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Attitude and Behaviour of Society towards Transport Carbon Emission Pollution in Sintok, Kedah

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Abstract--- *Carbon emission pollution and its effect on society have attracted international attention due to environmental, social and economic problems. However, it appears that society's attitude and behaviour is still unclear about the effects of carbon emission from transport as atmospheric pollutant. The purpose of this research is to study society's behaviour using Tripartite Model of Attitude (TMA) as the under-pinning theory towards transportation with low carbon emission in Sintok. Kedah. Quantitative approach has been used by using self-administered survey questionnaires adopting 5-point Likert scale with validated multi-item scale measurements. Quota sampling technique was used to sample 192 respondents from society in Sintok, Kedah. Dependent variable is behaviour with a single dimension. The independent variables are three components of attitude namely cognition, affection and conation. Multiple regression has been used for data analysis and hypotheses testing. This research explored behaviour of society using attitude sub-dimensions towards transportation with low carbon emission inSintok, the state of Kedah, Malaysia. The main finding is that cognitive a sub-dimension of attitude is not supported. However, affective and conative are supported.*

Keywords--- *Behaviour, Cognitive, Affective, Conative, Carbon Emission.*

I. INTRODUCTION

Transport emits carbon dioxide (CO_2) into the atmosphere causing atmospheric pollution. Carbon dioxide (CO_2) is a pollutant that needs society's cooperation to reduce the pollutant being emitted in the air(Mardani, Streimikiene, Cavallaro, Loganathan & Khoshnoudi, 2019).Environmental problems caused by pollutant such as carbon dioxide (CO_2) emission from transport can lead to atmospheric pollution causing global warming, natural resource depletion and acid rain which are threats to sustainable economic development of many countries (Caravaggio et. al., 2019). Global warming is an immediate environmental problem to society, however society might not be aware of the consequences caused by carbon dioxide (CO_2) emission from transport in the air. The increasing effects of global greenhouse issues have led to fragile environmental conditions which effect social, economic and human health (Cui et. al., 2019). Low carbon dioxide (CO_2) emission has become high priority in many nations around the globe including Malaysia. Transportation with low carbon dioxide (CO_2) emission cannot be realized without low carbon dioxide (CO_2) emission by individuals in the society.Hence, it is important to study the society's attitude and behaviour towards carbon dioxide (CO_2) emission from transport.

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However, the increase of transportation activities had contributed significantly to carbon dioxide (CO_2) emission in the atmosphere causing atmospheric pollution (Cranston, 2010). Low carbon dioxide (CO_2) emission is an important part in reducing pollution caused by transportation activities for the benefit of mankind (Ding, 2018). Government policy alone cannot guarantee success in the reduction of carbon dioxide (CO_2) pollution emitted by transports but attitude and behaviour of society will (Rasiah et al.,2017). Global warming due to carbon dioxide (CO_2) emission from transport concerns every nation on earth because of environmental, economic and social health related problems (Bazrbachi, 2017). Attitude can determine society behaviour towards lowering carbon dioxide (CO_2) emission caused by transport (Chen et al., 2014).Thenceforth, the objective for this paper is to analyse the relationship between cognition, affection and conation with behaviour towards low carbon dioxide (CO_2) emission among society.

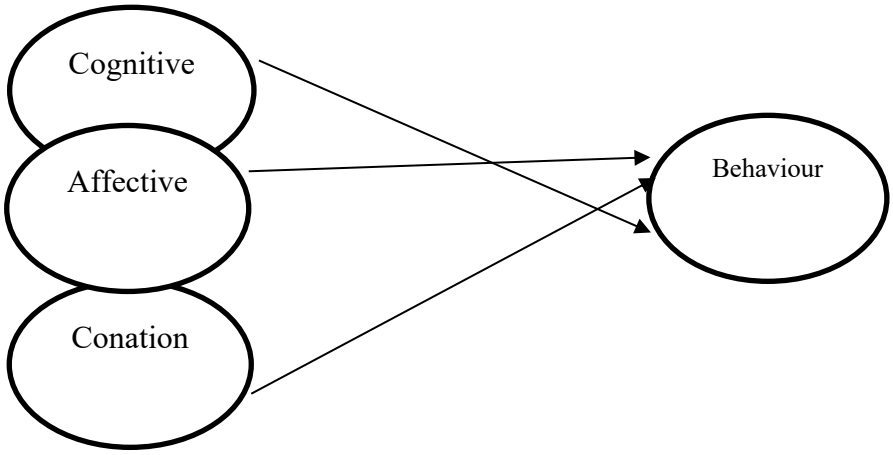
Ensuing that, this research will find answers to the following research questions: (1) Does society belief (cognitive) that CO_2 emission caused by transport is posing environmental risk? (2) Does society like (affective) clean air with low CO_2 emission caused by transport? and (3) Does society want to (conative) contribute towards low CO2 emission caused by transport?

II. Literature Review

Breckler (1984) had validated the tripartite attitude model that determines behaviour. The tripartite attitude theory consists of cognition, affection and conation to study behaviour which is a psychological abstraction of human thinking. Since this research is studying behaviour through attitude which is psychological in nature then this research is adopting an under-pinning theory from the field of psychology. The same approach has been adopted by Abaidullah (2017) and Suhartanto (2011). Abaidullah (2017) had studied the behaviour and attitude of consumers in developing brand loyal consumers towards retailers' stores. Suhartanto (2011) had adopted tripartite attitude model to develop a multi-dimensional model comprises of attitude and perception to study consumers' behaviour. The classical tripartite attitude model has been viewed in new perspective by Abaidullah (2017) and Suhartanto (2011). Other scholars in support of tripartite attitude models are Chen et. al. (2014), Ding et. al. (2018), Gifford and Nilsson (2014), Malhotra (2005) and Waygood and Avineri (2016). Ensuing scholars' suggestion, this research is adopting the tripartite attitude model as the under-pinning theory for this research.

Theoretical Framework and Hypotheses

The literature review above had allowed the formulation of conceptual framework with hypotheses for this research as depicted below:



Independent Variable Dependent Variable

Figure 1:
Proposed Research Framework

The following hypotheses are proposed:

H1: Cognition has a positive effect on behaviour of society towards transportation with lowcarbon emission in Sintok.

H2: Affection has a positive effect on behaviour of society towards transportation with low carbonemission in Sintok.

H3: Conation has a positive effect on behaviour of society towards transportation with low carbonemission in Sintok.

III. DATA COLLECTION

This research had adopted a quantitative approach upon considering suggestions from scholars, research questions and research objectives. According to Malhotra (2012), quantitative approach is a research methodology that aims to quantify the data to use statistics for analyzing the collected data. The research design in this study was cross sectional study using self-administered questionnaires. Data were collected from Sintok society in Kedah by using a set of validated questionnaires adapted from previous scholars to suit the research objectives of this study. The measurements were performed by using multi-items scales with 5-point Likert-Scale.

IV. DATA ANALYSIS

Result of Response Rate

This research had focused on the behaviour of society towards transportation with low transportation with low carbon emission in Sintok, Kedah. Three hundred (300) respondents were personally approached but only 220 respondents were willing to respond to the questionnaire. Scholars suggest that the collected data must be cleaned before performing an analysis to eliminate error (Hair et al.,2013; Malhotra, 2005). Further, 23 respondents were excluded from the dataset. Five outliers were excluded from the dataset, resulting only in 192 questionnaires deemed fit for further empirical analysis.

Table1: *Questionnaire response rate*

Respondents	Distributed Questionnaire	Returned Questionnaire	Fit for Analysis Questionnaire
Sintok	300	220	192
Total	300	220	192

Demographic of Respondents

Table 2 below depicts the demographic of respondents for self-administered survey questionnaire.

Table2: *Demographic of Respondents*

Demographic	Quota Criteria	Number of respondents	Percentage (%)
Gender	Female	110	57.30
	Male	82	42.70
Age	20 – 24 years	101	52.60
	25 – 29 years	66	34.40
	30 - 34 years	23	12.0
	35 – 39 years	2	1.0
Race	Malay	138	71.90
	Chinese	27	14.10
	Indian	20	10.4
	Others	7	3.60
Education Background	SPM	5	2.6
	DIPLOMA	35	18.2
	DEGREE	129	67.2
	MASTER	20	10.4
	PhD	3	1.6
Employment Status	Employed	24	12.5
	Self-employed	6	3.1
	Unemployed	6	3.1
	Student	156	81.3

The number of female's respondent (110) was more than male (82). It represented a ratio of 57.3% (female) and 42.7% (male) respectively which is similar the national demographic (Department of Statistics Malaysia in 2016).

Missing Data Treatment and Unengaged Responses

Hair (2013) posits that in managing missing data issue researcher should ensure that there is no systematic error in the response pattern. After data screening using SPSS revealed that no missing data in the dataset. The following step is checking for unengaged responses which can be detected by transferring the data to excel. The dataset was transferred together with the data ID for standard deviations checking. Standard deviations of 0.00 to 0.50 indicates unengaged responses which were deleted from the dataset. There were 23 unengaged responses which were deleted from the dataset and remaining 192 respondents remained for further analysis.

Reliability and Validity Test

Reliability test for the scales used in this research was conducted using Cronbach's Alpha based on standardized items.Cronbach's Alpha has an alpha coefficient with a value between 0 and 1 with the cut-off values of 0.7 or above suggest that the questions in the scale are measuring the same thing (Hair et. al., 2013).

Table 3: *Cronbach's Alpha results of reliability test*

Variables	No. of measuring Items	Item Deleted	Cronbach's Alpha
Behaviour (BEH)	3	-	.823
Cognitive (COG)	3	-	.710
Affective (AFF)	4	-	.823
Conative (CON)	4	-	.746

Multiple Regression Results

Table 4: *Multiple Regression Results*

Relationship	Path Coefficient (β)	T values	Coefficient of determination (R^2)	Decision
Cognitive ->Behaviour	.094	1.414		Rejected
Affective ->Behaviour	.481	7.389***	.328	Accepted
Conative ->Behaviour	.154	2.500**		Accepted

Note. Two-tailed test. Significant at *p<.05, **p<.01, *** p<.001

Multiple regression analysis was used to test if cognition, affection and conation significantly predict behaviour. The finding shows that cognitive does not significantly predict behaviour. The results of the regression indicated the three predictors explained 32.8% of the variance (R^2 =.328, F (3,188) = 30.585, p<.001). It was found that cognitive is insignificantly predicted behaviour(β = .0.94, *t* = 1.414), but affective (β = .481, *t* = 7.389, p<.001) and conative (β = .154, *t* = 2.500, p<.01) was significantly predicting behaviour.

Hypotheses Testing Summary

Hypotheses testing summary is presented in the table below:

Table 5: *Hypotheses testing summary*

Research Hypotheses	Results
H1: Cognition has a positive effect on behaviour of society towards transportation with low carbon dioxide (CO_2) emission	Rejected
H2: Affection has a positive effect on behaviour of society towards transportation with low carbon dioxide (CO_2) emission	Accepted
H3: Conation has a positive effect on behaviour of society towards transportation with low carbon dioxide (CO_2) emission	Accepted

From the table above it shows that H2 and H3 were accepted and H1 was rejected. This finding was in agreement with Chan et. al. (2014), Caravaggio et. al. (2019) and Brick and Lewis (2016).

VI. Study Results

The three (3) research questions formulated for this study have been answered.The tested relationships between cognitive, affective, conative and behaviourhelp to understand the society behaviour towards low carbon emission. Moving forward, authorities can use this finding for strategic and tactical implementation of low carbon dioxide (CO_2) emission campaign for awareness about pollution caused by carbon dioxide (CO_2) emission by transport. Cognitive approach will not be an effective approach as evidenced by this research finding but affective and conative approaches should be used instead to promote awareness among society.Authorities can establish and bolster effective campaign by using slogans like 'Save Our Planet' (Conative), 'Love Your Environment' (Affective) or'Love Your Environment and Save Our Planet'(combination of affective and conative).

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