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RESIDUAL WASTE BEHAVIOUR OF RESIDENTIAL HOUSEHOLDS

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Abstract

The world is experiencing environment deterioration and the deterioration is often linked with the rapid growth of a country. In addition, the industrial development and urban lifestyle are increasing which result in many cities having problems with disposal of recyclable and residual waste (non-recyclable). This study examines three factors that affect residual waste behaviour of Putrajaya residential communities. Data collection involved distributing 200 self-administered questionnaires to Putrajaya residents. Results indicate national culture, social influence and environmental governance influence the intention to adopt residual waste behaviour. The results from this research will assist Malaysian government agencies by providing information on residual waste behaviour services or attributes. Awareness programs by government agencies to focus on reducing residual wastes among residential communities must also be increased. Therefore, household residents should also be notified regularly about the potential benefits of separating waste and the harmful impact of the mounting waste generated from their houses.

Keywords: Residual waste, residential communities, theory of planned behaviour, consumer behaviour, Malaysia.

1. Introduction

As an emerging economy, Malaysians throw away a huge amount of domestic waste. It is estimated that 25,000 metric tonnes a day is disposed by Malaysians (Yahaya, 2013). In addition, on average waste disposal by a Malaysian citizen is 1.5 kg per person per day. Due to the increase in waste, a ministry under the Government of Malaysia called the Ministry of Housing and Local Government set up a National Solid Waste Management Department and the Solid Waste and a Public Cleansing Management Corporation Act 2007 (SWPCMC Act 2007) was later implemented (Manaf et al., 2009). According to this act households in 8 states in Malaysia will have to start separating their trash into recyclables and residual waste also known as non-recyclables. Residual waste is made up of waste from kitchen, food that is not eaten and diapers (Solid Waste and Public Cleansing Management Corporation, 2016).

1.1. Underpinning Theory

The theory employed to develop the framework originated from the Theory of Planned Behaviour. This theory (Ajzen & Fishbein, 1980) propose that before a desirable behaviour is determined people will consider several behavioural actions. This theory links that the most important beliefs are the factors that determine one's behaviour. Therefore, this theory is used in this study as the framework for examining the factors influencing residual waste behaviour among household residents. Many empirical studies on waste handling behaviours have applied the Theory of Planned Behavior. According to Ajzen and Fishbein (1980) a combination of attitude, subjective norms, and perceived behavioural control will result in the formation of a behavioural intention. Based on this rationale, the combination of the aforementioned factors leads to stronger behavioural intention. Past extant literature on pro-environmental behaviour, namely waste separation behaviour found attitudes as one of the main factors of waste behaviour among consumers. Studies undertaken in America and countries from Europe are many but studies on waste behaviour in developing countries seem to be lacking.

According to Ajzen and Fishbein (1980), attitude towards the behaviour is defined as the individual's positive or negative feelings about performing a behaviour. This behaviour is assessed through a person's behavioural consequences and the outcome of the consequences. Attitudes towards a behaviour are assumed to be based on behavioural beliefs which are a person's belief about the likely consequences of performing the behaviour. If residents adopting residual waste behaviour believes it is a good outcome, they tend to favour this behavioural action. Earlier research has found Western and non-Western residential as being "dissimilarly sensitive to contextual differences". Furthermore, consumers tend to be culture-bound and Western culture appears individualistic. In this present study, national culture as an additional proximal determinant of intention is investigated. In addition, an experimental study by Salazar et al. (2013), results found that "social influence which are likely peer groups such as colleagues, family and friends may influence one's decision making in choosing environmental products rather than conventional ones" (p. 172). Therefore, social influence with its dimensions is an important factor influencing residual waste behaviour. This present study conceptualised environmental governance as perceived behavioural control. Governance can be regarded as a complex arrangement where any government does not have ultimate authority to govern but the governance is shared with non-state actors with the application of 'new' modes of governance. Thus, in this study, national culture, social influence and environmental governance are

factors used to adopt residual waste behaviour and subsequently influence residents' residual waste behaviours. These factors are proposed in the model in Figure 01.

1.2. National Culture

Many definitions on culture exist but culture is the human-made part of the environment, the "learned and shared patterns of beliefs, behaviours and values of groups of interacting people" (Bennett, 1998, p. 2). On the other hand, national culture can be understood at the society, group and the identity level. Generally, culture tends to affect people's attitudes including attitude towards residual waste behaviour.

Not many theoretical studies on cultural effects have been investigated and there remain other consumer behaviour aspects on how cultural factors may affect attitudes, behavioural intention and actual behaviour. More studies need to examine the association between behavioural actions and culture as there are conflicting and mixed empirical results as to the relationships between culture and behavioural outcomes. Also, only selective dimensions have been investigated to determine the relationships between culture and behaviour. In addition, within the TPB models involving culture as moderating variables have also been examined (Kacen & Lee, 2002; Pavlou & Chai, 2002; Tan et al., 2004).

Hofstede (2010) defined that different cultures can be based on the values determined by people. There are five dimensions that culture can be distinguished as asserted by Hofstede (2010). Among these five dimensions, this study focuses on collectivism and femininity as the two dimensions are closely related to the intention to adopt residual waste behavior. Collectivism in this context means that the interest of group generally takes precedence over individual interest while femininity values include strong social relevance, the quality of life and other people's wellbeing.

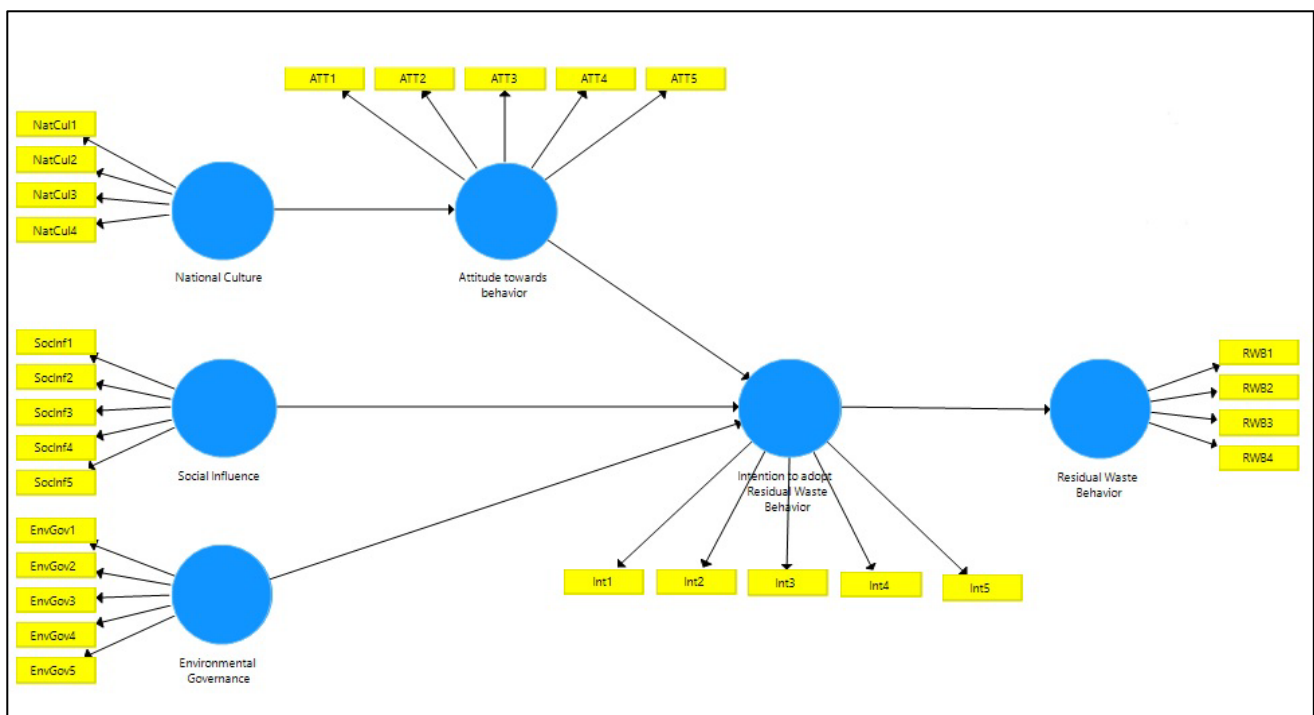*H1. National culture positively influences the attitude towards behaviour*

Figure 01. Proposed model and hypothesis

1.3. Social Influence

The change in a person's attitude or behaviour that results from interacting with other individuals or people from the same social group can be defined as social influence (Rashotte, 2007). In this context of social influence, the sources mainly come from important individuals such as family members, peers, neighbours and friends which they are serve as the key evaluators on individual's behaviours (Comber & Thieme, 2013). Wan et al. (2017) stated that when a person acts in response to social norm because they need to gain support from important individuals instead of ignoring negative response from them.

Empirical studies have found that an individual's recycling behaviour intentions are normally influenced by important people to them, Ling, Tong, and Ahmed (2018) stated that in Melaka households. Likewise, as stated by Ridzuan et al. (2017), Kuala Lumpur P.P.R households also stated that parents, siblings and neighbours are the important persons that influence an individual to have recycling behaviour especially from a mother since children tend to adhere to a mother's advice rather than others.

In terms of social influence, this factor plays a key role in individual behavioural intention and had been declared in several theories. This is in line with Rogers (1995), which stated that social influence does play a crucial role in affecting whether a person decided to adopt the intention. Based on this, social influence can be conceptualized as the social norm. Social norms are therefore positively linked to the intention of people to adopt residual waste behaviour.

H2. Social influence positively influences the intention to adopt residual waste behaviour.

1.4. Environmental Governance

The perceived behavioural control variable must be strong enough in order to make the behaviour more likely to occur. Many researchers say there exists an influence between perceived behavioural control and behavioural intention (Han, 2015; Hsu et al., 2017; Nahapetyan et al., 2019; Sheeran & Webb, 2016; Verma & Chandra, 2018). In this study, environmental governance is conceptualised as the perceived behavioural control. The idea of governance includes the complex arrangement of non-exclusive reliance on authority, the legitimate rules of governments and the shared models of new governance. In Malaysia, according to Tengku-Hamzah and Adeline (2011) the changes in governance is prevalent in environmental issues.

Consumer Motivation in Purchasing Green Products (2010) found that environmental laws and regulations make consumers to buy green products. The environmental regulatory policies and guidelines have been introduced during the past few decades, but still there is lack of environmental awareness in most countries (Sivasubramaniam, 2008).

Local authorities face management environmental issues resulting in many forums and conferences in all parts of the world. Carvalho and Fidelis (2011) indicated that governmental governance must play an important decisive role in the resolution of environment and quality issues. With environmental governance as antecedent of perceived control behaviour, the behaviour can occur and findings show the influence of perceived behaviour control towards the outcome of the intended behaviour.

H3. Environmental governance positively influences the intention to adopt residual waste behaviour.

1.5. Attitude towards Behaviour

Chen and Tung (2010) defined a feeling towards specific objects regardless it is a positive or negative, will exert and influence on behaviour as an attitude. Nevertheless, in a conscious or unconscious situation, behavioural decisions are frequently based upon attitudes. When a person wants to or sometimes do not perform a specific behaviour, this clarifies attitude does affect intentions. The more favourable the attitude, the stronger the intention is to perform that particular behaviour (Smith & Paladina, 2010). This cognitive process where consumers assess rationality in a sense such a human ability to upset the stability of belief is defined as the consumer's attitude towards the behaviour by Ajzen (1991) which has been highlighted in his numerous studies.

H4. Attitude towards behaviour influences the intention to adopt residual waste behaviour.

1.6. Intention to adopt Residual Waste Behaviour

Behavioural intention is made up of attitude, subjective norm, and perceived behavioural control as revealed by Theory of Planned Behaviour as per stated by Ajzen (1991). The theory has been confirmed and numerous studies over the years have adopted Theory of Planned Behaviour for systematic analysis (Boldero, 1995; Mannetti et al., 2004; Ramayah et al., 2012; Park & Ha, 2014; Wan et al., 2014). Shen et al. (2019) stated that studying the intention of people in any organization improves managers decision to predict individual behaviours because human interaction exits in organizations and the environment.

H5. The intention to adopt residual waste behaviour influence residual waste behaviour.

1.7. Residual Waste Behaviour

The environmental behaviours must change in order for humans to survive. Yoong et al. (2018) said that sustainability is crucial for a country because environmental consequences create serious impacts on a community. For example, in industries such as transport and energy, the processing of waste and changes in usage must also consider legislation and issues in production and consumption (Xu et al., 2016). However, Tai et al. (2011) stated that changing individual behaviors is difficult especially those in separating residual waste at home.

Separating wastes at source can be divided into two types of waste namely recyclable waste and residual waste. Recyclable waste consists of waste that can be recycled such as plastic, paper and aluminium while residual waste is made up of unused food and dirty diapers. There are many challenges in the aspects of management, facilities, and services in Malaysia as where the concept of waste separation is new. Moh and Abd Manaf (2017) clarified that to achieve a targeted recycling rate of 22% and Malaysia as a zero waste nation in 2020, everyone must participate and commit to being a green consumer.

2. Problem Statement

Currently, households in the privatized areas are required to place their waste bags in waste bins in front of their houses (kerbsides) and private collectors would collect the wastes twice or thrice a week. However, there are uncertainties in consumer awareness and attitude towards residual waste disposal. In addition, the mentality towards cleanliness, the sense of responsibility towards properly managing waste, as well as public concerns on the implications of not separating waste is critically lacking (Moh & Abd

Manaf, 2017). Many studies show households are in favour of recycling wastes, but these households did not necessarily translate this into action (Fielding et al., 2016; Mintz et al., 2019; Russell et al., 2017; Schanes et al., 2018). These issues may hinder the implementation of effective residual waste behaviour among residential communities. There are many literatures on studies in recycling behaviour (Miafidzyeva et al., 2013; Singhirunnusorn et al., 2013), household waste behaviour (Bernstad, 2014; Lanfranchi et al., 2016) and environmental conscious behaviour (Islam & Chandrasekaran, 2015; Tilikidou, 2013). Likewise, many studies on attitudes towards waste behaviour using the Theory of Planned Behaviour and consequently relationships that influence the outcome of waste behaviour have been investigated. However, to date research on residual waste behaviour in Malaysia is scarce, more so on residential communities. Hence, this research is to provide insights of residual waste behaviour of residential communities. Results from the study will help translate behaviour into actions and enhance environmental activities among residential communities.

3. Research Questions

- How does national culture influence residual waste behaviour?
- How can social influence influences residual waste behaviour?
- How can environmental governance influence residual waste behaviour?

4. Purpose of the Study

- To examine how national culture influences residual waste behaviour.
- To assess how social influence influences residual waste behaviour.
- To determine how environmental governance influence residual waste behaviour.

5. Research Methods

5.1. Measurement Development

Previous validated studies were taken and the items from those studies was used in the survey questions. A six-point Likert-type scales (1- strongly disagree to 6 - strongly agree) were utilised to measure all constructs which was adopted and adapted from previous studies. 200 survey were distributed throughout Putrajaya which is a suburban city in Malaysia. A total of 112 usable surveys were used for analysis.

The questionnaire consists of 7 sections. In Section A , national culture with 5 items (Yoo et al., 2011) was developed, Section B measured the households' attitude towards behaviour with 5 items (Goh, 2014), Section C measured households' social influence with 5 items (Alhassan et al., 2018), while the questions in Section D asked about the environmental governance with 5 items (Goh, 2014). Section E asked about the intention of households to adopt residual waste behaviour with 5 items (De Leeuw et al., 2015) and Section F asked about the households' residual waste behaviour (Akhtar et al., 2014). Section G is the sociodemographic information about the consumers.

5.2. Data Analysis

Data was analysed using the partial least square (PLS) approach using the SMART PLS Version 3.0 to test the hypothesis generated (Ringle et al., 2015). Bootstrapping method (200 resamples) was used to determine the significance levels for loadings, weights and path coefficients (Gil-Garcia, 2008).

In order to confirm convergent validity, Hair et al. (2014) suggest scholars should consider the outer loadings of the items and average variance extracted (AVE). As for confirming discriminant validity among variables, cross loading and the Fornell-Larcker criteria was used.

6. Findings

6.1. Demographic Profile of Respondents

112 respondents (56.0 percent) were females while 88 respondents (44.0 percent) were male out of the 200 respondents. The 40-49 years old (35.5 percent) and 30-39 years old (29.5 percent) had the highest number of respondents followed by the 50-59 years old (21.5 percent). For education qualification, about 32.5 percent had a Bachelor qualification, 26.0 percent were secondary school leavers and 23.5 percent of the respondents have a Diploma qualification. Majority of the respondents were married Malays (63.5 percent).

6.2. Measurement Model results

This study used the Anderson and Gerbing (1988) two-step approach. Convergent validity results are in Table 1 while discriminant validity is in Table 2. When loadings are greater than 0.5, composite reliability larger than 0.7 (Gefen et al., 2000) and the average variance extracted greater than 0.5 (Fornell & Lacker, 1981), convergent validity can be confirmed (Bagozzi & Yi, 1991).

Table 01. Results of measurement model

Model Construct	Measurement item	Loading	CR	AVE
National Culture	NatCul1	0.951	0.964	0.871
	NatCul2	0.960		
	NatCul3	0.888		
	NatCul4	0.932		
Social Influence	SocInf1	0.900	0.949	0.788
	SocInft2	0.934		
	SocInf3	0.758		
	SocInf4	0.888		
	SocInf5	0.938		
Environmental Governance	EnvGov1	0.948	0.942	0.768
	EnvGov2	0.670		
	EnvGov3	0.889		
	EnvGov4	0.886		
	EnvGov5	0.958		
Attitude towards behaviour	ATT1	0.799	0.954	0.808
	ATT2	0.962		
	ATT3	0.975		

	ATT4	0.975		
	ATT5	0.757		
Intention to adopt residual waste behaviour	INT1	0.875	0.981	0.910
	INT2	0.963		
	INT3	0.975		
	INT4	0.975		
	INT5	0.978		
Residual Waste Behaviour	RWB1	0.908	0.966	0.875
	RWB2	0.955		
	RWB3	0.909		
	RWB4	0.969		

Note: NatCul5 and NatCul6 were deleted due to low loadings <0.50;

The Fornell and Lacker (1981) criterion was used to test discriminant validity (see Table 2).

Table 02. Discriminant validity of constructs

Constructs	1	2	3	4	5	6
1. Attitude towards behaviour	0.899					
2. Environmental Governance	0.795	0.877				
3. Intention to adopt residual waste behaviour	0.842	0.836	0.954			
4. National Culture	0.752	0.390	0.605	0.933		
5. Residual Waste Behaviour	0.870	0.741	0.887	0.753	0.936	
6. Social Influence	00.581	0.579	0.623	0.432	0.629	0.888

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.

6.3. Structural Model

Results of structural model are presented in Table 3 and Figure 2.

Table 03. Results of structural model

| Hypothesis	Relationship	Coefficient	t-value	Decision
H1	National Culture -> Attitude towards behaviour	0.752	14.650**	Supported
H2	Social Influence -> Intention to adopt residual waste behaviour	0.130	3.744**	Supported
H3	Environmental Governance -> Intention to adopt residual waste behaviour	0.412	5.264**	Supported
H4	Attitude towards behaviour -> Intention to adopt residual waste behaviour	0.439	5.742**	Supported
H5	Intention to adopt residual waste behaviour -> Residual waste behaviour	0.887	45.033**	Supported

Note: *p<0.05; **p<0.01

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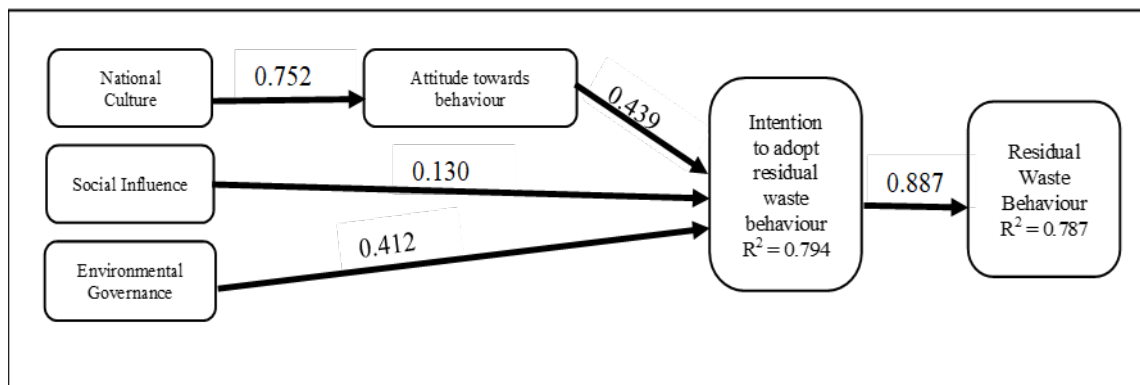
Figure 02. Results of the structural model analysis

7. Conclusion

To determine the factors that influence the intention to adopt residual waste behaviour and residual waste behaviour, national culture, social influence and environmental governance factors were examined. The findings show that these factors have positive effects on the intention to adopt residual waste behaviour. As per theoretical contribution, the theory of planned behaviour supported findings of the study for national culture, social influence and environmental governance where the theory of planned behaviour has exhibited greater predictive power.

National culture showed a stronger influence than social influence and environmental governance which is similar to a study by Noordin and Jusoff (2010) which stated that among Malaysians, harmony and social behaviour seem to be important factors of influence. This study also showed that social influence played an influencing role to adopt residual waste behaviour and residual waste behaviour which is supported by Sidique et al. (2010). Their study has confirmed that pressure from peers, family members and neighbourhood play an important role and give a positive effect on recycling behaviour.

Environmental governance had positive relationship towards intention to adopt residual waste behaviour and residual waste behaviour. This is similar to the study done by Salgado Carvalho and Fidélis (2011) which stated that environmental governance held a prominent decisive role in solving environmental problems and   environmental quality.

With the aim of achieving national zero waste in year 2020, the country's Solid Waste Management and Public Cleansing Act should be further enforced to ensure the long-term success of separation at source program. In line with that, Putrajaya households should also be notified on a regular basis about the potential benefits of separating waste and the harmful impact of the mounting waste generated from their houses. Households should know that these activities must be intensified and ongoing if they are to have a significant impact on residual waste behaviour. Thus, to improve knowledge of Putrajaya households about the practicalities of residual waste behaviour, such as what can be separated, ways to separate waste according to recyclable waste and non-recyclable waste and methods of disposing them, Putrajaya city council together with resident associations should make a concerted effort by introducing a public education program through formal or informal platforms. Putrajaya city council could also endorse a public figure or

social influencer to actively participate in residual waste behaviour activities. Furthermore, a mobile application can be developed to assist the government in monitoring the activities of residual waste. The application should have features where both households and city council could interact. For example, when an activity of separating waste is uploaded on the apps, the user will be granted some points which can be collected and redeemed for certain rewards. This application could be used to generate a database for government agencies and used as a tool to improve reporting on solid waste. Finally, more information could be disseminated via mobile apps and other communication medium to educate everyone about residual waste.

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