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Purchase intention related to legitimacy, uncertainty and innovation

Delso Vicente, Alberto Tomás*

Aguado-Tevar, Oscar **

Diaz-Marcos, Luis ***

Almonacid-Durán, Margarita ****

Abstract

There is currently a growing interest in understanding the purchase intention and acceptance of electric vehicles. In this regard, this study aims to analyze the factors that influence the context of sustainable mobility, focusing on purchase intention, perception of innovation, perception of legitimacy and uncertainty. A systematic literature review methodology was employed, covering articles published since 2005 in English and Spanish. The main results revealed a positive correlation between the availability of government incentives and purchase intention of electric vehicles, as well as the importance of effective communication of innovation to increase adoption. Furthermore, the relevance of uncertainty management and legitimacy as key factors was highlighted. In conclusion, these results have significant implications for the formulation of communication strategies, government incentive policies and the improvement of charging infrastructure to promote the adoption of electric vehicles and sustainable mobility.

Keywords: Purchase intention, perception of innovation; legitimacy; uncertainty; electric vehicles.

* PhD. student at the Rey Juan Carlos University, Madrid, Spain. Master in Senior Management. Lecturer at the Faculty of Economics and Business Administration at the Rey Juan Carlos University, Madrid, Spain. E-mail: alberto.delso@urjc.es ORCID: <https://orcid.org/0009-0000-6410-1132>

** PhD. Strategic Projects. Professor of Business and Managing Director of the Nebrija University, Madrid, Spain. E-mail: oaguado@nebrija.es ORCID: <https://orcid.org/0009-0001-9245-3167>

*** PhD. in Business Administration. Professor in the Business Area and CEO Nebrija University, Madrid, Spain. E-mail: ldiazmarcos@nebrija.es ORCID: <https://orcid.org/0009-0007-6580-0382>

**** PhD in Business Economics and Finance. Professor at the Rey Juan Carlos University, Madrid, Spain. E-mail: margarita.almonacid@urjc.es ORCID: <https://orcid.org/0000-0002-4299-6921>

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Intención de compra relacionada con la legitimidad, la incertidumbre y la innovación

Resumen

En la actualidad existe un creciente interés en comprender la intención de compra y la aceptación de los vehículos eléctricos. En este sentido, este estudio tiene como objetivo analizar los factores que influyen en el contexto de la movilidad sostenible, centrándose en la intención de compra, la percepción de innovación, la percepción de legitimidad y la incertidumbre. Se empleó una metodología de revisión sistemática de la literatura, que abarcó artículos publicados desde 2005 en inglés y español. Los principales resultados revelaron una correlación positiva entre la disponibilidad de incentivos gubernamentales y la intención de compra de vehículos eléctricos, así como la importancia de una comunicación eficaz de la innovación para aumentar la adopción. Además, se destacó la relevancia de la gestión de la incertidumbre y la legitimidad como factores clave. En conclusión, estos resultados tienen implicaciones significativas para la formulación de estrategias de comunicación, políticas de incentivos gubernamentales y la mejora de la infraestructura de carga para promover la adopción de vehículos eléctricos y la movilidad sostenible.

Palabras clave: Intención de compra, percepción de innovación; legitimidad; incertidumbre; vehículos eléctricos.

Introduction

Currently, there is a growing interest in understanding the purchase intention and acceptance of Electric Vehicles (EV), especially in the context of sustainable mobility and the transition towards cleaner forms of transport (Holden et al., 2020; Almansour, 2022; Corradi, Sica & Morone, 2023). This approach is justified by the crucial mass adoption of EVs to reduce greenhouse gas emissions and address climate change (Luna et al., 2020; Llopis-Albert, Palacios-Marqués & Simón-Moya, 2021; Panoutsou et al., 2021). This research seeks to identify the key factors influencing EV purchase intention, perception of innovation and uncertainty management by consumers and businesses. Its relevance lies in informing market strategies, public policies and business decisions that drive EV adoption, contributing to sustainable mobility and climate change mitigation.

The EV industry has undergone significant transformations in recent years, driven by technological advances, changes in consumer preferences, and an increased focus on environmental sustainability (Bonsu,

2020; Muratori et al., 2021). It is relevant to study the legitimacy and acceptance of EVs in the current environment due to their impact on sustainable mobility and the automotive market (Corradi et al., 2023). This study will contribute to understanding how the aforementioned variables affect consumer decisions and business strategies, being essential to address the challenges and opportunities of the transition towards cleaner and more efficient mobility.

This study will address the purchase intention of EVs, the perception of innovation in this sector, and the management of uncertainty by consumers and companies. Purchase intention refers to the willingness of an individual or company to purchase an EV. Innovation perception focuses on how consumers and businesses perceive new EV technologies and features compared to internal combustion vehicles (Tchetchik et al., 2020; Hoefl, 2021). Uncertainty management looks at how EV-related concerns such as range, maintenance costs, and charging infrastructure availability are managed (LaMonaca & Ryan, 2022; Patil, Kazemzadeh & Bansal, 2023).

It is important to study these variables

because of their impact on the automotive industry and consumer decisions. Previous authors such as Corradi et al. (2023) have highlighted the need to investigate how these variables influence EV acceptance and adoption, highlighting their relevance to understanding purchasing behaviors and business strategies in a transitional mobility context.

Despite the growing interest in EV legitimacy and acceptance, there is a gap in the literature regarding the integration of purchase intention, innovation perception, and uncertainty variables into a comprehensive analysis. Authors such as Kumar & Alok (2020); and Mukherjee & Ryan (2020), have highlighted the importance of studies that address these variables together to better understand EV adoption processes and their implications for the automotive industry. The research questions for this Systematic Literature Review (SLR) include:

RQ1: What are the determinants of EV purchase intention?

RQ2: How does it affect the perception of innovativeness by consumers and firms?

RQ3: How is uncertainty managed in the perspective of purchase intention?

RQ4: How does it affect the perception of legitimacy by consumers and firms?

RQ5: What are the implications of these factors for market strategies and public policies related to EVs?

The main objective of this research is to analyze the factors that influence the legitimacy and acceptance of EVs, specifically purchase intention, perception of innovativeness, and uncertainty. Sub-objectives include identifying the key determinants of purchase intention, analyzing the relationship between perception of innovativeness and EV acceptance, and exploring how uncertainties associated with EVs are managed. These points are crucial to understanding consumer attitudes and informing effective strategies to promote this technology.

This article brings originality by systematically and multidisciplinary integrating the variables of purchase intention,

perception of innovation and uncertainty, providing a complete and updated view of the dynamics that affect sustainable mobility.

The methodology of this research is based on a Systematic Literature Review (SLR), using specific tools and criteria for the selection and analysis of relevant studies on purchase intention, perception of innovation and uncertainty in EVs. The methodology proposed by Ling et al. (2021); and Lutfi et al. (2022) will be used, recognized for their experience in the analysis of factors that influence the adoption of sustainable technologies.

1. Electric Vehicles (EV): Purchase intention, perception of innovation and management of uncertainty

Purchase intention for electric vehicles (EVs) is a central concept in consumer psychology and purchasing behavior. According to Rogers' innovation adoption model, purchase intention reflects the willingness of an individual or firm to adopt an innovation, in this case, EVs (Sahin, 2006). Factors such as perceived relative advantages, value, lifestyle compatibility, perceived complexity, and observability influence the formation of this intention (Rezvani, Jansson & Bodin, 2015; Jaramillo-Bernal, Robao-Pinzón & Rojas-Berrio, 2018).

Consumer behavior theory is essential to understanding EV adoption. This theory focuses on how individual preferences, attitudes, and perceptions influence purchase decisions, innovation perception, and uncertainty management. Research such as Zhang, Bai & Shang (2018); and Gong, Ardeshiri & Rashidi (2020), underscore the importance of factors such as government incentives, environmental concerns, and perceived advantages in EV adoption. By analysing consumers' motivations and decision-making processes, this theory offers valuable insights for designing effective marketing strategies and policies that promote sustainable mobility and EV adoption.

Several studies have investigated the variables that affect EV acceptance and purchase intentions. Wu, Liao & Wang (2020), assessed factors influencing the acceptance of autonomous EVs in China, revealing a positive relationship between environmental concern and perceived usefulness. Featherman et al. (2021); and Rotaris, Giansoldati & Scorrano (2021), analysed the effect of consumer knowledge about EVs, perceived risks, usefulness and financial incentives, finding that knowledge increases usefulness and purchase intention but decreases perceived risks.

Jain, Bhaskar & Jain (2022), identified economic benefits and charging risk as factors affecting EV adoption, while Singh, Singh & Vaibhav (2020) highlighted efficiency, driving pleasure and economic benefits as motivators in the UK. These studies demonstrate the multifaceted nature of the determinants of EV adoption, ranging from economic incentives to environmental concerns and technological factors.

Furthermore, other studies have identified key determinants for early EV adopters in the US, showing that they tend to be highly educated and environmentally conscious. Social identity variables such as social norms and collective efficacy also influence EV uptake, with cost factors being particularly significant. Cost considerations have consistently emerged as a key variable in EV adoption, highlighting the importance of pricing strategies and subsidy policies in stimulating EV market growth.

The Technology Acceptance Model (TAM) states that a user's intention to adopt a technology is influenced by perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989). In the context of electric vehicles (EVs), the TAM suggests that consumers are more likely to adopt EVs if they view them as beneficial in terms of cost reduction, improved convenience, and alignment with their lifestyle (Xu et al., 2020; Jain et al., 2022). This model highlights that positive perceptions about the usefulness and ease of use of EVs can increase adoption rates

(Zhang et al., 2022).

The literature review highlights extensive research on the determinants of EV purchase, with an emphasis on attitudes, perceptions, and external factors such as price and incentives. However, the limited focus on user attitudes and perceptions in existing studies could result in suboptimal strategies for expanding the EV market to a broader consumer base.

Given the changing nature of the EV market and evolving consumer awareness, this study aims to contribute by analyzing technological concerns and personal attitudes, focusing on the emerging EV market in South Korea as a case study. Innovation perception refers to how consumers and businesses evaluate the innovative features of electric vehicles (EVs) compared to internal combustion vehicles. Rogers' innovation diffusion theory is relevant here, as it describes how this perception affects the adoption of new technologies. Factors such as relative advantage, compatibility with needs and values, perceived complexity, trialability, and effective communication of the innovation influence the perception and acceptance of EVs (Yuen et al., 2020; Yuen et al., 2021).

The relative advantage of EVs, compared to conventional vehicles, is crucial. This includes fuel savings, reduced environmental impact, and lower maintenance costs. The compatibility of EVs with needs, values, and lifestyles is also important. Consumers are more likely to adopt EVs if they align with their values of sustainability, technological advancement, and convenience.

The perceived complexity of EV technology and infrastructure is another relevant factor. Consumers may avoid EVs if they find them complicated to use or if the charging infrastructure is not accessible. The ability to try out EVs before purchase also influences the perception of innovation. Positive experiences in test drives or short-term rentals can significantly increase confidence in and acceptance of EVs.

Effective communication of innovation

is essential to shaping perception. A clear message about the benefits, features, and value of EVs can mitigate uncertainties and misconceptions, leading to more favorable perceptions and higher adoption rates. Recent studies by Kumar & Alok (2020), underline the multifaceted nature of innovation perception in EV adoption. Their research emphasizes the importance of addressing these factors holistically to foster a positive perception of innovation and accelerate widespread market acceptance of EVs.

Uncertainty management refers to how individuals and organizations handle doubts and concerns associated with electric vehicle (EV) adoption. According to Simon's (1990) theory of bounded rationality, EV adoption involves decisions under uncertainty, such as battery range, charging point availability, maintenance costs, and technological depreciation. Strategies such as information seeking, socialization, and risk minimization are relevant to manage this uncertainty (Dequech, 2001; Broadbent, Metternicht & Wiedmann, 2021).

In the context of EV adoption, uncertainty management is crucial. Simon's (1972) theory of bounded rationality helps to understand decision making under uncertainty, especially relevant to EVs. A main uncertainty is battery range and charging infrastructure (Noel et al., 2020; Metais et al., 2022). Consumers often worry about range limitations and charging point accessibility, especially on long trips. Strategies to manage this uncertainty include providing accurate information on range capabilities (Sun, Neumann & Harrison, 2020) and promoting advances in fast-charging technologies to reduce charging times (Wassiliadis et al., 2021).

Uncertainty theory, in the context of electric vehicle (EV) adoption, addresses consumers' perceived risks when considering this technology. Perceived uncertainty about EV durability, maintenance costs, and reliability significantly influences consumers' willingness to adopt them (Nowzohour & Stracca, 2020;

Featherman et al., 2021; Chidambaram et al., 2023). Effective uncertainty management can increase confidence in the legitimacy of EVs, but persistent challenges such as maintenance costs and durability need to be addressed to encourage broader adoption (Hauschild, Kara & Röpke, 2020; Zhang et al., 2022).

Maintenance costs pose uncertainties for potential EV buyers (Júnior et al., 2023). Although EVs require less maintenance than traditional vehicles due to having fewer moving parts, consumers may be hesitant about costs and availability of specialized services. Transparent information about maintenance schedules and warranty coverage can alleviate these concerns (Orsini et al., 2020).

Technological depreciation of EVs also affects adoption decisions (Kumar & Alok, 2020). Rapid technological advances raise concerns about the future value and potential obsolescence of EVs. Strategies such as buyback programs and clear information about resale values based on market trends can mitigate these uncertainties (Esmacilian et al., 2021). Information seeking and socialization are critical to managing uncertainty in electric vehicle (EV) adoption (Singh et al., 2020). Consumers rely on trusted sources, such as EV manufacturers and user communities, to gain information about EV features and benefits (Featherman et al., 2021). Socialization, through peer interactions and test drives, provides direct experiences and trust in EV technology (Singh et al., 2020).

Risk minimisation strategies are also essential to manage the uncertainties associated with EV adoption (Featherman et al., 2021). Offering extended warranties, EV-specific financing options and successful case studies can mitigate perceived risks (Hamzah et al., 2022), incentivising the adoption of sustainable transport solutions. Recent studies (Rindova & Courtney, 2020; Van Heuveln et al., 2021; Mishra, Singh & Rana, 2022), have highlighted the importance of proactive strategies and transparent communication to address uncertainties and foster an enabling environment for EV adoption.

2. Relationship between variables: Purchase intention, perception of innovation and uncertainty management

The theoretical framework suggests that electric vehicle (EV) purchase intention is influenced by perceived innovation and uncertainty management. A positive perception of innovation can increase

purchase intention, while effective uncertainty management can mitigate perceived barriers and increase willingness to adopt EVs (Xu et al., 2020; Featherman et al., 2021). The interaction between these variables is key to understanding how consumers and companies evaluate and decide on EV adoption in a mobility environment towards sustainability (Kumar & Alok, 2020).

Table 1
Relationship between Variables

| THEORY | KEY POINTS | ACADEMIC REFERENCES |
|------------------------------------|---|--|
| RATIONAL DECISION THEORY | - Focuses on individual decision making based on utility maximisation. - Considers economic and rational aspects that influence the adoption of EVs. | (Simon, 1972; Nowzohour & Stracca, 2020) |
| TECHNOLOGY ACCEPTANCE THEORY (TAM) | - It focuses on how perceived usefulness and ease of use influence technology adoption. - It analyses user attitudes towards innovation and their influence on the acceptance of EVs. | (Davis, 1989) |
| THEORY OF INNOVATION (DOI) | - Examines the process of adoption of technological innovations through stages of awareness, persuasion, and adoption. - It considers the influence of social factors on the acceptance of EVs. | (Rogers, 1962) |
| UNCERTAINTY THEORY | - Addresses the management of uncertainty and perceived risk in the adoption of new technologies such as EVs. - It considers the influence of trust and perceived risk on the decision. | (Simon, 1990; Nowzohour & Stracca, 2020) |
| CONSUMER BEHAVIOUR THEORY | - Analyses the psychological, social and economic factors that influence purchasing decisions. - It considers the attitude, perceived benefits, and motivations behind EV adoption. | (Engel, Kollat & Blackwell, 1968) |

Source: Own elaboration, 2024.

This theoretical framework provides a solid conceptual basis for analyzing the factors that influence EV legitimacy and acceptance, especially in relation to purchase intention, perception of innovativeness, and uncertainty. By integrating these theoretical perspectives, a more complete understanding of the dynamics affecting EV adoption can be obtained and effective strategies to promote sustainable mobility can be guided.

3. Methodology

A Systematic Literature Review (SLR) was conducted. Academic and scientific

databases were used to identify relevant studies using specific inclusion criteria, such as peer-reviewed articles and empirical studies that address the topics of interest. The decision to conduct a systematic literature review (SLR) on the legitimacy, innovation, uncertainty and purchase intention of electric vehicles (EVs) is based on their growing importance as a crucial area that intersects sustainable mobility, technology and consumer behaviour.

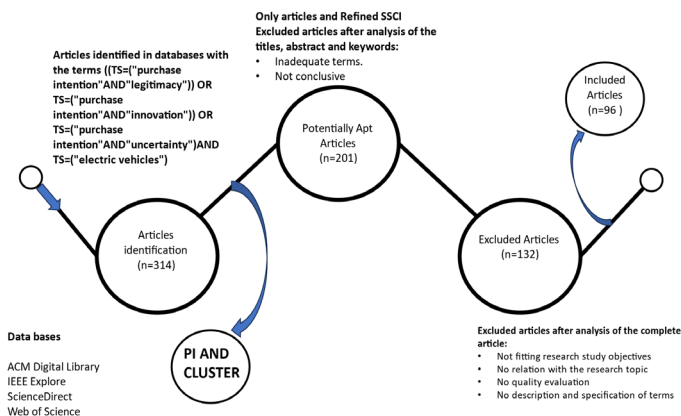
This study gains relevance due to its transformative implications for the automotive industry and its potential to significantly contribute to climate change mitigation. The main purpose of the SLR is to examine and synthesize current research streams related to

EV legitimacy, uncertainty, innovation and acceptance. This approach will allow for a deep understanding of how EV technology is reshaping both the automotive sector and broader societal dynamics.

For the Systematic Literature Review, key terms such as “electric vehicles”, “purchase intention”, “perception of innovation”, “uncertainty”, “legitimacy”, “innovation”, and relevant variants were defined. Databases such as Scopus, Web of Science, and Google Scholar will be used for an initial search, prioritizing articles published in the last five years in Spanish and English. Inclusion and exclusion criteria will focus on studies that examine purchase intention, perception of innovation, uncertainty, legitimacy, and acceptance of EVs in the context of sustainable mobility. Data collection will be limited to the

last year to ensure the relevance and timeliness of the information collected.

For the article filtering process according to the PRISMA criteria, the following steps were followed: Initially, all relevant articles will be collected according to the established search terms. Then, a review of titles and abstracts will be carried out to assess their relevance to the research objectives. Selected articles will be subjected to a thorough full-text review to assess their methodological quality and contribution to the topic of study. Strict exclusion criteria will be applied, discarding studies outside the period of interest, in non-relevant languages or addressing topics not directly related to purchase intention, perception of innovation and uncertainty in EVs (see Figure I).



Source: Own elaboration, 2024.

Figure I: Results of the Filtering Process

Visualization tools were used to analyze the structure and relationships between authors and key terms in the literature. In addition, qualitative data analysis and identification of thematic patterns in the selected articles were conducted. The risk of bias in the included studies was assessed to ensure the quality and

reliability of the results. This methodology ensured a rigorous and systematic approach to exploring the relevant literature on purchase intention, perception of innovation, and uncertainty in the legitimacy and acceptance of electric vehicles, thus providing a solid foundation for research and advancing

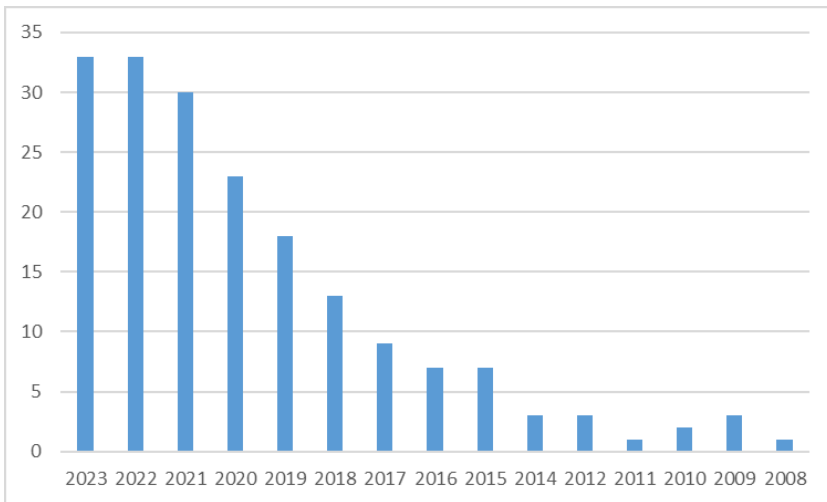
knowledge in this emerging and crucial field.

4. Purchase intention: Legitimacy, uncertainty and innovation

Following the systematic literature review (SLR) process on the legitimacy and acceptance of electric vehicles (EVs) in relation to purchase intention, perception of innovation and uncertainty, a number of significant findings have been obtained that contribute to a better understanding of this

emerging issue in sustainable mobility.

Productivity in terms of articles published on the topic shows a significant growth pattern over the years (see Chart I). Between 2010 and 2014, production was relatively low and constant, gradually increasing from 2015 onwards. However, the most notable period of growth is observed between 2017 and 2021, reaching a peak in 2023 with a significant number of articles published. Despite a slight decline after 2023, productivity remains at relatively high levels until 2024, reflecting continued interest and sustained activity in research on the topic.



Source: Own elaboration, 2024.

Chart I: Research articles published from 2008 to 2023

The analysis shows a significant increase in research on EV legitimacy, innovation and uncertainty, with a particular focus on purchase intention and perception of innovation as driving factors. The quantitative review revealed key trends in the literature, highlighting the importance of addressing uncertainty and legitimacy to promote mass adoption of EVs. Methodological comparisons

underlined a diversity of approaches, enriching the understanding of the topic and promoting interdisciplinary research.

The use of analytical software facilitated a clear visualization of concepts and relationships between authors, identifying trends and core areas of study in EVs. These analyses improved the validity and reliability of the findings of the systematic literature

review, providing crucial insights for future research, market strategies and policies in sustainable mobility and EV adoption.

The results indicate that the purchase intention of electric vehicles (EVs) is affected by factors such as economic and environmental advantages. According to Wang, Li & Zhao (2017); Wang, Wang & Lin (2018); Zhang et al. (2018); and Gong et al. (2020), there is a positive correlation between government incentives and consumers' willingness to purchase EVs. However, Biresselioglu, Kaplan & Yilmaz (2018) point out that the lack of charging infrastructure remains a significant barrier. In this regard, it is recommended to explore improvements in the accessibility of charging points as an area of future research.

Regarding the perception of innovation in EVs, our findings are consistent with Barth, Jugert & Fritsche (2016); and Zhao et al. (2022), who underline the importance of effectively communicating the innovative features of EVs to increase their acceptance. On the other hand, research such as Shirani et al. (2020) suggests that the perception of complexity still generates doubts among some consumers. It is crucial to continue exploring communication and education strategies to address these perceptions and encourage EV adoption.

The analysis of uncertainty and legitimacy in EV adoption reveals a complex picture. According to Nowzohour & Stracca (2020), adequate management of uncertainty can strengthen consumer confidence, while Hauschild et al. (2020), argue that challenges persist in terms of durability and maintenance costs. These considerations underline the need to address these issues in future research and public policies related to sustainable mobility.

Conclusions

This study has highlighted the critical importance of innovation perception, legitimacy and uncertainty management in the purchase intention of electric vehicles (EVs). The systematic literature review revealed that effective communication of the

innovative advantages and features of EVs is essential to increase their acceptance among consumers. Furthermore, the availability of government incentives and adequate charging infrastructure emerge as key factors that can mitigate perceived barriers. These findings underline the need for integrated strategies that address both practical concerns and cultural and technological perceptions to facilitate wider adoption of EVs and move towards sustainable mobility.

A limitation of this review is that mainly specific databases have been used, which could limit the diversity of sources consulted. Furthermore, it is acknowledged that there are other Boolean operators that could have broadened the search, although those selected were considered to be the most suitable for the stated objectives.

It is suggested to delve deeper into the antecedents and consequences of purchase intention in different industries and consumer segments. Furthermore, comparative studies examining how legitimacy, innovativeness, and uncertainty impact purchase intention in specific contexts or across competing brands could offer valuable insights. Investigating how these variables interact with each other and affect consumer decision-making processes is crucial.

Cross-cultural studies could also shed light on how cultural factors shape the relationship between these variables and purchase intention. The propositions guide future research, exploring the complex relationships between legitimacy, innovativeness, uncertainty, and purchase intention, considering contextual factors and consumer perceptions, providing a framework for testing complex hypotheses and improving understanding of consumer behavior in dynamic market environments.

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