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## Analysis of Factors Affecting the Green Purchase Intention of Electric Motorcycle: Case Study of Selis

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### Abstract

*Although Selis brand under PT.JUARA BIKE has been the pioneer of electric bicycle in Indonesia since 2011, the brand still has lack of demand on the electric motorcycle. The objective of this research is to analyze the factors affecting the green purchase intention of electric motorcycle. Some logical frameworks of this research are Subjective Norms, Aesthetic Value, Green Value, Perceived Price, and Perceived Quality. By using an online survey, a total of 300 respondents from people live in Jabodetabek region were collected. The findings showed that subjective norms, aesthetic value, green value, Perceived Price, and perceived quality influenced green purchase intention positively. The findings also revealed that green value, perceived quality and aesthetic value made the largest contribution in influencing green purchase intention among consumers. On the other hand, Perceived Price and subjective norms had a lesser significant impact on consumer intention to purchase green products.*

*Keywords: Subjective Norms, Aesthetic Value, Green Value, Perceived Price, Perceived Quality, Green Purchase Intention.*

## I. INTRODUCTION

Air pollution represents the biggest environmental risk to health. According to a report by World Health Organizations [1] in 2016, the cause of death of one out of nine people in the world is related to air pollution. Around 3 million people deaths were caused by ambient (outdoor) air pollution in 2012. Citizens in Africa, Asia or the Middle East are having higher risk due to the higher levels of air pollutants compared to other countries in the world. Some cities there have air pollution levels that are multiple times higher than those considered safe by the WHO. Based on WHO website, the main cause of air pollution is the usage of transportation such as motorcycles, cars, bus, etc [2]. In Southeast Asia, there are a lot of residents that have used the conventional motorcycle as the main means of urban transportation. Relatively high but flatly distributed job densities and population, narrow streets, and a uniformly distributed road network make the motorcycle a convenient choice from one place to another to travel in many cities. Cheap motorcycles, inexpensive fuel and easy credit payment methods make it an interesting choice as well. Motorcycles are very convenient transportation, not only because of the space efficiency due to their size but also the maneuverability, but their efficiency likely increases with the proportion of traffic comprising motorcycles [3]. In 2019, Indonesia was categorized as the sixth most air polluted country in the world [4]. Indonesian Motorcycle Industry Association (AISI) has data that the average motorcycle sales in Indonesia are between 6-8 million units per year from 2008 until 2019 and it has led to severe air condition in Indonesia [5]. Jakarta itself, as the capital city of Indonesia, has ranked as the fifth most air polluted city in the worlds [6]. If this situation is continuing to happen, it can shorten the life expectancy of Jakarta people up to 4 years [7].

As written on Kompas.com, the total number of motorcycles in Jakarta has reached 14,74 million units in 2018, which is three times greater than cars [8]. Motorcycle itself shares the largest segment of air pollution causes in Jakarta with 44.53%, followed by bus at 21.43% and cars at 16.11%. Seeing this high amount of pollution produced by motorcycles, it can be seen that many Jakarta's people are relying on using motorcycles all the time. On the other hand, there are also some companies in Indonesia that produce Electric Motorcycles, one of them is PT. JUARA BIKE. At the beginning, they focused only on electric bicycles / E-bike, but now they are selling Electric motorcycles as well. According to CNNIndonesia.com, Indonesian government is targeting to produce up to 2.1 millions Electric Motorcycles in 2025 [9].

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PT. JUARA BIKE has started to sell electric bikes since 2011, but until now the average production of the electric bike and motorcycle is only 72 thousands units/year, which is far below the average production of the conventional motorcycle. In fact, PT.JUARA BIKE only uses 30% of their production capacity due to lack of demand for electric bikes and motorcycles, and they can produce up to 240 thousands units/year if they maximize the production capacity. However, a lot of people in Indonesia do not have interest to purchase or switch from conventional motorcycle to electric motorcycle. It is known that changing from conventional motorcycles to electric motorcycles will reduce one of the primary harmful air pollution caused by conventional motorcycles and improve the local air quality [3].

## II. THEORETICAL FRAMEWORK

### 2.1 Literature Review

**Subjective Norms.** The term “subjective norm” can be defined as “the perceived social pressure to perform or not to perform the behavior” [10]. As stated by [11] that subjective norms are “the influence of others who are important/close to the person such as “close friends, relatives, colleagues, or business partners.” Subjective norm captures an individual's feeling about the social pressure they feel about a given behavior. Subjective norms refers to “observing the attitudes and behaviors of a person to change his or her self-faith and behaviors” [12], therefore purchase decisions are affected by the Internet , friends and family [13]. The opinions and suggestions from others typically affect the green purchase intention. Subjective norms are perceived social influences / pressures because of which an individual might indulge himself / herself in a particular behavior.

**Aesthetic Value.** Aesthetic value can be defined as “the degree of customer perception of the attractiveness and beauty of products” [14]. The concept of visual product aesthetics usually plays a basic role for ideas about the sensorial character of the products [15]. Following (Bloch, Brunel, Arnold and Charters, the aesthetic design or appeal of a product has many varieties from very low (own-label detergent) to very high (a painting or sculpture) [16], [17]. Visual aesthetics can be seen in many customer experiences most noticeably in fashion and electronic products such as smartphones, tablets and personal computers [18]. Products can be manufactured to be aesthetically interesting and pleasing for both touch and to the visually [19]. Moreover, aesthetic value is one of the most important factors affecting consumer preferences in many ways. A

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good or unique product design helps to differentiate products from its competitors and enables them to make a difference in the market [16].

Green Value. Haws, Winterich and Naylor, stated the concept of green values by defining them as “the tendency to explore the value of environmental protection through one’s purchases and consumption behaviors” [20]. Green value is the other name for environmentally friendly, eco-friendly and environmentally responsible [21]. Also has been stated by McEachern and McClean (2015), that green value is “a multifaceted concept which includes: minimization of pollution, responsible use of non-renewable resources, preservation of the environment, and animal welfare & species preservation.” [22] The green values construct thus encapsulates the tendency to express the value of environmental protection through one’s purchases and consumption behaviors. Thus, consumers with higher knowledge about green values are correspondingly generally more oriented towards protecting resources and more interested in buying green products.

Perceived Price. From the customer's perspective, Perceived price can be defined as “what is given up or sacrificed to obtain a product.” It is considered to be one of the most important elements in the green marketing mix. Roy (2013) has described Perceived price as the main reason customers choose not to buy green products because they are more likely to be more expensive [23]. In the simplest form, prices can be defined as “the nominal value charged to the customer to acquire products and to be benefited from the ownership or use of products” [24]. According to Roe et al., (2001), 67% of Americans were prepared to pay an additional five to ten percent more for ecologically compatible goods in 2000, and people with more environmentally aware people were prepared to pay an additional 15-20 percent more for green products [25]. Different with Indonesian customers, Indonesian customers are well known to be cost sensitive and unwilling to pay more for product characteristics [26].

Perceived Quality. Perceived quality is also important for customer decision making to take an action as a result, customers will compare the quality of alternatives with regard to price within a category [27]. According to Hacker (1991) perceived quality is “directly related to the reputation of the firm that manufactures the product.” [28] According to Zeithaml (1988) & Tsiotsou (2006) the perceived quality is defined as “the consumer’s judgement about a product’s overall excellence or superiority” [29], [30] and following Snoj, Pisnik Korda and Mumel (2004) perceived quality results from the comparison of consumer expectations with the actual performance of a brand or product [31].

Green Purchase Intention. Green purchase intention is the desire of a consumer to prefer, and their intention to purchase environmentally friendly products Chen and Chang (2012), Debora Indriani, Rahayu and Hadiwidjojo (2019) [32], [33]. On the other hand, Roe et al. argued this meant consumers bought green products in order to protect or not destroy the environment [25]. Also, Chan stated that green purchase intentions could be measured by three items, which are switching to a green version of a product, switching other brands for ecological reasons and considering to buy green or greener products [34]. The intention to buy green products can be explained as a particular type of environmentally friendly behavior which is reflected by the customers to express their concern towards the ecological system [35]. Ramayah, Lee and Mohamad (2010) indicated that green purchase intention is a crucial factor for determining the behavior of consumers [36].

## 2.2 Hypothesis Development

SN and GPI. According to the previous research, that subjective norms are one of the predictors of purchase intention [37]–[39]. There is a study from a previous researcher that found an associated between electric car usage and subjective norms [40]. In contrary results with the research in India, while some research show that there is no association between the intention to purchase green products with subjective norms , because the people tend to be more individualistic in their countries [41], some recent studies predict there is a significant direct relationship between subjective norms and the intention to purchase green products [42]. In the last research by Screen, Purbey and Sadarangani (2018) has proven that subjective norms have a significant impact on purchasing green products [43]. To conclude, the authors have the hypothesis:

H1#1: Subjective norms are positively associated with the Green purchase intention.

AV and GPI. Ares and Deliza (2010) has noted that there is a relationship between aesthetic value and the intention to purchase green products [44]. The shape and the color of a product has a positive influence on the intention to buy a product. The researcher Gallarza and Saura (2006) has applied aesthetic value to understand how it influences purchase intention and satisfaction in the travel industry [45]. Aesthetic value was frequently used to measure how it gives impact on customer decisions while shopping online [46]. Alternatively, aesthetic value has been found to have a significant impact with purchase intention [47], [48]. Moreover, Mohd et al., (2013) has proven that

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aesthetic value has a positive relationship in purchase intention of conventional motorcycles [49]. As a result, according to the above discussions, the hypothesis is proposed as the following:

H1#2: Aesthetic value is positively associated with the Green purchase intention.

GV and GPI. Consumers with stronger or higher knowledge about green values (i.e., “green” consumers) are generally oriented toward protecting resources at both the environmental and personal level. Based on the previous research, that green value has a positive impact for an upcycled product [14]. The findings by Haws, Winterich and Naylor (2014) showed that stronger green values increase consumer preference for environmentally friendly products [20]. If consumers perceive that the value of a product is higher, they are more likely to purchase the product [32]. In the rise of the environmentalism nowadays, green value is very important in order to have the intention to purchase green products, so according to the above discussions the following hypothesis is proposed:

H1#3: Green value is positively associated with the Green purchase intention.

PP and GPI. Studies by Manner et al (2007) have shown that cost is an important factor in the acquisition of customers, thus having a major effect on the satisfaction of customers. This means that Perceived Price may be a great factor leading a consumer’s intention of purchasing a product. Consumers consider price when evaluating products or services [50], [51]. As a result, customers who are willing to purchase green products consider the Perceived Price of these products, and green products are typically more expensive than ordinary products. Also, several studies have indicated that Perceived Price is a crucial factor affecting consumer use intention [52], [53]. Huang and Lin said that customers are willing to pay more money to purchase green products if they believe that the product will be beneficial for the environment [54]. As a result, according to the above discussions, the hypothesis is proposed as the following:

H1#4: Perceived Price is positively associated with the Green purchase intention.

PQ and GPI. Perceived quality has a significant relationship on consumer intention to purchase a product [55]. The positive impact towards product quality originates from the perceived quality dominance [56]. Subsequently perceived quality significantly sustains a long-standing consumer relationship such that purchase intentions remain as the most vital element that determines the intention to purchase green products [31]. On the other hand, some available empirical evidence shows that the results are inconsistent

depending on the situation. The research conducted by Boulding et al., (1993) shows that there is a significant direct effect relationship between purchase intention and perceived quality [57]. Thus, this research has the following hypothesis:

H1#5: Perceived quality is positively associated with the Green purchase intention.

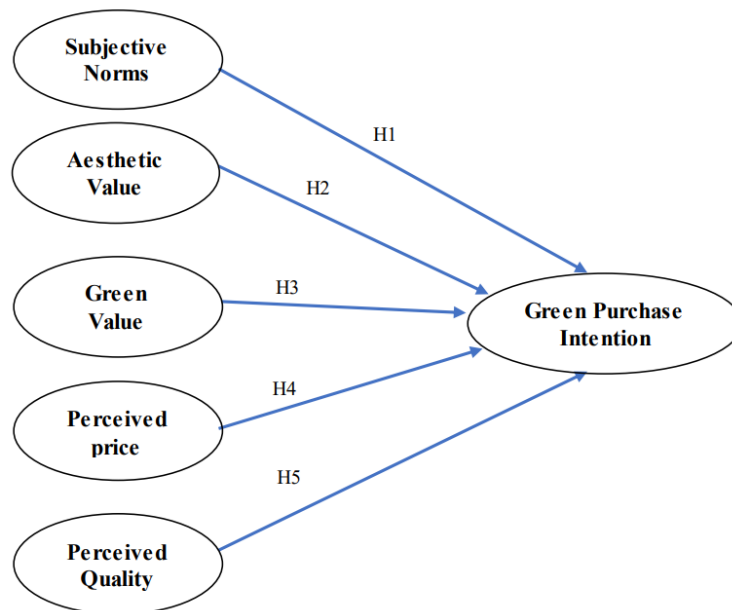


Figure 1. Research Model

Source: Author, 2020

### III. METHOD

#### 3.1 Data Collection & Method

In this research, the author uses descriptive study and will use non-probability judgement sampling for the sample collection. Descriptive study uses methods like quantitative analysis of secondary data, questionnaires, surveys and interviews. In this research, the descriptive study method was used to analyze the factors affecting the green purchase intention of electric motorcycles. The researcher chooses to use a descriptive method because the objective is to get first hand data from the respondents. Moreover, a descriptive study method has an advantage for the researcher because of its flexibility. This method can be used either quantitative or qualitative data or both, giving

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the researcher greater options in selecting the instrument for data-gathering. In this research, there were included primary data and secondary data types. The primary data were derived from the answers gathered by distributing the online questionnaires. While the secondary data were obtained from the previous studies & literatures that are in line with the current topic. Thus, there are three main stages in this research as the following:

Pre-test. Pre-test is an important step that should be done on a research. Failure to pre-test may enhance both sampling mistakes (because of failure to answer either a few questions or the entire questionnaire) and non-sampling mistakes (because of misunderstanding some questions, inaccurate or unclear skip patterns, or number of other reasons.) In a pre-test sample, there are a few steps the researcher needs to undergo, starting with data preparation, followed by data screening and validity & reliability test [58]. The first step of data analysis is data screening. It was done to make sure that the raw data is reliable, and it meets the requirements of basic assumptions by Hair et al., (2010). The first step, data preparation will be gathered from the information gathered from previous studies. The second step is data screening using SPSS software, and there are a few stages of data screening. The first data screening was done to check the missing data, to check whether the respondent has answered all the questionnaires completely or not. The second data screening was to evaluate the accuracy of the data and was determined using minimum and maximum theoretical range of scores between 1 and 5. The last data screening is to identify outliers [58]. After finish with data screening, then the pre-test sample should go to the validity & Reliability test. Validity test also use SPSS software to evaluate the validity of the questionnaire's construct. By using SPSS, six things can be evaluated; "KaiserMeyer-Olkin measure of sampling adequacy (KMO), Anti-image Matrices (the MSA scores), Bartlett's Test of Sphericity sig., Component matrix score (factor loading), component matrix (in 1 column or more than 1 column) and Communalities-Extractions scores."

Post-test. Post-test will be done after the pretest is done. Similar to the pre-test, but the posttest will be using a bigger sample. In the post-test, there will be data preparation and data screening. After making sure that all the data has passed the data screening, the next step is examining the multivariate assumption Hair et al., (2010). There are six stages to be done, called classical assumption tests. 1. Normality Test with Kolmogorov-Smirnov; 2. Normality Test with Normal Probability Plot (P-Plot Test) and Histogram graphic; 3. Linearity Test; 4. Homoscedasticity or Heteroscedasticity test with Scatter Plot graphic; 5. Non-Correlated Errors/Autocorrelation Test with Spearman Rho Test, and 6. Multicollinearity Test [58].

In-depth Interview. The data that was collected from this in-depth interview will be used for cross-checking from quantitative data. There will be 3 people as samples in this interview who are selected randomly from those who already fill in the questionnaires. The interviewees must be those who are already answered the questionnaires fully until the end

### 3.2 Sampling Size

Sampling is the selection process that targets a sufficient number of the right members from the population to generalize such characteristics of the population. Targeting a sufficient sample size is important to represent the whole population of the Jabodetabek area. According to Hair et al., (2010), "the number of respondents is at least five times as many observations as the number of variables to be analyzed, and the more acceptable sample size would have 10:1 ratio". So based on Hair et al definition, the sample size of this study can be calculated as below:

$$\text{Number of Variables} \times 5 = \text{Minimum Sample Size}$$

$$30 \times 5 = 150 \text{ respondents}$$

Hence, the needed number of minimum respondents for this specific study is 150 respondents. This minimum amount of sample size will determine the data and result of this study and determine the relationships between the independent variables and dependent variables. Values under the calculated amount such as the above will result in insufficient or reliable data results.

## IV. RESULTS AND DISCUSSION

Table 1 below shows the results from each latent variable, including the overall KMO, MSA, Bartlett's test, factor loading, component matrix column, communalities extraction score and cronbach's alpha score. All of the data taken are already valid and reliable and higher from the minimum validity and reliability parameters.

**Table 1.** Table of validity and reliability (Measurement Model analysis)

Item		Validity Parameters						Reliability Parameters
Construct	Questions	Overall KMO	MSA	Bartlett's Test	Factor Loading	Component Matrix Column	Communalities Extract	Cronbach's Alpha

							ion Score	
<b>SN</b>	1	0.848	0.893	0.000	0.733	1	0.537	0.874
	2		0.850		0.730		0.533	
	3		0.820		0.706		0.498	
	4		0.851		0.755		0.570	
	5		0.827		0.817		0.668	
	6		0.819		0.821		0.674	
	7		0.899		0.730		0.532	
<b>AV</b>	1	0.860	0.860	0.000	0.910	1	0.829	0.946
	2		0.881		0.924		0.854	
	3		0.832		0.939		0.851	
	4		0.837		0.936		0.876	
<b>GV</b>	1	0.824	0.839	0.000	0.849	1	0.721	0.882
	2		0.793		0.890		0.791	
	3		0.810		0.883		0.780	
	4		0.867		0.818		0.669	
<b>PP</b>	1	0.823	0.828	0.000	0.877	1	0.769	0.875
	2		0.820		0.883		0.779	
	3		0.773		0.909		0.825	
	4		0.916		0.755		0.570	
<b>PQ</b>	1	0.888	0.874	0.000	0.789	1	0.623	0.912
	2		0.869		0.792		0.627	
	3		0.930		0.819		0.672	
	4		0.888		0.786		0.618	
	5		0.894		0.785		0.616	
	6		0.893		0.835		0.696	
	7		0.875		0.887		0.787	
<b>GP I</b>	1	0.785	0.834	0.000	0.825	1	0.681	0.856
	2		0.855		0.730		0.532	
	3		0.744		0.886		0.785	
	4		0.755		0.893		0.797	

Table 2 below shows the R score, R Square, and adjusted R square for the used variable. The data taken from the SPSS software.

**Table 2.** Regression Analysis Test

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.712 <sup>a</sup>	.506	.498	2.47083

a. Predictors: (Constant), PQ, AV, GV, PP, SN

b. Dependent Variable: GPI

Table 3 below shows the T-Test (Partial) Score and F-Test (Simultaneously) Score for the used variable. It has a T-Score higher than the T-table and F-Score also higher than the F-Table. Thus, it is considered that all the hypotheses carried in this research are all accepted.

**Table 3.** Table of T-test, F-test & Hypothesis conclusion

Hypothesis	T-Test (Partial)		F-Test (Simultaneously)		Hypothesis Conclusion
	T-Score > T-Table (1.968)	Sig. < 0.05	F-Score > F-Table (2.26)	Sig. < 0.05	
H1: Subjective Norms	3.477	0.001	60.339	0.000	H1#1 Accepted
H2: Aesthetic Value	3.683	0.000			H1#2 Accepted
H3: Green Value	4.857	0.000			H1#3 Accepted
H4: Perceived Price	3.386	0.001			H1#4 Accepted
H5: Perceived Quality	3.777	0.000			H1#5 Accepted

## V. DISCUSSION

Based on the hypothesis results above, it can be determined that subjective norms have a positive and significant influence on green purchase intention because the t-score is higher than the t-table. It also has significance below the level of error of 0.05, or in other words, H1#1 – Subjective Norms positively associated with green purchase intentions are accepted. As previously stated by [43], subjective norms has the ability of making the consumers want to buy green products, which concludes that subjective norms also have

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a significant impact on consumer's green purchase intention. The presence of subjective norms on a consumer's perspective also will lead to beneficial for the business. It will lead consumers who already bought or not yet bought become influenced by the subjective norms.

Based on the table 3 above, it can be determined that aesthetic value has a positive and significant influence on green purchase intention because the t-score is higher than the t-table and has a significance value below the level of error of 0.05, or in other words, H1#2 – Aesthetic Value is positively associated with green purchase intention. As previously stated by [44] that there is a relationship between aesthetic and purchase intention. The shape and the color of a product has a positive influence on the intention to buy a product. In this research, aesthetic value shows the third highest affecting green purchase intention with 3.683 score. It can be concluded that aesthetic value plays a good role for green purchase intention of electric motorcycles. By creating an interesting design for the electric motorcycle, it is believed that it will increase the sales of the electric motorcycle.

Based on the table 3 above, it can be determined that green value has a positive and significant influence on green purchase intention because the t-score is higher than the t-table and has a significance value below the level of error of 0.05, or in other words, H1#3 – Green Value is positively associated with green purchase intention. As stated by [20] that stronger green values increase consumer preference for environmentally friendly products. The same case with electric motorcycles, people with higher green values will consider buying electric motorcycles compared with conventional motorcycles because of its more environmentally friendly. Also, in this research, green value has the highest score in the t-score compared to the others. It means that green value is the most influencing factor for green purchase intention.

Based on the table 3 above, it can be determined that Perceived Price has a positive and significant influence on green purchase intention because the t-score is higher than the t-table and has a significance value below the level of error of 0.05, or in other words, H1#4 – Perceived Price is positively associated with green purchase intention is accepted. As stated by [50], [51] that price is an important factor in the acquisition of customers, thus having a major effect on the satisfaction of customers. This means that price may be a great factor leading a consumer's intention of purchasing a product. Based on this research, consumers perceived Price of electric motorcycles already in line with the value of the product, and the price is acceptable. On the other hand, the sales of electric motorcycles in Indonesia are still considered low, so it is not in

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line with the normal economic theory that the higher the price, the higher the intention of purchasing an electric motorcycle.

Based on the table 3 above, it can be determined that perceived quality has a positive and significant influence on green purchase intention because the t-score is higher than the t-table and has a significance value below the level of error of 0.05, or in other words, H1#5 – Perceived Quality is positively associated with green purchase intention is accepted. As stated by [31] that perceived quality is the most vital influencer for customer purchase intention, because of long-term customer relationships. Consumers that already know the perceived quality of the product is good, will keep buying from the same company. As can be seen on the table 4.39 above, perceived quality is the second highest factor affecting green purchase intention. Thus, customers will choose the electric motorcycle with good quality and long-lasting without frequent servicing than better aesthetic value.

## VI. CONCLUSIONS

This research has five objectives that were set in the first chapter of this research. The first objective is to analyze whether subjective norms positively affect consumers' green purchase intention. The second objective is to learn whether aesthetic value has a positive impact towards consumers' intention to purchase. The third objective is to analyze whether green value has a positive impact towards consumers' green purchase intention. The fourth objective is to see whether Perceived Price has a positive impact towards consumers' intention to purchase. The last objective is to analyze whether perceived quality has a positive impact on consumers' green purchase intention.

After undergoing some data gathering processes, statistical tests and analyzing the results, there are five outcomes that can be concluded from this research. The results of this research signified several conclusions in line with consumers' intention to purchase green products. According to the t-score results, the score of subjective norms is the second lowest after Perceived Price. It means that subjective norms have contributed to the green purchase intention, but electric motorcycles are not considered cheap, so people cannot easily be influenced by only subjective norms. Aesthetic value has the third highest t-score after green value and perceived quality, it means that consumers are really influenced by the design of the electric motorcycle. Green value has the highest t-score among others, which is 4.857 and followed by Perceived Price with the lowest

t-score, which is 3.386. It can be concluded that green value of the consumers is the highest aspect that influenced consumers green purchase intention. People with higher green value will still consider buying an electric motorcycle, although the price is high, the design is not aesthetic, and the quality still not as good as the conventional motorcycle. On the other hand, Perceived Price has the lowest t-score, which means that Perceived Price has contribution but not as high as green value. Consumers still buy electric motorcycles if the price is high, but they will be attracted more if the price is cheaper. Perceived quality has the second highest score from the t-table, which is 3.777. It means that consumers are really influenced by the perceived quality of the electric motorcycle. So based on this research, it can be concluded that people will choose electric motorcycles with high quality but bad aesthetic design and expensive price, rather than low quality but good aesthetic and cheap price.

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