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UNDERSTANDING CONSUMERS INTENTION TO PURCHASE GREEN VEHICLE: A LITERATURE REVIEW

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Abstract:

Global warming is one of the main issues discuss by nations leaders. It is a crucial problem that needs to be address immediately. One of the solutions to global warming is green vehicles. Hybrids and electric vehicles are not new products in the automobile market. Unfortunately, the sales percentage for both types of green vehicles are still behind the petrol engine vehicles. Regardless of the world leaders' dream to fill the street with green vehicles by 2035 in developed countries, the dream is still far from reality. As for developing countries, the people are more familiar with hybrid vehicles compare to electric vehicles. Other than that, the consumer perceptions regarding green vehicles are not all in positive aspect. Green vehicles are more associated as luxury goods in consumer perspective. There are also critics on the reliability and durability of the green vehicles as consumers find trouble to believe that green vehicles could compete with petrol engine vehicles. This paper identifies factors that could influence consumer to purchase green vehicles. Thus, providing a better insight in promoting green vehicles to consumers.

Keywords:

Consumer Preference, Electric Vehicle, Green Vehicle, Hybrid Vehicle, Intention To Purchase

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Introduction

The world is concerned about global warming and world leaders are taking a more proactive approach in tackling the issue. United Nation had organized a conference UN Climate Change Conference in Glasgow (COP26) to gather nation leaders all over the world to sit together and discuss on best resolutions that could be implemented in short and long term for the good of our planet (Bee, Jin & Lee, 2023). One of the aspects that have been discussed is green vehicles. The developing countries are targeting to produce only zero-emission vehicles by 2035 and a global target is set by 2040. Private finance to support green vehicles research and production globally is one of the outcomes from COP26 in Glasgow. TOYOTA lates claimed new breakthrough technology for green vehicles battery will accelerating the momentum for green vehicles.

Unfortunately, these good news on zero-emission vehicles did not reflect on the current sales of vehicles especially in developing countries. The consumers are still doubtful and more sceptical regarding green vehicles. While consumers are generally more open to purchase hybrid vehicles nowadays, electric vehicles are not on the same level. There are hesitations to purchase electric vehicles, especially on charging facilities and the battery coverage range. As of now, Tesla Model Y, the best-selling model from Tesla offers a battery coverage range of 530 km in one charge (Guo & You,2023). The charging takes 12 hours to 36 hours to full charge depending on the charging method. This is not an attractive offer as petrol engine vehicles will take less than 5 minutes to be fully refilled and will cover further distance.

Meanwhile, TOYOTA latest breakthrough in electric battery claimed that they have created a new battery at a cheaper price, longer distance coverage and just 10 minutes for full charge. This is a major step up from Tesla Supercharge Network that offered 15 minutes charge for 321km coverage (Mombeuil & Diunugala, 2023). Nevertheless, all this super charging method is not available everywhere and anywhere. The special charging method is limited to certain areas and not exist yet in less developing countries. This is another roadblock that green vehicles manufacturers need to overcome.

Objective of the Study

To explore on latest research on determinants influencing green vehicles purchase.

Research Question

What has latest past research discussed about green vehicles?

Literature Review and Methodology

Review Stage

There are five articles published in Google Scholar that had been reviews in this study. All five studies chosen in this literature review are the latest study in the year 2023 and specifically written for green vehicles. The reason behind the use of Google Scholar instead of Web of Science or Scopus is the unavailability of specific articles on green vehicles that were published in 2023 from both publishers.

The articles use in this literature reviews are (Bee, Jin and Lee, 2023; Ong et al.,2023; Mombeuil and Diunugala, 2023; Suprihartini, Herdiansyah and Fahrizal, 2023; Guo and You, 2023; Ong et al.,2023). All five articles reviewed in this study are specifically written on green car, either as electric or hybrid vehicles.

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General Overview

There are many theories being used to test the relationship of various determinants of intention to purchase green vehicles. Each of the theories has its own strength and weakness. The common theories used in previous studies are Theory of Reason Action (TRA), Theory of Planned Behavior (TPB), Value Orientation Model, Norm Activation Theory, The Hunt-Vitell Model, The Consumption Value Theory, Cognitive-Affect-Behaviour, Value-Lifestyle-Behavior Hierarchy, Choice-Behaviour Model and Diffusion of Innovation Theory.

Of the five chosen articles, three of them used Theory of Planned Behaviour (TPB) and two of the articles used Sustainability Theory of Planned Behaviour (STPB). TPB is a common theory usually used to discuss the relationship between determinants with intention to purchase while STPB is an extension of TPB model that focuses on the sustainability domain of the TPB framework. The four domains of sustainability are human, social, economic, and environmental. The sustainability domain used in both studies discussed are economic sustainability domain.

Theory of Planned Behavior

The Theory of Planned Behaviour (TPB) posits that the stronger one's intention is towards a specific behaviour, the more likely they are to engage in that desired behaviour (Ajzen, 1991). In the context of consumer behavior, predicting consumer purchase intention is a crucial method (Newberry et al., 2003). Through TPB, multiple researchers have established a significant link between purchase intention and behaviour (Lai & Cheng, 2016; Liobikiene et al., 2017; Minbashrazgah et al., 2017; Ajzen & Fishbein, 2005).

Kanchanapibul et al. (2014) have asserted that the intention to make environmentally conscious purchases frequently influences buying behaviour due to concerns for human health and the environment. Scholars like Wiederhold and Martinez (2018), Arli et al. (2018), and Albayrak et al. (2013) propose that the components of TPB—attitudes, perceived behavioural control, and subjective norms—act as predictors of Green Purchase Behaviour (GPB). However, previous studies (He & Zhan, 2018; Liu et al., 2012; Zhang et al., 2018) indicate that the Norm Activation Model (NAM) and TPB are insufficient in explaining consumers' intentions to engage in environmentally friendly purchases, as these intentions are often driven more by self-interest and social approval.

Sustainability Domains

The sustainability domain encompasses various aspects of human, social, economic, and environmental factors that influence an individual's intention to purchase.

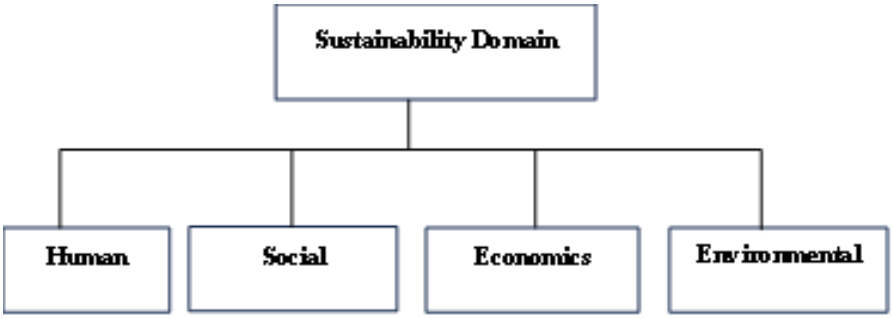

Figure 1: Sustainability Domain

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Human Influence: Human factors pertain to personal beliefs, values, and motivations. People who are personally invested in sustainable practices and have a strong environmental conscience are more likely to intend to purchase products that align with their values (Leng et al., 2020). This could be due to concerns for their own health, the well-being of their families, or a sense of responsibility towards the planet.

Social Influence: Social factors involve the impact of the people around an individual on their purchasing intentions. Social norms, peer pressure, and community expectations play a role here (Park & Lim, 2020). If sustainable consumption is considered fashionable or socially desirable within a person's social circles, they might be more inclined to purchase products that reflect this behavior.

Economic influence: Economic factors refer to the financial aspects of sustainable purchases. While some sustainable products might initially have higher price points, the long-term cost-effectiveness, and potential savings (e.g., energy-efficient appliances) can influence purchase intentions (Jouzdani & Govindan, 2021). Additionally, availability of financial incentives, such as tax breaks or subsidies for eco-friendly products, can sway consumers' decisions.

Environmental influence: Environmental factors relate to the impact of a product's production, usage, and disposal on the environment. Products that are environmentally friendly, have lower carbon footprints, use renewable resources, or promote recycling can attract consumers who are concerned about the planet's well-being (United Nation, 2023). Environmental education and awareness campaigns can also increase consumers' understanding of the consequences of their purchases.

Research Context

The data collected in the chosen articles were collected in Asian countries which are Sri Langka, Indonesia, China, and Philippines. The data were gathered using a questionnaire developed by the authors.

Table 1: List of Authorm Country and Methodology

Authors	Countries	Method
Mombeuil & Diunugala (2023)	Sri Langka	Physical Questionnaire
Suprihartini, Herdiansyah, & Fahrizal, (2023).	Indonesia	Physical Questionnaire
Guo & You (2023)	China	Physical Questionnaire
Ong et al. (2023A)	Indonesia & Philippines	Online Questionnaire
Ong et al. (2023B)	Indonesia & Philippines	Online Questionnaire

Determinants

There are multiple determinants studied by previous researcher. Some of the determinants discussed in the chosen articles are highlighted below.

Green Brand Awareness

Brand awareness refers to a consumer's capacity to promptly identify and remember a brand (Hoeffler and Keller, 2002; Aaker, 1996), or the "degree of a brand's presence in consumers'

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consciousness" (Pappu et al., 2005). In a similar vein, green brand awareness pertains to a consumer's ability to "identify and recollect that a brand is ecologically conscious" (Tseng and Hung, 2013; Chen and Chang, 2012). Utilizing the conventional branding approach, empirical research has discovered that brand awareness has a positive impact on market performance or the intention to purchase (e.g., Shamsudin et al., 2020; Malik et al., 2013; Chi et al., 2009), as well as on brand trust (e.g., Bernarto et al., 2020; Deka et al., 2020).

Green Brand Association

Brand associations encompass the underlying information that customers hold in their minds about a brand, whether it leans towards negative or positive perceptions. These associations are interconnected with specific nodes in the brain's memory (Emari et al., 2012; Aaker, 1991). Consequently, these brand associations serve as tools for collecting information that aid in achieving brand distinctiveness (Van Osselaer and Janiszewski, 2001). Similarly, green brand associations can be established by highlighting green product attributes (Hartmann and Ibáñez, 2006) to achieve differentiation as an environmentally conscious brand. Building upon this premise, Chen and Chang (2016) define green brand associations as the degree to which consumers are knowledgeable about green brands, and their emotional reactions and evaluations of these environmentally friendly brands.

Green Perceived Quality

Green Perceived Quality (GPQ) is a concept in the field of sustainability and environmental management that assesses the quality of a product or service from a green or environmentally friendly perspective. It refers to how consumers perceive the environmental attributes and sustainability aspects of a product or service (Zhang et al., 2018).

In essence, GPQ focuses on the extent to which a product or service aligns with ecological concerns and sustainability values. It considers factors such as the product's environmental impact, resource efficiency, recyclability, energy efficiency, and overall contribution to environmental conservation. Brands (Wiranto & Adialita, 2020).

Green Trust

Trust is a cornerstone for enduring relationships, built upon confidence in a partner's reliability and integrity (Morgan and Hunt, 1994). It encompasses dimensions like competency, trustworthiness, and benevolence (Gurviez and Korchia, 2002; Frisou, 2000; Rempel et al., 1985). In the context of environmentally conscious business, "green trust" emerges as the willingness to rely on a product or brand due to its environmental credibility, benevolence, and capability (Chen, 2010). This concept gains significance in consumer decisions regarding eco-friendly purchases, especially amidst concerns about greenwashing. Multiple studies establish a strong link between green trust and intention to purchase green products (Wasaya et al., 2021; Chinomona and Chivhungwa, 2019; Gil and Jacob, 2018; Cheung et al., 2015). Nonetheless, Tarabieh's research (2021) found no significant impact of green trust on green purchase intention.

Green Product Knowledge

Numerous researchers have delved into the realm of green product knowledge. Notably, Nobel Prize laureate Kristian Tripandoyo Tampubolon's work indicates a direct and substantial impact of green product knowledge on purchase intention (Tampubolon, 2021). In contrast, the research of Agung Wiranto Setyabudi and Tania Adilita suggests that the influence of green

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product knowledge on green purchase intention is contingent upon its mediation by green trust (Wiranto, A., & Adialita, 2020).

Perceived Price

A perceived price refers to the perception that consumers have regarding the cost of a product or service. It is their subjective evaluation of how much they believe a product is worth in terms of its price. Intention to purchase signifies the inclination or plan that consumers must buy a particular product or service.

When considering perceived price intention to purchase, it indicates that consumers' perception of the price of a product plays a role in shaping their intention to buy it (Chen & Chang, 2012). In essence, how consumers view the price of a product influences their decision or willingness to purchase it. This concept underscores the significance of consumers' beliefs about the cost of a product in their overall decision-making process.

Government Policy

In 2019, the government introduced Presidential Regulation No. 55 of 2019, focusing on expediting the Battery-Based Electric Motorized Vehicle (KBL) program, encompassing two-wheeled, three-wheeled, and four-wheeled or more vehicles. Although the regulation provided incentives, it did nott explicitly outline the incentive targets. Hence, there is a necessity for preliminary stages prior to entering the Electric-Based Vehicle industry (Mali et al., 2022). These stages involve establishing guidelines for Hybrid motor utilization (Pindoriya, R. M., Rajpurohit, B. S., Kumar, R., & Srivastava, 2018).

Behavioural Attitude

Behavioural attitude refers to an individual's mental and emotional outlook regarding a specific behaviour. It encompasses thoughts, emotions, and evaluations that determine whether they are inclined to engage in or avoid that behaviour (Hu et al., 2021). This attitude is shaped by personal experiences, values, and social influences. It greatly influences decision-making and can be positive, negative, or neutral, impacting behaviour outcomes (Fan et al., 2020). Understanding behavioural attitudes is vital for predicting and influencing behaviours in fields such as psychology, marketing, and public health, leading to more effective strategies for behaviour change.

Subjective Norm

Subjective norm refers to an individual's perception of social pressure or expectations from others regarding a specific behaviour. It encompasses the perceived beliefs and opinions of significant people or groups in the individual's life (Li et al., 2021). This subjective norm plays a crucial role in shaping an individual's intention to engage in or avoid a behaviour. It reflects the influence of social factors on decision-making and behaviour outcomes (Ma, Xia & Chang, 2022). In essence, subjective norm indicates how much an individual feels compelled or motivated to conform to others' expectations regarding a particular action.

Perceived Behavioral Control

Perceived behavioural control refers to an individual's perception of their ability to perform a specific behaviour (White & Sintov, 2017). It involves the person's belief in their capacity to successfully carry out the behaviour, considering both internal factors (such as skills and resources) and external factors (such as obstacles and environmental conditions). This perception of control strongly influences an individual's intention to engage in or avoid the

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behaviour. In essence, perceived behavioural control reflects how confident someone feels about their ability to execute a particular action, even in challenging circumstances.

Habit

Habit refers to repetitive and automatic behaviours that individuals perform in certain situations without much conscious thought (German et al., 2022). It becomes a routine or ingrained pattern of action. When discussing the impact of habit on behavioural intentions, it means that the habits people have developed can directly and significantly influence their intentions to engage in certain behaviours.

Price Value

When we perceive that what we are paying for something aligns well with its worth or benefits, our likelihood of intending to engage in a behaviour, such as making a purchase, is higher (Gunawan et al., 2022). In simpler terms, if we believe the price matches what we're getting, we are more inclined to go ahead with the action. This is because the perceived value we associate with the price directly impacts how motivated we are to follow through with our intentions.

Hedonic Motivation

Hedonic motivation, which is driven by seeking pleasure, enjoyment, or emotional satisfaction, directly and significantly impacts our intentions to take certain actions. When we are motivated by the pleasure or emotional gratification we expect to gain from an activity, it directly influences our intention to engage in that behaviour (Zhao et al., 2021). In simpler terms, if we believe that doing something will bring us joy or positive emotions, we are more likely to intend to do it. This is because the anticipation of a pleasurable experience directly shapes how strongly we want to follow through with our intentions.

Performance Expectancy

Performance expectancy exerts a direct and significant impact on behavioural intentions. The degree to which we believe that a specific action will yield positive results or contribute to our goals significantly shapes our intention to engage in that behaviour (Hassan et al, 2021). If we perceive that a behaviour will lead to favourable outcomes, our likelihood of intending to perform that action is heightened. This anticipation of positive results directly influences the strength of our motivation to act on our intentions.

Effort Expectancy

The perception of how easy or challenging a specific behaviour is believed to be directly affects the intention to engage in that behaviour (Saif et al., 2022). When a behaviour is perceived as requiring minimal effort, the likelihood of intending to perform that action increases. Conversely, if a behaviour is seen as demanding significant effort, the intention to carry it out might diminish. Essentially, the anticipation of the ease or difficulty of a behaviour directly shapes the motivation to follow through with intentions.

Facilitating Conditions

The presence of necessary resources, support, and opportunities directly influences the likelihood of intending to engage in a particular behaviour (Ong, 2022). When the conditions are favourable and conducive to carrying out the behaviour, the intention to perform that action is strengthened. In contrast, if the conditions are not conducive, the intention to engage in the behaviour may weaken. In essence, the availability of resources and supportive conditions

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directly shapes the motivation to follow through with intentions to perform a specific behaviour.

Perceived Environmental Concern

Perceived environmental concern involves how much an individual values and cares about the environment. It is about recognizing environmental issues and how dedicated someone is to address them. When people hold a strong concern for the environment, they tend to engage in actions that support its well-being, such as recycling or conserving energy (German et al., 2022). On the other hand, if this concern is lower, such actions might not be as important. This concept helps us grasp how individuals' feelings towards the environment influence their behaviours and decisions. It's essential for creating strategies and policies to safeguard the environment's health.

Perceived Economic Concern

Perceived economic concern refers to how much importance an individual places on economic factors or financial matters (Li et al., 2021). It involves recognizing the impact of economic conditions on one's life and decision-making. When someone perceives economic concerns as significant, they are more likely to consider financial aspects when making choices. Conversely, if economic concerns are deemed less important, financial considerations might have less influence.

Perceived Authority Support

Perceived authority support entails the level of significance attributed to approval from influential figures or institutions. It involves recognizing the endorsement or encouragement from respected sources. When a strong sense of authority support is perceived, individuals tend to lean more towards aligning their actions with that support (Li et al., 2021). Conversely, if the perceived authority support is weak, its impact on actions might be diminished. This concept provides insight into how individuals' perspectives on support from respected sources influence their behaviours and decisions. It holds importance in crafting strategies and policies that duly consider the role of authoritative endorsement.

Qualitative Research

This study is a qualitative study that focuses on five latest and selected studies as mentioned in the review stage. The result from all five studies is summarized in Table 2. All five studies used questionnaires to gather the data from respondents. The data were collected either physically or through online platforms. All data were gathered from respondents in Asian countries only. The reason for selecting data from Asian countries is due to Malaysia that is part of Asian countries. Thus, the data from these studies will be more relevant with Malaysia. All data has been analysed using SPSS data analysis.

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Results

Table 2 summarizes the relationship between determinants influencing intention to purchase with intention to purchase green vehicles for each study.

Table 2: Summary of Result

Author	Determinants	Significant	Methodology
Mombeuil and Diunugala (2023)	Green brand awareness	Yes	Questionnaire
	Green brand association	Yes	
	Perceived quality	Yes	
	Green trust	Yes	
Suprihartini, Herdiansyah and Fahrizal (2023)	Green product knowledge	Yes	Questionnaire
	Perceived price	No	
	Government policy	Yes	
Guo & You (2023)	Behavioural Attitude	Yes	Questionnaire
	Subjective Norm	Yes	
	Perceived Behavioral Control	Yes	
Ong et al. (2023A)	Habit	Yes	Questionnaire
	Price value	Yes	
	Hedonic Motivation	Yes	
	Performance Expectancy	Yes	
	Effort Expectancy	Yes	
	Facilitating Conditions	Yes	
Ong et al. (2023B)	Perceived Environmental Concern	Yes	Questionnaire
	Perceived Economic Concern	Yes	
	Perceived Authority Support	Yes	

Discussion

There are similar determinants discussed in the articles with different results. This could be due to different perception or understanding of the questionnaires. Some of the questions in the questionnaire are written in technical language that could lead to different interpretation from the respondents. Overall, there are many determinants that could influence consumer intention to purchase green vehicles. However, the numbers of sales for green vehicles are still way behind fuel power vehicles. Therefore, more research needs to be conducted to tackle this issue.

Objective and Research Question Achievement

The study has achieved the objective set in the beginning of this research to explore on the latest discussion on determinants influencing of green vehicles purchase. The research question on the latest discussion on green vehicles is also addressed in this study.

Conclusion

While there are many significant determinants that influence purchase intention of green vehicles, there are more aspects that is still not fully coverer such as the influence of culture, tradition, belief, and religion effect on consumer intention to purchase.

Contribution of the Study

Studying factors that impact the purchase of green vehicles benefits the nation, the environment, and society at large. Policies and industries are informed by insights into variables like as affordability, infrastructure, and public image, which together promote a sustainable automotive landscape. This research eventually benefits society, the environment,

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and the country's commitment to sustainability by lowering carbon footprints, improving air quality, and harmonising with national environmental goals.

Limitation of the Study

While the studies selected in this research are all from Asian countries but none of these countries comprise of multi ethnics like Malaysia. Other than that, this study only focuses on the result of the data. Focussing on the process of analysing the data could provide different insight on determinants influencing green vehicles purchase.

Future research

Most of the research conducted used respondents from the same ethnicity and religion. The result could be different in multiracial country likes Malaysia. Thus, future research could focus on these aspects in the future.

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