Determining Generation Y Intention to Purchase Electric Vehicles (EVs) in Klang Valley, Malaysia

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Abstract
With the current climate change challenges, it is imperative that more people are onboard on living a more sustainable lifestyle. One important aspect of this is to purchase an environment friendly car such as Electric vehicles (EVs). However, the obstacle in this effort is the willingness of Generation Y (Gen Y) in Klang Valley to purchase electric vehicles and the influencing variables because of the specific feature they look for when buying a car. The generation is selected based on their representation of significant automotive purchases in Malaysia. This study is guided by the theory of planned behaviour (TPB) to examine three key factors that influence the intention to purchase EVs among Gen Y in Klang Valley, Malaysia: Attitudes, Subjective Norms, and Perceived Behavioural Control. To achieve the research objective, this study employed an online survey which is quantitative approach. Data was gathered from a total of 233 study respondents, consisting of car purchasers (Gen Y) residing in the Klang Valley region. The acquired data was analyzed using SPSS software, including Descriptive analysis, Pearson Correlation Coefficient Analysis and Regression Analysis The findings of the study indicate that there is a positive relationship between Generation Y's behavioural attitudes, subjective norms, and perceived behavioural control variables, and their intention to acquire electric vehicles (EVs). Furthermore, a correlation was found between behavioural views, subjective norms and perceived behavioural control and the inclination to acquire electric vehicles among generation Y. Based on the findings, the theory's context substantiates the elements that influence buying intentions. The research holds significance as it has furnished pertinent insights to electric vehicle (EV) producers in the Klang Valley region and the government regarding strategies to promote the adoption of EVs among Malaysians. Hence, it is imperative to carry out further investigations into alternative urban areas.
Keywords: Behavioral Attitudes, Generation Y, Intention to Purchase, Perceived Behavioral Control, Subjective Norms

Introduction

Electric vehicles (EVs) have significantly contributed to the sustainability of world economic growth. Therefore, it is of critical importance to understand and examine the variables impacting the intention to purchase EVs. Currently, electric vehicles have been effectively developed as a solution to inadequate fossil fuels and environmental challenges such as carbon emissions (Abu-Alkeir et al., 2020). Environmental issues that stem from transportation have increased, making transportation account for 20% of greenhouse gas emissions (Khazaei, 2019). In Malaysia, transportation accounts for the largest portion of greenhouse gas emissions since 2016, accounting for 29%. Thus, in the context of the increasing greenhouse gases in Malaysia, the government has taken multiple actions to introduce policies that aim at reducing these environmental issues. The Malaysian government has introduced the EVs program under the National Automotive Policy 2014 (NAP 2014), which promotes the manufacturing and sales of EVs (Ministry of International Trade and Industry (MITI), 2014).

One of the most affected cities with increased greenhouse gases resulting from transportation in Malaysia is Klang Valley. Within the region, one of the government's policies to limit greenhouse gases from transportation is to encourage people to use electric vehicles (Jain et al., 2022). This aspect ranks Malaysia among the developing nations in Southeast Asia to actively promote the use of electric vehicles. The use of electric vehicles in Klang Valley has significantly changed in the last five years since the government began advocating for such. For example, in the first quarter of 2019, the number of registered electric vehicles in Klang Valley significantly grew by 11% to 1,524 units (Tu et al., 2019). Accordingly, many cities in Klang Valley have adopted long-term electric vehicles development plans. The target of Malaysia is to keep one million cumulative electric vehicles by 2025 across all its cities to promote green development across the major towns. Klang Valley is slowly becoming one of the country's largest markets for electric vehicles. Consumers, especially Gen Y, are looking at this technological improvement to help ensure a green environment and conservation of natural sources of energy.

In Southeast Asia, Malaysia is one of the developing nations with the most significant market share for electric vehicles. In the early years of 2015, Malaysia targeted the development of over 20000 charges, including over 300 fast chargers, by 2020 (Jayaraman et al., 2018). In 2020, the total sales of electric vehicles in Malaysia were 157,771 units, a 21% increase from the sales in 2019. In Klang Valley, electric car purchases were high between 2016 and 2018. In 2019, there was a significant decline in the purchase of electric vehicles across the cities. The examples above indicate that the market prospects for electric vehicles in Malaysia are relatively optimistic across the major cities. Klang Valley is among the regions of Malaysia with significantly increased carbon emissions in the last ten years (Khazaei, 2019). However, the government made positive changes by introducing policies that would reduce the number of carbon emissions. To achieve these targets, the government launched the EV program under the National Automotive Policy 2014 (NAP 2014), which promotes the manufacturing and sales of EVs.

Background of Research

The history of EV production in Malaysia began in the late 1990s through Perusahaan Otomobil Elektrik (Malaysia) Sdn. Bhd. (POEM). This company was established in 1996 as a

joint venture between Tenaga Nasional and Frazer-Nash Research (Kowang et al., 2018). The company introduced Eleksuria as the first electric vehicle, launched in 1997. Electric vehicles were used as personnel transporters during the 1998 Commonwealth Games and 2000 Summer Olympics during these periods. Since the 2000s, more than 500,000 passenger cars have been sold in Klang Valley's domestic market, which is expected to reach 1 million by 2030. It is predicted that vehicles will consume up to 6 million tons of oil and emit over 500 metric tons of carbon gases yearly. In 2016, Klang Valley was ranked among the largest emitter of carbon gases because of increased transportation activities in the region (Lim et al., 2019). The sale of conventional vehicles in Klang Valley is higher than the sale of electric vehicles, which is still a worry because of the potential increase in carbon emissions.

Electric vehicles have become a niche in the automobile industry in Malaysia and have been trying to gain popularity in the past ten years (Kowang et al., 2018). The government has also been introducing measures that aim to increase the adoption of electric vehicles in the country. For example, in 2012, the government introduced a full exemption on import tax to support the adoption of electric vehicles under the 2012 Budget through to 2013 (Singh et al., 2020). As one of the largest markets for automobiles in Malaysia, Klang Valley is primarily dependent on unsustainable fossil-fuel-driven means of transport. The emission of carbon from the transportation sector is increasing within the region and raising a lot of concerns regarding the increasing rates of global warming. The carbon emissions in the region were significant at about 1.56% in 2018, which has contributed to countless deplorable climate-related extremes such as drought, storms, and floods (Xiao et al., 2018). Klang Valley has the most cities emitting carbon gasses that account for about 6.9% of global warming in Malaysia.

Particularly, Malaysia aims at reducing the overall carbon emissions across its states by 30 to 35% by 2025 (Mustapa et al., 2020). In 2018, the petroleum consumption in Klang Valley significantly grew by 4.9% and was projected to experience a further upsurge by 2025. These are some of the concerns that encouraged the government to introduce the EV program under the National Automotive Policy 2014 NAP (2014), which promotes the manufacturing and sales of EVs. The program has effectively increased the adoption of electric vehicles across the country. Malaysian EV program is still an emerging technology, and the market structure and infrastructure required for such development in Malaysia are still inchoate. The purchasing cost of electric vehicles is still higher than the regular petroleum vehicles because of the cost of purchasing the car batteries. Countries such as Norway have a high demand for electric vehicles because of the smaller subsidies such as free parking areas and exemption from road tax (Tanwir & Hamzah, 2020). Various studies have pointed out how the current Gen Y will accelerate the adoption of electric vehicles because of the rapid technological advancements. This feature implies that most researchers have acknowledged the development of electric vehicles and have begun paying attention to the rate of their purchase, especially Gen Y (Vafaei-Zadeh et al., 2022)

Problem Statement
Building on the above discussion, it is imperative that more people purchase a more environment friendly cars such as EVs. However, the most challenging issue is the willingness of Generation Y in Klang Valley to purchase electric vehicles and the influencing variables because of the specific feature they look for when buying a car. The concept of electric vehicles in developing nations such as Malaysia is low, being that the entire concept was

introduced by developed nations such as the US, China, and France (Singh et al., 2020). Recently, Malaysia began to vigorously promote the sale of electric vehicles because of the increasing environmental issues and depletion of natural sources of energy (Tanwir & Hamzah, 2020). With the latest developments in this sector, few researchers have begun to examine the rate of adoption of these vehicles, especially among the current Generation Y because they are the highest buyers of cars. Nevertheless, the research on the intention to purchase electric vehicles in Malaysia is still at the early stage, leading to less knowledge about it. In the context of Malaysia, the sale of electric vehicles has been the lowest and not consistent in the last five years, an aspect that is closely related to the reduced acceptance of EVs. Many researchers believe that Malaysians still do not know the significance of electric vehicles (Tanwir & Hamzah, 2020; Muzir et al., 2022).

A report by Zero Emission Vehicle Association (ZEVA) stated that sales of electric vehicles in Malaysia reached 13,257 units in 2023, bringing the total number of electric vehicles on Malaysian roads to 16,763 units. This number is still low compared to non-EVs which are at 17, 244,978. (nst.com.my, 2023). The Electric Vehicle (EV) market in Malaysia is relatively small but growing rapidly. According to the Malaysian Automotive Association (MAA), 2,717 EVs were sold in 2021, a significant increase from the 1,642 units sold in 2020. The EV market share in Malaysia is still relatively low, accounting for only 0.4% of total vehicle sales. However, with the Government's goal to have 125,000 EVs on the road by 2030, the market is expected to grow in the coming years.

The total number of registered electric vehicles in Malaysia still shows the country's low purchased of the vehicles. In Klang Valley, less than 50 electric vehicles are registered (Jain et al., 2022). Even with introducing the cheapest electric vehicle Hyundai Kona EV in the country, which goes for RM150, 000, there is still a lower rate of adoption of the vehicles in the region. A report by the Malaysian Reserve indicated that the market for electric vehicles is lowering because of the limited knowledge and awareness of the vehicles (Singh et al., 2020). The report further indicated that the lack of awareness among the current consumers, who are comprised of Generation Y, is hampering the growth of the electric vehicles market in the country. K Ravindran, the president of the UMW Toyota Motor Sdn Bhd, indicated that the lack of adequate awareness of the importance of electric vehicles plays a significant role in the reduced acceptance or adoption among Generation Y (Jain et al., 2022). Despite the owners of the vehicles facing the challenge of limited charging facilities, Ravindran expressed that limited awareness was a major challenge among the manufacturers in the country.

Despite the number of registered EVs in Malaysia, some places have the lowest number of EVs, meaning that there is also the lowest acceptance of the vehicles in the region. Because of the lower acceptance of EVs in Malaysia and particularly in Klang Valley, many scholars argue that it is because of the increased costly EVs produced locally or imported from other countries. The least cost of EV in the country is slightly RM150, 000, which is considered costly for many households, especially the current Generation Y. Other scholars argue that the declining sales of EVs are because of the current Covid-19 pandemic that has implicated the economy (Ye et al., 2021). Overall, the Covid-19 pandemic affected the sales volume of various commodities as prices are raging higher (Abu-Alkeir et al., 2020). There are academics who believe that the declining sales are because of the lack of knowledge, awareness, and social demographics that affect the intention to purchase vehicle consumers in the country.

Therefore, this research acknowledges that several variables might affect the intention to purchase EV car in Malaysia. Particularly, this research will explore some of these variables by focusing on the Klang Valley region. Specifically, the research will focus on identifying how the lack of adequate knowledge and awareness and the social demographic variables are affecting the intention to purchase EVs in Klang Valley. More emphasis will be given to the purchase intentions of the current Generation Y living in the region because they are the biggest consumers in buying cars.

Research Objectives, Research Questions and Significance of Study
The main research objective is to determine the variables influencing Gen Y intention to purchase EVs in Klang Valley. Specifically, there are 3 research objectives, namely, To examine the relationship between behavioural attitudes and Gen Y intention to purchase EVs in Klang Valley, To examine the relationship between Subjective Norms and Gen Y intention to purchase EVs in Klang Valley and To examine the relationship between Perceived Behavioral Control and Gen Y intention to purchase EVs in Klang Valley. The primary research question is what the variables are influencing Gen Y's intention to purchase EVs in Klang Valley Cities, Malaysia. This is followed by the 3 specific research questions; Is there a relationship between Behavioral Attitudes and Gen Y intention to purchase EVs in Klang Valley, Is there a relationship between Subjective Norms and Gen Y intention to purchase EVs in Klang Valley and Is there a relationship between perceived behavioural control and Gen Y intention to purchase EVs in Klang Valley?

The study results will benefit the consumers, manufacturers, and the government. This study may benefit the researcher in consumer intention to purchase EVs in Klang Valley, where a total of not less than 187 charging stations are available throughout the Klang Valley area. There is previous research done on finding the acceptance level of EVs among Individual Consumers in Malaysia. However, in this research, we zoom further into Generation Y as our subject and the intention to purchase, specifically in behavioral Attitudes, Subjective Norms, and Perceived Behavioral Control. Gen Y is a mature professional (mid Management), and they encompass one of the major car owners. This study could pave further the understanding of EVs and their acceptance among Gen Y, and this information is helpful for customers' buying behaviors further. The government would benefit by implementing policies that would increase the purchase of cars that reduce carbon emissions from the transportation sector. This is achieved by first understanding the Gen Y intention to purchase EVs in the context of behavioral attitudes, subjective norms, and perceived behavioral control, which is explored in this research study.

The current research will mainly examine the relationship in Gen Y with the intention of purchasing EVs. The generation is part of the current generation that holds the key to the success of the automobile industry. The study will focus on Malaysia, specifically among the Klang Valley cities, one of the country's most significant areas. Klang Valley is one of the regions that have recorded reduced sales of electric cars in the past few years, especially during the current period of the Covid-19 pandemic. The research will examine the purchase of EVs in the last five years to determine the trends among Generation Y. Historically, the research will rely on the articles and journals about the same issues which were published in the last five years. This feature will help attain the most recent information about the variables that affect the adoption of EVs in Klang Valley among Generation Y. The study will

specifically examine behavioral Attitudes, Subjective Norms, and Perceived Behavioral Control. These three variables affect EVs' purchase intention among Generation Y in Klang Valley.

Literature Review

Many academic scholars have examined the variables that influence Gen Y intention to purchase of EVs. The studies have examined the variables that affect Gen Y buying intentions on EVs. In the previous chapter, the research introduced the main research problem, and the research questions it seeks to answer. In this chapter, the primary purpose is to examine the contributions of the previous scholars in answering the current research questions. The focus will be on their findings on the relationship between the variables that affect Gen Y intention to purchase EVs. Also, this chapter will examine some theoretical underpinnings that will help us understand the main problem the research seeks to solve. A conceptual framework and research hypotheses will be formulated to show the possible relationship between independent and dependent variables. The dependent variable in the research is Gen Y intention to purchase, while the independent variables include behavioral attitudes, subjective norms, and perceived behavioral control. The chapter will mainly present historical and theoretical aspects of the research problem.

Behavioral Attitude

In psychology, an attitude refers to a particular way of thinking and feeling towards something. It refers to the degree of adverse and favorable evaluations of the behavioral consequences (Ye et al., 2021). In the context of the current research, an attitude refers to the opinions and feelings of the consumers towards EVs and their behaviors as a result of the opinions and feelings. It relates to what the consumers think or believe about EVs and the potential consequences of such beliefs and opinions on their behaviors. The attitudes towards the purchase of vehicles entail what the customers consider as the potential outcomes after they have decided to purchase the cars.

Subjective Norms

Theoretical Framework of the Theory of Planned Behavior (TPB): subjective norms refer to social influence from significant people and their expectations towards a particular behavior. Subjective norms indicate the perceived social pressure/approval a person thinks will result during adapting the given activity and the unseen one. The idea is based on the belief that people's behaviors are not merely influenced by their own attitudes and opinions, but also by society around them.

Subjective norms refer to combining normative beliefs and motivation. Also, normative beliefs involve an individual's perspective on the views of referents in society that support or oppose a specific behaviour of their conduct. Family, friends, colleagues, or even society as a whole can be the referent individuals. Hence, subjective norms signify the expectations of those close persons with regard to the social norms which should be complied, as well as those motivations that prompt to fulfill the same social norms or refrain from their implementation.

Perceived Behavioral Control

One element derived from Theory of Planned Behavior (TPB), Perceived Behavioral Control is that measure how hard it will be to engage in specific behavior as viewed by the individual. Essentially, it portrays how much an individual feels they are able to perform that particular activity. The control is subjective to factors that are either internal or external and include individual skills, resources, availability, and constraints from outside influences.

People who have a strong sense of behavioral control believe that they can act because they are equipped with relevant abilities and resources. However, an individual who has low perceived behavioral control may not be able to execute the behaviour because of constraints such as external factors or low abilities.

Intention to Purchase

In psychology, purchase intention refers to the customers' attitude towards a particular purchasing behavior and their degree of willingness to pay (Kowang et al., 2018). Intention to purchase may signify the willingness of a customer to buy a certain product or a certain service from the seller or producer. In the current research, the intention to purchase refers to the measure of customers' attitudes toward purchasing EVs, and it is determined by the variables affecting their attitudes and perception. It is the willingness of the customers to buy the EVs or the measure of their propensity to buy the vehicles. Overall, it is the intention of the customers to make a purchase. The theory of planned behavior indicates that purchase intention is an excellent determinant of purchasing behaviors.

Generation Y

Generation Y, popularly denoted as Gen Y, is also referred to as the Millennials. They represent the demographic cohort that follows Generation X and precedes Generation Z. People who fall within this generation are born between the 1980s and early 2000s (1981 to 1996) (Xiao et al., 2018). Currently, these people are between 25 and 40 years old. Often, people within this generation are described as confident and ambitious. They are the internet generation and are thought to be more family-oriented and willing to sacrifice career advancement for an effective work-life balance. In the research context, Gen Y was chosen because they are the first to adopt digital communication; hence, they are regarded as tech-savvies.

Electric Vehicles (EVs)

EVs refer to a shortened acronym for an electric vehicle. EVs are regarded as vehicles that are either fully or partially powered on electric power, which they use to move to their next destinations (Mustapa et al., 2020). Most of these electric vehicles have low running costs because they have fewer moving parts for maintenance. They are also environmentally friendly since they use little or no fossil fuels (diesel or petrol). Examples of electric vehicles include Tata Tigor EV, Hyundai Kona Electric, Mahindra e2oPlus, and Mahindra e-Verito. In the context of this research, EVs refers to vehicles that use no fossil fuels and rely solely on electric power to move.

Theoretical Underpinning

The underpinning theory in this study is the theory of planned behavior (TPB), which links individuals' beliefs to their behaviors. Icek Ajzen proposed the theory in 1985 in his chapter

"From intentions to action: A theory of planned behavior" (Bosnjak et al., 2020). The theory maintains that three core components, subjective norms, attitude, and perceived behavioral control, will shape the behavioral intentions of individuals. These behavioral intentions are the most proximal determinant of human social behaviors. The theory was developed from the idea of reasoned action, and they argue that certain individual behaviors are determined by their behavioral intentions. These behavioral intentions are simultaneously influenced by the subjective norms and attitudes of the individuals. Behavioral intentions measure the degree of willingness of the individuals to engage in a particular behavior. A subjective norm refers to the perceived social pressure that an individual will receive upon performing a specific behavior. When these subjective norms are influenced, they have more impact on behavioral intentions (Bosnjak et al., 2020). Perceived behavioral control measures the difficulty an individual will experience when practicing a specific behavior.
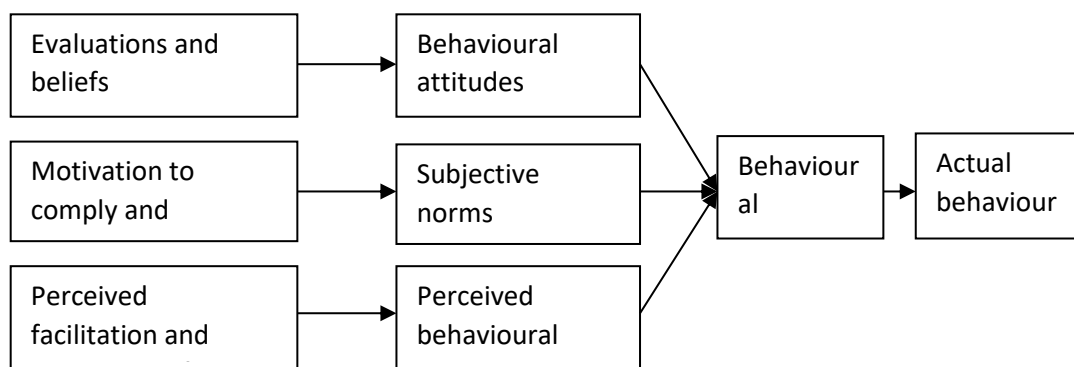

Figure 1: Theory of planned behavior

Theory of planned behavior advocates that the perceived behavioral control will affect behavioral intention in addition to attitude towards subjective norms and behaviors. In the context of the theory, the three components work to influence the purchasing intentions of Generation Y on EVs. The theory is constructed on the expectancy-value model of attitude, which argues that the attitude of individuals to buy EVs is based on their beliefs (Bosnjak et al., 2020). The importance of the theory in the current research is that it incorporates several variables aiming to predict the probability of a customer staying with the same behavior or making a behavioral change when making purchases. This study believes that the three components of the theory could affect the behavioral intentions of the generation from buying the EVs and influence their behaviors in selecting the best vehicles. The interpretation of the theory in this context is feasible under three facets.

The first facet is attitude, which refers to the degree of adverse or favorable evaluation of the consequences of a particular behavior. The assessment can result in negative or positive outcomes. In the context of the current research, the attitude of Generation Y towards purchasing EVs entails proper considerations of the potential outcomes, such as the performance of the vehicles. The second facet is the subjective norm, a social situational variable that serves as social pressure or others' expectations felt by consumers after performing a behavior. In the context of the current research, it refers to the belief that people will approve or disapprove of the purchase of vehicles. Families, friends, and societal pressures will determine the customers' behavioral intentions of using the EVs and selecting one. The third facet is the perceived behavioral control, which is the perception of customers

about the ease or difficulty in performing the behaviors. This facet is connected to the customers' ability to purchase vehicles and the perceptions about their ease of use.

Conceptual Framework and Hypotheses Development
Based on the theoretical framework (theory of planned behavior) discussed above, the research has drawn three major variables that influence Gen Y intention to purchase EVs. The influencing variables are behavioral attitudes, subjective norms, and perceived behavioral control which will serve as the independent variables in the study. The dependent variable identified is the acceptance of the customers of EVs, which is indicated by their intentions to purchase the vehicles. On the other hand, a hypothesis refers to a statement of expectation or prediction that this research will test. It refers to a proposed explanation or supposition that researchers make without evidence by stating a point that requires further investigation. In that context, the following shows the formulated conceptual framework and hypotheses. The hypotheses that the study will test will mainly comprise the alternative hypotheses.
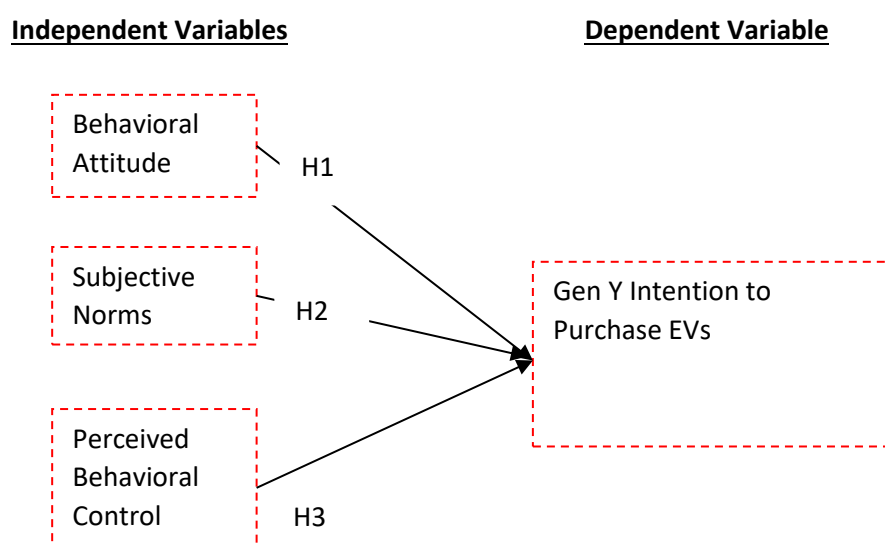

Figure 2: Hypotheses

From the figure, the three hypotheses for this research will test the relationship between the independent variables and dependent variables as follows:

H1:   There is a relationship between behavioural attitude and Gen Y intention to purchase EVs in Klang Valley.
H2:   There is a relationship between subjective norms and Gen Y intention to purchase EVs in Klang Valley.
H3:   There is a relationship between perceived behavioral control and Gen Y intention to purchase EVs in Klang Valley.

Dependent Variables
Behavioral Attitude (BA)
Behavioral Attitude is one of the major variables that affect the intentions of Gen Y into purchasing EVs because it is directly related to their behavioral tendency. Consumers' attitude is summarized as their tastes, preferences, and endorsements used when making purchasing

decisions (Krishnan & Koshy, 2021). There are four major components of attitude that would shape the purchasing intentions of Gen Y on EVs. The first component is the price of the cars. The current generation is more sensitive to the price of goods and services. They believe that higher prices are reflected through higher quality of the same goods and services. With lower prices, the consumers will form lower perceptions or expectations of the quality of the electric vehicles, and they will choose counterfeits when there are some price advantages. The second component is brand awareness (Tu & Yang, 2019). Consumers would mainly purchase brands they are fully aware of. The brand-conscious consumers are more selective, and they will buy well-known brands and are willing to buy cheaper vehicles to meet their needs.

The third component is a risk. Since most consumers are likely to purchase brands, they are well aware of, they are likely to develop perceived risks. For example, customers may think about developing pre-purchase uncertainty about the degree and type of expected loss resulting from the use and purchase of the vehicles (Tu & Yang, 2019). Perceived risk is the most important variable that would predict the consumers' attitude toward buying electric vehicles. Most customers will experience the judgment on the potential and probability of problems occurring after the purchase of vehicles. The judgments will influence their purchasing decisions. The last component is integrity, which is similarly important as the perceived risks (Krishnan & Koshy, 2021). For example, if customers value integrity, their chances of viewing conventional vehicles as alternatives to EVs are less. However, if the customers do not value integrity, their chances of buying alternative conventional vehicles are high. This feature implies that integrity positively influences the customers' behavioral attitudes toward alternative vehicles to EVs. The above discussion supports H1.

Subjective Norms (SN)
Research studies related to consumer behavior and consumer decision making have focused on the effects of subjective norms on consumer intention toward purchase. The subjective norm theory underlined by TPB refers to the expected peer pressure that people perceive will be upon them over a certain purchase. Lots of studies have examined this complicated relationship between social influences and consumer intentions, explaining complex patterns of intersubjective norms.

According to Yan et al (2019), social influence plays a major role in explaining consumer intent. Examples of these factors constituting subjective norms include friends' opinions, relatives', and those of peers. According to research done by Ajzen (1991), subjective norms are influenced by what an individual believes and assumes about significant others' approval or disapproval of certain behavior. Normative influences on buying from a consumer perspective, can be via word of mouth/gossip, social media networks, or cultural trends.

In addition, the literature examines the significance of reference groups on influencing consumer intentions. The primary reference groups that play a significant role in forming subjective norms include individuals whom consumers recognize and would be willing to be like. According to social identity theory, people usually exhibit behaviors that are similar to those of their friends or reference group. This is because they want to accept themselves as a member of this group. This is especially true in consumer markets which associate items with certain styles of life or different groups of people.

Besides, subjective norms are greatly influenced by culture and society which in turn affect consumers' intended behavior. Cultural notions about consumptive behaviors, social class considerations, and being "in" are powerful determinants of what is seen as appropriate or desirable in many people's minds. It is vital in understanding the cultural dynamics in which subjective norms work among different consumer segments.

Perceived Behavioral Control (PBC)
The role of PBC as an antecedent in predicting and explaining consumer intention is one of the most popular research topics in consumer behavior and decision making. The Theory of Planned Behaviour views perceived behavioural control as people's feeling of how hard it is to do something. PBC refers to one's self-efficacy in buying behavior and how it can be facilitated or impeded by both internal and external forces.

Literature review has shown the importance that one's perception on behavioral control plays in developing consumer intentions. It has been shown that consumers are likely to state their intent toward purchase when it has been perceived to be a higher level of control in the consumer purchasing process. The skills, knowledge and confidence of an individual acts as an internal factor determines the level of PBC in consumer decision making. For instance, it has emerged out of numerous studies that consumer perception of behavioral control can be enhanced when one feels competent on things like reading product information, navigating online sites or examining product quality leading to increased purchase intentions.

The consumer's subjective norm perception is influenced by other external factors, as well. These components (accessibility, convenience and resources) are important factors in the purchase behavioral intention (PBC). Examples of the consumer purchasing control include ease of navigation on the site, customer support and the simpleness of the purchase process. Taylor and Todd (1995) in their research stress the importance of external factors, which indicate that the perceived ease-of-use of technology substantially affects individuals perceived behavioral control regarding adapting technology. In the research carried out by Venkatesh et al (2003) within the scope of adoption of technology, it has been observed that perceived behavioral control, especially perceived ease of use, strongly determines users' intentions to accept new innovations.

Research Methodology
Research Design
The choice of a research design often depends on the context of the research problem that seeks to be solved. Therefore, it refers to the overall method chosen by researchers to integrate the various components of a study Siedlecki (2020) coherently and logically. Most of the mainstream researchers that have discussed the variables that influence Gen Y intention to purchase electric cars have used quantitative research designs to structure their overall data collection and analysis. In most of these mainstream researches, the researchers argue that the problem is best analyzed by collecting quantitative information from the research respondents. Other scholars have argued that the difficulty in adopting the qualitative in similar research is that there are higher chances of ambiguous findings, which makes generalizability difficult. The current research adopted a quantitative research design to supervise the overall data collection and analysis.

Population and Sampling

The population identified included people within the context of Gen Y. The generation was specifically chosen because they are primarily associated with the current technology and have a high preference for expensive cars. Therefore, in the current research, 233 respondents were sampled, comprising Malaysian car consumers living in Klang Valley in Malaysia. Because the research chose the population from Gen Y, most of the participants were between the ages of 25 and 40.

On the other hand, Gen Y in Malaysia constitutes about 40% of the entire population. In Klang Valley, 45% of the population is categorized as Gen Y. This feature implies that this group is huge and cannot be effectively studied because of time and financial constraints. Therefore, it was advisable that the research only selects a portion of the population representing the entire population. In that case, only 233 research respondents were selected using the convenience non-probability sampling technique. Because Gen Y is the largest population in Klang Valley, it was important for the researcher to only use the reachable respondents and available respondents for the research. This way, the convenience sampling method was the best alternative.

Data Collection and Procedure

In most of the previous studies that have been researched the variables that affect the purchasing intentions of customers on EVs, questionnaire surveys have been the most preferred method of collecting quantitative information. Therefore, a questionnaire survey was the chosen method to collect data from the research participants in the current research. The questionnaire was divided into two sections. The first section contained demographic information of the research participants. Some of the information contained in this section included Gender, Age, Annual Income, Education, and Marital Status. In the second section, the questionnaire survey contained the questionnaire questions that helped in collecting information from the research participants. The questions were developed based on a close-ended format, meaning that the respondents were to answer questions based on the options given. The Likert Five-Point scale was used to determine the level of agreement of the research participants with sets of statements. After developing the questionnaire questions, they were distributed to the research participants in the form of Google Forms through their emails. Thus, the respondents were each given between 30 and 40 minutes to respond to the questionnaire questions. After responding to the questionnaire questions, they returned the Forms to the researcher, who examined for potential biases such as incomplete responses. All the questionnaire documents were valid and were used for data analysis.

Data Analysis

Three procedures guided the overall data analysis in the current research. These procedures included Descriptive analysis, Regression Analysis, and Pearson Correlation Coefficient Analysis. Descriptive analysis is where the researcher describes, shows, and summarizes data points constructively such that patterns emerge that fulfill every condition of the data. Regression analysis is where the researcher examines the strength of the relationship between dependent and independent variables used in the study. Pearson Correlation Coefficient analysis is where the researcher measured the statistical relationship, or association, between dependent and independent variables. It was the best-known method of measuring the association between variables because it is based on covariance.

Results and Analysis

Table 1

Gender representation in the study

		Frequency	Percentage (%)
Valid	Female	121	51.93
	Male	112	48.07
	Total	233	100.0

Table 1 shows gender distribution a total of 233 respondents who participated in the data collection process. Based on the table, 51.93% of the participants (121) were Females, whereas the other 48.07% (112) were Males. Based on the table, the female participants were higher than the male participants by 3.86%. The applicability or generalizability of the outcomes could have been limited to females more than males.

Age

Table 2

Age distribution of the research participants

Age	Number of respondents	Percentage (%)
25 to 29	52	22.31
30 to 35	100	42.92
36 to 40	81	34.77
Total	233	100

From Table 2, it is demonstrated that there is substantial emphasis on the age category of 30 to 35-year-olds, as they make up the greatest number at approximately 43%. In contrast, the age group of 25 to 29, which accounts for around 22% of the respondents, seems to be considerably underrepresented. This indicates possible constraints in reaching out to them for the survey or biases in their participation. Conversely, the age group of 36 to 40, including approximately 35% of the participants, falls in a moderate position between the other two groups.

Annual Income

Table 3

Annual income distribution of the research respondents

Annual Income Level	Number of Respondents	Percentage (%)
RM2000 to RM3000	45	19.3
RM3001 to RM4000	57	24.5
RM4001 to RM5000	82	35.2
Above RM5000	49	21
Total	233	100

Table 4.3 illustrates the frequency distribution of respondents' yearly earnings among four distinct income categories: RM2000 to RM3000, RM3001 to RM4000, RM4001 to RM5000,

and above RM5000. Within these categories, the category with the biggest number of respondents is RM4001 to RM5000, which represents 35.2% of the total respondents. The RM3001 to RM4000 range, which accounts for 24.5% of the respondents, closely trails behind. In contrast, the responses falling between RM2000 to RM3000 and above RM5000 groups account for 19.3% and 21% of the total, respectively.

Educational Level
Table 4
Educational Level of Research Participants

Education Level	Number of Respondents	Percentage (%)
Diploma	42	18
Bachelor's degree or equivalent	62	26.7
Master's degree	42	18
Doctoral degree	45	19.3
Professional degree	42	18
Total	233	100

Based on Table 4, the data supplied presents an overview of the distribution of education levels among the respondents, categorized into five groups: Diploma, bachelor's degree or equivalent, master's degree, Doctoral degree, and Professional degree. The largest proportion of participants is evenly distributed among the categories of bachelor's degree or equivalent, master's degree, and Professional degree, with each category accounting for 18% of the overall respondents. Conversely, individuals holding Doctoral degrees account for 19.3% of the overall sample, and those with Diplomas make up 18%.

Marital Status
Table 5
Marital status of the research participants

Marital Status	Number of Respondents	Percentage (%)
Married	109	46.8
Single	124	53.2
Total	233	100.0

From Table 5, 109 respondents are married and 124 are single. Overall, 53.2% of the research 46.8% were married, while 53.2% of the participants were single

Reliability and validity tests for the variables
Table 6
Reliability Test
Reliability Statistics

Cronbach's Alpha	N of Items
.851	12

From the above table, the alpha coefficient for all the items from both the dependent and independent variables was .851, indicating that the variables had a high internal consistency. This aspect implies that the accepted level of reliability with the variable is 85.1% and that the items under these variables are highly correlated. Therefore, because of the high reliability percentage, the responses of the research participants under these variables are highly reliable in answering the research questions.

Pearson Correlation Analysis
Table 7
Pearson correlation

	Behavioral Attitude	Subjective Norms	Perceived Behavioral Control	Gen Y Intention To Purchase EVs
Behavioral Attitude	1	0.525	0.247	0.412
Subjective Norms	0.525	1	0.498	0.597
Perceived Behavioral Control	0.247	0.498	1	0.502
Gen Y Intention to Purchase EVs	0.412	0.597	0.502	1

From the above Table 8, the correlation analysis provides valuable insights into the relationships between the independent variables (Behavioral Attitudes, Subjective Norms, And Perceived Behavioral Control) and the dependent variable (Gen Y Intention To Purchase EVs). The correlation coefficients and associated significance levels are indicative of the strength and statistical significance of these relationships.

Firstly, examining the correlation between Behavioral Attitudes and Gen Y intention to Purchase EVS, a statistically significant positive correlation of 0.412** is observed (p < 0.01). This suggests that individuals with more positive behavioral attitudes towards electric vehicles tend to have a higher intention to purchase them. Therefore, there is a significant relationship between behavioural attitude and Gen Y intention to purchase EVs in Klang Valley (H1).

Moving to the correlation between Subjective Norms and Gen Y Intention to Purchase EVs, a stronger positive correlation of 0.597** is found (p < 0.01). This implies that the perceived social influences or norms significantly contribute to the respondents' intention to purchase electric vehicles. This indicates there is a relationship between subjective norms and Gen Y intention to purchase EVs in Klang Valley (H2).

Similarly, the correlation between Perceived Behavioral Control and Gen Y Intention to Purchase EVs, is also statistically significant at 0.502** (p < 0.01). This suggests that individuals who feel more in control of their ability to adopt electric vehicles are more likely to express a higher intention to purchase them. Hence, there is a relationship between perceived behavioral control and Gen Y intention to purchase EVs in Klang Valley (H3).

In summary, the correlation analysis demonstrates statistically significant positive relationships between each of the independent variables (Behavioral Attitudes, Subjective Norms, And Perceived Behavioral Control) and the dependent variable (Gen Y Intention to

Purchase EVs). These findings suggest that individuals with more positive attitudes, stronger perceived social norms, and higher perceived behavioral control are more inclined to express a greater intention to purchase electric vehicles. The significance levels (p-values) below 0.01 indicate a high level of confidence in the correlations observed.

Regression Analysis
Table 8
Multiple Linear Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.653ᵃ	.427	.419	.38038

a. Predictors: (Constant), Perceived Behavioral Control, Behavioral Attitudes, Subjective Norms

The result of the summary model indicates that the output of the regression analysis is 42.7% fit to conduct prediction of Gen Y intention to purchase EVs since R-squared = .427.

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.650	3	8.217	56.789	.000ᵇ
	Residual	33.134	229	.145		
	Total	57.784	232			

a. Dependent Variable: Gen Y Intention to Purchase EVs
B. Predictors: (Constant), Perceived Behavioral Control, Behavioral Attitudes, Subjective Norms

The ANOVA results indicate that there is some significant variability between the groups in terms of the intention to purchase electric vehicles. The F-ratio, which is calculated as the ratio of the Between-Group Mean Square to the Within-Group Mean Square, can be used to test the statistical significance of these differences. A higher Between-Group Mean Square relative to the Within-Group Mean Square would contribute to a larger F-ratio, suggesting potential significance.

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.757	.239		3.169	.002
	Behavioral Attitudes	.133	.055	.141	2.400	.017
	Subjective Norms	.385	.065	.387	5.885	.000
	Perceived Behavioral Control	.268	.056	.274	4.751	.000

a. Dependent Variable: Gen Y Intention to Purchase EVs

The presented coefficients are derived from a regression analysis aimed at examining the relationships between predictor variables (Behavioral Attitudes, Subjective Norms, Perceived Behavioral Control) and the dependent variable, Gen Y Intention To Purchase EVs. Each coefficient provides insights into the magnitude and direction of the influence that the corresponding predictor variable has on the dependent variable.

The intercept term, represented by the constant (.757), indicates the expected value of the dependent variable when all predictor variables are zero. In this case, the intercept is statistically significant (t = 3.169, p = .002), suggesting that even when all predictors are zero, there is a significant non-zero expected value for the intention to purchase electric vehicles.

Moving to the predictor variables, Behavioral Attitudes, Subjective Norms, and Perceived Behavioral Control, their unstandardized coefficients (B) represent the change in the dependent variable associated with a one-unit change in each predictor, holding other predictors constant. The standardized coefficients (Beta) provide a measure of the strength and direction of the effect in standard deviation units.

For Behavioral Attitudes, the unstandardized coefficient is .133, suggesting that a one-unit increase in Behavioral Attitudes is associated with a .133-unit increase in the dependent variable, Gen Y Intention To Purchase EVs. The standardized coefficient (Beta) is .141, indicating a moderate positive effect in standard deviation units. This effect is statistically significant (t = 2.400, p = .017), implying that Behavioral Attitudes have a meaningful impact on the intention to purchase electric vehicles.

Similarly, Subjective Norms and Perceived Behavioral Control also show statistically significant positive effects on the intention to purchase electric vehicles. A one-unit increase in Subjective Norms is associated with a .385-unit increase in the dependent variable, with a standardized coefficient (Beta) of .387 (t = 5.885, p = .000). Likewise, a one-unit increase in Perceived Behavioral Control corresponds to a .268-unit increase in the dependent variable, with a standardized coefficient (Beta) of .274 (t = 4.751, p = .000).

Based on the regression analysis, it was revealed that Behavioral Attitudes, Subjective Norms, And Perceived Behavioral Control are all significant predictors of Gen Y Intention To Purchase Electric Vehicles. The standardized coefficients help gauge the relative strength of these predictors, emphasizing their importance in influencing individuals' intentions to adopt electric vehicles.

Discussion, Conclusion, and Recommendation
Based on the summary of results in the previous section, this chapter offers a discussion of each independent variables influencing Gen Y Intention to Purchase EVs. Most of the results from the analysis are consistent with previous literature that discussed the potential factors affecting the purchase of EVs.

Behavioral Attitude
The study results demonstrated that behavioral attitude affects the Gen Y Intention to Purchase EVs. Individual attitudes hugely affect the purchase intention of goods and services, especially the current Generation that values information (Krishnan & Koshy, 2021). In the

purchase of other goods and services, there are three major attitude factors that affect the purchase intention. These attitude factors include risk, price, and personal gratification. For example, if customers find the prices too high in normal goods, there is an increased possibility that they will purchase the goods. However, in luxury goods, prices are used to determine the quality of the goods. In that case, high prices will attract intention to purchase (Ng et al., 2018). The effect of attitude on the intention to purchase on the other goods can also be applied in the current case of EVs in Klang Valley. People will buy these vehicles based on their thoughts and opinions of the cars, such as their perceived performance, distance range, and efficiency. When all these factors are not met, there are increased chances that Gen Y, who values information and technology, would not purchase vehicles.

Attitude toward EVs has played a significant role in purchasing, especially among Gen Y. People have different attitudes towards these vehicles, which reduces their purchasing intentions (Okada et al., 2019). For example, some think that these vehicles are expensive, and they cannot afford them. Others believe that because these vehicles are electric powered, they cannot go for longer journeys being that the charging stations are still limited. These attitudes will reduce EVs' adoption, acceptance, or intention to purchase.

For example, the result established that Gen Y in Klang Valley believes that these vehicles are excellent in helping to fight carbon emissions and eliminate environmental issues. Others also believe that these vehicles have a high-performance rate with great speed and engine performance (Tu & Yang, 2019). These factors will increase the intention to purchase of the population. Therefore, the attitudes of people can greatly impact the purchasing intentions towards EVs based on the factors that discourage or attract the consumers towards the acceptance of EVs.

Subjective Norm

Electric vehicles purchased by Gen y is greatly influenced by subjective norms. These perceptions are related to social pressures emanating from friends, parents, other peers and other forms of society's expectations. For Gen Y, subjective norms play an important part in influencing attitudes and the intention to purchase electric vehicles.

Peer pressure is crucial among many Gen Y individuals. These social circles are instrumental in establishing a trend, whereby one's attitude has to conform to how others perceive the EV acceptability. Social conformities may also push Gen Y people to consider EVs as a result of seeing their peers experience positive things while using electric cars.

Another important element of subjective norms is family influence. Gen Y individuals are greatly affected by their respective choices or attitudes held by their family members. It shows family norms based on which people can choose automobiles. Subjective norms relating to EV intention to purchase is influenced by family dynamics, common values, and between-generation discussions.

Furthermore, subjective norms are created by the larger societal environment. When societal forces point at sustainability, environmental obligation, greenness then it becomes a social expectation, as a result, generation Y will be compelled to agree to them. Reinforcing societal

norms through social media, environmental campaigns, and public discourse can foster intention to purchase EVs in society.

Subjective norms are made up of several facets such as social norms and normally, one of them is termed as normative pressure. Normative pressures can be experienced by Gen Y individuals if they consider purchasing EVs as both environmental-friendly and socially correct. Normative pressure is influenced by peer desire to assimilate, seek social approval or match to perceived societal values that can affect EV purchased.

Perceived Behavioral Control
The perceived Behavioral Control has a major influence on the willingness of the Gen Y segment to buy the electric vehicles, indicating its belief in it. This theory is based on the Theory of Planned Behavior and focuses on how people perceive themselves as able to influence the causes of a certain type of action. The perception of control that Gen Y feels towards EVs is complex involving different elements.

Another important factor is the availability of charger infrastructure. They will accept EVs by Gen Y, if they find their stations easily accessible and reliable. Ensuring ready to use charging facilities boosts their perception of owning EV as viable option under practical considerations.

Boosting perceived behavioral control necessitates addressing issues such as range anxiety. Range anxiety is addressed by technological advancements including enhanced battery range alongside a fully developed charging network. It improves Gen Y people's sense of power on how they will incorporate the usage of an electric car into their daily life activities.

Perceived behavioural control involves financial aspects such as the cost of buying an EV and operational cost. Gen Y perceives control over financial aspects of EV adoption due to the government inducements and subsidies as well as affordability of EVs. Making the switch to electric cars, makes them afford it as well as assuring them of their financial feasibility.

Conclusion
In conclusion, the research has established that behavioural attitude, subjective norm, and perceived behavioral control of EVs will affect Gen Y's intention to purchase EVS in Klang Valley. Since the introduction of EVs in Malaysia more than ten years ago, there have been reduced purchases, especially among Gen Y consumers. Many studies have attempted to associate various variables with Malaysia's low acceptance of vehicles. Different researchers have used different variables and theories, such as the theory of planned behaviour, to examine the responsible factors. The current research adopted the behavioural attitude, subjective norm, and perceived behavioral control variables to determine how they are influencing the Gen Y acceptance of EVs in Klang Valley, Malaysia.

A quantitative research design was adopted, and data was collected using questionnaire surveys from 233 research participants, who were mainly Gen Y population. Data were then analyzed using regression analysis, Pearson correlation, and descriptive analysis to determine the relationship between the acceptance of EVS and the identified variables. After the analysis, the research found a positive and significant relationship between the three factors and the purchase intention. Subjective norm was among the factors that largely determined

the purchase intention of the generation on acceptance of the EVs. The research concluded that EVs' behavioral attitude, subjective norm, and perceived behavioral control affected their acceptance among Gen Y in Klang Valley, Malaysia.

Recommendation

This research collected information from Gen Y living in Klang Valley, Malaysia. The results must be hard to generalize because of the different perceptions of people and location. There is a need for future researchers to investigate the same research problem using a population from different locations. It is also recommended that future research be qualitative to capture the exact opinions and thoughts of the research respondents on the factors influencing their purchase intentions on EVs.

The discussion of the research is limited to Gen Y, who are currently between 25 and 40 years old. This aspect means that it is difficult to generalize the findings to other generations because each generation has different characteristics. Therefore, future researchers should capture other generations in their sample population. Additionally, the study was oriented toward consumer demand and ignored EV-related technologies. Consequently, it is recommended that future researchers should connect industry and consumers from the industrial and technological perspectives of electric vehicles.

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