companies and other stakeholders, particularly environmental activists. In addition, no study focuses on analyzing the view of consumer innovators according to the KAI framework. Specifically, the effect of green advertising skepticism on EV adoption and other value dimensions such as quality, emotional, price, social and green value are investigated.

The article's structure is as follows: after the introduction, the study's theoretical foundation is presented in a literature review, and the proposed research hypotheses are justified. Subsequently, the study's methodology and results are presented, followed by a conclusion.

2 | THEORETICAL FRAMEWORK

2.1 | Adaption-innovation theory

Developed by Kirton (1976) to define individuals' cognitive preferences, KAI assumes that all people can be distinguished by their

manner of doing things better or differently. The first type of consumers is called adopters, and the second type are innovators. Adaptation-innovation is part of their personality and influences one's decision-making, so these characteristics support decision-making processes and how one prefers to solve a problem. Adopters are precise, methodical, cautious, disciplined, and follow established rules, while innovators think for themselves by finding new solutions to existing problems. In other words, adopters act and make decisions consistently with the established method, whereas innovators are more willing to make decisions that challenge the current paradigm. However, the theory suggests that as a bipolar latent continuum in terms of psychometrics. Therefore, the terms "more adaptive" and "more innovative" are more appropriate. Innovators are often the ones who challenge rules, since they have little regard for past customs. Adopters rarely challenge rules. A relevant characteristic shared by innovators is insensitivity to social peers with a tendency to neglect established group cohesion and, doing so, hampering cooperation, while a typical adopter is usually sensitive to the needs of others and maintains group cohesion and cooperation (Kirton, 1976). Therefore, more adaptive individuals use rules to solve problems, whereas more innovative personalities understate them.

Traditionally this theory has been applied to the business environment. Kirton's research (Kirton, 1980) examines the differences between adopters and innovators within various departments, companies, and management courses. KAI scores are positively associated with innovation, sensation-seeking and risk-taking, and negatively correlated with bossiness (Goldsmith, 1984). Chilton and Bloodgood (2010) examined the integration of KAI and facets of knowledge management theories, and their results indicate that adopters generally favor to work with explicit knowledge, while innovators largely prefer to work with more implicit knowledge in their tactics. It is important to note that neither cognitive style is inherently superior; they are merely distinct. As per KAI, both early adopters and innovators have their own strengths and weaknesses. Hence, organizations require a balance of both types (Kirton, 1976).

As indicated above, despite public authorities' interest in promoting EV purchases, the adoption rate is low. Previous research has tried to identify the profile most likely to purchase an EV (Higuera-Castillo, Molinillo, et al., 2020; Jaiswal et al., 2022; Lu et al., 2019), but none of that research was based on KAI with a focus on innovators. Innovative buyers are often more open to new ideas, technologies, and solutions. They tend to seek out products and services that offer unique and novel features, and they are more likely to embrace change. When it comes to environmental aspects, innovative buyers may perceive them as an opportunity for differentiation and improvement (Li et al., 2021). For these buyers, green aspects add value in several ways. Firstly, they may see green products as innovative solutions that align with their own forward-thinking mindset (Dangelico & Pujari, 2010). Products or services incorporate sustainable materials, energy-efficient technologies, or eco-friendly production processes are seen as cutting-edge and appealing to their desire for novelty. Secondly, innovative buyers recognize the long-term benefits of green choices (Ansar, 2013; Hussain et al., 2020). They may value the

potential cost savings associated with energy-efficient products or the positive impact on their health and well-being from using non-toxic or organic products. They also appreciate the positive societal impact of supporting companies that prioritize sustainability. Moreover, innovative buyers often have a strong sense of personal values and a desire to make a positive impact on the world (Veerabhadrapa et al., 2022). They actively seek out green options to align their purchasing decisions with their values. For these buyers, the value they place on green aspects goes beyond the product itself and extends to the larger impact it has on society and the environment.

2.2 | Perceived value

In customer research the notion of perceived value has been recognized as a vital component for predicting future purchase intentions (Kautish et al., 2020; McDougall & Levesque, 2000). The crucial challenge is to advance ecological considerations to become a top priority when deciding on the consumption of automobiles, particularly the inherent technology. With the increasing awareness of the negative impact that consumption can have on the environment (Sharma et al., 2022), we must take proactive measures to safeguard our planet and secure a sustainable future (Koller et al., 2011). Taking the consumers' perspective, value emerges as relationship between quality and price, and those two elements affect the perception of value for money. According to Zeithaml (1988), some customers associate value with an affordable price by means of the volume (or number) for money ratio. Others perceive value as a combination of quality and cost mapping to a value-for-money ratio. Complementing, Zeithaml (1988) noted that some customers estimate value based on all the applicable "get" and "give" components, which led to her definition of perceived value as the customer's comprehensive evaluation of a product's benefits and drawbacks. McDougall and Levesque (2000) define *perceived value* as the consequences or benefits customers receive relative to costs, including the paid price and other costs relating to the purchase. Benefits include the value desired by customers, while costs comprise both monetary and nonmonetary expenses, for example, time or opportunity costs. Furthermore, *product attractiveness* is a combination of objective utility-based and emotional aspects (Zhang et al., 2014), which implies a potential discrepancy between the benefits received and related expenses.

Sweeney and Soutar (2001) established a four-dimensional scale consisting of utilitarian and hedonic components to demonstrate that multiple dimensions better explain customer choice. The present research focused on the customers' understanding of value of durable goods, specifically, EVs. The four dimensions are *value-for-money*, *emotional*, *quality*, and *social*. Typically, studies on purchasing durable goods focus on functional value. By adopting Sweeney and Soutar's dimensions, we highlight the relevance of emotional value and underline the importance of exploring all dimensions of customer value before choosing a marketing approach.

In the context Koller et al. (2011) distinguish the value dimensions "green to have quality", "green to be seen" and "green to feel good"

from the financial perspective "green to save money". Together, these observations underlie the *value-in-transaction* concept, which is well established in marketing research as a means of analyzing and predicting customers' buying behavior (Vargo et al., 2014). In their *value-in-impact* conceptualization, Matthies et al. (2016) extend this concept by adding social and environmental components that reflect how customers' norms affect purchase decisions.

The perceived value scale is frequently adopted and used in marketing research in the contexts of services and goods (Chen & Lin, 2019; Wang et al., 2019; Woo & Kim, 2019; Zhang et al., 2020).

2.3 | Green ads skepticism

Several research papers have examined the factors preceding GAS (Huang & Darmayanti, 2014) or have analyzed it as a moderating variable (Ali et al., 2021). However, a limited amount of research has specifically examined the effect of GAS on purchase intention. GAS may influence consumers' perception of the credibility and authenticity of green claims made by automobile manufacturers. Suppose consumers are skeptical of the environmental claims made in green advertising. In that case, they may question the overall value proposition of green cars, including their environmental benefits, fuel efficiency, and long-term cost savings. Wei et al. (2017) demonstrate that GAS is a precursor to customer attitudes toward green products. Luo et al. (2020) discovered that GAS on social media negatively impacts green purchase intention. Furthermore, research has indicated that males tend to exhibit more skepticism toward green advertising than females (Yu, 2020). Goh and Balaji (2016) suggest that green skepticism diminishes customers' inclination to purchase sustainable care products. GAS may affect consumers' trust in the automobile industry's information regarding their vehicles' environmental impact. This lack of trust can potentially diminish the perceived value of green cars, as consumers may be uncertain about the actual environmental benefits or the extent to which these claims align with reality. Additionally, studies have proposed that more environmentally conscious individuals tend to be more skeptical of green advertisements (Do Paço & Reis, 2012).

Despite research on various aspects related to electric vehicles (EVs), there is a need for more studies examining the impact of GAS on EV adoption. However, previous studies have established that reliability is one of the primary factors influencing EV purchases (Higuera-Castillo et al., 2021), and that green trust negatively moderates the relationship between attitude and intention to adopt EVs (Moon, 2021).

Furthermore, GAS may also indirectly impact perceived value by influencing consumers' attitudes and beliefs toward green products in general. If consumers hold negative attitudes toward green advertising or perceive it as manipulative, their overall perception of green products, including green cars, may be influenced. This, in turn, can affect their perceived value by shaping their expectations and judgments about the benefits, costs, and overall desirability of green automobiles.

Recognizing the significance of ecological value can offer a strategic advantage and facilitate repositioning efforts. This also reflects the growing importance of sustainability attributes and green claims has made them more appealing to consumers who prioritize ecological values (Kautish et al., 2020). Ecological value has been found to be associated with various dimensions of value, including cognitive aspects (such as functionality and economic benefits) and affective aspects (including emotional and social value). Consequently, communication strategies should leverage the interplay between these different value dimensions. An effective approach may involve a combination of informative and emotional appeals (Koller et al., 2011).

2.4 | Research hypotheses

Growing concern and awareness about environmental issues have resulted in consumers' increasing interest in sustainable and green values. Companies have responded to this trend by manufacturing green products and supporting green practices, but they face difficulties in effectively marketing approaches (Khare & Kautish, 2021a, 2021b).

The distinctive characteristics of products are determining customers' choice are assessed with in choice contexts, which are subjective in nature (Sánchez et al., 2006). According to Sweeney and Soutar (2001), *quality value* embraces the tangible or functional benefits a product provides to customers. Emotional value, on the other hand, encompasses customers' emotional or psychological desires and the satisfaction they receive from the emotions or affective experiences a product elicits; such psychological needs can encompass feelings of comfort and enjoyment. A product's *price value* reflects the satisfaction it provides based on the price, time, or effort invested in obtaining it, whereas social value describes how one's social uplift my means of communicating the intended self-concept by owning and using a product, as well as its social utility in terms of status or prestige. This value is related to interactions among people and to the value associated with individual recognition through consumption.

In electric car adoption, some papers have assessed the effect of perceived value on adoption intention (Asadi et al., 2021; Higuera-Castillo, Molinillo, et al., 2019) and how various factors affect perceived value and its effect on adoption. In these cases, a unidimensional scale measures perceived value. For example, Kim et al. (2018) note the substantial impact of perceived value to predict customers' intention to use EVs; they found environmental concerns and financial incentives increase of the influence of perceived value on intent to adopt. Ju and Kim (2022) show that product quality, price, and a well-developed infrastructure positively influence perceived value. Consolidating, perceived value positively influences purchase intention toward EVs (Ng et al., 2018). Hur et al. (2013) indicate that perceived social, emotional, and functional values positively affect hybrid car owners' satisfaction, and customer satisfaction with innovative technology generally leads to customer loyalty (Falkenreck & Wagner, 2011). Technical specifications, uncertainties in terms of its degradation and life span lead to a reasonable suspect that EVs will

follow a different value depreciation than conventional vehicles (Schloter, 2022).

The decision to buy green products can be impacted by several factors, one of which is the attributes that these products possess. Previous research has shown that characteristics such as style, quality, and appeal play a crucial role in motivating consumers to purchase eco-friendly options (Gulzari et al., 2022; Khare & Kautish, 2021a, 2021b). Ju and Kim (2022) show that product quality, price, and a well-developed infrastructure positively influence perceived value. Therefore, the following research hypothesis is proposed:

Because of the above findings, this study proposed the following research hypotheses regarding perceived value:

H1. Quality value is positively associated with purchase intention.

Despite the consensus that emotions play a significant role in consumer behavior (Laros & Steenkamp, 2005), research on emotions show a significant relevance for EV purchase intentions (He et al., 2023; Singh et al., 2020). While there is a growing interest in EVs as a sustainable mode of transportation, there has been little exploration into how consumers' emotions influence their willingness to adopt this new technology. Therefore, there is a pressing need for further research to better understand the role of emotions in EV adoption behavior, which can help inform marketing and communication strategies aimed at promoting EV adoption. He and Hu (2022) show that perceived value mediates the relationship from emotional value to EV adoption. Therefore, the following research hypothesis is proposed:

H2. Emotional value is positively associated with purchase intention.

Previous research identified price and range as main predictors of EV purchases (Asadi et al., 2021; Secinaro et al., 2022). However, other features are even more important, as people do not make a purely rational decision when buying an EV (White & Sintov, 2017). Degirmenci and Breitner (2017) suggest environmental performance as a stronger predictor of purchase intention than price and range confidence. Even other studies as Gulzari et al. (2022) show it does not impact on intention. Price plays an important role to predict purchases and purchase intention and it was identified as a barrier of EV adoption (Noel et al., 2020). While price value plays a positive impact on EV intention (Vafaei-Zadeh et al., 2022). Therefore, the following research hypothesis is proposed:

H3. Price value is positively associated with purchase intention.

Social value is related to interactions among people and to the value associated with individual recognition through consumption; understanding that social context influences our purchasing choices (Kautish et al., 2022). This is in line with previous research indicating

that social identification with its related social norms positively influences the consumer perception and the behavioral intention (Kautish & Khare, 2022; Mohamed et al., 2016). Previous research has consistently displayed the importance of psychological factors such as societal influence on the intention to purchase (Singh et al., 2020). Sang and Bekhet (2015) and Liao et al. (2017) found that the choices of an individual in extreme cases depend much more on their relatives, friends, family, and society and have a significant impact on EV adoption. Therefore, the following research hypothesis is proposed:

H4. Social value is positively associated with purchase intention.

Green marketing has developed extensively to encounter the green needs of customers, but its definition has altered over time in parallel with the rising relevance of sustainability (Dangelico & Vocellelli, 2017). According to Groening et al. (2018), green marketing is a holistic concept describing products and services' production, consumption, and disposal being less detrimental to the environment. Modern societies are strongly concerned about the environment, and green-conscious customers are willing to buy innovative products to reduce environmental harm. Thus, consumers who are inclined to be environmentally friendly will buy green products (Kautish et al., 2019) and electric vehicles (Higuera-Castillo, Molinillo, et al., 2020). As a result, companies implement green marketing strategies to attract green customers (Zulauf & Wagner, 2021), so practitioners aim to precisely understand customers' needs and segment the green market.

Chen (2013, p. 296) defines green perceived value (GPV) as "a customer's overall appraisal of the net benefit of a product or service between what is received and that is given based on the customer's environmental desires, sustainable expectations, and green needs." As consumers become more environmentally conscious, their expectations and preferences are shifting toward products that offer not only functional benefits but also contribute to a greener and more sustainable future. GPV positively affects green purchase intentions (Chen & Chang, 2012). According to Luo et al. (2022) green value has a positive effect on consumer satisfaction and thereby promote the intention to purchase green products. When consumers perceive a product to be environmentally friendly, they are more likely to experience a sense of satisfaction and fulfillment in their purchase decision. This is because they feel they are making a positive impact on the environment and aligning their values with their consumption choices. As a result, customers are more likely to develop a strong emotional connection with the brand and exhibit higher levels of loyalty and repeat purchase behavior.

Overall, environmental concern is an important stimulus that influences EV adoption (Wu et al., 2019), although there are studies that cannot demonstrate a significant direct relationship (Kautish et al., 2021). While a recent study claims that GPV positively influences the purchase intention of hybrid vehicles (Hamzah & Tanwir, 2021). GPV has also been examined in a public bike system context and was found to be significantly positively related to green loyalty (Chen, 2016). GPV affects attitudes and intentions to buy

green products (Toulabi et al., 2021). Koller et al. (2011) showed GPV has a significant impact in consumer loyalty intentions of car users. In conclusion, the proposed research hypothesis focusing on the relationship between green perceived value and purchase intention is justified by the increasing importance of sustainability and the demand for eco-friendly products, so, as with the previous dimensions and based on the literature review, we proposed following research hypothesis:

H5. Green perceived value is positively associated with purchase intention.

Green advertising, comprising advertisers' strategies to establish their goods as green products in customers' minds, is on the rise in business practice (Groening et al., 2018). Its positive relationship with green purchase intention has been widely recognized (Schmuck et al., 2018). However, ads are not always as credible or trustworthy as one would like, making it necessary to analyze the effect of skepticism on EV adoption (Bobanac et al., 2018). According to Obermiller and Spangenberg (1998), *skepticism* describes the tendency of customers to disbelieve advertising claims. Unverifiable advertising claims provoke skepticism, distrust, or disbelief from customers (Foreh & Grier, 2003; Kautish & Sharma, 2020). Indeed, customers often view claims related to environmental impact with skepticism and misinterpret them (Bickart & Ruth, 2012). GAS describes customers' tendency to disbelieve green ads' claims (Cheng et al., 2020; Schmuck et al., 2018). Green marketers are advised to emphasize environmental knowledge and consequences to promote the environmentally conscious consumer behavior, and increase consumer concern to augment the willingness to be environmentally friendly (Kautish & Sharma, 2020).

Several papers have studied the antecedents of GAS (Huang & Darmayanti, 2014) or analyzed it as a moderator (Ali et al., 2021), but few have analyzed the effect of this variable on purchase intention. Some examples are found in the study of Wei et al. (2017), which shows that GAS is an antecedent of customer attitudes toward green products. Luo et al. (2020) found that GAS on social media negatively affects green purchase intention. It has also been found that males are more skeptical of green advertising than females (Yu, 2020). Goh and Balaji (2016) indicate that green skepticism reduces customers' intention to buy sustainable care products. Furthermore, studies suggest that more environmentally concerned individuals are more skeptical of green ads (Do Paço & Reis, 2012). However, there are no studies on EVs that analyze this factor's impact on adoption, although studies have found that reliability is one of the main factors influencing purchase (Higuera-Castillo et al., 2021) and that, green trust moderates the relation of attitude and intention to adopt EVs negatively (Moon, 2021). Consolidating the following research hypotheses were proposed:

H6. Green advertising skepticism is negatively associated with purchase intention.

H7. Green advertising skepticism is negatively associated with green perceived value.

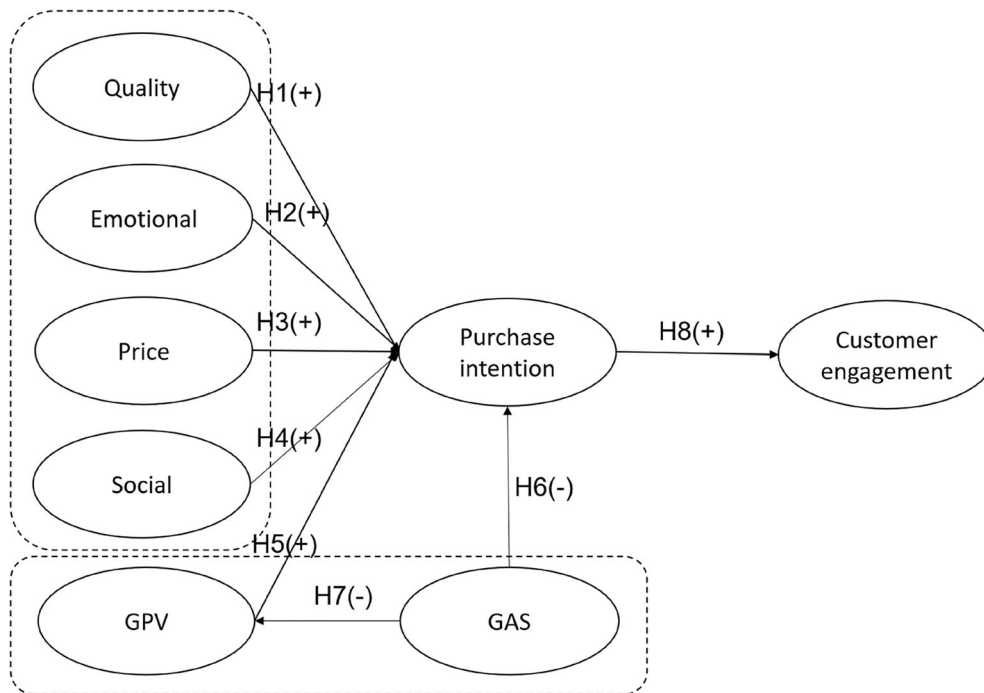


FIGURE 1 The proposed theoretical behavioral model. GAS, green ads skepticism; GPV, green perceived value.

Finally, *purchase intention* is as the intended or planned future behavior; it represents the probability of transforming beliefs and attitudes about a product in action (Ajzen, 2001; Pradeep et al., 2021). The concept of *customer engagement* has many facets, and there is no consensus on its definition, but it has been extensively studied in recent years (Harmeling et al., 2017). According to McDonald et al. (2022), customer engagement is an emerging perspective that provides a holistic view of how customers' interactive experiences with organizations create value for both parties. This concept has been applied in various business domains (Barari et al., 2021). Ullah et al. (2021) point out that customer experience increases customer engagement in EV purchasing. Previous research found environmental concerns and customer experience's effects on customer engagement (Kautish & Dash, 2017; Wu et al., 2019), but there is no significant theoretical foundation to support the effect of customer perceived value (PERVAL) on customer engagement in this field of study. It is important to note, however, that the literature confirms that perceived value is a central predictor of customer loyalty (Kautish et al., 2020; Kautish & Sharma, 2019) (Figure 1). Therefore, the following research hypothesis was proposed:

H8. Purchase intention is positively associated with customer engagement.

3 | METHODS

3.1 | Data collection

For data collection, an online questionnaire was developed and distributed using a customer panel in April 2022. The data were obtained

through a quota sampling method representing the structure of each population by means of geographical districts. Therefore, the three national data sets are representative for the three nations under consideration, cover both urban and rural living individuals and enable statistical testing because of random sampling within the districts. Following the guidance of Horn and Wagner (2020) respondents needed to qualify by their intention to buy a new car or to have bought a new car recently. Thus, respondents are involved and most likely have paid attention to EV vendors advertisements. The robustness of the measurement scales was tested during the initial stage of the research. The data were filtered by eliminating subjects who were not part of the target sample and those who were not considered innovative. The KAI inventory ensured that the sample comprised only innovative customers with a score of 110–140. All participants with a lower score were eliminated from the sample.

The final sample comprised 791 participants: 283 from Germany, 294 from Spain, and 214 from Chile. Their average age was 39 years, 78.4% lived in urban areas, 44.5% were male, all had a driving license, and most had purchased an EV in recent months or declared their intention to do so.

3.2 | Measurement scales

This study adopted Kirton's KAI inventory (Kirton, 1976) to measure users' innovation or adaptation level. We used Sweeney and Soutar's scale (Sweeney & Soutar, 2001) to measure perceived value, as it was created and successfully implemented in the context of durable goods (such as a vehicle). Later, Walsh et al. (2014) simplified this scale in several versions. The 12-item PERVAL-Short was chosen for this study, as it shows good model fit, predictive validity, and evidence of

TABLE 1 Outer model assessment.

Constructs and measured items	Standard loadings
PERVAL (adapted from Walsh et al., 2014)	
Quality (functional value) (Cronbach's $\alpha = .838$; CR = .888; AVE = .726)	
Is of high quality	.823
Is well built	.866
Has an acceptable standard of quality	.866
Emotional (Cronbach's $\alpha = .841$; CR = .904; AVE = .759)	
Would enjoy one of them	.875
Would make me want to use it	.881
Would make me feel good to have one	.858
Price (value for money) (Cronbach's $\alpha = .838$; CR = .902; AVE = .754)	
Is reasonably priced	.821
Offers good value for money	.891
Is a good product for the price	.890
Social (Cronbach's $\alpha = .872$; CR = .921; AVE = .796)	
Would help me to feel accepted by others	.894
Would improve the way I am perceived by others	.896
Would make a good impression on other people if I had one	.886
Green perceived value (Cronbach's $\alpha = .906$; CR = .930; AVE = .727) (adapted from Chen, 2013)	
The benefits of EVs on the environment are extremely positive	.829
The benefits of EVs on the environment meet my expectations	.818
I would purchase an EV because it is more environmentally friendly than an internal combustion vehicle	.870
I would purchase an EV because it is environmentally friendly	.868
I would purchase an EV because of the positive impact on the environment compared to traditional internal combustion vehicles	.878
Green ads skepticism (Cronbach's $\alpha = .913$; CR = .938; AVE = .792) (adapted from Mohr et al., 1998)	
Most advertising on the environmental benefits derived from the use of EVs is deceiving	.899
Most advertising on the environmental benefits of EVs are intended to mislead rather than inform consumers	.899
I do not generally trust advertising on the environmental benefits of EVs	.886
Because environmental ads are exaggerated, it would be better to not have consumers receive them	.876
Purchase intention (Cronbach's $\alpha = .863$; CR = .917; AVE = .754) (adapted from He & Zhan, 2018; Sahin et al., 2012)	
The EV is my first choice when purchasing a new car.	.889
I will buy an EV in the near future	.855
Next time, I will buy an EV	.915
Green customer engagement (Cronbach's $\alpha = .858$; CR = .904; AVE = .703) (adapted from Pansari & Kumar, 2017; Ullah et al., 2021)	
Overall, I am happy with EVs	.753
I say positive things about EVs to others	.849
I encourage my friends and family to buy and use EVs	.866
I would recommend an EV to someone who seeks my advice on cars	.880

partial metric invariance. Because we collected data from Germany, Spain, and Chile, this was crucial for the research. The short scale was also chosen because it takes up less space in the questionnaire (Nenkov et al., 2008) and reduces response bias caused by boredom and fatigue (Walsh et al., 2014). The measure for GPV was adapted from Chen (2013) and that for green advertising skepticism from Mohr et al. (1998). The scale for attitude was adapted from

Ajzen (1991) and that for intention to adopt from Sahin et al. (2012) and He and Zhan (2018). Lastly, the measure for customer engagement was adapted from Pansari and Kumar (2017) and Ullah et al. (2021).

All the measures were implemented as Likert-type scales (1–5 points). The participants were asked to indicate their degree of agreement with each statement.

	CE	EMO	GAS	GPV	PI	PRICE	QUALITY	SOCIAL
CE	0.838	0.655	0.205	0.705	0.810	0.556	0.599	0.496
EMO	0.550	0.871	0.358	0.700	0.537	0.394	0.757	0.358
GAS	-0.177	-0.314	0.890	0.374	0.154	0.073	0.322	0.137
GPV	0.613	0.612	-0.341	0.853	0.521	0.386	0.674	0.263
PI	0.703	0.458	-0.139	0.462	0.886	0.561	0.495	0.560
PRICE	0.482	0.345	0.036	0.344	0.486	0.868	0.605	0.610
QUALITY	0.493	0.627	-0.279	0.577	0.416	0.506	0.852	0.419
SOCIAL	0.442	0.312	0.114	0.238	0.490	0.523	0.352	0.892

Note: The main diagonal represents the square roots of the AVE. Values below the diagonal are the inter-construct correlations (Fornell-Larcker test), and values above the diagonal show the HTMT ratio.

Abbreviations: CE, customer engagement; EMO, emotional value; GAS, green ads skepticism; GPV, green perceived value; PI, purchase intention.

TABLE 2 Discriminant validity.

4 | RESULTS

4.1 | Assessment of the measurement model

The measurement model was analyzed through reliability, convergent, and discriminant analyses using the following indicators and recommended limit in each case: Cronbach's alpha ($\geq .7$) (Cronbach, 1951), composite reliability (CR) ($\geq .7$), and average variance extracted (AVE) ($\geq .5$) (Fornell & Larcker, 1981; Hair, Hollingsworth, et al., 2017). All the values exceeded the recommended level (Table 1), confirming internal consistency and convergent validity. Additionally, we examined the loadings of each item, which were significant and greater than 0.7 (Hair, 2011).

To test for discriminant validity, two methods were applied: the Fornell-Larcker criterion, which questions if the correlations between dimensions are lower than the square root value of the AVE (Fornell & Larcker, 1981), and the Heterotrait-Monotrait ratio (HTMT), which determines if the correlations between pairs of constructs are lower than 0.9 (Henseler et al., 2014). The outcomes of both methods were in accordance with the recommendations by the literature, thus establishing discriminant validity (Table 2).

A collinearity test was done to observe the multicollinearity among the dependent variables. In this test, variance inflation factor values of less than five are considered acceptable; our result was 2.176, indicating that there was no multicollinearity. (Hair, Hult, et al., 2017). We also analyzed common method bias (CMB) with Harman's single factor test, where all items loaded into a single common factor. Consistent with previous research, if a single factor's total variance is less than 50%, it has no effect on the data. The results reveal that they explain 36% of the variance, indicating the absence of Common Method Bias (CMB).

4.2 | Assessment of the structural model

The suggested model's research hypotheses were tested using structural equation modeling (SEM) with SmartPLS 4.0 software. To test

the hypotheses, a bootstrapping analysis with 5000 subsamples randomly extracted from the original data set was conducted. Table 3 shows the results of all the tested research hypotheses, indicating that they are all accepted at a 5% level except H1 (quality: purchase intention).

The model's explanatory performance was evaluated by the variance explained (R^2). The value for GPV is 0.116, which means that GAS explains 11.6% of GPV. The value for purchase intention is 0.420, meaning that emotional, price, social, and green value together with GAS explain 42% of purchase intention. The R^2 for customer engagement is 0.522, indicating that purchase intention and its antecedents explain 52.2% of customer engagement.

To determine the differences between the observed correlation and the predicted correlation, the standardized mean squared residual (SRMR) ratio was examined as an indicator of model fit (Henseler et al., 2014). With 0.065 the result is below the suggested threshold of 0.08 (Figure 2).

Finally, the total effect of the research hypotheses on customer engagement was analyzed. Table 4 shows that the variable with the strongest positive influence is social value, followed by green value. However, GAS also has a decisive but negative influence.

5 | DISCUSSION

5.1 | Theoretical contribution

This manuscript makes at least two important contributions to the theoretical framework in the area. First, we complement the adaptation-innovation theory proposed by Kirton's (1976) and apply it to explain the adoption of EV consumption. The theory suggests that people stand on a continuum from adaptation to innovation, reflecting their preferences and approaches when faced with challenging decisions. We propose to add the constructs of green advertising skepticism (Huang & Darmayanti's, 2014) and emotional value facilitated by the automotive (Sweeney & Soutar's, 2001) to the KAI model. This addition

TABLE 3 Inner model assessment (bootstrapping = 5000).

Research hypothesis	Path coefficient	Std dev.	t-value	p-value	Result
H1(+) Quality → PI	-0.053	0.048	1.115	.265	Not supported
H2(+) Emotional → PI	0.164	0.052	3.191	.001	Supported
H3(+) Price → PI	0.230	0.045	5.099	.000	Supported
H4(+) Social → PI	0.293	0.041	7.191	.000	Supported
H5(+) GPV → PI	0.220	0.044	5.015	.000	Supported
H6(-) GAS → PI	-0.069	0.030	2.288	.022	Supported
H7(-) GAS → GPV	-0.341	0.032	10.667	.000	Supported
H8(+) PI → CE	0.703	0.024	29.214	.000	Supported

Abbreviations: CE, customer engagement; GAS, green ads skepticism; GPV, green perceived value; PI, purchase intention.

FIGURE 2 Results of the proposed theoretical model by SEM. GAS, green ads skepticism; GPV, green perceived value. ***p-value <.001; **p-value <.05; ns, nonsignificant.

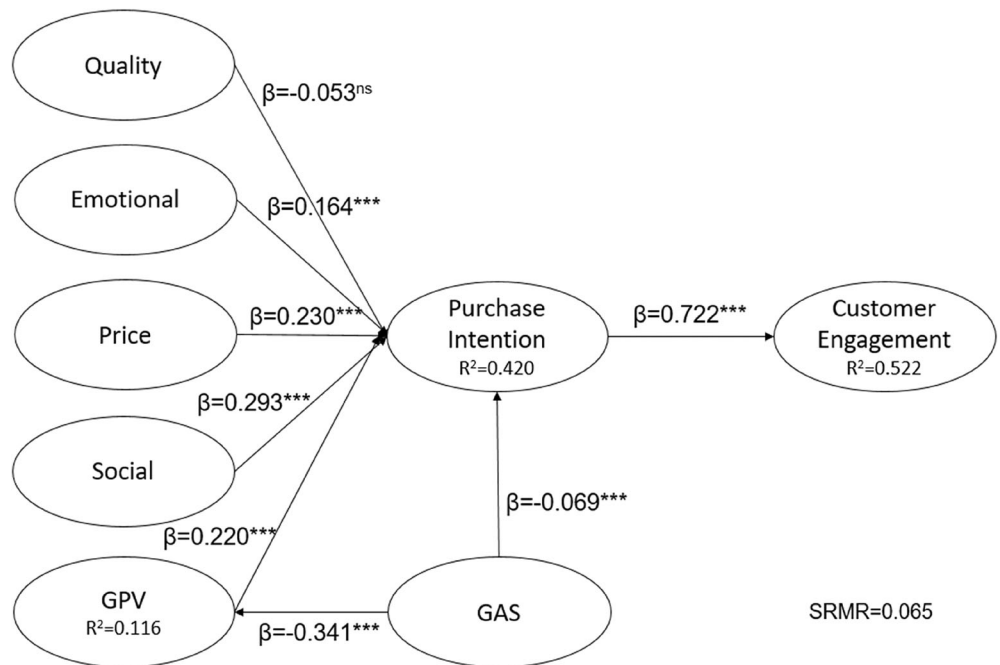


TABLE 4 Total effects on customer engagement.

Research hypothesis	Direct effect		Indirect effect		Total effect
	Path coefficient	p-value	Path coefficient	p-value	
Quality → INT → CE	-0.053	.260	-0.038	.262	n.s.
Emotional → INT → CE	0.164	.001	0.119	.002	0.283
Price → INT → CE	0.230	.000	0.166	.000	0.396
Social → INT → CE	0.293	.000	0.211	.000	0.504
GPV → INT → CE	0.220	.000	0.159	.000	0.407
GAS → GPV → INT → CE	-0.341; -0.075	.000; .000	-0.054	.000	-0.47
GAS → INT → CE	-0.068	.022	-0.049	.022	0.117

has allowed us to capture internal and personal factors and motivations more comprehensively and to improve the explanatory power of purchase intention in the model. The model can explain 42% of the variance of purchase intention and 52% of customer engagement.

Secondly, research focusing on innovative buyers is very scarce even though this group of subjects tends to be more open to new ideas, technologies, and solutions than other groups of buyers. In other words, they obviously have a different behavior than the other potential buyers. The literature suggests that adopters recognize

benefits in adopting green solutions because they lead to cost savings associated with efficiency, improve sustainability and because it aligns with their values (Hussain et al., 2020; Veerabhadrapa et al., 2022). Previous research has addressed the study of EV adoption without distinguishing between innovators and adapters.

This study highlights the importance of green perceived value and social value in EV adoption. Management in the transport sector can benefit from these implications by focusing their efforts on raising awareness of the environmental and social benefits of EVs, addressing skepticism toward green advertising, and highlighting the social value of EVs. Implementing economic incentives and tailoring strategies to different markets can also be key to promoting greater adoption of EVs and moving toward a more sustainable future in transport.

Regarding the relationships of the model, all our model's hypotheses were supported except one of them. The emotional, price, and social value directly and positively influence purchase intention. These results are consistent with the findings of Hur et al. (2013) as is the suggestion that marketing communication should be directed toward satisfying hedonic value rather than utilitarian value, as customers do not yet have enough information to value the purchase, which affects their perception (Zhang et al., 2022). However, the relationship between quality and purchase intention was not supported. The perceived quality scale was based on the measurement of the overall quality of the EV, and the perception of quality were based on the standard of the individual and the automobile industry. The previous research of Chen and Lin (2019) found no significant relationship between quality and purchase intention. Lane and Potter (2007) argue that customers who do not perceive that an EV is of the best available quality are unlikely to buy. The non-significant result may be due to several factors: (a) users may not yet understand how to measure the quality of an EV (Pradeep et al., 2021) or may not understand how EV builders communicate it (Zhang et al., 2022); (b) users see no differences between the EVs of different brands, or those differences are not enough to make them decide to purchase the vehicle; (c) the quality of EVs does not differ from the perceived quality of internal combustion vehicles, which, coupled with EVs' higher price, could circumvent the purchase; (e) expectations of EV technology are higher than their perceived performance in terms of, for example, speed, power, battery life, or charging duration (Globisch et al., 2019).

Regarding the second research aim of this study, GAS has a direct negative effect on GPV and purchase intention; in turn, GPV positively and directly affects purchase intention. As predicted by Luo et al. (2020), green skepticism negatively influences EV perceived value and purchase intention, and the literature has shown that this effect is correlated with attitude toward the environment. Therefore, the credibility of green communication is critical. As skepticism is reduced (credibility increases), purchase intention will increase, but purchase intention is also indirectly moderated by perceived green value.

Finally, the results indicate a positive relationship between purchase intention and customer engagement. Although there are few relevant studies in the literature, our results are consistent with those of Ullah et al. (2021). Specifically, Ullah et al. advocate for increasing

EV connectivity and automation but also suggest that EV involvement could increase customer engagement. Customers who are more engaged exhibit higher expectations and conduct a more thorough information search.

5.2 | Managerial implications

This study offers several substantial implications for the management in the transportation sector and the promotion of sustainable solutions regarding the adoption of EVs. The conclusions drawn from the empirical analysis of the determinants of customers' intention to adopt EVs, with a specific emphasis on the concept of green value, provide valuable insights to guide future commercial strategies.

Firstly, the study highlights the importance of green perceived value in customers' intention to adopt EVs. To foster mass adoption of EVs, manufacturers should concentrate their efforts on raising awareness about the environmental and social benefits associated with the use of electric vehicles. This could be achieved through marketing and communication campaigns that underscore the positive impact of EVs in reducing greenhouse gas emissions and protecting the environment.

Additionally, the study identifies green advertising skepticism as a factor that negatively influences the intention to purchase EVs. Organizations should be aware of this perception and address it through transparency and honesty in their sustainability-related marketing messages. Green advertising must be supported by facts and measurable results to build consumer confidence in the real benefits of electric vehicles.

Furthermore, the social value of EVs emerges as the most influential factor in customers' purchase intention, even more so than price and perceived green value. This implies that, apart from highlighting environmental benefits, marketing and sales strategies should emphasize how adopting EVs can enhance social perception and customer image. Highlighting corporate social responsibility aspects and the role of consumers in combating climate change could increase the appeal of EVs.

In this regard, although social value is a determining factor, price remains significant in customers' purchase decision. Governments and transportation sector companies may consider implementing economic incentives, such as subsidies and tax reductions, to lower the acquisition cost of EVs and make them more affordable to a broader range of consumers.

Finally, since this study was conducted in three countries (Germany, Spain, and Chile), it is essential to acknowledge the cultural and socioeconomic differences between regions and adapt EV marketing strategies and promotion policies accordingly. Ongoing research in different geographical contexts can provide valuable information to tailor strategies and enhance the effectiveness of EV promotion initiatives.

In conclusion, manufacturers should examine the characteristics of EVs that determine their perceived quality and then measure the importance to customers of each to build a targeted communication

policy to increase the influence of perceived quality on purchase intention. Commercial information must be credible, informative, and emphasize green benefits with regard to the economic expenses and various costs associated with the purchase. Devising different communication campaigns according to the individual's involvement with a greater or lesser degree of information provided might prove valuable. For example, the most involved users could be featured in customer magazines specializing in EVs, so a company would target magazine media with a more in-depth advertisement than would be the case for radio or TV (mass media). They could also run campaigns on social media, where the involved customers upload pictures from their car during rides. As this research focuses on adopters, it would be more beneficial to allocate a greater economic effort to communicate with potential customers through explicit media with a greater capacity to transmit values, such as websites, social media, mass media, and celebrity spokespersons.

5.3 | Policy implications

We propose several implications based on the previous findings and conclusions: Policy makers should concentrate their efforts on raising awareness of the environmental and social benefits associated with the use of EVs. This could be achieved through marketing and communication campaigns that highlight the positive impact of EVs in reducing greenhouse gas emissions and protecting the environment. These campaigns must be supported by measurable (verifiable) facts and results from relevant and reliable sources. The support of influencers will be beneficial. It is important to find the media and influencers most valued by adopters.

Additionally, governments and companies in the transport sector could consider applying economic incentives, such as subsidies and tax reductions, to lower the purchase cost of EVs and make them more affordable to a wider range of consumers (Higuera-Castillo et al., 2023). Such actions would facilitate adoption by a wider group of adapters (with less purchasing power) but also by innovators and other more risk-averse groups.

5.4 | Limitations and future lines of research

While this study contributes valuable insights into understanding the adoption of EVs, it is essential to acknowledge certain limitations that warrant consideration and suggest directions for future research.

Firstly, the sample, drawn from three countries, exhibits homogeneity in certain population characteristics. However, the method of data collection used raises concerns about the generalizability of findings to a broader population. Future research could employ more diverse and representative samples, encompassing a wider range of sociodemographic variables, to enhance the external validity of the results.

Secondly, the cross-sectional design of this study provides a snapshot of attitudes and behaviors at a specific point in time. A more

dynamic understanding of EV adoption could be gained through longitudinal research, allowing for the exploration of behavioral changes over time and the identification of evolving trends in environmental value perceptions.

Another limitation associated with the methodology is related to the technique employed for data analysis. In this case, we used PLS-SEM analysis with limitations related to sensitivity to sample size (Wagner & Grimm, 2023), lower efficiency in cases of non-normally distributed data, among others. Future analyses could include other methodologies such as Ordinary Least Squares analysis.

Additionally, the lack of a supported relationship between quality and purchase intention may stem from limitations in how perceived quality was measured. Future research should delve into the specific aspects that users consider when assessing the quality of EVs, investigating factors such as performance metrics, brand perception, and user expectations in greater detail.

Moreover, while this study acknowledges the negative impact of green advertising skepticism on green perceived value and purchase intention, a more nuanced exploration of the factors influencing skepticism is warranted. Future research could delve into the specific types of green messages that trigger skepticism and explore strategies to enhance the credibility of green communication. Additionally, investigating the effectiveness of different types of green advertising messages and strategies in mitigating skepticism and enhancing perceived value could provide practical insights for communication campaigns. This research could involve experimental designs to test the impact of various communication approaches on consumer perceptions. Also, further research could investigate the most effective communication channels for different levels of customer engagement, considering the diverse information needs of potential EV customers.

In the same vein, exploring cultural and regional variations in EV adoption patterns could enhance the external validity of the findings. Future research might investigate how cultural differences influence the perceived value of EVs and the effectiveness of marketing strategies across diverse geographical contexts. Additionally, assessing the actual social and environmental impact of EV adoption could be a fruitful avenue for future research. This may involve exploring the real-world effects of increased EV adoption on carbon emissions, air quality, and societal well-being.

6 | CONCLUSIONS

This study provides insights for adopters and innovators in adopting EVs. Adopters are influenced by emotional, price, and social values, and marketers should emphasize these aspects to attract their interest. As early adopters, innovators require comprehensive information about perceived quality and environmental benefits. Tailored communication through explicit media channels is effective for influencing their purchase intentions.

The study indicates that perceived quality does not directly influence purchase intention, suggesting the need for targeted communication strategies to enhance the impact of perceived quality.

Emotional, price and social values positively influence purchase intention, highlighting the importance of satisfying hedonic value in marketing. Green advertising skepticism negatively affects EV perceived value, emphasizing the need for credible, informative, and green-focused communication.

Furthermore, a positive relationship is found between purchase intention and customer engagement. Marketers should customize communication campaigns based on customers' involvement, utilizing connectivity, automation, and in-depth information to enhance engagement.

In summary, this study provides valuable implications for marketing EVs, considering adopters' and innovators' preferences, perceived quality, values, skepticism, and customer engagement.

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REFERENCES

- Ahmadi, P., & Khoshnevisan, A. (2022). Dynamic simulation and lifecycle assessment of hydrogen fuel cell electric vehicles considering various hydrogen production methods. *International Journal of Hydrogen Energy*, 47(62), 26758–26769.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52(1), 27–58.
- Ali, M., Hassan, U., Mustapha, I., & Osman, S. (2021). An empirical analysis of the moderating effect of consumer skepticism between social value orientations and green advertising effectiveness. *Nankai Business Review International*, 12(3), 458–482.
- Ansar, N. (2013). Impact of green marketing on consumer purchase intention. *Mediterranean Journal of Social Sciences*, 4(11), 650.
- Asadi, S., Nilashi, M., Samad, S., Abdullah, R., Mahmoud, M., Alkinani, M. H., & Yadegaridehkordi, E. (2021). Factors impacting consumers' intention toward adoption of electric vehicles in Malaysia. *Journal of Cleaner Production*, 282, 124474.
- Barari, M., Ross, M., Thaichon, S., & Surachartkumtonkun, J. (2021). A meta-analysis of customer engagement behaviour. *International Journal of Consumer Studies*, 45(4), 457–477.
- Bastida-Molina, P., Ribó-Pérez, D., Gómez-Navarro, T., & Hurtado-Pérez, E. (2022). What is the problem? The obstacles to the electrification of urban mobility in Mediterranean cities. Case study of Valencia, Spain. *Renewable and Sustainable Energy Reviews*, 166, 112649.
- Bickart, B. A., & Ruth, J. A. (2012). Green eco-seals and advertising persuasion. *Journal of Advertising*, 41(4), 51–67.
- Bobanac, V., Pandzic, H., & Capuder, T. (2018, June). Survey on electric vehicles and battery swapping stations: Expectations of existing and future EV owners. In *In 2018 IEEE international energy conference (ENERGYCON)* (pp. 1–6). IEEE.
- Brinkmann, D., & Bhatisevi, V. (2021). Purchase intention for electric vehicles among young adults in Thailand. *Vision: The Journal of Business Perspective*, 27, 110–118.
- Chen, S. C., & Lin, C. P. (2019). Understanding the effect of social media marketing activities: The mediation of social identification, perceived value, and satisfaction. *Technological Forecasting and Social Change*, 140, 22–32.
- Chen, S. Y. (2013). Towards green loyalty: Driving from green perceived value, green satisfaction, and green trust. *Sustainable Development*, 21(5), 294–308.
- Chen, S. Y. (2016). Using the sustainable modified TAM and TPB to analyze the effects of perceived green value on loyalty to a public bike system. *Transportation Research Part A: Policy and Practice*, 88, 58–72.
- Chen, Y. S., & Chang, C. H. (2012). Enhance green purchase intentions: The roles of green perceived value, green perceived risk, and green trust. *Management Decision*, 50(3), 502–520.
- Cheng, Z. H., Chang, C. T., & Lee, Y. K. (2020). Linking hedonic and utilitarian shopping values to consumer skepticism and green consumption: The roles of environmental involvement and locus of control. *Review of Managerial Science*, 14(1), 61–85.
- Chilton, M. A., & Bloodgood, J. M. (2010). Adaption-innovation theory and knowledge use in organizations. *Management Decision*, 48(8), 1159–1180.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334.
- Dangelico, R. M., & Pujari, D. (2010). Mainstreaming green product innovation: Why and how companies integrate environmental sustainability. *Journal of Business Ethics*, 95, 471–486.
- Dangelico, R. M., & Vocalelli, D. (2017). “Green marketing”: An analysis of definitions, strategy steps, and tools through a systematic review of the literature. *Journal of Cleaner Production*, 165, 1263–1279.
- Degirmenci, K., & Breitner, M. H. (2017). Consumer purchase intentions for electric vehicles: Is green more important than price and range? *Transportation Research Part D: Transport and Environment*, 51, 250–260.
- Do Paço, A. M. F., & Reis, R. (2012). Factors affecting skepticism toward green advertising. *Journal of Advertising*, 41(4), 147–155.
- Falkenreck, C., & Wagner, R. (2011). The impact of perceived innovativeness on maintaining a buyer–seller relationship in health care markets: A cross-cultural study. *Journal of Marketing Management*, 27(3–4), 225–242.
- Foreh, M. R., & Grier, S. (2003). When is honesty the best policy? The effect of stated company intent on consumer skepticism. *Journal of Consumer Psychology*, 13(3), 349–356.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Girard, A., Roberts, C., Simon, F., & Ordoñez, J. (2019). Solar electricity production and taxi electrical vehicle conversion in Chile. *Journal of Cleaner Production*, 210, 1261–1269.
- Globisch, J., Plötz, P., Dütschke, E., & Wietschel, M. (2019). Consumer preferences for public charging infrastructure for electric vehicles. *Transport Policy*, 81, 54–63.
- Goh, S. K., & Balaji, M. S. (2016). Linking green skepticism to green purchase behavior. *Journal of Cleaner Production*, 131, 629–638.
- Goldsmith, R. E. (1984). Personality characteristics associated with adaption-innovation. *The Journal of Psychology*, 117(2), 159–165.
- Groening, C., Sarkis, J., & Zhu, Q. (2018). Green marketing consumer-level theory review: A compendium of applied theories and further research directions. *Journal of Cleaner Production*, 172, 1848–1866.
- Gulzari, A., Wang, Y., & Prybutok, V. (2022). A green experience with eco-friendly cars: A young consumer electric vehicle rental behavioral model. *Journal of Retailing and Consumer Services*, 65, 102877.
- Habich-Sobiegalla, S., Kostka, G., & Anzinger, N. (2018). Electric vehicle purchase intentions of Chinese, Russian and Brazilian citizens: An

- international comparative study. *Journal of Cleaner Production*, 205, 188–200.
- Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management and Data Systems*, 117(3), 442–458.
- Hair, J. F. (2011). Multivariate data analysis: An overview. In M. Lovric (Ed.), *International Encyclopedia of Statistical Science*. Springer.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Thiele, K. O. (2017). Mirror, mirror on the wall: A comparative evaluation of composite-based structural equation modeling methods. *Journal of the Academy of Marketing Science*, 45(5), 616–632.
- Hamzah, M. I., & Tanwir, N. S. (2021). Do pro-environmental factors lead to purchase intention of hybrid vehicles? The moderating effects of environmental knowledge. *Journal of Cleaner Production*, 279, 123643.
- Harmeling, C. M., Moffett, J. W., Arnold, M. J., & Carlson, B. D. (2017). Toward a theory of customer engagement marketing. *Journal of the Academy of Marketing Science*, 45(3), 312–335.
- He, X., & Hu, Y. (2022). Understanding the role of emotions in consumer adoption of electric vehicles: The mediating effect of perceived value. *Journal of Environmental Planning and Management*, 65(1), 84–104.
- He, X., & Zhan, W. (2018). How to activate moral norm to adopt electric vehicles in China? An empirical study based on extended norm activation theory. *Journal of Cleaner Production*, 172, 3546–3556.
- He, Z., Zhou, Y., Wang, J., Shen, W., Li, W., & Lu, W. (2023). Influence of emotion on purchase intention of electric vehicles: A comparative study of consumers with different income levels. *Current Psychology*, 42(25), 21704–21719.
- Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., ... Calantone, R. J. (2014). Common beliefs and reality about PLS: Comments on Rönkkö and Evermann (2013). *Organizational Research Methods*, 17(2), 182–209.
- Higueras-Castillo, E., Guillén, A., Herrera, L.-J., & Liébana-Cabanillas, F. (2021). Adoption of electric vehicles: Which factors are really important? *International Journal of Sustainable Transportation*, 15(10), 799–813.
- Higueras-Castillo, E., Kalinic, Z., Marinkovic, V., & Liébana-Cabanillas, F. J. (2020). A mixed analysis of perceptions of electric and hybrid vehicles. *Energy Policy*, 136, 111076.
- Higueras-Castillo, E., Liébana-Cabanillas, F. J., Muñoz-Leiva, F., & García-Maroto, I. (2019). Evaluating consumer attitudes toward electromobility and the moderating effect of perceived consumer effectiveness. *Journal of Retailing and Consumer Services*, 51, 387–398.
- Higueras-Castillo, E., Molinillo, S., Coca-Stefaniak, J. A., & Liébana-Cabanillas, F. (2019). Perceived value and customer adoption of electric and hybrid vehicles. *Sustainability*, 11(18), 4956.
- Higueras-Castillo, E., Molinillo, S., Coca-Stefaniak, J. A., & Liébana-Cabanillas, F. (2020). Potential early adopters of hybrid and electric vehicles in Spain—Towards a customer profile. *Sustainability*, 12(11), 4345.
- Higueras-Castillo, E., Ramdhony, D., Kalinic, Z., & Liébana-Cabanillas, F. (2023). Examining the two-dimensional perceived market place influence and the role of financial incentives by SEM and ANN. *Expert Systems*, 41(1), e13480.
- Horn, R., & Wagner, R. (2020). Advancing reputation measurement: Evolving toward improved quantitative assessments. *Marketing Intelligence and Planning*, 38(2), 181–194.
- Huang, J., & Darmayanti, D. (2014). Factors affecting skepticism toward green advertising: A study of university students in Jakarta. *Journal of Business Strategy and Execution*, 7(1), 23–44.
- Hur, W. M., Kim, Y., & Park, K. (2013). Assessing the effects of perceived value and satisfaction on customer loyalty: A ‘Green’ perspective. *Corporate Social Responsibility and Environmental Management*, 20(3), 146–156.
- Hussain, S. A., Haq, M. A. U., & Soomro, Y. A. (2020). Factors influencing consumers' green purchase behavior: Green advertising as moderator. *Marketing and Management of Innovations*, 4, 144–153.
- Jaiswal, D., Deshmukh, A. K., & Thaichon, P. (2022). Who will adopt electric vehicles? Segmenting and exemplifying potential buyer heterogeneity and forthcoming research. *Journal of Retailing and Consumer Services*, 67, 102969.
- Ju, N., & Kim, S. H. (2022). Electric vehicle resistance from Korean and American millennials: Environmental concerns and perception. *Transportation Research Part D: Transport and Environment*, 109, 103387.
- Kautish, P., & Dash, G. (2017). Environmentally concerned consumer behavior: Evidence from consumers in Rajasthan. *Journal of Modelling in Management*, 12(4), 712–738.
- Kautish, P., & Khare, A. (2022). Antecedents of sustainable fashion apparel purchase behavior. *Journal of Consumer Marketing*, 39(5), 475–487. <https://doi.org/10.1108/JCM-04-2020-3733>
- Kautish, P., Khare, A., & Sharma, R. (2020). Values, sustainability consciousness, and intentions for SDG endorsement. *Marketing Intelligence & Planning*, 38(7), 921–939.
- Kautish, P., Paco, A., & Thaichon, P. (2022). Sustainable consumption and plastic packaging: Relationships among product involvement, perceived marketplace influence and choice behavior. *Journal of Retailing and Consumer Services*, 67, 103032.
- Kautish, P., Paul, J., & Sharma, R. (2019). The moderating influence of environmental consciousness and recycling intentions on green purchase behavior. *Journal of Cleaner Production*, 228, 1425–1436.
- Kautish, P., & Sharma, R. (2019). Value orientation, green attitude and green behavioral intentions: An empirical investigation among young consumers. *Young Consumers*, 20(4), 338–358.
- Kautish, P., & Sharma, R. (2020). Determinants of pro-environmental behavior and environmentally conscious consumer behavior: An empirical investigation from emerging markets. *Business Strategy and Development*, 3(1), 112–127.
- Kautish, P., Sharma, R., Mangla, S. K., Jabeen, F., & Awan, U. (2021). Understanding choice behavior towards plastic consumption: An emerging market investigation. *Resources, Conservation and Recycling*, 174, 105828.
- Khare, A., & Kautish, P. (2021a). Antecedents to green apparel purchase behavior of Indian consumers. *Journal of Global Scholars of Marketing Science*, 32(2), 222–251.
- Khare, A., & Kautish, P. (2021b). Cosmopolitanism, self-identity, online communities and green apparel perception. *Marketing Intelligence & Planning*, 39(1), 91–108.
- Kim, M. K., Oh, J., Park, J. H., & Joo, C. (2018). Perceived value and adoption intention for electric vehicles in Korea: Moderating effects of environmental traits and government supports. *Energy*, 159, 799–809.
- Kirton, M. (1976). Adaptors and innovators: A description and measure. *Journal of Applied Psychology*, 61(5), 622–629.
- Kirton, M. (1980). Adaptors and innovators in organizations. *Human Relations*, 33(4), 213–224.
- Koller, M., Floh, A., & Zauner, A. (2011). Further insights into perceived value and consumer loyalty: A “green” perspective. *Psychology & Marketing*, 28(12), 1154–1176.
- Lane, B., & Potter, S. (2007). The adoption of cleaner vehicles in the UK: Exploring the consumer attitude–action gap. *Journal of Cleaner Production*, 15(11–12), 1085–1092.
- Laros, F. J., & Steenkamp, J. B. E. (2005). Emotions in consumer behavior: A hierarchical approach. *Journal of Business Research*, 58(10), 1437–1445.
- Li, L., Wang, Z., Li, Y., & Liao, A. (2021). Impacts of consumer innovativeness on the intention to purchase sustainable products. *Sustainable Production and Consumption*, 27, 774–786.
- Liao, F., Molin, E., & van Wee, B. (2017). Consumer preferences for electric vehicles: A literature review. *Transport Reviews*, 37(3), 252–275.

- Lu, Z., Peiyi, W., Ping, C., Xianglong, L., Baoqun, Z., & Longfei, M. (2019). Customer segmentation algorithm based on data mining for electric vehicles. In *2019 IEEE 4th International Conference on Cloud Computing and Big Data Analysis (ICCCBDA)* (pp. 77–83). IEEE.
- Luo, B., Li, L., & Sun, Y. (2022). Understanding the influence of consumers' perceived value on energy-saving products purchase intention. *Frontiers in Psychology, 12*, 640376.
- Luo, B., Sun, Y., Shen, J., & Xia, L. (2020). How does green advertising skepticism on social media affect consumer intention to purchase green products? *Journal of Consumer Behaviour, 19*(4), 371–381.
- Matthies, B. D., D'Amato, D., Berghäll, S., Ekholm, T., Hoen, H. F., Holopainen, J., Korhonen, J., Lähtinen, K., Mattila, O., Toppinen, A., Valsta, L., Wang, L., & Yousefpour, R. (2016). An ecosystem service-dominant logic? – Integrating the ecosystem service approach and the service-dominant logic. *Journal of Cleaner Production, 124*, 51–64.
- McDonald, H., Biscaia, R., Yoshida, M., Conduit, J., & Doyle, J. P. (2022). Customer engagement in sport: An updated review and research agenda. *Journal of Sport Management, 36*(3), 289–304.
- McDougall, G. H., & Levesque, T. (2000). Customer satisfaction with services: Putting perceived value into the equation. *Journal of Services Marketing, 14*(5), 392–410.
- Mohamed, M., Higgins, C., Ferguson, M., & Kanaroglou, P. (2016). Identifying and characterizing potential electric vehicle adopters in Canada: A two-stage modelling approach. *Transport Policy, 52*, 100–112.
- Mohr, L. A., Eroglu, D., & Ellen, P. S. (1998). The development and testing of a measure of skepticism toward environmental claims in marketers' communications. *Journal of Consumer Affairs, 32*(1), 30–55.
- Moon, S. J. (2021). Effect of consumer environmental propensity and innovative propensity on intention to purchase electric vehicles: Applying an extended theory of planned behavior. *International Journal of Sustainable Transportation, 16*(1), 1–15.
- Nenkov, G. Y., Morrin, M., Schwartz, B., Ward, A., & Hulland, J. (2008). A short form of the maximization scale: Factor structure, reliability and validity studies. *Judgment and Decision making, 3*(5), 371–388.
- Ng, M., Law, M., & Zhang, S. (2018). Predicting purchase intention of electric vehicles in Hong Kong. *Australasian Marketing Journal; AMJ, 26*(3), 272–280.
- Noel, L., de Rubens, G. Z., Kester, J., & Sovacool, B. K. (2020). Understanding the socio-technical nexus of Nordic electric vehicle (EV) barriers: A qualitative discussion of range, price, charging and knowledge. *Energy Policy, 138*, 111292.
- Obermiller, C., & Spangenberg, E. R. (1998). Development of a scale to measure consumer skepticism toward advertising. *Journal of Consumer Psychology, 7*(2), 159–186.
- Pansari, A., & Kumar, V. (2017). Customer engagement: The construct, antecedents, and consequences. *Journal of the Academy of Marketing Science, 45*(3), 294–311.
- Pradeep, V. H., Amshala, V. T., & Kadali, B. R. (2021). Does perceived technology and knowledge of maintenance influence purchase intention of BEVs. *Transportation Research Part D: Transport and Environment, 93*, 102759.
- Ruoso, A. C., & Ribeiro, J. L. D. (2022). An assessment of barriers and solutions for the deployment of electric vehicles in the Brazilian market. *Transport Policy, 127*, 218–229.
- Sahin, A., Zehir, C., & Kitapci, H. (2012). The effects of brand experience and service quality on repurchase intention: The role of brand relationship quality. *African Journal of Business Management, 6*(45), 11190–11201.
- Sánchez, J., Callarisa, L., Rodríguez, R. M., & Moliner, M. A. (2006). Perceived value of the purchase of a tourism product. *Tourism Management, 27*(3), 394–409.
- Sang, Y. N., & Bekhet, H. A. (2015). Modelling electric vehicle usage intentions: An empirical study in Malaysia. *Journal of Cleaner Production, 92*, 75–83.
- Schloter, L. (2022). Empirical analysis of the depreciation of electric vehicles compared to gasoline vehicles. *Transport Policy, 126*, 268–279.
- Schmuck, D., Matthes, J., & Naderer, B. (2018). Misleading consumers with green advertising? An affect–reason–involvement account of green-washing effects in environmental advertising. *Journal of Advertising, 47*(2), 127–145.
- Secinaro, S., Calandra, D., Lanzalonga, F., & Ferraris, A. (2022). Electric vehicles' consumer behaviours: Mapping the field and providing a research agenda. *Journal of Business Research, 150*, 399–416.
- Sharma, N., Paço, A., & Kautish, P. (2022). The impact of eco-innovation on green buying behavior: The moderating effect of emotional loyalty and generation. *Management of Environmental Quality, 33*(4), 1026–1045.
- Sharma, R., Shahbaz, M., Kautish, P., & Vo, X. V. (2021). Does energy consumption reinforce environmental pollution? Evidence from emerging Asian economies. *Journal of Environmental Management, 297*, 113272.
- Singh, V., Singh, T., Higuera-Castillo, E., & Liébana-Cabanillas, F. (2023). Sustainable road transportation adoption research: A meta and weight analysis, and moderation analysis. *Journal of Cleaner Production, 392*, 136276.
- Singh, V., Singh, V., & Vaibhav, S. (2020). A review and simple meta-analysis of factors influencing adoption of electric vehicles. *Transportation Research Part D: Transport and Environment, 86*, 102436.
- Sun, K. K., He, S. Y., & Thøgersen, J. (2022). The purchase intention of electric vehicles in Hong Kong, a high-density Asian context, and main differences from a Nordic context. *Transport Policy, 128*, 98–112.
- Sweeney, J. C., & Soutar, G. N. (2001). Consumer perceived value: The development of a multiple item scale. *Journal of Retailing, 77*(2), 203–220.
- Toulabi, Z., Arvaneh, M., & Shojaeian, P. (2021). The role of green perceived value on the attitude towards green products and the intention to buy the consumer. *Environmental Education and Sustainable Development, 9*(3), 81–98.
- Ullah, A., Zhang, Q., & Ahmed, M. (2021). The impact of smart connectivity features on customer engagement in electric vehicles. *Sustainable Production and Consumption, 26*, 203–212.
- Vafaei-Zadeh, A., Wong, T. K., Hanifah, H., Teoh, A. P., & Nawaser, K. (2022). Modelling electric vehicle purchase intention among generation Y consumers in Malaysia. *Research in Transportation Business & Management, 43*, 100784.
- Vargo, S. L., Lusch, R. F., & Morgan, F. W. (2014). Historical perspectives on service-dominant logic. In *The service-dominant logic of marketing* (pp. 47–60). Routledge.
- Veerabhadrapa, N. B. B., Fernandes, S., & Panda, R. (2022). A review of green purchase with reference to individual consumers and organizational consumers: A TCCM approach. *Cleaner and Responsible Consumption, 8*(2), 100097.
- Wagner, R., & Grimm, M. S. (2023). Empirical validation of the 10-times rule for SEM. In *State of the art in partial least squares structural equation modeling (PLS-SEM) methodological extensions and applications in the social sciences and beyond* (pp. 3–7). Springer.
- Walsh, G., Shiu, E., & Hassan, L. M. (2014). Replicating, validating, and reducing the length of the consumer perceived value scale. *Journal of Business Research, 67*(3), 260–267.
- Wang, Y., Gu, J., Wang, S., & Wang, J. (2019). Understanding consumers' willingness to use ride-sharing services: The roles of perceived value and perceived risk. *Transportation Research Part C: Emerging Technologies, 105*, 504–519.
- Wei, C. F., Chiang, C. T., Kou, T. C., & Lee, B. C. (2017). Toward sustainable livelihoods: Investigating the drivers of purchase behavior for green products. *Business Strategy and the Environment, 26*(5), 626–639.
- Weiss, M., Zerfass, A., & Helmers, E. (2019). Fully electric and plug-in hybrid cars: an analysis of learning rates, user costs, and costs for mitigating CO₂ and air pollutant emissions. *Journal of Cleaner Production, 212*, 1478–1489.
- White, L. V., & Sintov, N. D. (2017). You are what you drive: Environmentalist and social innovator symbolism drives electric vehicle adoption intentions. *Transportation Research Part A: Policy and Practice, 99*, 94–113.



- Woo, E., & Kim, Y. G. (2019). 'Consumer attitudes and buying behavior for green food products: From the aspect of green perceived value (GPV)'. *British Food Journal*, 121(2), 320–332.
- Wu, J., Liao, H., Wang, J. W., & Chen, T. (2019). The role of environmental concern in the public acceptance of autonomous electric vehicles: A survey from China. *Transportation Research Part F: Traffic Psychology and Behaviour*, 60, 37–46.
- Xu, G., Wang, S., Li, J., & Zhao, D. (2020). Moving towards sustainable purchase behavior: Examining the determinants of consumers' intentions to adopt electric vehicles. *Environmental Science and Pollution Research International*, 27(18), 22535–22546.
- Yu, J. (2020). Consumer responses toward green advertising: The effects of gender, advertising skepticism, and green motive attribution. *Journal of Marketing Communications*, 26(4), 414–433.
- Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, 52(3), 2–22.
- Zhang, H., Sun, J., Liu, F., & Knight, J. G. (2014). Be rational or be emotional: Advertising appeals, service types and consumer responses. *European Journal of Marketing*, 48(11/12), 2105–2126.
- Zhang, J., Jia, R., Yang, H., & Dong, K. (2022). Does electric vehicle promotion in the public sector contribute to urban transport carbon emissions reduction? *Transport Policy*, 125, 151–163.
- Zhang, Y., Xiao, C., & Zhou, G. (2020). Willingness to pay a price premium for energy-saving appliances: Role of perceived value and energy efficiency labeling. *Journal of Cleaner Production*, 242, 118555.
- Zulauf, K., & Wagner, R. (2021). Urban and rural sustainability: Divergent concepts and their consequences for marketing. *Frontiers in Sustainability*, 2, 670866.

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