

# Impact of Perceived Value on Customer Adoption: Examining the Moderating Effect of Perceived Risk Towards Alternative Fuel Vehicles

Jayani H.K.D.H.M<sup>1</sup>  
N T Hewapathirana<sup>2</sup>  
Thilina Dk<sup>3</sup>

---

## ABSTRACT

The technological development of the transportation modes, non-fuel-based vehicle concept becomes the most challenging customer decision. Using internal combustion engines will cause damages to the environment by producing deleterious emissions and fossil fuels. The movement to alternative fuel vehicles (AEVs) as a sustainable transportation method supports reducing environmental issues. As it found the grey area in knowledge in Risk and benefits in the context of AEVs, this study aimed to improve the current understanding of the risk-benefit relationship concerning intentions to adopt AFVs. This study is based on five dimensions of perceived values to measure the intention to adopt AFVs by associating perceived risk and consumer attitudes. The current investigation is based on 399 consumers, and the results depicted that quality, price, emotion, social, and ecological values greatly impact consumer attitudes towards AFVs. However, as a moderator, perceived risk impact only social and emotional values with consumer attitudes.

**KEYWORDS:** Alternative Fuel Vehicles, Consumer Attitudes, Ecological Value, Emotion Value, Perceived Values, Perceived Risk

---

Date of Submission: 08-09-2022

Date of Acceptance: 24-09-2022

---

## I. INTRODUCTION

Transportation has become an integral component of the whole world. The evolution of transportation has brought humans from simple canoes to space travel, and there is no telling where human beings could go next and how they will get there (Nguyen, 2020). Transportation was, is, and will be the most significant matter in human lives, giving one definition to transportation will not fulfill the gap. Because sometimes it is a kind of trip between two places, a journey supports bringing heavy goods from one place to another and a movement of a battlefield like war or sometimes it is used for trade and business activities. So, transportation makes a big contribution to the market to maintain the stability of the daily activities to gain palmy economy. With technology development, the transportation industry produces high technological movement modes by introducing high technological advancements. In modern society, humans are carried away on the sustainable environment around technological advancements. In line with this, environmentally favorable mobilities become more popular among people because they produce low emissions and those vehicles are more concerned with society's sustainability.

The boost of the vehicles is badly affected to a sustainable environment. Environmental pollution makes harmful effects on the health of people as well as the whole world that it will lead to a lower the healthiness of individuals. In accordance with Air Resource Management Centre (AIRMAX), there are five sources of air pollution, and the transportation sector can be identified as the major source. According to the air quality report of Sri Lanka 2012, Air pollutants associated with vehicle emissions include Particulate Matter (PM), Lead Aerosol, Oxides of Nitrogen (NOX), Ozone (O3), Carbon Monoxide (CO), Sulfur Dioxide (SO2) and Volatile Organic Compounds (VOC). As it changes the environment by using transportation modes, we abide to protect the environment. Therefore, everyone must look carefully at the environmental changes from using transport modes.

However, today most people prefer greener concepts (Whitmarsh, 2009) because that they try to convert their traditional consumption activities to eco-friendly activities. Dash, 2012 explores (as cited in Panday and Bansal, 2014) investment in greener cars, capitalization of under-utilized areas, and infrastructure development will enhance economic growth and reduce emissions. As an example, the Indian government has taken different policies for encouraging greener society among their people such as 'National Electric Mobility Plan', 'National Mission for Electric Mobility, and 'National Hybrid Propulsion Program' to promote

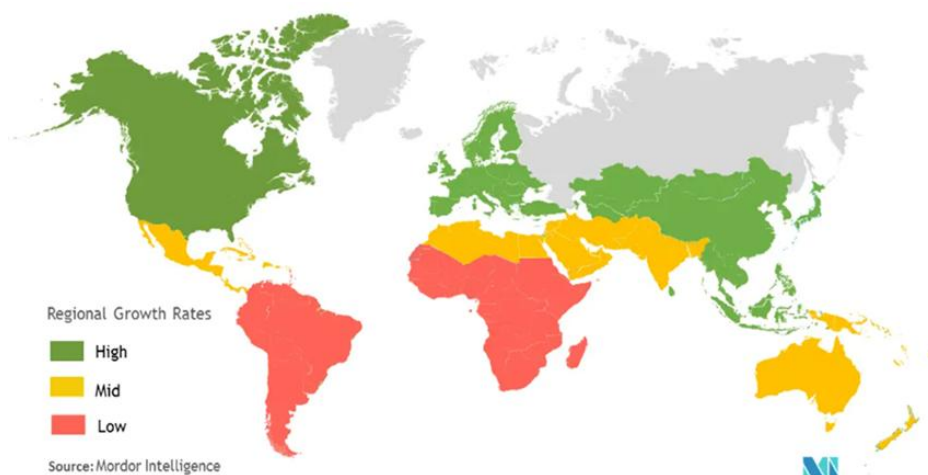
environmentally-friendly vehicles. These encouragements have been led customers to make purchases of greener vehicles. Yang, Kato and Ando (2017) expressed that vehicle market in Japan is expected to be enlarge to 50% in 2020, according to the Cabinet Meeting of Japan, 2008.

Furthermore, the study presented that the non-fuel-based vehicles increased dramatically from 2018 to 2013 according to the report from Japan Automobile Manufactures Association Inc. (JAMA). Napon, Tetsuhiro, Atsushi and Sathita (2015) discussed regarding the most suitable fuel saving consumption driving mode as the alternative fuel vehicle and it can be considered a potential way of reducing CO<sub>2</sub> emissions. As it is represented, 13 million ton/year of CO<sub>2</sub> is emitted to the environment from automobiles in Bangkok and it can be reduced through usage of alternative fuel vehicle. Alternative fuel vehicles (AFVs) are all types of vehicles which can be powered by biogas or electricity rather than traditional (Petrol or Diesel fuels) petroleum fuels (Jansson, 2011). AFVs come with varied technologies. Those options are Hybrid electric vehicles (HEVs), Plug-in hybrid electric vehicles (PHEVs), Battery Electric Vehicles (BEVs), Extended-range Battery Electric Vehicles (E-REVs).

A common type of AFVs that are in use today are Hybrid Electric Vehicles consisting of both electric motors powered by batteries and conventional gasoline engine (internal combustion engine) supported to gain maximum power to achieve fuel economy with low emission (Essays, UK, November 2018). Furthermore, it is stated that hybrid electric vehicle (1) charges the battery when it travels when down the hills, (2) automatically switches between gasoline and batteries in certain situations, when necessary, (3) provides a function to charge its battery by regenerated energy when the driver uses that brake system. As an environment-friendly car, hybrid electric vehicle ("Advantages and Disadvantages of Hybrid Cars," 2017) (1) can reduce the number of fuel emissions released to the air, (2) saves fuel since it can use batteries to operate it without fuel consumption, (3) produces less pollution and greenhouse gases, (4) can increase mileage because the car combine engine that uses gas with an electric motor to reduce gas consumption to balance each other ("Introduction of Hybrid Cars Marketing Essay," n.d.).

However, some consumers are reluctant to purchase efficient fuel-saving technologies. According to Gayer & Viscusi (2013); Mannix & Dudley (2015) stated as a reason, fuel-saving technologies may not fulfill the consumer's private benefit-cost test. Duncan, Julian, Carley, Siddiki, Ziropiannis, and Graham (2018) expressed such technologies are regularly greater costly to buy than usual technologies and it is viable that the customer refuses to purchase these kinds of products because consumers perceive fuel savings are no longer massive adequate to cover the additional cost incurred throughout the life of the product. Furthermore, the study stated that fuel-saving technology has a payback period that exceeds the product's useful life. As another reason, Allcott and Wozny (2014) explained that consumers may impose "internalities" on themselves, perhaps by undervaluing fuel savings. Duncan (2019) stated most U.S consumers are adopting slowly for fuel-saving innovation. Carlucci, Cira, and Lanza (2018) presented, Europe in 2016, the percentage of new alternative vehicles (Liquified Petroleum Gas (LPG), natural gas, and Ethanol E85 fuels) was only 1.3%, whereas the share of diesel and petrol engines was 49.5% and 45.8%, respectively. Olson (2018) introduced factors affecting the slowdown of the development of fuel saving vehicles such as the high price of green cars, the lack of refueling/charging infrastructure, long refueling time, and restricted driving range compared to the conventional vehicles. Plotz, Gnann, and Sprei (2016) introduced one more reason in addition to Olsen's (2018) study, the presence of network externalities can also cause inertia in the development and diffusion of green cars. As per the study of Yang, Kato and Ando (2017), alternative fuel vehicles are not increased confessedly due to the two reasons; 1) consumers are not confident with the fuel facilities for alternative fuel vehicles, 2) alternative fuel vehicles are more expensive than internal combustion engine with the same design and the capacity.

However, in Sri Lanka, the statistics have revealed a relatively high penetration rate for alternative fuel vehicles such as plug-in hybrid electric vehicles (PHEVs), battery electric vehicles (BEVs), hybrid electric vehicles (HEVs), and extended-range battery electric vehicles (E-REVs) (Karunanayake & Samarasinghe, 2019), even though the automobile industry environment has unfavorable market conditions. According to the Norwegian Road Federation (NFR), a public road infrastructure administration in Norway, it has been shown 31.2% of sales were pure electric in 2018 and for December 2018, 65.4% of the total cars registered in Norway were either pure electric or hybrid. Therefore, Norway plans to end the use of fossil fuels in vehicles by 2025 ("Hybrid Vehicle Market | Growth, Statistics, Industry Forecast 2025-2025," 2020). Furthermore, the study states China is dominating the hybrid market because the share of conventional fuel engine buses in China decreased from 62.7% in 2013 to 36.9% in 2018 while the share of energy buses rose from a negligible 0.33% in 2013 to 63.2% in 2018. Additionally, Figure I shows the forecasted growth rate of the hybrid vehicle market globally.



**Figure 1 Hybrid Vehicle Market (Growth Rate by Region 2020)**

Source: Hybrid Vehicle Market | Growth, Statistics, Industry Forecast 2025-2025, 2020

However, as a result of doing a deeper look at the alternative fuel vehicles market in Sri Lanka, below opinions found; (1) AFVs are not made as an economical vehicle but rather a green car, (2) consumers buy AFVs without knowing the complexity of the machines of vehicles (3) Consumers buy certain cars based solely on the vehicle's modernity and do not consider the vehicle's long-term viability (4) AFVs can be bought at a low price due to fewer tax expenses (5) fuel economy of a car is more dependent on the way consumer drive and the type of his/her car (6) there are no AFV users in Sri Lanka who bought to 'save the world,' and consumers buy those because they are said to be 'economical' and 'look modern'. However, based on the statistical review of "Hybrid Vehicle Market, Growth, Statistics, Industry Forecast 2025," Sri Lanka recognizes the Hybrid market's high regional growth in 2025. Some companies like Uber will pay the premium payment for their drivers if they drive alternative fuel vehicles. However, in Sri Lanka, the companies make no such announcements about premium payments, but 60%-70% of Uber and Pick-Me's registrations are AFVs.

All in all, consideration people buy AFVs without knowing the real benefits and risks associated with such purchasing. Because of that, some scholars argue similar situations which are related to the AFVs market. Consumers should know anticipated values and risks contain with such vehicle purchasing. As mentioned earlier Sunitha and Justus (2012), if the consumer makes wrong decisions on buying automobiles, he/she may have to face many problems such as poor performances, poor self-image, and insecurities which are resulted to create financial risk, social risk, physical risk, and performance risk. The study focused on the determinants and the relationship of perceived values on consumer attitudes towards AFVs vehicles and how much consumers' perceived values and perceived risks are related to consumer attitudes on intention to adopt and check the worthiness of consumer selection as not available much more studies in Sri Lankan context. The study focused mainly on five value dimensions: quality value, price value, social value, emotional value, and ecological value related to AFVs' purchasing decisions and how it influences consumer attitudes towards AFVs purchase. Those value dimensions are taken from the PERVAL scale and ecological value introduced as a new area that needs to be concerned as AFVs are more favorable to society. As the AFV concept has various detriments, the study focused on another factor, perceived risk as moderating factor; financial risk, functional risk, social risk, and emotional risk have been considered as one concept which is affected the consumer attitudes towards AFVs. Finally, the study measure how it will change the consumer attitude towards AFV on consumer purchase intention by associating both value dimensions and perceived risk.

## **II. LITERATURE REVIEW**

As buying behavior is part of consumer behavior, it can be recognized as a complex process among human-day activities. As per Kotler and Keller (2016) a consumer should pass five buying behavioral stages to fulfill the process. As an example, if consumer purchases one product as his/her habit, he/she is not going to search much more about the product, so it will be a simple purchase. However, some researchers present those consumers may have to omit or reverse these stages due to routine behavior and frequent buying patterns (Latuszynska, Furajji and Wawrzyniak, 2012) and some researchers present due to complexity of the purchasing pattern or value of the product like; automobiles, they must go through these five stages (Shende, 2014). So, it will be depended on consumer buying behavior and the product involvement. Generally, automobile purchasing is not a daily purchasing activity and automobiles can be considered high-involvement products. Determinants of the vehicle purchasing must be a considerable area when purchase a vehicle. Varieties scholars introduce

different attributes, however Stavkova, Stejskal and Toufarova (2008) explained that most of the consumers buy products due to not because of the functional values of the product but because of the subjectively perceived values. Furthermore, Salomon (2004) explained that it does not mean that products' basic function is not important, but that the today's role of product exceeds its service limits. Stavkova et al. (2008) discussed that consumer often purchase products due to their subjectively perceived value rather than their primary functions. It does not mean that the products' basic functions are not important, but that the contemporary role is more than its basic use-value Soloman, 2014 (as cited in Latuszynska et al. 2012). Therefore, consumers do not rate any product due to the core attribute of the product and consumer prefer product qualities that can be intangible or tangible and influence the perceived advantages of consumers.

As same as the buying behavioral process, the perceived value concept should be identified as a complex process. It covers multiple attributes rather than a single attribute that is adduced from uni-dimensional concept because perceived value as a multi-dimensional concept. Many scholars explained manifolddenominatives of perceived value, which help create customer value to gain competitive advantage. As there is no definite definition for perceived value dimension, Wang, Po Lo, Chi, & Yang, 2004; Sanchez-Fernandez & Iniesta-Bonillo, 2007, a confederate rate of scholars(Aulia, Sukati and Sulaiman, 2016; Sanchez-Fernandez & Iniesta-Bonillo, 2007; Smith, Smith, Colgate and Mark , 2007; Wang, 2004; Yee & San, 2011) accept the definition of Zeithaml (1988), who defined consumer perceived value as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given". That is strongly related to benefit that the customer receives as a return for any cost they incurred. In other hand it is trade-off between "giving" versus "getting" respectively what is sacrifices versus what is received. To gain a real value of purchasing, consumers expect more positive attributes which can be monitory or non-monitory for what they spend to construct the process of purchasing. As stated in prior discussion, perceived value as a multi-dimensional concept it covers more value dimensions and those can be used for rational customers when they make purchasing decisions. When it comes to the AFV concept is the most efficient decision for sustainable environment as it affords positive vibes to whole world.

When considering history of AFVs, the first AFV was patented in 1905. Prius was the first commercial hybrid electric vehicle (HEV) which is introduced by Toyota in mid 1990s. Some common examples of the HEV are the early versions of the Toyota Prius, Honda Insight and Honda Civic Hybrid.The combination of both electric motor and gasoline engine is supported to create good acceleration and gas mileage of up to about 50 miles per gallon. HEVs provide good drivability, high mileage, and low emissions using technology that is available today, their chance of success seems good.Castillo, Molinillo, Stefaniak and Cabanillas, 2019 stated that internal combustion engines act as a key source for urban air pollution. So, the government and other institute of automobiles should introduce electric mobilities to society to reduce noxious emissions and reliance on fossil fuel.As it stated by Sunitha and Justus (2012) if consumer make wrong decisions on buying automobiles, he/she may have to face for lot of problems such as poor performances, poor self-image and insecurities which are resulted to create financial risk, social risk, physical risk and performance risk. Failures of mobilities will be occurred in future period and may not be in present. Given that purchasers should consider past, present and specially in future. Therefore, both perceived value dimensions and perceived risk dimensions are more significant areas in the automobile market.

Ozaki and Sevastyanova (2011) investigated consumer purchase motivation to AFVs, and the study found the financial benefits related to transport policy is favorably affected for motivation in purchase of AFVs. Gallagher and Muehlegger (2011) examined main three variables called; federal incentives, gas prices, and consumer preferences on AFV adoption and magnitude positive effect is represented from gas prices, and consumer preferences.Beise and Rennings (2005) explained that as avoiding or reducing environmental harms, an eco-innovation can be seen as a new product.Rezvani, Jansson and Bengtsson (2018) demonstrated gain, normative and hedonic motivation are affected to adopt to electric mobilities. Moreover, Hong, Khan and Abdulla (2013) said attitudinal factors and perceived behavioral control are important determinants for the adoption of AFVs.Rajendran and Jayakrishnan (2019) investigated perceived risk towards consumer decisions to buy automobiles and the study has been explained that regardless of the nature of the occasions, perceived risk creates a significant outcome on every single purchasing decision. According to Gallagher &Muehlegger, 2011; Ozaki &Sevastyanova, 2011, stated that owners of AFVs gain benefits and favorable outcomes due to policy-related remuneration and lower fuel costs but intention to adopt can be impeded through expensive initial purchase prices and high maintenance costs for batteries (Soon, Luen and Siang, 2013). Wang, Fan, Zhao, Yang and Fu (2014) identified that psychological risk can major influence HEVs purchase.Thilina and Gunawardane (2019) said that in Sri Lankan context, people may be resistant to buy HEVs, because they are concerned that other people perceive them as too progressive or as a green geek.Karunanayake and Samarasinghe (2019) studied on AFVs and perceived risk as a moderating variable. Moreover, the study has pointed out that the impact of perceived risk on the relationship between purchasing determinants and purchase intention of AFVs has statistically proven that perceived risk moderates the relationship.

All in all, the research evidence demonstrated the availability of huge dimensions that may motivate or de-motivate AFVs purchasing. But above studies are not considered consumer attitudes on value dimensions and risk dimensions. However, Higuera-Castillo et al. (2019) discussed the concept of consumer attitude as a key mediator and due to the participation of the attitude as a mediator the other independent variables have been changed the consumer intention to adopt towards to electric mobilities. Although, the study has not considered the perceived risk that how it will be affected to the adoption of automobiles. AFV as a high technological involvement product, customers should consider what kinds of uncertainties can be occurred after buying the vehicle. Those uncertainties may be occurred in recently or in forceable future. As stated earlier, many scholars discussed separate relationship between perceived values with consumer adoption to AFVs and perceived risk with the adoption to AFVs. By association of both perceived values and perceived risk together, it will change the consumer attitude towards AFVs, and it may be an extensive area to study.

Consumer attitude can be explained as "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object" Fishbein and Ajzen, 1975, (as cited in Chang, Lan-Lan, 2013). Simply, attitude is person's behavioral beliefs and positive or negative evaluation of the behavior. As instance, Hidrue, Parsons, Kempton and Gardner (2011) explained that consumers who have more positive attitudes to green vehicles are more preferring to adopt HEVs and their willingness to pay for green cars are more. It means the positive attitude for some certain of behavior is more affected to intention for adopt and practice of mentioned behavior. Wang et al. 2014, introduced different factors which are consisted within the perceived behavioral control such as technology, price, availability or knowledge to use the HEVs and to adopt to the behavior of HEVs. Rezvani, Jansson and Bodin (2015) mentioned in their study that most of the published research related to electric mobility vehicles are focused on primarily on the role of consumer attitudes, values, beliefs and norms pertaining to the environment with regards to their purchase intentions. Higuera-Castillo et al. (2019) discussed the concept of consumer attitude as a key mediator and due to the participation of the attitude as a mediator the other independent variables have been changed the consumer intention to adopt towards to electric mobilities. By considering those discussions, based on the consumption value theory and the discussion of Sweeney and Soutar (2001), the perceived value dimensions (PERVAL) can be taken into consideration for evaluate the perceived values of consumers as it is covered more value dimensions in order to understand the relationship of attitudes towards to AFVs would contribution for current vehicle market.

### III. CONCEPTUALIZATION & OPERATIONALIZATION

Based on the past discussions, the researcher proposed the complete model by formulating hypotheses to the study. As per the most contradictory judgments and statements of previous scholars, most of the studies consider value creation is most significant because the competitive advantage of a business is depended on level of consumer value Woodruff, 1997 (as cited in Smith, Smith); Parasuraman, 1998 (as cited in Asgarpour, Hamid, & Sulaiman, 2015). Perceived value theories limited to some extent than PERVAL scale and it has quality, price, emotional and social value which is coming under consumption value theory even though they can be recognized under multi- dimension construct. Therefore, the present study chooses main independent variables as quality, price, emotion and social values. In addition to the study uses one factor called ecological value as it describes by Koller, Floh and Zauner (2011) as a new perceived value dimension. However, previous studies did not use the ecological value dimension for their studies, but present study uses it because AFV concept is closer to the influences for a sustainable environment.

AFVs manufacturers should have to introduce more models to the automobile market to attract customers by concerning fuel efficiency, easy operation, and high quality in terms of durability and reliability. Price is the monetary cost of sacrifices to gain the advantage of the product. Emotion is the psychological requirement of consumers and the fourth social, which is another factor expected by external parties. AFV as the sustainable product ecological value creates a wide range of benefits to the environment and it is the fifth value dimension. Several studies like Higuera-Castillo et al. (2019) discussed the concept of consumer attitude as a key mediator and due to the participation of the attitude as a mediator the other independent variables have been changed the consumer intention to adopt towards to electric mobilities. On that basis below hypotheses have been formulated in the study.

**Hypothesis 01 (H1)** *There is a significant impact between perceived quality value and consumer attitudes towards alternative fuel vehicles.*

**Hypothesis 02 (H2)** *There is a significant impact between perceived price value and consumer attitudes towards alternative fuel vehicles.*

**Hypothesis 03 (H3)** *There is a significant impact between perceived emotion value and consumer attitudes towards alternative fuel vehicles.*

**Hypothesis 04 (H4)** *There is a significant impact between perceived social value and consumer attitudes towards alternative fuel vehicles.*

**Hypothesis 05(H5)** *There is a significant impact between perceived ecological value and consumer attitudes towards alternative fuel vehicles.*

**Hypothesis 06(H6)** *Consumer attitude mediates the effect of perceived values and intention to adopt of alternative fuel vehicles.*

According to Gallagher & Muehlegger, 2011; Ozaki & Sevastyanova, 2011, stated that owners of AFVs gain benefits and favorable outcomes due to policy-related remuneration and lower fuel costs but intention to adopt can be impeded through expensive initial purchase prices and high maintenance costs for batteries (Soon et al., 2013). Yee and San (2011) stated that the perceived risk factors do have a significant direct impact on the purchasing intention of automobiles because automobiles are moderately more costly resources that most customers see forward to their automobiles enduring a long time. By considering financial, economic, social and physical risk together and perceived risk as a multidimensional concept (Jacoby and Kaplan, 1972; Yuksel and Yuksel, 2007; Hirunyawipada and Paswan, 2006; Stone and Grønhaug, 1993) and the moderator (Wu, Chen and Lu, 2014; Chiu et al., 2012; HuyTuu et al., 2011; Campbell and Goodstein, 2001) below hypotheses have been developed

**Hypothesis 07 (H7)** *Perceived risk moderates the effect of Perceived Quality Value and consumer attitudes towards alternative fuel vehicles.*

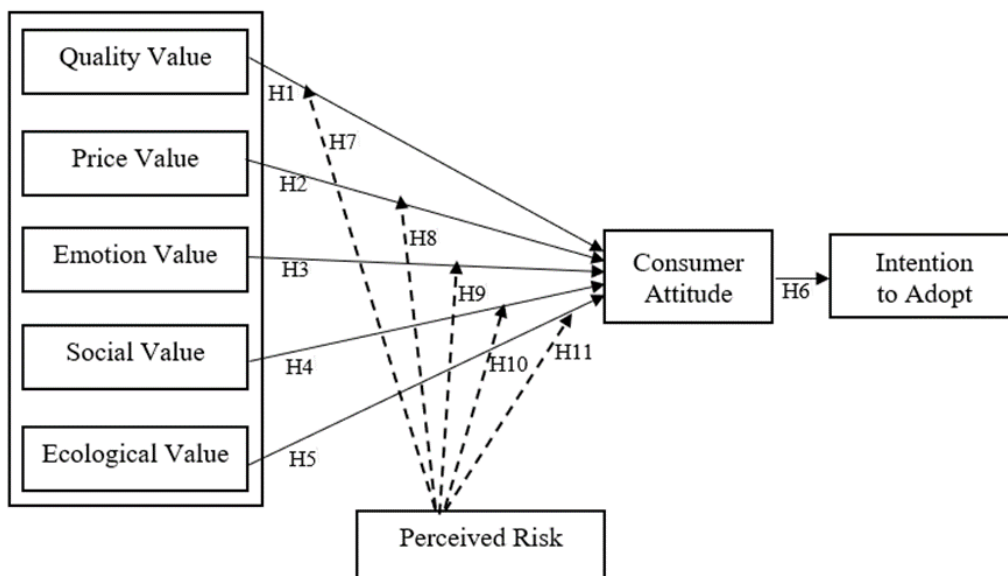
**Hypothesis 08 (H8)** *Perceived risk moderates the effect of Perceived Price Value and consumer attitudes towards alternative fuel vehicles.*

**Hypothesis 09 (H9)** *Perceived risk moderates the effect of Perceived Emotion Value and consumer attitudes towards alternative fuel vehicles.*

**Hypothesis 10 (H10)** *Perceived risk moderates the effect of Perceived Social Value and consumer attitudes towards alternative fuel vehicles.*

**Hypothesis 11 (H11)** *Perceived risk moderates the effect of Perceived Ecological Value and consumer attitudes towards alternative fuel vehicles.*

An outline of this study's theoretical model is shown below Figure II.



**Figure II** *Proposed research model*

#### IV. RESEARCH METHODS

Measure of the study have been done by using previous scholars. All four dimensions of PERVAL scale quality, price, social and emotional and other value dimension of ecological value were assessed from Higuera-Castillo et al., 2019; Walsh, Shiu & Hassan, 2014; Karunanayake and Samarasinghe, 2019; Yang and Jolly, 2009; Wei and Jung, 2017; Khazaei and Khazaei, 2016; Yu and Lee, 2019. Intention to adopt was assessed by Chang and Jai, 2015; Higuera-Castillo et al., 2019. Moreover, attitude has been measured from Higuera-Castillo et al., 2019; Mohamed, Higgins, Ferguson, & Kanaroglou, 2016., and considered three measures. The study was used 13 items to assess the perceived risk dimension under four types of risk types from McLeay, Yoganathan, Osburg and Pandit, 2018; Sunitha et al., 2012; Karunanayake and Samarasinghe,

2019. All these items have been operationalized using the five-Likert Scale and below Table I outlined all the measures.

**Table I Operationalization Table**

Variable	Measurement Indicators
Quality Value	<ul style="list-style-type: none"> <li>• AFVs are well made.</li> <li>• AFVs would perform consistently.</li> </ul>
Price Value	<ul style="list-style-type: none"> <li>• AFVs would be economical.</li> <li>• AFVs are reasonably priced.</li> <li>• AFVs offer value for money you spent.</li> </ul>
Emotional Value	<ul style="list-style-type: none"> <li>• I feel relaxed when I drive anAFV.</li> <li>• AFV would make me feel good when driving.</li> <li>• AFV is one that I would enjoy than conventional vehicles.</li> </ul>
Social Value	<ul style="list-style-type: none"> <li>• A AFV would be a status symbol for me.</li> <li>• Driving a AFV that attracts others' attention is important to me.</li> <li>• People whose opinions are important to me find AFV</li> </ul>
Ecological Value	<ul style="list-style-type: none"> <li>• AFV cause less pollution.</li> <li>• AFV are environmentally friendly.</li> <li>• AFV have more environmental benefits than other conventional vehicles.</li> </ul>
Intention to Adopt	<ul style="list-style-type: none"> <li>• I believe that adoption of AFV makes my life easier.</li> <li>• I expect to drive a AFV car in the near future.</li> <li>• If I have to purchase a vehicle within the next 5 years, I will purchase anAFV.</li> </ul>
Consumer Attitude	<ul style="list-style-type: none"> <li>• In the long term, I think buying anAFV is more cost effective than owning a conventional.</li> <li>• In the long term, I think buying anAFV is more cost effective than owning a conventional.</li> <li>• I think buying anAFV is a good decision.</li> </ul>
Perceived Risk	<ul style="list-style-type: none"> <li>• I am afraid that I am buying an expensive car like AFV.</li> <li>• I am afraid the cost of spares for this car can be expensive.</li> <li>• I am afraid of my decision to buy a car as I can invest that amount in some immovable properties (Opportunity cost).</li> <li>• I am confused if the AFV is worth the money I spend.</li> <li>• I am not sure that local technician can handle this technologically superior car.</li> <li>• I am doubtful AFV does have a good battery life.</li> <li>• I am doubtful of AFV comfort.</li> <li>• I feel that this AFV does not have malfunctioning in its technical equipment.</li> <li>• I am afraid if my social standing will get decreased after buying anAFV.</li> <li>• I am not sure if my friends will compliment me on my decision to purchase this car.</li> <li>• I am confused if AFV is liked by all members of the family.</li> <li>• I am afraid that I will make a poor choice of anAFV.</li> <li>• I am unsure about the performance of my AFV after 3 - 4 years.</li> </ul>

Based on the positivism philosophy and the objectivity the study was done and the researcher collected data from the existing and potential consumers who are older than 18 years which means who own a driving license according to the minimum requirement of the Department of Motor Traffic in Sri Lanka. Self-administrated questionnaire which is included open-ended, close-ended and Likert scale questions was distributed for respondents who can easily access to the survey and data obtained in between May to July 2020. Among 410 responses, 399 valid responses were gathered, and 97% responses rate was presented. Below Table II shows the demographic characteristics of the survey. And it shows 63.9% in between 25 and 30 years old, 51.6% were female and 78.9% were employed who may in full time or part-time jobs.

**Table II Descriptive Statistics**

		Frequency	Percent
Age	18 - 24 years' old	56	14
	25- 30 years' old	255	63.9
	31- 35 years' old	51	12.8
	36- 40 years' old	20	5
	41- 45 years' old	5	1.3

	46- 50 years, old	2	0.5
	51 years old or older	10	2.5
<b>Gender</b>	Male	193	48.4
	Female	206	51.6
	Total	399	100.0
<b>Driving Experience</b>	0-1	140	35.1
	1-3	93	23.3
	3-5	44	11
	5-8	38	9.5
	More than 8	84	21.1
<b>Profession</b>	Unemployed	18	4.5
	Employed	315	78.9
	Retired	7	1.8
	Student	36	9
	Self-employed	23	5.8

As quantifiable data available in the present study, descriptive statistics will have been used for the analysis part of the study to determine the relationship to test the hypothesis constructed. The responses have been analyzed using the SPSS software.

## V. RESULTS

### a. Assessment of the Measurement Model

According to Sarmah and Hazarika (2012) stated prominent methods, (1) Test-Retest reliability (2) Parallel forms reliability (3) Internal consistency reliability to calculate the reliability of the research study. The present study used the internal consistency reliability to measure the consistency of the research because interrelationship between variables can be measured using this. Based on the rules provided by George and Mallery (2003), if the value of (Cronbach's alpha)  $\alpha$  is : " $\alpha > .9$  – Excellent Reliability,  $\alpha > .8$  – Good Reliability,  $\alpha > .7$  – Acceptable Reliability,  $\alpha > .6$  – Questionable Reliability,  $\alpha > .5$  – Poor Reliability, and  $\alpha < .5$  – Unacceptable Reliability". Current study it was greater than the minimum requirement for all the variables. Based on the Exploratory Factor Analysis current study was assessed both discriminant validity and convergent validity using the technique of factor loading. Before running the factor loading, study was fulfilled the requirement of Kaiser–Meyer–Olkin (KMO) and Bartlett's test because to verify that enough inter-item correlations exist to suggest that factors can be derived from the input data. According to Hair, Joseph, William, Babin, and Anderson, 2013 (as cited by Pattnaik, 2019) to satisfy this, the value of KMO should be greater than 0.7 and the study was satisfied it. Table III had been shown the result of KMO. According to the factor loading analysis nine different groups were created, and it is called as discrimination and the loading of values under each group known as convergent. Carlson and Herdman (2010) states that to verify the convergent validity of a test the value 0.70 is recommended, whereas those below 0.50 should be avoided. As per the requirement of previous research study's appropriate reliability, convergent validity (Table IV) and the discriminant validity (Table V) could be shown in the current study.

**Table III Test for Kaiser–Meyer–Olkin (KMO) and Bartlett's Test**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.843
Bartlett's Test of Sphericity	Approx. Chi-Square	6187.168
	Df	528
	Sig.	0

**Table IV Reliability and Convergent Validity**

Concept	Variable	Measurement Indicator	Factor Loading	Cronbach's Alpha (CA)
Perceived Value	Quality Value	PQ01	0.850	0.818
		PQ02	0.830	
Perceived Value	Price Value	PP01	0.723	0.740
		PP02	0.794	
		PP03	0.806	



Concept	Variable	Measurement Indicator	Factor Loading	Cronbach's Alpha (CA)
	Emotional Value	PE01 PE02 PE03	0.792 0.787 0.536	0.756
	Social Value	PS01 PS02 PS03	0.751 0.797 0.677	0.825
	Ecological Value	PEC01 PEC02 PEC03	0.868 0.862 0.732	0.805
Intention to Adopt	Intention to Adopt	II01 II02 II03	0.715 0.734 0.793	0.772
Consumer Attitudes	Consumer Attitudes	CC01 CC02 CC03	0.685 0.760 0.775	0.733
Perceived Risk	Financial Risk	PF01 PF02 PF03 PF04	0.739 0.824 0.682 0.579	0.858
	Functional Risk	PFL PFB PFC PFM	0.684 0.663 0.626 0.700	
	Social Risk	PSS PSC	0.769 0.774	
	Phycological Risk	PPF PPC PPU	0.741 0.781 0.625	

**Table V Exploratory Factor Analysis – Factor Loading (Discriminant Validity)**

**Rotated Component Matrix<sup>a</sup>**

	Component								
	1	2	3	4	5	6	7	8	9
II03	.793								
CC02	.760								
II02	.734								
CC01	.685								
II01	.715								
PPC		.781							
PSC		.774							
PSS		.769							
PPF		.741							
PS02			.797						
PS01			.751						
PS03			.677						
PE03			.536						
PEC01				.868					
PEC02				.862					

Rotated Component Matrix <sup>a</sup>						
PEC03		.732				
CC03		.775				
PF02			.824			
PF01			.739			
PF03			.682			
PF04			.579			
PFM				.700		
PFL				.684		
PFB				.663		
PFC				.626		
PPU				.625		
PP03					.806	
PP02					.794	
PP01					.723	
PQ01						.850
PQ02						.830
PE01						.792
PE02						.787

II03- Goal, CC02- Independent, II02- Expectation, CC01- Effectiveness, II01- Life Easier PPC- Cognitive Dissonance, PSC- Companion Influence PSS- Social Identity, PPF- Family Influence, PS02- Attraction, PS01- Identity, PS03-Recommendations, PE03- Entertaining, PEC01- Environmental Concern, PEC02- Environmentally Favorable, PEC03- Green Value, CC03- Climate Change, PF02- Maintenance CostPF01- Initial Price PF03- Opportunity Cost, PF04- Real Value, PFM- Malfunctioning, PFL-Local Technician Capacity, PFB- Battery Lifetime, PFC- Comfortability, PPU- Uncomfortable Feelings, PP03- Value for Money, PP02- Purchase value, PP01- Economical, PQ01- Physical EvidencePQ02- Performance, PE01- Unfettered, PE02- Favorable Feelings *Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization*

**b. Assessment of the Direct Relationship**

By considering the Pearson's Product Movement Correlation analysis and the Regression analysis, a hypothesis test to check the direct relationship can be tested. As all hypotheses are concerned with a positive or negative relationship ( $H_A > 0$ ), two-tailed test is used in the correlation analysis. The study had been taken the decision of the acceptance of the relationship between consumer attitudes and the independent variables by considering the contribution to the significance level and consider the 95% of confidence level to check whether the hypothesis being accepted or not. It means significance level should be less than 0.05 (Sig. < 0.05) to accept the hypothesis. To evaluate whether the data of the study fit to the regression model, consider the result of R, R<sup>2</sup>, Adjusted R<sup>2</sup> and Standard Error of the estimate. Frost (2017) states that small R<sup>2</sup> values are not always a problem, and high R<sup>2</sup> value are not necessarily good. So, the study does not show a highest R<sup>2</sup> in the model summary of each variable (Table VI).

**Table VI Hypotheses Testing**

Hypothesis	Relationship	Beta	Sig.	Decision	R <sup>2</sup>	Sig. FΔ
H1	QV and CA	.214	0.000 < 0.05	Accepted		
H2	PV and CA	.105	0.012 < 0.05	Accepted		
H3	EV and CA	.279	0.000 < 0.05	Accepted		
H4	SV and CA	.146	0.004 < 0.05	Accepted		
H5	ECV and CA	.231	0.000 < 0.05	Accepted		
	QV				0.258	
	PV				0.317	
	EV				0.415	
	SV					
	ECV				0.425	
					0.471	
						0.000

**c. Assessment of Moderating Effect**

The study has been focused on moderating effect of perceived value on consumer attitudes to make their intention to adopt towards AFVs. Here the researcher used Perceived Risk as the moderator based on the literature found to study. Then the researcher has been tested moderating effect for all independent variables with the consumer attitudes and check whether each hypothesis is significant or not because of the engagement of perceived risk as a moderator. The significance scenario is when it comes to a separate analysis the outcome has been created with a new variable called "interaction variable" which is created by multiplying the independent variable with the moderating variable. In order to get the decision regarding separate significance level, evaluated the interaction variable in addition to other variables. Interaction variables some scholars named as "interaction term".As per the moderating scenario, the moderator is significant if the p value of interaction variable is less than 0.05 (at the level of 5%) and both LLCI and ULCI should be represented from either plus sign or minus sign to be the p value as significant. Liu, West, Levy and Aiken (2017) used the confidence interval for their study and stated that both LLCI and ULCI should be impacted in same way. Evaluating the result of model summary statistic, the study was checked the significance of overall model as P value is equal to 0 in each variable. (Table VII)

**Table VII Assessment of Moderating Effect**

Independent Variable	Interaction Term			Results	P
	p	LLCI	ULCI		
QV	0.9210	-0.1365	0.1233	Insignificant	0.0000
PV	0.4598	-0.1083	0.2390	Insignificant	0.0000
EV	0.0073	0.0572	0.3650	Significant	0.0000
SV	0.0000	0.1550	0.3733	Significant	0.0000
ECV	0.9995	-0.1462	0.1461	Insignificant	0.0000

*LLCI – Lower-Level Confidence Interval, ULCI - Upper-Level Confidence Interval*

**d. Assessment of Mediating Effect**

The study was checked whether the consumer attitude is mediated the consumer perceived value and the consumer intention to adopt. As per Baron and Kenny, 1986 (as cited in Chaudhuri, 2000) stated that the method of Bootstrapping use to gain the confidence intervals in order to find the mediating effect or the indirect effect in between variables. Among other methods such as Sobel test, the bootstrapping method has been recognized as major method (MacKinnon & Fairchild, 2009).

**Table VIII Assessment of Mediating Effect**

Indirect effect of Perceived Value on Intention to Adopt				
	Effect	BootSE	BootLLCI	BootULCI
Consumer Attitude	0.4014	0.0550	0.2962	0.5125

*BootLLCI – Bootstrapping Lower-Level Confidence Interval, BootULCI - Bootstrapping Upper-Level Confidence Interval*

BootLLCI and BootULCI are represented the same effect (positive effect). Thus it can be identified that this mediation effect fulfills the confidence level requirement to become the model as significance. Simply, the indirect effect is significant and there is a mediation effect.

**VI. DISCUSSION**

As per the research question "To what extent the perceived risk changes the relationship between perceived value and consumer attitude towards purchase intention of AFVs?", three main objectives have been created by the researcher namely, (1) To identify the consumer perceived value dimensions of AFVs and its relationship on consumer attitudes towards AFVs. (2) To determine the impact on consumer attitudes towards purchase intention of AFVs. (3) To determine the impact of perceived risk association between perceived value dimensions and consumer attitudes towards AFVs.

Based on the previous literature, the researcher used PERVAL model, which is recognized under consumption value theory, to identify the consumer perceived value dimensions (Sweeney and Soutar,2001) namely, Quality Value, Price Value, Emotion Value and Social Value. Other than these four dimensions, the present study has been used Ecological Value, which is introduced by Koller, Floh and Zauner (2011). Multiple regression is used to check the direct relationship between consumer perceived value dimensions and consumer

attitude towards AFVs. According to the results, direct effect of perceived value has been accepted by the statistical measurement on consumer attitude towards AFVs in order to satisfy the *first objective* of the study.

Perceived risk act as a moderator (Chiu, Wang, Fang and Huang, 2012) and Sunitha, Justus (2012) stated that consumers may have to face a lot of problems due to perceived risk when they are making the purchasing designs on automobiles. AFVs are technological advancement product and most of the people does not prefer and afraid on those technologies. As per Jahng et al., 2007 consumer attitudes on new technology may change the purchasing intention. It intends that uncertainty and attitudes are related with each other and may do changes on consumer decisions. Thus the study needs to measure the moderator effect of perceived risk and what kinds of impact does it make by associating perceived value dimensions and consumer attitudes as the *third objective* of the study. As current study results, it shows the moderator effect of Emotional Value\*Perceived Risk->Consumer), Social Value \*Perceived Risk->Consumer Attitude and others have been rejected (Quality Value\*Perceived Risk->Consumer Attitude, Price Value\*Perceived Risk->Consumer Attitude and Ecological Value\*Perceived Risk->Consumer Attitude) due to under requirements of the moderator analysis. So, the H9 and H10 are accepted and H7, H8 and H11 have been rejected by the current study. Table IX shows the decision on Hypotheses.

**Table IX Decision on Hypothesis**

Hypothesis	Relationship	p	LLCI	ULCI	Decision
H7	QV*PR->CA	0.921	-0.1365	0.1233	Rejected
H8	PV*PR->CA	0.4598	-0.1083	0.239	Rejected
H9	EV*PR->CA	0.0073	0.0572	0.3650	Accepted
H10	SV*PR->CA	0.0000	0.1550	0.3733	Accepted
H11	ECV*PR->CA	0.9995	-0.1462	0.1461	Rejected

*Note:* QV – Quality Value, PV – Price Value, EV – Emotion Value, SV – Social Value, ECV – Ecological Value, CA – Consumer Attitudes, PR – Perceived Risk, LLCI – Lower-Level Confidence Interval, ULCI - Upper-Level Confidence Interval

With reference to the *second objective* to determine the impact on consumer attitudes towards purchase intention of AFVs, the researcher proceed the mediating effect of consumer attitudes in between perceived value dimensions and consumer intention to adopt (Higuera-Castillo et al.,2019) for AFVs. It shows that the there is an indirect impact of consumer attitudes in between perceived value dimensions and consumer intention to adopt because Bootstrapping Lower-Level Confidence Interval and Bootstrapping Upper-Level Confidence Interval act in a same way and give same impact. So, H6 is supported to current model.

### *Theoretical Implications on Hypotheses*

#### **1. Quality Value and Consumer Attitudes towards AFVs**

Jin and Gu (2005) stated (as cited in National Quality Research Center, 1995) perceived quality as the degree to which a product or service provides key customer requirements (customization) and how reliably these requirements are delivered (reliability). According to Sweeney and Soutar (2001) quality value is one of the elements of PERVAL scale. Jin and Gu (2005) perceived quality value is a judgmental element in consumer decision making because consumer compare product quality with other same range of products within a category. Most of the study check the quality value and purchasing decision of automobiles but limited study found that how quality value affect to the consumer attitude toward buying object. Rust and Oliver, 1994 (as cited in Saleem, Ghafar, Ibrahim, Yousuf and Ahmed, 2015) stated if product quality is high, it facilitates to increase the purchase intention of consumers. Jacoby and Olson, 1985 (as cited in Asshidin, Abidin and Borhan, 2016) states in the field of marketing, the construct of perceived quality has been widely acknowledged as the primary driver of purchase intention. The present study indicated that there is an impact between the quality value towards AFVs by using the concept of consumer attitude under H1.

#### **2. Price Value and Consumer Attitudes towards AFVs**

Price value can be identified as a major factor that each customer considers on making decision on product and services. Krause et al. (2016) revealed that the purchase price of AFVs create large marginal effect on the demand of vehicles and the study further suggested that government bodies and marketers should make substantial consideration on price reduction of AFVs. Based on the variability of prices and time value of money

is affected for purchasing of durable products. Higuera-Castillo et al. (2019) explained value for money is a key variable factor that consumer makes motivated for purchasing intention towards hybrid and electric mobilities. Price of fossil fuel and the vehicle price is significant for consumer to make their purchase decisions. Because, if fuel price daily goes up, the operating cost of vehicle is also increased. As same as the battery price of the vehicle make more influence specially for hybrid and electric autos. Therefore, consumer may think of the cost related to the battery replacement before they take buying decision (Mourato, Saynor, and Hart, 2004). The study measures how price value affects to consumer attitudes on purchasing AFVs because high price, low price, economic impact may change the consumer attitudes regarding vehicle. As mentioned by the literature value of the battery of AFVs may create negative effect inside the consumer mindset. It will create negative impact between price value and consumer attitude. But some people think that AFVs are more fuel efficiency than conventional vehicles because of the fuel efficiency. Based on those literatures, the researcher builds up the H2 and it was supported by the present model as it fulfills requirements in multiple regression model.

### **3. Emotion Value and Consumer Attitudes towards AFVs**

Sheth, Newman and Gross (1991) stated emotional values refers different aspects of feelings such as excitement, disappointment or pleasant which are associated with consumption. When it considers in the automobile, Ozaki and Sevastyanova (2011) says based on electric mobilities, emotional value may be feeling of comfort, pleasure or ease of driving and Higuera-Castillo et al. (2019) says emotional value is one of key motivators for adopting to electric and hybrid mobilities. As another statement, Wen and Noor (2015) explain that emotional value indirectly influences for purchasing intention through consumer attitudes. It was depicted by the present study by measuring the impact of these two. So, the result of the study was indicated that the emotion value and the consumer attitudes make a sense towards AFVs as it fulfills the requirements.

### **4. Social Value and Consumer Attitudes towards AFVs**

Social value refers the social utilities like prestige and status in the society for a person (Walsh et al. 2014) Previous scholars describe social value in automobiles based on social responsibilities Wang et al. (2014) which are considered in using autos in the society. As explains in earlier chapters transportation is most important area in every society because it facilitates and reduces the complexity of works. When attaching it into automobiles, according to Wang et al. (2014), to be a social recognition person or create social identity among varieties people, they have to use the less carbonized vehicles to win the social responsibility concept. As states by Koller et al. (2011) if consumer is willing to purchase AFVs, the person can signal to others as she or he is a pro-social rather than pro self-individual. Simply it says that consumer attitude may affected by social involvement. So, the study was needed to get the idea of whether social value impact or not with the consumer attitude towards AFVs and build the H4. Output of the analysis indicated that that there is an impact between these two and H4.

### **5. Ecological Value and Consumer Attitudes towards AFVs**

Above four value dimensions are derived from the PERVAL scale (Sweeney and Soutar, 2001) and Ecological Value is introduced as a new concept to Perceived value by (Zauner et al., 2011) as most of the people consider environmental changes which can be occurred due to the purchasing patterns and decisions which are taken by consumers. Haustein & Jensen (2018) revealed that consumers of Battery electric vehicles (BEV) are prouder about their vehicles than consumers of conventional vehicles because BEVs express environmental awareness and openness for new technologies are more likely to consider buying a BEV. Cordell, Murphy, Riitters, Kurt and Harvard (2005) define the ecological value is level of benefits that the space, water, minerals, biota, and all other factors that make up natural ecosystems provide to support native life forms. As it covers a wider area, ecological value become a salient factor for everyone. When considering the environment and transportation, people should have to consider ecological value concept before making decision regarding purchasing. The study was introduced the ecological value as a new element to the consumer perceived value dimensions. According to the literatures, AFVs are produced less carbons to the society than traditional conventional vehicles. So, AFV usages create favorable effects on environment. Based on these discussions and the literatures, H5 was created and to check whether ecological values of AFVs are impacted or not with consumer attitudes. The results of multiple regression, it was shown the impact which can be accepted by the H5.

### **6. The Impact of Consumer Attitudes on the Relationship between Consumer Perceived Values and Intention to Adopt**

Consumer attitude is concept that can be derived from theory of planned behavior and people intention is consisted with three conceptually independent predictors called; attitude, subjective norms, and perception of behavioral control (Ajzen, 1991). Fishbein and Ajzen, 1975, (as cited in Chang, Lan-Lan, 2013) explained attitude as "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to

a given object". Simply, attitude is person's behavioral beliefs and positive or negative evaluation of the behavior. Nosi et al. (2017) depicted that buying intention of consumer was intensively influenced by consumer attitude. Rezvani, Jansson and Bodin (2015) and Higuera-Castillo et al. (2019) use consumer attitude for their research studies which are related for electric mobilities. Moreover, Higuera-Castillo et al. (2019) discussed the concept of consumer attitude as a key mediator and due to the participation of the attitude as a mediator and the other independent variables have been changed the consumer intention to adopt towards to electric mobilities. Based on that the present study was built the H6 to check the impact of consumer attitudes on the relationship between consumer perceived values and intention to adopt. According to the mediator analysis, the hypothesis 06 was accepted.

## **7. The Impact of Perceived Risk on the Relationship between Consumer Perceived Values and Consumer Attitudes**

The concept of risk can be explained as the chance that an outcome or investment's actual gains will differ from an expected outcome or return. Risk can be occurred in varieties ways. Most people are afraid to go with new technological products as those are not familiar to people. According to Noor (2016) ,AFVs are innovative products and due to this people does not prefer to buy AFVs at once. Earlier discussed the values which are related to AFVs under five dimensions, but those dimensions may be changed due to the involvement of perceived risk. As per Zeithaml (1988) the perception of value based on tradeoff between the benefits and the sacrifices. So, to become a rational consumer they should consider both benefits and sacrifices which are related with the purchasing decisions. Those are based on the uncertainties around the benefits as well as sacrifices. The study was checked the impact of perceived risk on the relationship between individual consumer perceived values and consumer attitudes and how perceived value change the consumer attitudes towards AFVs due to the moderating effect of perceived risk. According to Chaudhuri (2000) the risk act as a moderating variable because if consumers have not enough information to cope with their uncertainties, they cannot do their purchasing process as it is, and it may affect to lower level of consumer attitudes and purchasing intentions. Here the study was considered perceived risk as a moderator based on the literature provided by the study. According to previous scholars, there are different types of risks like, financial risk, functional risk, social risk, and psychological risk. The present study was built the questionnaire to be distributed to respondents by including how different risk types affected to consumer attitudes towards AFVs. In order to that below hypotheses had been developed.

### **a. The Impact of Perceived Risk on the Relationship between Quality Value and Consumer Attitude**

Due to the low battery capacity of AFV it may damage the functionality of the vehicle which are affected for performance risk (Wiedmann et al., 2011; Thilina and Gunawardane, 2019). Due to the performance risk it may damage the quality value of AFVs in order to create the negative impact on consumer attitudes towards AFVs. As this is not much more tested in previous studies relevant to automobile sector and the researcher found that perceived risk does not moderate the impact on Quality value and the consumer attitude, so the H7 was rejected by the study.

### **b. The Impact of Perceived Risk on the Relationship between Price Value and Consumer Attitude**

Gallagher & Muehlegger, 2011; Ozaki & Sevastyanova, 2011, stated that owners of AFVs gain benefits and favorable outcomes due to policy-related remuneration and lower fuel costs but intention to adopt can be impeded through expensive initial purchase prices and high maintenance costs for batteries (Soon et al., 2013). Wiedmann et al. (2011) depicted that due to problems related with the batteries of AFVs, the price may reduce in future. Those discussions are illustrated the financial uncertainties can be occurred in consumer purchase intention. As same as above, H8 was rejected and found that there is no impact of perceived risk in between perceived price value and the consumer attitudes.

### **c. The Impact of Perceived Risk on the Relationship between Emotion Value and Consumer Attitude**

According to the results of the study it shows (Emotional Value\*Perceived Risk->Consumer Attitude)  $p = 0.007$ , LLCI = 0.0572, ULCI = 0.365 and it represents positive impact for both Lower-Level Confidence Interval and Upper-Level Confidence Interval so it shows that the impact of perceived risk on the relationship between emotion value and consumer attitude. So, H9 can be accepted.

### **d. The Impact of Perceived Risk on the Relationship between Social Value and Consumer Attitude**

According to the behavior of different social groups is affected to perceived risk like social risk. Turrentine and Kurani, (2007) pointed out the concept of "social stigma" against fuel-efficient vehicles and found that the vehicles with good fuel economy were most of the time considered "cheap" and less appealing to middle- and upper-class buyers. As Sri Lankan context, people may be resistant to buy HEVs, because they are concerned that other people perceive them as too progressive or as a green geek (Thilina and Gunawardane,

2019). In the study it was represented a positive impact of perceived risk on the relationship between social value and consumer attitude. Hence, H10 was accepted.

**e. The Impact of Perceived Risk on the Relationship between Ecological Value and Consumer Attitude**

As a main character of the perceived value in relevant to automobile, ecological value affected for consumers to make choices. Today most of the people consider and adopted for greener concept and they consider both positive and negative impacts can be occurred in due to their purchasing decision. As AFVs are more favorable for environment, the result also shows that there is no impact from perceived risk between ecological value and consumer attitude. So, the study had been rejected H11. The result was shown; Social Value\*Perceived Risk->Consumer Attitude)  $p = 1$ , LLCI = -0.1462, ULCI = 0.1461.

**Managerial Implications**

**a. Automobile Manufactures**

an automobile maker, any of the producer should know about the real benefits and other uncertainties can be occurred from the product. Because consumers are more knowledgeable today with the changing environment. As consumer consider present and forceable future, automobile makers should have to consider both present and future uncertainties which are related with the mobilities. As instance, before making or design the automobiles they should consider what kinds of qualities, automobile prices, social factors, consumers'psychological mindsets and environment effects that related to the mobilities. As per the study, it can be concluded that consumer attitude act as a salient factor with the perceived values as well as with consumer intention to adopt of AFVs. Before processing vehicles, producer should consider consumer attitudes towards autos, whether they are positive or not. As social and emotional values are related with uncertainties, producer should produce autos, to attract all the parties around the customers, if not other parties may ignore the product first and customers also have to ignore the purchasing decision secondly without thinking their own. Another important factor is collaborative with each other. It means that the technology development and manufacturing costs could be reduced if manufacturers engaged in a more collaborative relationship with regards to common standards, which could lead to price reductions affecting the purchase and maintenance of AFVs.

**b. Marketers**

A marketer should be able to market any product whether it is new to the market or not, whether it has wider benefits or not because it is a one of responsibilities of a marketer which can be done to capture the market share. The Ecological value is a more powerful factor in AFVs because greener concept can be easily spread throughout the world due to favorable benefits to the environment. Marketing managers should consider environmental benefits before process the marketing mix. Another thing is most of the people does not know reality of the AFVs concept. Some of them accept the vehicles and some others are not accept the vehicles. Different opinions are available in the industry about the AFVs concept. Some believe that AFVs are not economical rather than environmentally friendly vehicle, some other buy vehicle due to considering only the modernity of the vehicle etc. Simply it appears that the scenario of the AFVs concept is not spread the world as a one volition. So, marketer should think about the AFVs concept carefully before doing any promotional activities to make one thought among people. The researcher needs to know that whether the uncertainties change the consumer value dimensions on AFVs and finally the result have been shown that uncertainties change only emotional value and the social value with consumer attitudes and other values are not affected from uncertainties in order to change the consumer attitudes towards AFVs. Hence, the marketing managers should have to more concern about consumers emotional and social value dimensions as they are affected by risk dimensions. When making marketing activities marketers should carefully manage the consumer feelings and thoughts as well as social factors.

**c. Public Entities**

As government entities, those are responsible parties for whole world because they have the power of ignore unfavorable products from the society and contribute for favorable products to promote them. As per the literature, AFVs are popular among people due to positive impacts to the environment. But most of the people ignore the product due to law battery capacity, high price to replace the batteries, high price of spares etc. As government bodies, they can ignore those kinds of negative experiences from the society by reducing the taxes on spares, encouraging AFVs agents, promoting AFVs as possible, arranging tax reliefs for AFVs buyers etc. Then people may encourage to concern more on AFVs than conventional vehicles. For that, manufacturers of AFVs should optimize their supply chains and negotiate with relevant governments for the introduction of new policies and sector-specific investment incentives to reduce prices and improve the value for money of AFVs.

### **Future Research Directions**

This study provides a significant contribution to existing knowledge to identify issues and rectify them, it is not exempt from its own limitations which can be resolved from future studies. As mentioned earlier the research was carried out only in Sri Lanka. Therefore, the generalizability of the findings to other consumers, cultures, societies would depend on a widening of this study to other world of regions in order to obtain relevant cross-country comparisons. As this study collected data from people who are more than 18 years old and having a driving license with them and based on both current users as well as potential users of auto market. Future research studies should address this by, using the sample before and after consumers test drive an AFV because it will be supported to answer in proper manner for consumer attitude variable as it is changing due to several factors. Present study focused only the perceived value dimensions and had not used any technical performance characteristics of AFVs. Future researchers can introduce technical performance characteristics of AFVs like, acceleration, low engine noise etc. in addition to perceived value dimensions. Then responses can easily think about the scenario of vehicle and provide proper answer for research questions. As mentioned in the section of limitation, consumers may not take the decision of buying a vehicle at once. Before coming to the vehicle shop, customers find a lot of information regarding vehicles through social medias and from other automobile related societies. By looking more information they are more knowledgeable and some time they may have wrong decisions as well. Future researchers can consider the social media as a moderating factor in addition to perceived risk dimension.

### **References**

- [1]. Adnan, N., Nordin, S. M., Rahman, I., Vasant, P. M., & Noor, A. (2016). A comprehensive review on theoretical framework-based electric vehicle consumer adoption research. *International Journal of Energy Research*, 41(3), 317–335. <https://doi.org/10.1002/er.3640>
- [2]. Advantages and Disadvantages of Hybrid Cars. (2017, January 3). Retrieved from Conserve Energy Future website: <https://www.conserve-energy-future.com/advantages-and-disadvantages-of-hybrid-cars.php>.
- [3]. Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-t](https://doi.org/10.1016/0749-5978(91)90020-t)
- [4]. Allcott, H., & Wozny, N. (2014). Gasoline Prices, Fuel Economy, and the Energy Paradox. *Review of Economics and Statistics*, 96(5), 779–795. [https://doi.org/10.1162/rest\\_a\\_00419](https://doi.org/10.1162/rest_a_00419)
- [5]. Asgarpour, R., Hamid, A., & Sulaiman, Z. (2015). *Review of A Review on Customer Perceived Value and Its Main Components*, Vol. 1 (2). Retrieved from <https://www.researchgate.net/publication/278677913>.
- [6]. Asshidin, N. H. N., Abidin, N., & Borhan, H. B. (2016). Perceived Quality and Emotional Value that Influence Consumer's Purchase Intention towards American and Local Products. *Procedia Economics and Finance*, 35, 639–643. [https://doi.org/10.1016/s2212-5671\(16\)00078-2](https://doi.org/10.1016/s2212-5671(16)00078-2)
- [7]. Aulia, S. A., Sukati, I., & Sulaiman, Z. (2016). A Review: Customer Perceived Value and its Dimension. *Asian Journal of Social Sciences and Management Studies*, 3(2), 150–162. <https://doi.org/10.20448/journal.500/2016.3.2/500.2.150.162>
- [8]. Babin, B. J., Darden, W. R., & Griffin, M. (1994). Work and/or Fun: Measuring Hedonic and Utilitarian Shopping Value. *Journal of Consumer Research*, 20(4), 644. <https://doi.org/10.1086/209376>
- [9]. Beise, M., & Rennings, K. (2005). Lead markets and regulation: a framework for analyzing the international diffusion of environmental innovations. *Ecological Economics*, 52(1), 5–17. <https://doi.org/10.1016/j.ecolecon.2004.06.007>
- [10]. Campbell, M. C., & Goodstein, R. C. (2001). The Moderating Effect of Perceived Risk on Consumers' Evaluations of Product Incongruity: Preference for the Norm: Table 1. *Journal of Consumer Research*, 28(3), 439–449. <https://doi.org/10.1086/323731>
- [11]. Carlson, K. D., & Herdman, A. O. (2010). Understanding the Impact of Convergent Validity on Research Results. *Organizational Research Methods*, 15(1), 17–32. <https://doi.org/10.1177/1094428110392383>
- [12]. Carlucci, F., Cirà, A., & Lanza, G. (2018). Hybrid Electric Vehicles: Some Theoretical Considerations on Consumption Behaviour. *Sustainability*, 10(4), 1302. <https://doi.org/10.3390/su10041302>
- [13]. Chai Wen, T., & Mohd. Noor, N. A. (2015). What Affects Malaysian Consumers' Intention to Purchase Hybrid Car? *Asian Social Science*, 11(26). <https://doi.org/10.5539/ass.v11n26p52>
- [14]. Chang, H., & Jai, T. (2015). Is fast fashion sustainable? The effect of positioning strategies on consumers' attitudes and purchase intentions. *Social Responsibility Journal*, 11(4), 853–867. doi: 10.1108/srj-07-2014-0095
- [15]. Chang, Lan-Lan. (2013). *Influencing Factors on Creative Tourists' Revisiting Intentions: The Roles of Motivation, Experience and Perceived Value*. 25-34. [https://tigerprints.clemson.edu/all\\_dissertations/1084](https://tigerprints.clemson.edu/all_dissertations/1084)
- [16]. Chaudhuri, A. (2000). A Macro Analysis of the Relationship of Product Involvement and Information Search: The Role of Risk. *Journal of Marketing Theory and Practice*, 8(1), 1–15. <https://doi.org/10.1080/10696679.2000.11501856>
- [17]. Chiu, C.-M., Wang, E. T. G., Fang, Y.-H., & Huang, H.-Y. (2012). Understanding customers' repeat purchase intentions in B2C e-commerce: the roles of utilitarian value, hedonic value and perceived risk. *Information Systems Journal*, 24(1), 85–114. <https://doi.org/10.1111/j.1365-2575.2012.00407.x>
- [18]. cLeay, F., Yoganathan, V., Osburg, V.-S., & Pandit, A. (2018). Risks and drivers of hybrid car adoption: A cross-cultural segmentation analysis. *Journal of Cleaner Production*, 189, 519–528. <https://doi.org/10.1016/j.jclepro.2018.04.031>
- [19]. Cordell, H. Ken; Murphy, Danielle; Riitters, Kurt H.; Harvard, J.E., III. 2005. The natural ecological value of wilderness. In: *The Multiple Values of Wilderness*: 205-249
- [20]. Duncan, D., Ku, A. L., Julian, A., Carley, S., Siddiki, S., Ziogiannis, N., & Graham, J. D. (2018). Most Consumers Don't Buy Hybrids: Is Rational Choice a Sufficient Explanation? *Journal of Benefit-Cost Analysis*, 10(1), 1–38. <https://doi.org/10.1017/bca.2018.24>
- [21]. Frost, J. (2017). How to interpret R-squared in regression analysis. Retrieved from <http://statisticsbyjim.com/regression/interpret-rsquared-regression/> Accessed on 02 June 2018
- [22]. Gallagher, K. S., & Muehlegger, E. (2011). Giving green to get green? Incentives and consumer adoption of hybrid vehicle technology. *Journal of Environmental Economics and Management*, 61(1), 1–15. <https://doi.org/10.1016/j.jeem.2010.05.004>



- [23]. Gayer, T., & Viscusi, W. K. (2013). Overriding consumer preferences with energy regulations. *Journal of Regulatory Economics*, 43(3), 248–264. <https://doi.org/10.1007/s11149-013-9210-2>
- [24]. George, D., & Mallery, P. (2003). SPSS for Windows step by step: A simple guide and reference. 11.0 update (4th ed.). Boston: Allyn & Bacon.
- [25]. Hausteijn, S., & Jensen, A. F. (2018). Factors of electric vehicle adoption: A comparison of conventional and electric car users based on an extended theory of planned behavior. *International Journal of Sustainable Transportation*, 12(7), 484–496. <https://doi.org/10.1080/15568318.2017.1398790>
- [26]. Heffner, R. R., Kurani, K. S., & Turrentine, T. S. (2007). Symbolism in California's early market for hybrid electric vehicles. *Transportation Research Part D: Transport and Environment*, 12(6), 396–413. <https://doi.org/10.1016/j.trd.2007.04.003>
- [27]. Hidrue, M. K., Parsons, G. R., Kempton, W., & Gardner, M. P. (2011). Willingness to pay for electric vehicles and their attributes. *Resource and Energy Economics*, 33(3), 686–705. <https://doi.org/10.1016/j.reseneeco.2011.02.002>
- [28]. Higuera-Castillo, E., Molinillo, S., Coca-Stefaniak, J. A., & Liébana-Cabanillas, F. (2019). Perceived Value and Customer Adoption of Electric and Hybrid Vehicles. *Sustainability*, 11(18), 4956. <https://doi.org/10.3390/su11184956>
- [29]. Hirunyawipada, T., & Paswan, A. K. (2006). Consumer innovativeness and perceived risk: implications for high technology product adoption. *Journal of Consumer Marketing*, 23(4), 182–198. <https://doi.org/10.1108/07363760610674310>
- [30]. Hong, Y.H., Khan, K., & Abdullah M.M. (2013). The Determinants of Hybrid Vehicle Adoption: Malaysia Perspective. *Australian Journal of Basic and Applied Sciences*, 7(8): 347-454.
- [31]. HuyTuu, H., Ottar Olsen, S., & ThiThuyLinh, P. (2011). The moderator effects of perceived risk, objective knowledge and certainty in the satisfaction-loyalty relationship. *Journal of Consumer Marketing*, 28(5), 363–375. <https://doi.org/10.1108/07363761111150017>
- [32]. Jacoby, J., and Kaplan, L.B. (1972). The Components of Perceived Risk. Proceedings of the Third Annual Conference of the Association for Consumer Research: Association for Consumer Research, 382-393.
- [33]. Jahng, J., Jain, H., & Ramamurthy, K. (2007). Effects of interaction richness on consumer attitudes and behavioral intentions in e-commerce: some experimental results. *European Journal of Information Systems*, 16(3), 254–269. <https://doi.org/10.1057/palgrave.ejis.3000665>
- [34]. Jakobsson, N., Gnann, T., Plötz, P., Sprei, F., & Karlsson, S. (2016). Are multi-car households better suited for battery electric vehicles? – Driving patterns and economics in Sweden and Germany. *Transportation Research Part C: Emerging Technologies*, 65, 1-15. doi: 10.1016/j.trc.2016.01.018
- [35]. Jin, B., & GuSuh, Y. (2005). Integrating effect of consumer perception factors in predicting private brand purchase in a Korean discount store context. *Journal of Consumer Marketing*, 22(2), 62–71. <https://doi.org/10.1108/07363760510589226>
- [36]. Karunanayake, T., & Samarasinghe, D. (2019). The Effect of Perceived Risk on the Purchase Intention of Alternative Fuel Vehicles. An Extension to UTAUT. *Sri Lankan Journal of Management*, 23(2), 68-98.
- [37]. Khazaei, H., & Khazaei, A. K. (2006). Review of Electric Vehicles and Factors That Influencing Their Adoption Moderating Effects of Driving Experience and Voluntariness of Use (Conceptual Framework). *IOSR Journal of Business and Management*, Volume 18(Issue 12, Ver. III), 60–65. <https://doi.org/10.9790/487X-1812036065>
- [38]. Koller, M., Floh, A., & Zauner, A. (2011). Further insights into perceived value and consumer loyalty: A "Green" perspective. *Psychology and Marketing*, 28(12), 1154–1176. <https://doi.org/10.1002/mar.20432>
- [39]. Kotler, P., & Keller, K. (2016). A framework for marketing management. Boston: Pearson.
- [40]. Krause, R. M., Lane, B. W., Carley, S., & Graham, J. D. (2016). Assessing demand by urban consumers for plug-in electric vehicles under future cost and technological scenarios. *International Journal of Sustainable Transportation*, 10(8), 742–751. <https://doi.org/10.1080/15568318.2016.1148213>
- [41]. MacKinnon, D., & Fairchild, A. (2009). Current Directions in Mediation Analysis. *Current Directions in Psychological Science*, 18(1), 16-20. doi: 10.1111/j.1467-8721.2009.01598.x
- [42]. Małgorzata Łatuszyńska, M., Fatimah Furajji, F., & Agata Wawrzyniak, A. (2012). An Empirical Study of the Factors Influencing Consumer Behaviour in the Electric Appliances Market. *Contemporary Economics*, 6(3), 76. doi: 10.5709/ce.1897-9254.52
- [43]. Mannix, B. F., & Dudley, S. E. (2015). The Limits of Irrationality as A Rationale for Regulation. *Journal of Policy Analysis and Management*, 34(3), 705–712. <https://doi.org/10.1002/pam.21841>
- [44]. Mohamed, M., Higgins, C., Ferguson, M., & Kanaroglou, P. (2016). Identifying and characterizing potential electric vehicle adopters in Canada: A two-stage modelling approach. *Transport Policy*, 52, 100-112. doi: 10.1016/j.tranpol.2016.07.006
- [45]. Mourato, S., Saynor, B., & Hart, D. (2004). Greening London's black cabs: a study of driver's preferences for fuel cell taxis. *Energy Policy*, 32(5), 685-695. doi: 10.1016/s0301-4215(02)00335-x
- [46]. Napon, S., Tetsuhiro, I., Atsushi, F., & Sathita, M. (2015). Review of Study on Fuel Consumption Estimation Considering the Impacts of Hybrid Vehicle Promotion Based on Time Sharing of Driving Regimes from Probe Data in Bangkok]. *Journal of the Eastern Asia Society for Transportation Studies*, 11(EISSN: 1881-1124), pp 939-953. <https://doi.org/https://doi.org/10.11175/easts.11.939>
- [47]. Nosi, C., Pucci, T., Silvestri, C., & Aquilani, B. (2017). Does Value Co-Creation Really Matter? An Investigation of Italian Millennials Intention to Buy Electric Cars. *Sustainability*, 9(12), 2159. <https://doi.org/10.3390/su9122159>
- [48]. Olson, E. L. (2018). Lead market learning in the development and diffusion of electric vehicles. *Journal of Cleaner Production*, 172, 3279–3288. <https://doi.org/10.1016/j.jclepro.2017.10.318>
- [49]. Ozaki, R., & Sevastyanova, K. (2011). Going hybrid: An analysis of consumer purchase motivations. *Energy Policy*, 39(5), 2217–2227. <https://doi.org/10.1016/j.enpol.2010.04.024>
- [50]. Panday, A., & Bansal, H. O. (2014). Green transportation: need, technology and challenges. *International Journal of Global Energy Issues*, 37(5/6), 304. <https://doi.org/10.1504/ijgei.2014.067663>
- [51]. Pattnaik, S. (2019). Working with Second-order Construct in Measurement Model: An Illustration Using Empirical Data. *Methodological Issues in Management Research: Advances, Challenges, and the Way Ahead*, 249–259. <https://doi.org/10.1108/978-1-78973-973-220191014>
- [52]. Rajendran, K., & Jayakrishnan, J. (2019). Consumer Perceived Risk in Car Purchase. *ICTACT Journal on Management Studies*, Volume: 04, 736-741. <https://doi:10.21917/ijms.2018.0100>
- [53]. Rezvani, Z., Jansson, J., & Bengtsson, M. (2018). Consumer motivations for sustainable consumption: The interaction of gain, normative and hedonic motivations on electric vehicle adoption. *Business Strategy and the Environment*, 27(8), 1272–1283. <https://doi.org/10.1002/bse.2074>
- [54]. Rezvani, Z., Jansson, J., & Bodin, J. (2015). Advances in consumer electric vehicle adoption research: A review and research agenda. *Transportation Research Part D: Transport And Environment*, 34, 122-136. doi: 10.1016/j.trd.2014.10.010

- [55]. Saleem, Abdul Ghafar, Muhammad Ibrahim, Muhammad Yousuf, Naveed Ahmed, A. (2015). Product Perceived Quality and Purchase Intention with Consumer Satisfaction. *Global Journal of Management and Business Research*. Retrieved from <https://journalofbusiness.org/index.php/GJMBR/article/view/1684>.
- [56]. Sánchez-Fernández, R., & Iniesta-Bonillo, M. (2007). The concept of perceived value: a systematic review of the research. *Marketing Theory*, 7(4), 427-451. doi: 10.1177/1470593107083165
- [57]. Sarmah, H. K., & Hazarika B.B. (2012). Determination of Reliability and Validity measures of a questionnaire, *Indian Journal of Education and Information Management*, Vol:1, ISSN:2277-5374, 518-527.
- [58]. Shende, V. (2014). Analysis of Research in Consumer Behavior of Automobile Passenger Car Customer. *International Journal of Scientific and Research Publications*, Volume 4, Issue 2.
- [59]. Sheth, J. N., Newman, B. L., & Gross, B. L. (1991). Why we buy what we buy: A theory of consumption values. *Journal of Business Research*, 22(2), 159-170. [https://doi.org/10.1016/0148-2963\(91\)90050-8](https://doi.org/10.1016/0148-2963(91)90050-8)
- [60]. Smith, & Smith, J. & Colgate, & Mark. (2007). Customer Value Creation: A Practical Framework. *Journal of Marketing Theory and Practice*. 15. 7-23. 10.2753/MTP1069-6679150101.
- [61]. Soon, W. L., Wong KeeLuen, & Jenny Marisa Lim Dao Siang. (2013). Hybrid Vehicle Adoption â€ A Conceptual Study. *Journal of Education and Vocational Research*, 4(6), 165-168. <https://doi.org/10.22610/jevr.v4i6.115>
- [62]. Stavkova, J., Stejskal, L., Toufarova, Z. (2008) Factors Influencing Consumer Behavior. *Agricultural Economics – Czech*, 54(6), 276-284.
- [63]. Stone, R. N., & Grønhaug, K. (1993). Perceived Risk: Further Considerations for the Marketing Discipline. *European Journal of Marketing*, 27(3), 39-50. <https://doi.org/10.1108/03090569310026637>
- [64]. Sunitha, T., Justus, T. F., & Ramesh, M. (2012). Determinants of Perceived Risk in Purchase of Car. *Pacific Business Review International*, 5(2), 35-43.
- [65]. Sweeney, J. C., & Soutar, G. N. (2001). Consumer perceived value: The development of a multiple item scale. *Journal of Retailing*, 77(2), 203-220. [https://doi.org/10.1016/s0022-4359\(01\)00041-0](https://doi.org/10.1016/s0022-4359(01)00041-0)
- [66]. Thilina, D., & Gunawardane, N. (2019). The effect of perceived risk on the purchase intention of electric vehicles: an extension to the technology acceptance model. *International Journal of Electric and Hybrid Vehicles*, 11(1), 73. <https://doi.org/10.1504/ijehv.2019.098717>
- [67]. Walsh, G., Shiu, E., & Hassan, L. M. (2014). Replicating, validating, and reducing the length of the consumer perceived value scale. *Journal of Business Research*, 67(3), 260-267. <https://doi.org/10.1016/j.jbusres.2013.05.012>
- [68]. Wang, S., Fan, J., Zhao, D., Yang, S., & Fu, Y. (2014). Predicting consumers' intention to adopt hybrid electric vehicles: using an extended version of the theory of planned behavior model. *Transportation*, 43(1), 123-143. <https://doi.org/10.1007/s11116-014-9567-9>
- [69]. Wang, Y., Po Lo, H., Chi, R., & Yang, Y. (2004). An integrated framework for customer value and customer- relationship- management performance: a customer- based perspective from China. *Managing Service Quality: An International Journal*, 14(2/3), 169-182. <https://doi.org/10.1108/09604520410528590>
- [70]. Wei, X., & Jung, S. (2017) Understanding Chinese Consumers' Intention to Purchase Sustainable Fashion Products: The Moderating Role of Face-Saving Orientation. (2017). *Sustainability*, 9(9), 1570. doi: 10.3390/su9091570
- [71]. Wiedmann, K.-P., Hennigs, N., Pankalla, L., Kassubek, M., & Seegebarth, B. (2011). Adoption barriers and resistance to sustainable solutions in the automotive sector. *Journal of Business Research*, 64(11), 1201-1206. <https://doi.org/10.1016/j.jbusres.2011.06.023>
- [72]. Wu, W.-Y., Chen, S.-H., & Lu, H.-Y. (2014). The Moderating Roles of Perceived Risks and Social Influences with Regard to the Effects of Consumers' Perceived Value and Online Purchasing. *Proceedings of the 2010 Academy of Marketing Science (AMS) Annual Conference*, 269-273. [https://doi.org/10.1007/978-3-319-11797-3\\_156](https://doi.org/10.1007/978-3-319-11797-3_156)
- [73]. Yang, K., & Jolly, L. D. (2009). The effects of consumer perceived value and subjective norm on mobile data service adoption between American and Korean consumers. *Journal of Retailing and Consumer Services*, 16(6), 502-508. <https://doi.org/10.1016/j.jretconser.2009.08.005>
- [74]. Yang, J., Kato, H., & Ando, R. (2017). [Review of Examining the Energy Cost Saving by Adopting Plug in Hybrid Electric Vehicles : Case Study in Toyota City, Japan]. *Journal of Eastern Asia Society for Transportation Studies*, Vol. 12(ISSN 1881-1124), 478-488. <https://doi.org/https://doi.org/10.11175/easts.12.478>
- [75]. Yee, C.J., San, N.C. (2011), Consumers' perceived quality, perceived value, and perceived risk towards purchase decision on automobile. *American Journal of Economics and Business Administration*, 3(1), 47-57
- [76]. Yu, S., & Lee, J. (2019). The Effects of Consumers' Perceived Values on Intention to Purchase Upcycled Products. *Sustainability*, 11(4), 1034. <https://doi.org/10.3390/su11041034>
- [77]. Yüksel, A., & Yüksel, F. (2007). Shopping risk perceptions: Effects on tourists' emotions, satisfaction and expressed loyalty intentions. *Tourism Management*, 28(3), 703-713. doi: 10.1016/j.tourman.2006.04.025
- [78]. Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1988). Communication and Control Processes in the Delivery of Service Quality. *Journal of Marketing*, 52(2), 35-48. <https://doi.org/10.1177/002224298805200203>

Jayani H.K.D.H.M, et. al. "Impact of Perceived Value on Customer Adoption: Examining the Moderating Effect of Perceived Risk Towards Alternative Fuel Vehicles." *International Journal of Business and Management Invention (IJBMI)*, vol. 11(09), 2022, pp. 75-92. Journal DOI-10.35629/8028