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Article

Consumer perception towards electric cars, an inductive study with specific reference to the Jordanian market

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Abstract: Electric cars are manufactured to address environmental problems, reduce dependence on fossil fuels, and nullify climate change. Their production aligns with sustainability objectives by encouraging cleaner transportation options, promoting energy efficiency, and contributing to a transition towards eco-friendly mobility in an answer to global environmental challenges. In Jordan, similar to any international market, car dealers and traders import electric cars. However, the prevailing perceptions and attitudes of Jordanian consumers need strong consideration. Nevertheless, there is still uncertainty and a need for more trust in electric vehicles among Jordanian consumers. Therefore, this research aims to ascertain whether electric cars have a lasting positive perception among Jordanians through an inductive research approach. Employing thematic qualitative analysis, this research is supported by the diffusion of innovation theory. Notably, the research findings provided robust insights, further leading to reinforcing the idea about the pervasive attitudes of Jordanian consumers. Thus, this research concludes that there still needs to be more confidence regarding electric vehicles among most consumers in Jordan. Furthermore, this research offers practical and theoretical contributions to Jordan's policymakers and electric vehicle companies.

Keywords: consumer perception; electric vehicles; emerging brands; brands

1. Introduction

Automobile transport is traditionally considered a source of environmental pollution, specifically in big metropolitan cities (Gelmanova et al., 2018). As mentioned earlier, the world is witnessing an ecological change, which is leading and will lead to catastrophic consequences. Resources such as energy sources are getting scarcer, so all governments and international companies like the vehicle industry are coping with those challenges (Meyn, 2015). On the other hand, consumers are becoming more aware of environmentally friendly products. Besides rising and unstable prices, oil consumers are pushing for alternatives such as electric vehicles. Therefore, in the fight against global warming and the forthcoming oil shortages, zero-emission vehicles have become the focus of transport policies to decrease greenhouse gas emissions from transportation (Wilberforce et al., 2017). Furthermore, modern-day consumers now depend on people and goods' mobility (Altun et al., 2019). As noted by Milev et al. (2021), electric cars hold critical significance in the current landscape due to their intelligent system, potentially addressing existing environmental problems and contributing to the global shift toward sustainable mobility. At the fore, the importance of electric cars is in their role as a pivotal solution to mitigating the negative environmental consequences associated with conventional

internal combustion engine vehicles. Traditional vehicles are the main contributors to air pollution and greenhouse gas emissions, aggravating climate change and posing severe health hazards. Electric cars, powered by clean energy sources, i.e., electricity, substantially decrease or eradicate these harmful emissions. By encouraging a shift from fossil fuel reliance, electric cars play a critical role in reducing air pollution, improving air quality, and mitigating climate shifts, contributing to a more sustainable and ecologically liable transportation sector (Horn et al., 2019).

However, transport systems worldwide cause environmental damage and destruction by fuel emissions (Helmers et al., 2017; Helmers and Weiss, 2017). With trade and industry evolution and prompt economic growth in Jordan, tremendously inflated fuel costs, and the shortage of adequate communal transportation in Jordan (Zawaydeh, 2017), purchasers must possess private vehicles for transport. According to Ottesen et al. (2022), the transportation sector is one of Jordan's significant contributors to CO_2 emissions, with a 29% contribution of all emissions. According to a report produced by the World Bank (2022), it states that "*Greenhouse gas emissions from Jordan transportation sector are expected to have escalated to over 11,000 Gg of CO_2 a year over the same time frame, costing the economy a staggering 500 million to 1000 million USD annually*". Additionally, car ownership in Jordan has steadily increased by 5.3% annually between 2015 and 2020 (Attari, 2020).

Most demand studies for EVs, like this research, have used stated preference analysis in some form. The earliest studies started in response to the 1970s oil crisis. However, historically, the low market share for EVs is caused by "anxiety," a primary consumer concern. Substantial preference heterogeneity was also discovered (Venjakob et al., 2020). Energy prices can differ widely depending on numerous elements involving geopolitical events, supply and demand underlying forces, government policies and strategies, technological developments, and environmental concerns (Racz et al., 2015). The research aims to ascertain whether electric vehicles have a lasting positive perception among Jordanians. However, it is worth mentioning that an advantage for adopting an electric vehicle by the consumer is attractive in terms of saving money; according to Graham and Brunggard (2021), EVs for personal use have a lower operating cost than fuel-based vehicles. Also, EVs need less maintenance and fixing costs. Furthermore, Parker et al. (2021) stated that owning an EV may save money compared with fuel-based vehicles in the American market. As EV ownership in Jordan is a part of the free market world, the Jordanian market is also witnessing growth in EV ownership, representing 18 percent of the car ownership in Jordan (JT, 2022). However, compared to other OECD countries, this percentage is still low as some countries' EV ownership represents higher percentages, like Germany (38%), France (32.6%), and Spain (24%).

Study objectives and significance

This research aims to explore the perceptions of Jordanians concerning electric vehicles (EVs) and their role in mitigating individual carbon impressions. By performing a thorough investigation, this research concentrates on understanding and comprehending the factors impacting how Jordanians perceive EVs as environmentally friendly choices. This involves exploring existing perspectives,

opinions, and awareness levels among Jordanian consumers regarding the contribution of electric vehicles to decreasing carbon emissions. The insights acquired from this goal will contribute to a more in-depth familiarity with the factors shaping consumer behavior towards EVs in the context of environmental sustainability. Additionally, this study aims to explore the multifaceted perceptions of electric vehicles as a tool for financial savings among Jordanians. In this regard, the research includes a qualitative analysis of how individuals perceive the cost-effectiveness of EVs compared to traditional fuel-based vehicles, assessing factors such as energy prices and the economic impact on daily consumption behavior. Furthermore, this research explores the effect of fuel-inflated energy prices on consumers' buying decision process concerning their choice of vehicle (Sandri et al., 2020). **Table 1** summarizes a comprehensive operationalization of examination constructs. Exploring these complicated associations between financial and economic concerns, consumer perceptions, and the influence of fuel costs on consumption behavior will provide a sensible understanding of the monetary extent of EV adoption in Jordan. The third intent of this research is to offer a comprehensive conceptual framework that synthesizes the connection between fuel-inflated prices, general inflation, and the emergence of EV brands. Therefore, this will involve mapping the associations and dependence between these variables to create a thematic understanding. By developing this conceptual framework, the research strives to offer a structured view of the factors affecting the adoption of electric vehicles within the broader economic context in Jordan. Further, the framework provided by this research will contribute to theoretical knowledge and nourish valuable insights for policymakers, enterprise stakeholders, and organizations seeking to navigate the changing landscape of electric vehicle adoption (Bucher et al., 2019). Thus, the importance of this study lies in its potential to inform and suggest stakeholders in the transportation sector, policymakers, and companies working in the automotive industry. Comprehending how Jordanians consider electric vehicles in terms of the environmental consequences of their carbon footprint, financial concerns, and economic aspects can steer the development of targeted awareness campaigns, policy interventions, and market strategies. The study addresses essential voids in knowledge, providing an in-depth viewpoint on the factors influencing consumer perceptions and behaviors, ultimately contributing to the improvement of endurable and economically feasible transportation resolutions in Jordan.

Table 1. Operationalization of key constructs in the current study.

S/R.	Construct	Definition	Source
1	Consumer perceptions	Consumer perception is emotional reactions and perspectives towards a product or brand, which involves estimating consumers' emotional responses, preferences, and satisfaction with a product and evaluating aesthetics, packaging, and brand image. Perception is the cognitive process by which consumers assess and make sense of information related to a product or service. This includes how individuals process visual impulses, determine product features, and develop product quality beliefs.	(Bennett and Vijaygopal, 2018; Brase, 2019)

Table 1. (*Continued*).

S/R.	Construct	Definition	Source
2	Electric cars	Electric cars are driven by electric motors powered by rechargeable batteries, especially vehicles with an electric drivetrain capable of being charged through external energy sources such as electric charging stations or home charging units. Electric cars are operationalized through their market presence, which is viewed as the percentage of total car sales attributed to electric automobiles within a precise time frame (e.g., quarterly or annually). For example, electric cars with a battery-only or plug-in hybrid system account for at least 5% of total car sales in a quarter.	(Jensen and Cherchi, 2013; Ottesen et al., 2022)
3	Sustainability objectives	Sustainability objectives are defined from a social standpoint, focusing on community well-being, equitable labor practices, and social equity. These objectives could involve encouraging a healthy ecological environment and local employment, assuring safe working conditions, and contributing to community development initiatives. Sustainability objectives are operationally defined quantitatively, determining measurable targets and key performance indicators (KPIs). For instance, a sustainability goal may be to attain a 20% decrease in water use or a 30% increase in the use of recycled materials in product packaging over a distinct period.	(Helmers et al., 2017; Racz et al., 2015)
4	Carbon footprints	Carbon footprints are the total amount of greenhouse gas emissions, calculated in carbon dioxide equivalents (CO_2), directly and indirectly linked to a person's activities within a precise time frame, such as a year. This includes emissions from transport, energy consumption, and lifestyle preferences. Carbon footprints are the public's awareness, comprehension, and attitudes toward the idea of carbon footprints. This could involve scrutinizing individuals to measure their familiarity with carbon footprints, willingness to embrace eco-friendly practices and environmental awareness.	(Alkhalidi et al., 2021; Zolait, 2014)

2. Literature review

2.1. Diffusion of innovation theory

This investigation is backed by the diffusion of innovation theory offered by Everett Rogers, which researches how new ideas, developments, or innovations are applied and embraced within a social system. Regarding the current research objectives (Brdulak et al., 2021), The diffusion of innovation theory furnishes a lens to comprehend how the social process of communication, influences, and buying decision-making impact the adoption of elected vehicles in Jordan. Therefore, the theory categorizes adopters into distinguishable consumer groups based on their willingness to adopt inventions, ranging from early adopters to late majority and laggards (Ramachandran et al., 2020). This categorization can shed light on the diverse stages of acceptance or resistance towards electric vehicles in Jordan (Bokolo, 2023). This concept is particularly relevant for exploring the complex perceptions of electric cars, including their part in lessening carbon footprints and as a means for financial and economic savings. Further, it permits the investigation of factors affecting the adoption rate, such as perceived advantages, compatibility with present values, and the effect of social networks. Apprehending how information about electric cars is shared within Jordanian society and how various groups of consumers embrace or resist this innovation will contribute to extensive analysis (Seebauer et al., 2019). In a parallel context, the diffusion of innovations theory is presumed to offer in-depth insights into the factors affecting the adoption curve by synthesizing the connection between fuel-inflated prices, general inflation, and the emergence of electric vehicle brands. The diffusion of innovations theory offers in-depth insights into the factors affecting the adoption curve. It helps determine the communication channels and social dynamics contributing to the endorsement or rejection of electric cars as an

inventive solution in reaction to economic factors. When talking about the diffusion of innovation and electric vehicles, Mitra and their empirical insights (Mitra et al., 2020) offer valuable insights as they analyzed innovation diffusion in emerging markets, examining four different cases. Also, the publication's thematic emphasis expands to initiatives, i.e., specifying the preponderance of electric vehicles, including buses, across various countries and making efforts to assess the energy consumption linked with electric cars (Kastner and Bobeth, 2018).

2.2. Perceptions concerning e-vehicles

Perception is how an individual selects, organizes, and interprets stimuli into a meaningful and coherent world picture (Dimitropoulos et al., 2016). Perceived behavior control represents the individual's perception of the difficulty of performing a specific behavior (Ajzen, 2002). The more resources and opportunities the individual thinks he has, the stronger the perceived behavior control will be (Zolait, 2014). When potential consumers have sufficient economic capacity and have the right to decide, and there are adequate charging resources around their living and working areas, potential consumers will think it is easy to buy an electric vehicle in the future and have more robust control over the perceived behavior of purchasing electric vehicles (Abdallah and Tounsi, 2019). For consumers, selecting a car is a complicated and highly involved buying decision process (Albatayneh et al., 2021). The vehicle market is getting competitive in Jordan as it offers used and brand-new vehicles, including new emerging Chinese brands. In the virtual world (Almesafri and Habes, 2023), all information is available, in addition to the intense competition of sponsored ads on social media, which assists Jordanians in making better buying decisions over diverse vehicle categories and brands.

Furthermore, the chances of purchasing a personal fuel vehicle are higher than buying an electric car due to factors like battery ranges and battery replacement (Alkhalidi et al., 2021, 2022; Hashemi et al., 2023). Besides, there is a considerable selection, and the results of not deciding well classically will last long. They may cost a lot to correct and make the consumer enter the feeling of cognitive dissonance (Albatayneh et al., 2021). Additionally, many sponsored Ads and influencers in the virtual world may need to be more transparent and clear (Hamed and Bressler, 2019). Consumers enter the process of keenly evaluating vehicles for purchasing when they experience a convincing and apparent need for a car. Further, shared with the ability and desire to purchase, consumers are said to be 'in the market' for a new vehicle. This emphasizes that the consumer is saving money or has access to funds for the purchase and intends to complete the purchase of a car soon (Turienzo et al., 2022). Consumers evaluate the perceived risk in complicated, highly involved buying situations requiring complex engagement levels (Li et al., 2021). Furthermore, vehicle buyers examine and assess cost performance 'lifestyle image, which can be associated with some brands, social influences, and the vehicle's environmental credentials like fuel economy/emissions (Helmers and Weiss, 2017; Milev et al., 2021). Furthermore, several factors influence the decision to purchase an EV, including technological, country, policy, and environmental influences.

2.3. Consumers attitudes towards electric cars

Research across different fields has broadly investigated public attitudes toward electric vehicles. Investigations have investigated the level of public acceptance, approaches employed to evaluate the advantages and disadvantages of electric vehicles, and the facets affecting people's perspectives on these vehicles (Bennett and Vijaygopal, 2018). Casley et al. (2013) identified protection, expense, legislation, productivity, efficiency, and environmental influence as six factors related to electric vehicle acceptance. Their results suggested that efficiency, productivity, and ecological influence positively affected participants. At the same time, safety, cost, and legislation had a negative effect, indicating the need for technological advancements and restrictions before widespread public acceptance.

Jensen and Cherchi (2013) discovered that the most attractive aspects of electric vehicles include the possible benefits of safety, amenities, and amenities. However, concerns about liability, cost, and the loss of control over vehicles appeared as chief concerns among the public. Woldeamanuel and Nguyen (2018) compared electric vehicle attitudes between millennials and non-millennials, indicating that non-millennials were more concerned about the effectiveness of electric vehicle technology and its functional use. Further, several studies have been conducted to compare views on electric vehicle uses, concerns, and willingness to pay (Bennett and Vijaygopal, 2018; Liao et al., 2017; Trivedi and Kishore, 2020). These studies found a typically positive attitude toward electric vehicles, with individuals from developed countries describing more concern about data privacy. On the contrary, respondents from China and India expressed more favorable opinions and interest in electric cars.

2.4. Emerging brands

Emerging brands are pretty and somewhat new or need more brand awareness and popularity than brands leading their industry. They are in the early stages of growth and are often branded and considered innovative, exceptional, and distinctive marketing (Du et al., 2018). Additionally, an emerging brand does not have the recognition of well-established brands. Still, they are archetypally nimble, adjustable, compliant, and able to change the market rules. Their success often depends on factors, for example, (product quality and the capability to associate the brand with the target market) (Buranelli de Oliveira et al., 2022; Racz et al., 2015). These brands can be found in various industries, from technology and consumer goods to fashion and food (Holmberg and Erdemir, 2019). They may transition into more established and recognized brands as they gain more visibility and consumer trust.

Regarding emerging brands, there is a great deal of vagueness on the path of operability; emerging brands can achieve optimum and ideal uniqueness, but on the boundary condition, emerging brands should present more conformity or distinctiveness with their local peers in global markets. Furthermore, emerging brands face two competing forces, unity, and distinctiveness, and the strategic balance perspective has provided the most explicit guidance on how firms can attain optimal distinctiveness. Consumers in different overseas markets will have different legitimacy perceptions of emerging brands, which will have a vital impact on the globalization of brands (Vitta, 2021).

3. Methodology

The researchers adopted an inductive, theory-building methodology to answer the research questions. Qualitative research design can be complicated depending on a researcher's experience with a particular type of methodology (Albloush et al., 2024; Alhanatleh et al., 2024; Elhami and Khoshnevisan, 2022; Youssef et al., 2023). Many researchers seek to grow and expand their knowledge and experience with qualitative design to apply diversified research paradigms for future investigations (Hu and Chang, 2017). This research adopts an inductive approach, starting with data collection and, afterward, theory building (Malagon-Maldonado, 2014). The inductive approach looks for patterns and connections from the observed world (DeGracia et al., 2014). This qualitative method explores and answers the earlier research question (Hennink et al., 2020). Firstly, there are two reasons why the qualitative study method is suitable for our research. The research questions are mainly of the 'what' and 'how' types appropriate for qualitative research. Then, it explores different perspectives and is used to answer other research questions (Hennink et al., 2020). Phenomenology is "a research philosophy that sees social phenomena as socially constructed and is particularly concerned with generating meanings and gaining insights into those phenomena*"* (Qutoshi, 2018). Phenomenology is a research philosophy that permits researchers to associate the spirit of human experience and comprehend the phenomenon described by research participants (Williams, 2021). Furthermore, phenomenology concerns how humans understand and see the world around them. Additionally, grabbing humans' experiences makes phenomenology a philosophy since it is based on the appeal of understanding and making sense of means of knowing. The aim is that through the data, researchers can explore and shed light on undeveloped theories (Neubauer et al., 2019). The process involves studying a few people through vast and prolonged engagement with harvest patterns and creating meaningful associations (Chesnay, 2015).

3.1. Focus groups

Focus groups are utilized as a method of exploring and investigating current issues that help people engage with topics that impact their communities, societies, and personal lives (Litosseliti, 2010). Dialogues and discussions are an effective technique to use focus groups to help people discuss current issues that are complex problems (Guest et al., 2017). Further, focus groups are dialogues where people can express and state their different points of view on a matter and search for common and shared grounds for action. Besides, participating in a focus group can influence participants in several ways. Additionally, it can offer a collective reflection and action that catches excellent power from the participants (Arthur et al., 2012).

3.2. Sampling

Purposive sampling is a non-random sampling method used in qualitative studies. Unlike random sampling approaches, which include picking participants randomly by chance, purposeful sampling involves intentionally and purposely selecting the research participants or cases with precise and detailed characteristics or experiences related to the research problem (Acharya et al., 2013). This approach is beneficial

when the goal is to gain in-depth insights or when specific criteria are essential for the study (Ahmad et al., 2023). This technique was used in this research because it supports theory building (inductive research) (Novikov and Novikov, 2013), as the focus groups contained undergraduate and postgraduate students from private and public universities in Jordan. Fifty-five participants participated in 7 focus groups; each group consisted of six to eight participants from undergraduate and postgraduate students from several universities in Jordan.

The sampling selection strategy sought to collect possible participants' sociodemographic information (e.g., age, gender, educational levels), so the study participants were from different sociodemographic backgrounds to ensure that the sample was representative. Therefore, undergraduate and postgraduate students were chosen to participate. Furthermore, the researchers ensured they would participate in the focus group sessions. As mentioned earlier, a purposeful sampling technique was employed; 55 participants were deliberately separated into seven groups. Additionally, the researchers agreed that data and theoretical saturation had been reached following the seventh interview when sameness and repetitions in new data and no additional information were found. The following **Table 2** represents the research participants' summary.

Table 2. Research participants' summary.

Age range	**18–50 years old**
Males	52%
Females	48%
Highest degree gained	
Masters	15
Bachelor	40
Age of participant	
18–29	40
30–39	10
40–49	4
50–59	1
60+	0
Monthly income (JoD)	
less than 500	45
500–1000	5
1000–1500	2
1500–2000	1
more than 2000	2
Have you own an electric car?	
Yes	20%
No	80%
If No, do you consider buying an electric car?	
Yes	25%
No	75%

3.3. Thematic analysis

After recording the interviews, the data was written out precisely and exactly, translated from Arabic to English, and manually analyzed using an inductive thematic analysis technique. The codes were also developed manually for analysis, giving the researchers more control over the data (Braun and Clarke, 2006). The investigations followed these methods: separating transcripts into divisions based on identifying theme shifts, coding the developed sections by categorizing and recognizing recurring subthemes in the coded list of sections, and lastly, identifying recurring themes, which captured several subthemes and establishing a more abstract summary of the content of the interviews (Cernasev and Axon, 2023; Dawadi, 2020).

4. Results and discussion

The data from the focus group discussions were organized into four predominant themes: 1) driving experience, 2) saving, trust, and readability, 3) between luxury and fuel economy, and 4) lack of environmental awareness. Moreover, the analysis, generating themes, and coding process were all mentioned in the methodology chapter. Overarching themes and subthemes emerging from this study are presented in **Table 3**.

Table 3. Emerging themes and sub-themes in the current research.

Emerging themes	**Emerging sub-themes**
Driving experience	1) The engine sounds 2) Driving experience
Saving, trust, and readability	1) Saving 2) Friends' recommendation (WOM)—Trust 3) The early models' trust issues.
Between luxury and fuel economy	1) Tesla vs. others 2) Age and occupation 3) Prestige of driving
Lack of environmental awareness	1) None of the participants mentioned the environment

4.1. Driving experience

The first theme identified from the focus groups was the driving experience, a significant theme of the focus group interviews. It was mentioned in all interviews, specifically from male participants, as many said they would not consider buying an electric vehicle as they would lose the engine's sound. They thought that driving an electric car was not a real driving experience, as male youth in their early 'twenties perceptions of electric vehicles differed, as one participant sarcastically said, "It is a vehicle, not a mobile phone, to charge it daily." Furthermore, another university student stated, "*I cannot drive a vehicle without an engine sound*," and several participants agreed. In this regard, youth in their early twenties enjoy the driving experience of a fuel-engine vehicle. This can conclude that youth prefer driving experience or money-saving like older participants. As noted by Featherman et al. (2021), the lack of engine sounds in electric cars has been cited as one of the factors contributing to adoption reluctance among some users. Conventional internal combustion engine (ICE) cars produce distinctive sounds that have become

interchangeable with the idea of a running vehicle. Notably, the sound of a revving engine has been profoundly rooted in the cultural and social views of driving. For many, the lack of this noise may create a sense of obliviousness and make them uncertain about the electric vehicle (EV) driving experience.

Furthermore, another contribution from a postgraduate student was a male, 27; I felt that the driving experience was insulting. As a result, a segment of the Jordanian market still needs to be ready, or even more, they are not convinced to purchase an EV. Even though it is evident that there is a shift in the Jordanian market towards EVs, there is resistance to the concept of EVs. Another participant stated, "*I feel it is a toy, not a real car*," and another mentioned, "*My friend bought an EV, and he is suffering while driving it*." Additionally, a female student expressed, "*There is nothing that can beat a fuel car; it is enduring and easy to drive*." Agreeing with Kester et al. (2018), the concern that electric cars are not deemed "real cars" by some possible users is a decisive factor contributing to adoption unwillingness. Numerous elements add to this perception, and managing these concerns is vital for the broader acceptance of electric vehicles (EVs). Furthermore, it is argued that some users may have stereotypes that electric cars are not as strong or offer a different level of performance than classic fuel-based vehicles.

4.2. Saving, trust, and readability

This research indicates an extensive need for more trust regarding electric vehicles among consumers in the Jordanian market. In spite of the predominant global tendency towards sustainable green practices and the observable surge in the worldwide manufacturing of electric cars, skepticism, and ambiguity continue among Jordanians. Further, the lack of trust might be ascribed to multiple variables, including anxieties and worries regarding the reliability of electric vehicles, inadequate familiarity with their advantages, and the novelty of rising companies within the Jordanian industry. Existing literature (Adnan et al., 2017; Adu-Gyamfi et al., 2024; Rodrigues et al., 2021) indicates that the lower operating expenses of electric cars are compared to their traditional counterparts. The simplified design of electric drivetrains, rarer moving parts, and decreased maintenance requirements contribute to reduced operational expenses. Research shows that the absence of oil changes, rarer brake replacements, and lower energy expenditures for charging can significantly affect the overall cost of ownership. Hence, while conducting the interviews, there were prominent opinions and views between consumers born in the seventies and eighties of the last decade and those born in the late nineties and early. Two of the participants were in their early forties. Their perception of electric vehicles was rational, as their point of view was economically and financially driven, as their perception was saving money; a participant stated: "*My friend bought an electric vehicle, and he highly recommended it to me, as it is financially efficient*." P1—43 years old—male. So, based on this result, it is clear that Jordanians have different perceptions regarding EVs; from a logical point of view, regarding fuel prices, and as stated in the first theme, as a student said, "*In terms of saving, it will save money, but for long distances, it is not reliable*." The results of this explorative research were controversial, as it was clear that Jordanian consumers have incredibly different

perceptions of electric vehicles. The focus group discussions showed that most male students prefer driving a fuel vehicle for several reasons, as mentioned in the previous section, such as enjoying the experience of the traditional form of cars. So, it is evident that for the Jordanian, "*I will buy only new models and only from well-known vehicle producers, as I do not trust early models of electric vehicles*." P2—45 years old—male. Another participant stated: "*High-risk*," 20 females; based on this, it is clear that trust is an issue with many of the consumers in Jordan.

4.3. Between luxury and fuel economy

Empirical evidence suggests that economic factors significantly influence consumer perceptions and attitudes toward electric vehicles. The ambiguity regarding gasoline costs and the possibility of achieving prolonged economic benefits through the adoption of electric cars necessitates deliberate interventions from policymakers and industry partners to navigate this ever-changing environment effectively. This theme mainly emerged from postgraduate students in their mid-level careers or owning a small business, as it was clear that they are not sensitive to high prices. Moreover, this theme emerged with a well-established EV brand, specifically Tesla; in this part, none of the participants had trust issues and mentioned savings, as a participant noted, "*Tesla because it is a strong brand"* male—40 years old, business owner. Another participant said that Tesla has advanced technology.

Furthermore, and reassuring to what the previous participant stated, another postgraduate male student said, "*Tesla, they have advanced technology*." Notably, existing discussions (Carley et al., 2019; He et al., 2018) consistently highlight Tesla's position as an innovator in the automotive industry. Researchers underline the company's commitment to cutting-edge technologies, i.e., electric drivetrains, self-sufficient driving features, and energy depository solutions. Integrating cutting-edge technologies into Tesla's vehicles is recognized as a critical factor setting the brand apart. Besides, the positive image linked with Tesla usually cites factors such as intelligent design, high-performance abilities, and a commitment to sustainability. The brand's attraction to environmentally conscious consumers and tech enthusiasts is a recurrent theme in academic dialogues (Rafiq et al., 2024). Thus, the research findings suggest that consumer opinions of new electric vehicle brands are highly influenced by the economic backdrop, characterized by shifting gasoline prices and overall inflation. This paradigm possesses the potential to function as a beneficial instrument for policymakers and industry stakeholders in comprehending the complex processes that influence consumer choices. It enables them to make well-informed decisions that facilitate the widespread adoption of electric vehicles.

4.4. Lack of environmental awareness

This study's primary objective was to investigate Jordanian individuals' perceptions regarding electric vehicles as a means of reducing their carbon emissions. The findings indicate an increasing awareness of environmental issues among customers in Jordan. However, the relationship between electric vehicles and their potential impact on reducing carbon footprints must be better understood. This investigation emphasizes the need to execute intensive awareness efforts and

educational programs to address the difference between consumers' comprehension and the environmental advantages of electric vehicles. Findings showed that only three out of the fifty-five participants considered buying an electric car to reduce their carbon footprint. Results should only include a limited proportion of participants having environmental awareness. In contrast, others need more understanding, as it is evident that there is a lack of ecological awareness among Jordanians, as university students are a sample of Jordanian society. Therefore, a promotional and educational campaign must be held to create awareness among Jordanians creating environmental awareness. In this regard, the lack of environmental awareness has been recognized as an influential factor contributing to reluctance to purchase electric cars, as evidenced by academic literature (Axsen et al., 2017; Morton, 2022). Research consistently highlights the crucial role of environmental consciousness in shaping consumer attitudes toward electric vehicles (EVs). According to Kester et al. (2019), a considerable portion of the consumer base needs to show a greater awareness of the environmental impact associated with conventional internal combustion engine (ICE) vehicles. The lack of awareness concerning the damaging effects of traditional cars on air quality and climate change contributes to a decreased motivation to transition to electric alternatives.

5. Conclusion

In conclusion, the outcomes of this research offer insight into the intricate and diverse perspectives held by Jordanian consumers of electric vehicles (EVs). The outcomes emphasize the contentious nature of perspectives toward electric vehicles (EVs), revealing notable discrepancies among individuals. Further, the capability to classify consumers into segments according to their experiences, brand preferences, and trust levels presents a practical understanding of the complex dynamics underlying the uptake of electric vehicles in the Jordanian market. Moreover, the results of this investigation reveal a range of opinions, indicating that a standardized approach may not be appropriate for encouraging the adoption of electric vehicles in Jordan. Instead, it is essential to implement a focused and differentiated strategy that considers the distinct needs and concerns of diverse consumer segments. Car manufacturers, policymakers, and environmental campaigners can utilize this sophisticated information to customize interventions, marketing strategies, and policy measures that appeal to distinct customer classifications.

Even though there are a lack of widespread adoption presents distinct difficulties, it also presents prospects for customization and innovation within the electric vehicle (EV) sector. By identifying and haggling with the unique elements that impact customer perceptions, such as those associated with driving experience, brand, reputation, or trust, stakeholders can actively help surmount barriers to electric vehicle (EV) adoption in Jordan. The continuing uncertainties in customer perceptions are crucial for producers and policymakers to participate actively in a cooperative endeavor. By executing focused strategies that precisely target the issues revealed in this study, it is possible to mitigate the current knowledge gaps, establish trust and confidence, and cultivate a more conducive atmosphere for adopting electric vehicles (EVs) in Jordan. The capacity to classify consumers into discrete segments provides a

framework for customizing communication strategies, product attributes, features and characteristics, and support services that correspond to the particular preferences and reservations of each subgroup. This research results demonstrate that the case around consumer perceptions might be viewed as a manageable challenge rather than an insurmountable obstacle for individuals aiming to promote sustainable transportation in Jordan. By recognizing and addressing the multitude of perspectives and personal encounters, individuals with vested interests can contribute to transforming the discourse surrounding electric vehicles (EVs), enabling a broader and more various integration of EVs within the Jordanian market.

Likewise, this investigation highlights the need for more trust among customers in Jordan regarding electric vehicles, highlighting the need for specific initiatives to rectify misunderstandings and foster knowledge dissemination. This analysis identifies significant emphasis on the influence of economic aspects on customer perceptions, indicating that efforts focused on emphasizing the continuing economic advantages of electric vehicles may play a vital role. Similarly, this research has constructed a conceptual framework that furnishes a valuable guide for policymakers and industry stakeholders to comprehend the complex relationship between economic variables and consumer perspectives. This framework finally contributes to developing a more favorable perception of electric vehicles within the Jordanian market.

The research results have meaningful, practical consequences for policymakers and industry stakeholders involved in Jordan's electric car sector. Enforcing customized awareness marketing campaigns, educational activities, and economic incentives to increase electric vehicles' perceived advantages and mitigate customer concerns is proposed. Again, it is crucial to prioritize efforts to foster trust in developing electric car manufacturers utilizing transparent communication and implementing procedures to guarantee the reliability of their products. This study contributes to the scholarly conversation surrounding consumer attitudes toward electric vehicles, specifically focusing on emerging markets such as Jordan. The findings derived from this study have the potential to contribute to future research endeavors and provide valuable guidance for practical initiatives targeted at fostering sustainable transportation practices. On its whole, this study establishes a foundation for a consumer base in Jordan that is more environmentally aware and responsive towards electric vehicles through the resolution of the difficulties that have been identified. However, yet, governments and environmental advocates are encouraging people to adopt electric vehicles as an environmentally friendly product. It is worth mentioning that there are doubts about its production's negative consequences on the environment, which might have a negative impact as there are high emissions in the production stage, which might hurt human toxicity and eutrophication (Xia and Li, 2022).

5.1. Theoretical implications

This research has specific implications, considering the diffusion of innovation theory. First, the relevant theory is reflected in acknowledging cultural preferences and the opposition of particular demographic groups, especially young males, to

embracing electric vehicles due to the perceived loss of the classic driving experience. The diffusion theory asserts that innovations spread through society precisely, and comprehending cultural attitudes is vital in forecasting the adoption rate. Further, the focus on economic rationality aligns with the diffusion theory's concept that perceived benefits and cost-saving motivations usually affect the decision to adopt an innovation. Individuals born in the seventies and eighties view EVs for financial reasons, demonstrating the diffusion process's economic dimension.

Likewise, the doubt regarding early models of electric vehicles and the need to build trust lined up with the diffusion theory, which recognizes that trust and credibility play a vital role in adopting new innovations. Overcoming trust barriers is essential to the successful diffusion of electric cars among skeptical consumers. The debate around the positive perception of well-established EV brands, notably Tesla, resonates with the diffusion theory's emphasis on the role of influential adopters and opinion leaders. Tesla's reputation as an innovator aligns with the theory's assertions that early adopters can significantly affect the adoption curve. Finally, recognizing a gap in environmental understanding among Jordanian consumers is consistent with the diffusion theory's concept of different adopter categories. Those with inflexible environmental awareness symbolize a part of the population that may fall into the diffusion procedure's late majority or laggard categories. Therefore, the implications drawn from this research study align with its rudimentary principles by identifying the impact of cultural, economic, and social aspects on the adoption of electric vehicles in the Jordanian market.

5.2. Study limitations and recommendations for future research

This research is based on a novel topic yet contains some primary limitations. First, this research has a geographical limitation, indicating the generalizability of results in other countries as questions. Future research can delimit this concern by focusing on electric car acceptance and users' views in their countries and expand this generalizability. The second limitation involves using a single qualitative method for data gathering. Future research built on the result of this study must have a larger sample adopting a deductive research approach (theory testing), as this study was theory-building (inductive). Notably, although the relevant method has gained much popularity and is preferred by several researchers, it has also faced criticism due to certain limitations. Future researchers can conduct mixed-method research investigations to further overcome this limitation in their studies. Finally, the limitation of current research is the sample size employed in the current research based on the criteria and requirements of qualitative studies. Considering the relevant sample size, the generalizability of results is another primary concern and limitation. Future researchers can employ quantitative approaches and gather data from larger sample sizes to further delimit this concern.

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