

APPLICATION OF THEORY OF PLANNED BEHAVIOUR TO PREDICT CONSUMER INTENTION TO PURCHASE SAFER CAR

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Abstract— The fatality reduction of 141 car occupants recorded from year 2013 to 2014 indirectly indicates the significant improvement of car safety in Malaysia. This could be partly due to the stricter legislation implemented by the government and also the emerging automobile safety rating program known as New Car Assessment Program for Southeast Asian Countries (ASEAN NCAP). Nevertheless, its benefit in improving the safety of car occupants will not be optimized if the consumers do not purchase the safer cars as behavior changes. Therefore, this study is employed to explore the behavior of consumers with regards to safer car purchasing. The conceptual framework based on Theory of Planned Behavior (TPB) is proposed and the developed instrument has been tested which appeared valid and reliable. The proposed hypotheses were met as well based on preliminary analyses.

Keywords— ASEAN NCAP, Car Safety, Purchase Intention, Road Traffic Accident, Theory of Planned Behavior.

I. INTRODUCTION

Globally, road traffic crashes have caused more than 1.25 million fatalities (WHO 2015). Comparing to earlier report, road traffic fatality recorded during that time was only 1 million people (WHO 2009). Amongst the workable counter measure to improve the current condition is for the vehicle sold in the country to meet minimum safety standard (WHO 2015).

In Malaysia, the car occupant fatalities is deliberate as the second in the statistic after motorcyclist. Motorcyclist recorded for 63% of total deaths in 2014. Meanwhile car occupants and pedestrian followed by 19% and 8% of total road fatalities.

The car occupant survival in 2014 shows a result of 141 lives saved which indicated in the statistics. 1399 car occupant fatalities has been recorded in 2013 compare to only 1258 in 2014. Although it is not definite, the Malaysia Government interventions has showed some results. Since 2009, the level of car safety has been elevated through regulation-based and consumer-based approach. (Khairil Anwar, A.K., Mohd Hafzi, M.I., Intan, O., Arokiasamy, L., 2015).

Hence, there is a need to encourage more people buying safer car or more equipped safety car in Malaysia in order to lower the statistics. Dukic, T., Hanson, L., and Falkmer, T., (2006) found that behaviour study in relation to car safety has been minor explored. Bazerman (2001) explained that purchasing decision based on safety is not sole decision of the consumer. The factors that contributing to car purchase are cost, brand image, safety, fuel economy, maintenance and reliability.

The study believes that by understanding automotive consumerism based on consumer, car manufacturer and policy makers will create new knowledge that leads to better sales for safer cars in Malaysia.

Thus, this paper aims to propose a conceptual framework on the application of Theory of Planned Behavior (TPB) to predict consumer intention to purchase safer car, demonstrate the reliability and validity of the test instrument, and present the preliminary findings.

II. THEORETICAL AND CONCEPTUAL FRAMEWORKS

There are numerous theories addressing human behavior. One of the most widely researched models predicting behavioral intentions is Theory of Planned Behavior (TPB). It was developed based on the extension of the Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975). The TRA is a social-psychological model which claims that a person's actual behavior in performing certain action is directly guided, as a central factor, by his or her own behavioral intention, which in turns is jointly determined by subjective norms and attitude towards the behavior (Fishbein and Ajzen 1975).

TPB is an important social cognitive model that aims to explain variance in consumer behavior (Ajzen 1991) and has been proven to be successful in doing so in many studies (Liao, C.J., Chen, L., Yen, C.Y., 2007; Kaiser 2006). While the TPB can be considered as the most influential theory in health psychology (Zemore and Ajzen 2014), it has also been validated in the context of pro-environmental behavior (Whitmarsh and O'Neill 2010). TPB has also been used to study safety related behaviors e.g. helmet use among motorcyclists (Ali, M., Saeed, M.M.S., Ali, M.M., and Haidar N., 2011), and occupational health-related behavior (Colemont and Van den Broucke 2008).

In addition, previous studies have shown that TPB provides an excellent framework for identifying

predictors of intention to purchase automobile related technologies e.g. autonomous (Kelkel R. 2015) and environmentally friendly vehicles (Afroz et al. 2015; Hong et al. 2013; Emsenhuber 2012; Moons & De Pelsmacker 2012). In the context of safer car, TPB can be considered as an appropriate behavioral model to be utilized. Thus, this study proposes the conceptual framework as illustrated in **Figure 1**.

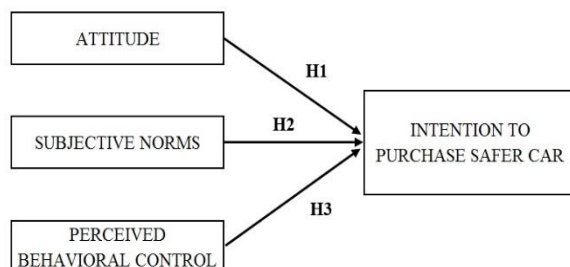


Figure 1: Conceptual Framework

2.1. Attitude towards Purchasing Safer Car

The TPB proposes that behavior is affected by intention, which in turn, is affected by attitude towards the behavior. Attituderefers to the degree to which an individual has a favorable or unfavorable evaluation of the given behavior. It is hypothesized that individual will develop a positive attitude toward the behavior if he or she believes that the specific behavior will produce a good outcome (Ajzen & Fishbein, 1980).

Although there is no established study on behavioral intention to purchase safer car with respect to attitudinal factor, there are other related studies on automobiles applying TPB that can be referred. Many researchers reported consumers having very positive attitudes towards purchasing other automobile related features such as autonomous (Afroz, R., Masud, M. M., Akhtar, R., Islam, M. A., & Duasa, J. B., 2015) and electric vehicles (Kelkel 2015; Emsenhuber 2012; Moons & De Pelsmacker 2012). Therefore, the hypothesis for this construct is proposed as follows;

H1: There is a positive correlation between attitude and intention to purchase safer car.

2.2. Subjective Norms

Subjective norms refer to perceived social pressure from other persons on whether or not to perform the specific behavior (Ajzen 1991). Empirical studies have shown that social influence from family and friend has an effect on vehicle purchasing intentions (Kelkel 2015; Moons & De Pelsmacker 2012).

Rogers (1995) also highlighted the importance of mass media and external communication in influencing intention towards a product, which can be considered as part of social norms. Moons & De Pelsmacker (2012) have also included this element into their study which can be considered for safer car as well. Thus, the hypothesis for this construct is proposed as follows;

H2: There is a positive correlation between subjective norm and intention to purchase safer car.

2.3. Perceived Behavioral Control

Perceived behavioral control refers to the factors that may impede the performance of the behavior (Ajzen 1991) which can be categorized into two components. The first part is self-efficacy which can be defined as an individual's self confidence in his or her ability to perform a behavior.

The second part, on the other hand, termed as facilitating condition, refers to availability of resources needed to engage in a behavior (Tan and Teo 2000). In other words, the perception about how difficult it is to perform the given behavior is subject to affordability and availability of that particular product (Ajzen 1991).

In the case of electric vehicles, another form of PBC i.e. government incentives in the forms of tax and sale reductions, and fuel policy were also considered (Hong et al. 2013). Therefore, for this study, the element of government incentives and also manufacturer's safety priority were included as well. Taking that into consideration, the hypothesis for this construct is proposed as follows;

H3: There is a positive correlation between perceived behavioral control and intention to purchase safer car.

III. VALIDITY AND RELIABILITY OF THE INSTRUMENT

In order to confirm the results authentication, the research instrument has to be valid and reliable (Ary, D., Jacobs, L.C., and Razavieh, A., 2002). Reliability involves repeated administration of the research instrument in order to ensure that same results are generated when this instrument is used multiple times. Validity, on the other hand, is the ability of the instrument to represent the characteristics of the intended measurements accurately.

3.1. Development of the Instrument

This study utilized survey questionnaires as the instrument of research to gather primary data from the participants. Surveys are the most popular data assortment instrument as data can be composed easily from large population in cost operative manner. This tool also allows the researcher to collect data from large sample size (Leedy and Ormrod 2012).

The questionnaire comprised of two main parts. The first part contains all the measurement items of the four constructs arranged in random order whereas the second part covers the demographic profiles. It was constructed in both English and Malay languages in order to ensure that respondents with different first languages could understand all the items.

All the construct domain and measurement items were adapted from a comprehensive review of past studies (Kelkel R. 2015; Hong, Y., Khan, N., &

Abdullah, M., 2013; Emsenhuber 2012; Moons & De Pelsmacker 2012). Due to the different context of the study, most of the items were not taken directly in the existing literatures but were modified. New items were developed as well following the guideline by Ajzen (2013) in constructing TPB questionnaire, based on exploratory qualitative study. **Table 1** summarizes the list of adapted and new items for each respective construct.

Table1:Four main constructs and adapted items used for questionnaire

Construct	Literature Source
Attitude (ATT) [5 items]	ATT1(Kelkel 2015) ATT2 (Moons & De Pelsmacker 2012) ATT3 (Kelkel 2015; Moons & De Pelsmacker 2012) ATT4 (Kelkel 2015; Moons & De Pelsmacker 2012) ATT5 (Exploratory study)
Subjective Norms (SN) [6 items]	SN1(Kelkel 2015; Moons & De Pelsmacker 2012) SN2(Kelkel 2015; Moons & De Pelsmacker 2012) SN3(Exploratory study) SN4 (Moons & De Pelsmacker 2012) SN5(Exploratory study) SN6(Exploratory study)
Perceived Behavioral Control (PBC) [5 items]	PBC1(Moons & De Pelsmacker 2012) PBC2(Ajzen 2013) PBC3 (Hong et al. 2013) PBC4 (Hong et al. 2013) PBC5 (Exploratory study)
Intention to Purchase Safer Car (PI) [2 items]	PI1 (Emsenhuber 2012) PI2 (Emsenhuber 2012) PI3 (Emsenhuber 2012)

3.2. Validity of the Instrument

Firstly, face validity was conducted in which the instrument was reviewed by supervisory committee on clarity and relevance of the test items to participants. After all the feedbacks and comments were considered, the improved instrument was assessed for content validity. This was necessary as most of the items were modified from existing literatures and newly developed.

For this process, twelve subject matter experts (SMEs) from research institutions and universities were approached but only nine of them agreed to participate. They were required to judge and rate the test items as either ‘Essential’, ‘Useful but Not Essential’, or ‘Not Necessary’ to represent each respective construct.

Based on assumptions that a greater level of content validity represents a larger number of SME’s agreement that a particular item is essential, Lawshe (1975) developed a formula termed as Content Validation Ratio (CVR) and provided a table of critical values for the CVR based on the number of SME. The formula is as follows;

$$CVR = \frac{n_e - N/2}{N/2}$$

where CVR = Content Validation Ratio,
 n_e = number of SME indicating essential, and
 N = total number of SME

Generally, the CVR values for all the test items representing each construct met the requirement of critical CVR value of 0.78 for 9 SMEs (Lawshe 1975). Thus, this instrument can be considered as valid. Further assessment on construct validity will be performed once the data collection is completed.

3.3. Reliability of the Instrument

Pre-testing was conducted among 30 respondents in order to ensure the reliability of the questionnaire. The respondents were also given the opportunity to comment of any confusion and suggest for any improvement.

Generally, the results of the test for all four constructs met the requirement of 0.70 Cronbach’s Alpha value (α) for social science study except PBC (0.65). The reliability results for each construct are indicated in **Table 2**.

The low number of Cronbach’s Alpha value (α) for PBC could be due to the low number of respondent. Although the value can still be considered as acceptable according to certain studies, improvement on the test items will be made before the data collection.

Table 2: Cronbach’s Alpha Reliability Test Result for Pre-Testing

Construct	Number of items	Cronbach’s Alpha value (α)
ATT	5	0.75
SN	6	0.81
PBC	5	0.65
PI	3	0.75

IV. PRELIMINARY FINDINGS

A preliminary correlation analysis was performed using the Statistical Package for Social Science (SPSS) version 16.0 on the pre-testing data to check whether or not the hypotheses have been met. Based on **Table 3**, **Table 4** and **Table 5**, PI is significantly and positively correlated with ATT, SN and PBC, which confirms with the hypotheses.

Table 3: Correlation Analysis between ATT and PI

		ATT	PI
ATT	Pearson Correlation	1	.694**
	Sig. (2-tailed)		.000
	N	30	30
PI	Pearson Correlation	.694**	1
	Sig. (2-tailed)	.000	
	N	30	30

** Correlation is significant at the 0.01 level (2-tailed).

Table 4: Correlation Analysis between SN and PI

		SN	PI
SN	Pearson Correlation	1	.545**
	Sig. (2-tailed)		.000
	N	30	30
PI	Pearson Correlation	.545**	1
	Sig. (2-tailed)	.000	
	N	30	30

** Correlation is significant at the 0.01 level (2-tailed).

Table 5: Correlation Analysis between PBC and PI

		PBC	PI
PBC	Pearson Correlation	1	.465**
	Sig. (2-tailed)		.010
	N	30	30
PI	Pearson Correlation	.465**	1
	Sig. (2-tailed)	.010	
	N	30	30

** Correlation is significant at the 0.01 level (2-tailed).

CONCLUSIONS

Utilizing TPB as the theoretical and conceptual frameworks for this study on safer car purchasing has been proposed. The developed instrument has also been tested and appeared valid and reliable. Furthermore, the correlation analyses from pre-testing data revealed that all three hypotheses were met. Slight improvement will be made before the data collection commences.

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