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Human Communication is a publication of the Pacific and Asian Communication Association (PACA). Human Communication publishes qualitative and quantitative research that focuses on original research, theories, and/or methodologies that contributes to the understanding of human symbolic activities. Studies reporting on non-mediated contexts of the communication process that emphasizes on the theoretical and practical relevance of their findings are welcomed. The journal publishes online twice a year. There are no submission fees for this journal.

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The Mediating Effect of Attitude on Factors Affecting the Recycling of Waste Products among Malaysian Youths

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Abstract
The reception of youths to the Malaysian government recycling programmes is poor; what more, their participation. As such, this study tries to investigate the mediating effect attitude on awareness, perception and perceived cleanliness-related issues on recycling of waste products among youths. The study uses the quantitative research design and employs the survey method for data collection. Questionnaires were distributed to Malaysian youths in Kuala Lumpur. Results show that youths have a positive awareness, perception, perceived cleanliness-related issues, attitude and behavior on recycling. The relationships between behavior and awareness, perception, perceived cleanliness-related issues, and attitude are positive and significant. However, attitude is only able to mediate the relationship between perception and behavior on recycling. To a certain extent, the social learning theory holds true for the study. It is suggested that the government should promote the recycling campaign through television, newspapers and the Internet.

Keywords: *Attitude; behavior; cleanliness; recycling program; Malaysian youths.*

INTRODUCTION

The Government of Malaysia launched a recycling program in 1993. Then, 11 November was declared as the National Recycling Day. However, despite several successive recycling campaigns in Malaysia, public response to the programme has been disappointing (The Borneo Post, 2015). In addition, efforts to educate, create awareness and motivate the community to respond positively have failed. In Malaysia, the continued production of solid wastes has reached a level of concern. This is because public participation in the recycling programmes has been very low in Malaysia.

It is known that the Malaysian government has launched numerous recycling programmes to create environmental awareness among the public and individuals. However, the system fails to reach its target and the fundamental motivation of educating youths on the importance of protecting the environment will not materialize just by recycling. The target is 22% by 2020 and yet the current rate is only 10.5%, which is much lower compared to other developing countries. The educational and promotional systems provided by the government of Malaysia entails providing bins at designated places tagged with different colors, where orange bin is for plastic and aluminum, blue bin for paper and brown bin for glass. The Alam Flora, an agency responsible for the disposing of solid waste, should be able to apply the 3R (Reduce, Reuse, Recycle) programme in order to make Malaysia a clean place to live in. Malaysians have been exposed to the campaign since its launch and many schools have also made efforts to implement the same. Yet, many still do not practice it fully. So, is it the way that the programme is implemented or is it the cultural element that is not being instilled into the educational system? Therefore, this study hopes to emphasize the importance of learning and practicing the good habit of cleanliness and orderliness for the well-being of the Malaysian populace now and in the future. By studying the practices of the present youths in Malaysia, future plans and strategies can be enforced by the relevant authorities so that the recycling campaign is materialized to the fullest.

Even the newly established localities are facing low participation of recycling among youths, therefore, this study tries to assess the mediating effect of attitude influencing such behavior. Hopefully, positive attitude correlates with high participation despite the fact that Latif and Omar (2012) found that no such relationship exists in their study in Tioman. Similarly, awareness does not guarantee recycling behavior (Omran, Mahmood, Abdul Aziz & Robinson, 2009); therefore, we put up the idea of attitude as the mediating variable in the hope that awareness is indirectly influencing recycling behavior.

Recycling is a process to convert waste materials into new products to prevent waste of potentially useful materials, reduce the consumption of fresh raw materials, reduce energy usage, and air and water pollution through a lesser need for waste disposal and lower greenhouse gas emissions as compared to plastic production (Albu & Ivan, 2013).

The objectives of the study are (1) to determine the level of awareness, perception, perceived cleanliness-related issues, attitude and behavior on recycling, (2) to analyze the relationships between awareness, perception, perceived cleanliness-related issues and attitudes with recycling of waste products, and (3) to test the mediating effect of attitude on awareness, perception and perceived cleanliness-related issues on recycling of waste products.

Once the objectives of the study are attained, this study hopes to contribute to the theory as well as to the body of knowledge. Since the theory used in this study is Social Learning Theory which cites that knowledge influences attitude and, in turn, influences the behavior. However, this study has included not only acquired knowledge but also knowledge from the exposure to the media through awareness, perception of recycling and perceived cleanliness-related issues. These three concepts, when integrated, can be considered as precursors to knowledge on recycling of waste products.

Previous studies in Malaysia used the Theory of Planned Behavior (Akil, Foziah & Ho, 2015; Mahmoud & Osman, 2010) and Theory of Reason Action (Ramayah & Rahbar, 2013). However, this study tries to look at the application of the Social Learning Theory perspective; a contribution aspect of this study is to test the applicability of the said theory.

The practical contribution of this study is that youths can estimate their behavior based on the questions asked in the study. Since their participation is low in the recycling of waste products, hopefully, the education system, whether at school, college, university and organizational level, should be able to instill positive recycling habits in order to maintain a clean and healthy environment. Hence, relevant authorities in the respective institutions should remind youths of the benefits of maintaining a clean atmosphere.

LITERATURE REVIEW

The Social Learning Theory

The social learning theory (Bandura, 1962) indicates that behavior is learned from the environment through observational learning. In addition, Bandura suggests that learning of behavior also occurs through observation of rewards and punishment. This theory suggests that learning is a cognitive process and is done by observing the surrounding environment. Learning by observing means imitating or following the behavior learnt from parents, friends, media, and schools.

According to Bandura, an individual being observed is called a model, who provides examples of behavior for the observers. After some time, the observers may copy such behavior (Cherry, 2014). If a person imitates the behavior of a model and the rewards he/she gets is pleasant, he/she is likely to continue with the behavior. Furthermore, if another person sees an individual who practices good habits and is being rewarded, it is more likely that he/she will repeat the behavior. In other words, this behavior has been reinforced (strengthened).

Factors Influencing the Recycling of Waste Products

It is essential to comprehend that environmental problems cannot be solved just by technology or laws alone. It is possible only with changes in the behaviors of individuals. Changing behavior requires changes in attitudes, knowledge and moral values. The government has promoted recycling programmes through campaigns: however, little has been achieved due to the lack of awareness on recycling services available and the lukewarm attitudes of the households.

On the other hand, Zahari (2012) finds that situational factors and perceived behavioral control have significant impact on the recycling of waste products among secondary school students. However, attitude and monetary incentive are not significant reasons for recycling. Situational factors include the availability of recycling facilities such as bins, trucks and information/notice boards. He also highlights that school students believe that a good recycling infrastructure will increase recycling of waste products, not only in schools but also at home and in public areas. This means that a greater number of recycling bins will make recycling easier, and in turn increase the recycling of waste products. This is supported with recent findings by Zhang, Huang, Yin and Gong (2015) who cite that situational factors have an important impact on waste separation behavior, highlighting that lack of time and inconvenience in terms of place will likely inhibit residents' waste separation behavior. The survey results imply that, "although residents felt that they had enough time to participate in waste separation, its level of convenience should be enhanced" (Zhang et al, 2015, p. 9488). In addition, McCarty and Shrum (1993) have discovered that an important finding of their study involves the strength of the relationships between attitudes about recycling and the behaviors of recycling. Consistent with previous research, the inconvenience of recycling is strongly related to whether individuals have a positive attitude towards it.

Awareness of the Recycling of Waste Products

The government has implemented many effective programmes towards making recycling a positive cultural practice among Malaysians. Among the campaigns launched by the Malaysian government are: (a) 3R Campaign (Reduce, Reuse and Recycle) in 2013, (b) Mandatory waste separation in 2015, (c) Recycle E-Waste in 2015, and (d) Fines of RM1000 for not separating the waste products, with effect from January 1, 2016 (Mustapha, 2015). The outcomes of such campaigns can be summarized as having poor participation among youths (Akil, Foziah & Ho, 2015; Latif & Omar, 2012; Mahmud & Osman, 2010; Mustafa, 2015; Mustang et al., 2015; Omran, Mahmood, Abdul Aziz & Robinson, 2009; Ramayah & Rahbar, 2013).

Awareness on recycling is perceived as mandatory to cultivate a positive attitude and behavior in saving the environment. Mahmud and Osman (2010) reveal that secondary students are still unaware of recycling information and facilities available besides the ones provided at their schools. Zen and Yusuf (2014), on the other hand, state that Malaysian behavior towards recycling is influenced by their awareness of the importance of living in a clean environment. Mutang, Ismail, Seok, Bahari, Madlan, Wider and Das (2015) identify that recyclers are willing to engage in recycling activities even though inadequate facilities are provided since they are driven by their awareness of the environment. They further synthesize the thematic analysis on what motivates Sabahans to recycle which comprises (a) an awareness towards the importance of the environment, (b) environmental cleanliness, (c) pollution reduction, and (d) maintaining the earth in the long run.

Akil and Foziah (2015) state that elder people are found to be more active in recycling compared to the younger ones. Thus, there is a need to encourage youngsters to become actively involved in recycling activities. Zain et al. (2012) find that 77% of the respondents who were willing to participate in recycling activities, agreed that recycling is important for preserving the environment and that it can indirectly encourage self-awareness. The media also plays a significant role in influencing Malaysians towards practicing recycling. Mustafa (2015) has

stated that a maximum fine of RM1000 be imposed on people who do not separate solid waste into suitable plastic bags before dumping them in their residential areas. He informs that notices will be issued to those who fail to do so in the first three months after the Act is implemented, and that action will be taken if they still refuse to do as required under Act 672. The enforcement of such an act is very important to ensure that nobody is spared of the law. This is because by nature people do not want to be punished as the Social Learning Theory indicates that rewards will be granted if good behavior is exhibited. Therefore, through this theory, hopefully people will avoid punishment, and instead go for the reward gained through performing good habits.

Perception of the Recycling of Waste Products

Perception has an effect on one's behavior and acceptance to participate in recycling. One might perceive recycling as a good effort in maintaining cleanliness; however, in reality it is not being practiced (Armitage & Conner, 1985). On the other hand, one may do exactly as what one perceives.

Many studies in Social Sciences have linked perception with behavior. Armitage and Conner (1985) suggest that people have a rational basis for their behavior and that they consider the implications of their actions. One might perceive recycling as a good effort in maintaining cleanliness, however, in reality it is not being practiced.

The efforts required to recycle have been examined as part of the recycling decision process (Granzin & Olson, 1991). Perceived effort is distinct from general attitudes toward recycling and is important in the recycling decision. They state that perceived effort may result in a negative or positive impact on recycling of waste products, depending on support from situational factors.

Perceived Cleanliness-related Issues on Recycling of Waste Products

Cleanliness is an essential part of Islamic life and in fact, the meaning and spirit behind the concept of cleanliness transcends the common concept of conventional cleanliness (Qasmi, 2014). The Islamic concept of cleanliness consists of two aspects: physical and spiritual. As far as physical cleanliness is concerned, it is related to the human body and the environment. Islam instructs Muslims to maintain cleanliness of roads and streets and to protect the environment from obliteration. In Malaysia, about 61% of the 32 million population (Department of Statistics, Official Portal, 2017 at https://www.dosm.gov.my) are Muslims, followed by Buddhists (20%), Christians (9.2%), Hindus (6.3%) and traditional Chinese (1.3%). In fact all religions encourage cleanliness and have some concerns on cleanliness.

The religions in Malaysia are also practiced in most parts of Asia. Therefore, cleanliness should be a part of their daily culture and religious practice. Since all religions encourage cleanliness, the inculcating of the values of cleanliness is hoped to be observed and practiced through recycling, as such behavior is in line with their religious practices. So, youths should learn and practice recycling for environmental cleanliness. Their positive attitude enhances recycling practices for a cleaner environment.

In Asia, countries like Japan, Korea and Singapore are respected for maintaining environmental cleanliness. Recycling of waste is one of their primary initiatives for keeping their environment clean. Specifically, Japan (Benton & Hazell, 2015; Rujivanarom, 2017) has been practicing recycling since the 1950s and their people are accustomed to such good habits. In Korea, on the other hand, penalties are enforced on people who violate the regulations of recycling (Rothman

& Thompson, 2017). In order to survive in a clean world of tomorrow, youths need to have a positive perception and attitude towards cleanliness.

Attitudes and the Recycling

Attitude is another predictor that has often been associated with behavior. Fishben and Ajzen (1975) describe attitude as a person's reaction through the soul, whose behavior can become a common habit and which can determine whether a person's actions are positive or negative. Past researchers have identified a significant relationship between both variables. Zain, Basri, Mahmood, Zakaria and Shahudin (2012) highlight the importance of attitude in determining positive behavior among the UKM community towards recycling of waste products. They believe that a positive change of attitude among the UKM community is very important. If the individual has knowledge and is aware of the importance of recycling, but takes no action, the initiative will not succeed. They suggest that "movement of individuals toward positive attitudes and behaviors regarding sustainable practices can affect the success of recycling activities at UKM" (Zain et al., 2012, p. 172). In addition, Latif and Omar (2012) investigated the recycling of waste products in relation to attitude, materialism, collectivism and individualism among the residents in Tioman Island. They aimed to investigate the most powerful determinant of the recycling of waste products on the island and found that consumers who hold positive recycling attitudes are more likely to be involved in the recycling of waste products. On the other hand, consumers who hold higher individualistic and materialistic values are less likely to be involved in the recycling of waste products. Meanwhile, in Illinois, Williams (2011), in her study on second graders in Fox Creek Elementary School has identified that the students have a strong positive attitude towards saving the environment. The study reveals that educating the minds of youths from an early age can inculcate an attitude towards making the recycling of waste products a positive norm.

Attitude is important in determining the recycling behaviour (Myers, 1990; Larsen, 1995). Myers (1990) states that attitude allows an individual to comprehend a subject and predicts his/her behaviour and the decision-making process. There is a high correlation between attitudes and recycling of waste products. With the availability of recycling bins on campus, students' perception towards recycling is positive and it is reflected in their attitude.

Attitude and recycling have been much studied (Jennings, 2004; Omran, Mahmood, Abdul Aziz, & Robinson, 2009; Wan, Cheung, & Shan, 2012) and Jennings (2004) finds that attitude can motivate youths to recycle and to adopt positive pro-recycling attitudes. Omran et al., (2009) state that education can create a positive attitude of recycling. Wan et al. (2012) indicate that by having a positive attitude towards recycling, a person is motivated to recycle. These evidences prove that with the right exposure, education and attitude, awareness towards recycling of waste products can be instilled in our youths.

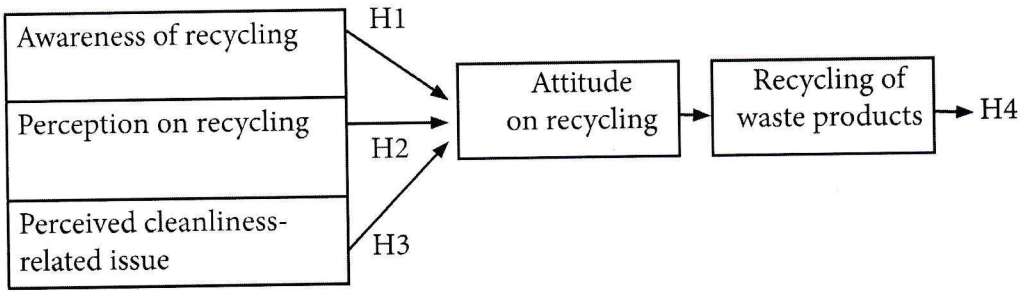
Mediating Effect of Attitude on Factors Affecting Recycling of Waste Products

Attitude has been frequently used to explain human behavior (Zimbardo, Ebbesen, & Maslach, 1977). Homer and Kahle's (1988) cognitive hierarchy model states that values can indirectly influence behavior through the mediation of attitudes. Shanmugam and Savarimuthu (2014) concur with the aforementioned idea and find that attitude towards using mobile

banking mediates the relationship between perceived usefulness and behavioral intention to use mobile banking. Norazah, Ramayah and Norbayah (2008) conclude in their study that perceived usefulness and perceived ease of online shopping are mediated by attitude. Earlier, Smith and Petty (1994) had indicated that attitude mediates the behavior of blood donors in a pro-environmental experiment and further concluded that attitude remains a powerful variable that leads one to perform an action. This is also supported by Oreg and Katz-Gerro (2006), who find that in predicting pro-environmental behavior, willingness to sacrifice for the environment with positive attitude mediates one's values and beliefs.

HVMcCarthy and Shrum (1993) indicate that attitudes and beliefs about recycling would provide a mediating role between values and recycling of waste products. They deliberately state that with the intermediary of attitude, one can possibly change perception, values and behavior towards performing an action. Other studies focusing on attitude as a mediating factor include clothing disposal behavior by Yee, Hasnah and Ramayah (2016), internet advertising by Yang (2004) and online banking by Amin, Rizal, Suddin and Zuraidah (2008). Therefore, this indicates the need to gauge whether attitude can be a mediating factor in influencing behavior towards performing recycling among youths in Malaysia. Therefore, following the considerations of Homer and Kahle (1988), a critical objective of this study is to understand the relationship between awareness, perception, perceived cleanliness-related issues and recycling of waste products while considering the role of attitude as a possible mediating variable.

Theoretical Framework



Research Hypotheses

H1: There is a positive relationship between awareness and attitude on recycling of waste products.

H2: There is a positive relationship between perception and attitude on recycling of waste products.

H3: There is a positive relationship between perceived cleanliness-related issues and attitude on recycling of waste products.

H4: There is a positive relationship between attitude and recycling of waste products.

H5: Attitude mediates the relationship between awareness, perception and perceived cleanliness-related issues with recycling of waste products.

SH5.1: Attitude mediates the relationship between awareness and recycling of waste products.

SH5.2: Attitude mediates the relationship between perception of recycling and recycling of waste products.

SH5.3: Attitude mediates the relationship between perceived cleanliness-related issues and recycling of waste products.

The hypotheses developed are based on the Social Learning Theory, especially for the mediating effect of attitude on recycling behavior. The direct effect between the independent variables (awareness, perception and perceived cleanliness-related issues) exists and their relationships are significant. This is because the study emphasizes on the mediating effect of attitude on the recycling behavior.

METHODOLOGY

This research uses the quantitative research design. A cross-sectional questionnaire survey is conducted and data is collected using a questionnaire on a sample of youths in Kuala Lumpur, Malaysia in October 2015. A total of 456 respondents completed the survey questionnaires.

Each construct is measured using 10 items. Each item is measured using a 5-point Likert scale, where 1=strongly disagree, 2=disagree, 3=slightly agree, 4=agree, and 5=strongly agree. Examples of **awareness of recycling** items are: "I am aware of waste recycling" and "I heard about recycling from television". **Perception on recycling** item examples are: "I think recycling is important" and "I think it is easy to practice recycling" while **perceived cleanliness-related issues** are measured by items: "Cleanliness begins by recycling" and "I believe the recycling program is beneficial to instill the culture of cleanliness". **Attitude**, on the other hand, is measured by: "I like to recycle" and "I like the idea of government enforcement on recycling" and **behavior on recycling** is measured as "I separate the recycled waste at the designated place" and "I do purchase recycled items at the store". All the items are reliable when the Cronbach's alpha exceeds 0.70; specifically, awareness (α=.813), perception (α=.879), perceived cleanliness-related issues (α=.871), attitude (α=.894), and behavior (α=.931), as shown in Table 1.

Table 1 Reliability test using Cronbach's alpha

Variables	No. of items	Cronbach's Alpha
Awareness of recycling	10	.813
Perception on recycling	10	.879
Cleanliness-related issues on recycling	10	.871
Attitude on recycling	10	.894
Recycling behavior	10	.931

The collected data is analyzed using SPSS 23. Both descriptive (frequency, percentage, mean, standard deviation, minimum and maximum) and inferential statistics (one-sample t-test, zero-order and partial correlation, and hierarchical multiple regression) are used.

FINDINGS

Demographic Characteristics of Respondents

Out of a total of 456 respondents, there is an almost equal number of males (50.7%) and females (49.3%). They are composed of mainly Malays with 348 respondents (76.3%), Chinese (8.1%), Indians (6.4%) and "Others" (9.2%). A majority of the respondents are Muslims (85.7%), while

4.6% are Christians, Hindus (4.4%), Buddhists (3.7%), and those that belong to other religions (1.6%). With regard to age, adolescents (55.3%), young adults (24.6%) and teenagers (20.1%) make up the group. In the 1997 National Youth Development Policy, youths range between the ages of 13 to 39. This means that all age groups represented in this study are youths.

Awareness of Recycling

A majority of the respondents are aware of waste recycling (85.0%), or have heard about recycling from television (81.8%) and from campaigns (81.0%). About three-quarters of the number of respondents have heard about recycling from schools (79.2%), newspapers (74.6%), and the Internet (73.1%). A substantial number of the respondents have heard of recycling from radio (69.9%), family members (66.8%), magazines (65.7%), and from friends (64.4%). Table 2 shows that the overall awareness is 74.2%. The results show that the awareness of recycling is positively rated by youths (t=22.584, p=.000). The results, thus, imply that youths are aware of the recycling programmes through established traditional media (TV, newspapers, radio and magazines) and the new media, specifically the Internet. Both media play an important role in disseminating information about the government's recycling campaign. However, the youths hear less through interpersonal communication (family members and friends).

Table 2 One sample t-test for awareness on recycling

No.	Awareness of Recycling	N	%	Mean*	SD	t**	p
1.	I am aware of waste recycling.	455	85.0	4.248	0.764	34.858	.000
2.	I hear about recycling from television.	455	81.8	4.092	0.898	25.946	.000
3.	I hear about recycling from campaign.	455	81.0	4.048	1.048	21.331	.000
4.	I hear about recycling from school.	455	79.2	3.958	1.103	18.534	.000
5.	I hear about recycling from newspaper.	455	74.6	3.732	1.036	15.069	.000
6.	I hear about recycling from the Internet.	455	73.1	3.657	1.144	12.249	.000
7.	I hear about recycling from radio.	455	69.9	3.495	1.200	8.790	.000
8.	I hear about recycling from my family members.	455	66.8	3.341	1.187	6.119	.000
9.	I hear about recycling from magazine.	455	65.7	3.284	1.233	4.904	.000
10.	I hear about recycling from my friends.	455	64.4	3.222	1.239	3.823	.000
	Overall awareness of recycling	**455**	**74.2**	**3.708**	**0.668**	**22.584**	**.000**

*1=strongly disagree (1-20%), 2=disagree (21-40%), 3=slightly agree (41-60%), 4=agree (61-80%), 5=strongly agree (81-100%)
** test value=3

Perception on Recycling

The respondents' perception of recycling is presented in Table 3. A majority of the respondents (89.1%) strongly agree that recycling promotes a healthy environment,and they believe that recycling is important (88.7%); recycling should be practiced from childhood (88.5%); recycling is the best way to maintain the condition of our earth (88.2%) and recycling provides us a clean place to live in (86.3%). The respondents also prefer to have recycling facilities everywhere (87.3%) and to recycle at home (80.5%). The respondents have positive thoughts

about recycling, in that they think the government gets more benefits from recycling (82.3%); their family supports recycling (80.4%); and it is easy to practice recycling (78.2%). The overall t value is 44.254 and all items are positive and significant. It can be implied that although youths perceive recycling as important and good for the environment, there are some who still think that recycling practices should be made easier to conduct. On the whole, youths acknowledge that there are benefits from recycling.

Table 3 One sample t-test for perception of recycling

No.	Variable	N	%	Mean*	SD	t	p
1	I think recycling promotes a healthy environment.	455	89.1	4.457	0.711	43.772	.000
2	I think recycling is important.	455	88.7	4.437	0.771	39.760	.000
3	I believe that recycling must be practiced from an early age.	455	88.5	4.426	0.767	39.653	.000
4	I believe that recycling is the best way to maintain our earth condition.	455	88.2	4.409	0.765	39.262	.000
5	I prefer to have recycling facilities everywhere.	455	87.3	4.367	0.810	36.010	.000
6	I believe that recycling provides us a clean place to live in.	455	86.3	4.317	0.837	33.531	.000
7	I think the government gets more benefits from recycling.	455	82.3	4.117	0.916	26.003	.000
8	I prefer to recycle at home.	455	80.5	4.024	1.007	21.686	.000
9	I think my family supports recycling.	455	80.4	4.022	1.013	21.522	.000
10	I think it is easy to practice recycling.	455	78.2	3.910	1.032	18.811	.000
	Overall Perception	**455**	**85.0**	**4.248**	**0.602**	**44.254**	**.000**

*1=strongly disagree (1-20%), 2=disagree (21-40%), 3=slightly agree (41-60%), 4=agree (61-80%), 5=strongly agree (81-100%)
** test value=3

Perceived Cleanliness-related Issues on Recycling

Table 4 presents the respondents' perception on cleanliness-related issues of recycling. A majority of the respondents (88.6%) strongly agree that recycling helps to improve the balance of nature, believe that recycling is beneficial in order to instill the cleanliness culture (85.5%) and strongly agree that recycling helps to maintain cleanliness at home, school, workplace and other places (84.8%). In addition, the respondents also perceive that recycling is important to maintain cleanliness (83.5%) and that recycling facilities should be made available to them to maintain cleanliness (80.7%). They also attest to keeping containers covered in order to avoid pest infestations (80.2%). A substantial number of the respondents admit that cleanliness begins by recycling (78.6%); it is difficult to maintain cleanliness without recycling (74.4%); but they also separate paper, glass and plastics for recycling (70.3%). The least perceived cleanliness item was rated as follows: "I separate food waste from recyclable waste" (68.0%). The overall t value is 29.672 (p=.000) and all items are positive and significant. It can be implied that youths have a positive perception of cleanliness.

Table 4 One sample t-test for perceived cleanliness-related issues on recycling

No.	Variable	N	%	Mean*	SD	t**	p
1	Recycling helps to improve the balance of nature.	455	88.6	4.431	0.799	38.214	.000
2	I believe the recycling program is beneficial to instill the culture of cleanliness.	455	85.5	4.274	0.879	30.939	.000
3	Recycling helps to maintain cleanliness at home, school, workplace and etc.	455	84.8	4.242	0.917	28.899	.000
4	Recycling is important to maintain cleanliness.	455	83.5	4.174	0.926	27.035	.000
5	I am aware of recycling facilities available to me to maintain cleanliness (e.g. containers).	455	80.7	4.035	0.999	22.095	.000
6	I close the covers of containers to avoid pest infestations (e.g. flies, rats and cockroaches).	455	80.2	4.008	1.063	20.224	.000
7	Cleanliness begins by recycling.	455	78.6	3.932	1.042	19.077	.000
8	It is difficult to maintain cleanliness without recycling.	455	74.4	3.721	1.088	14.131	.000
9	I separate paper, glass and plastics for recycling.	455	70.3	3.514	1.224	8.966	.000
10	I separate food waste from recyclable waste.	455	68.0	3.402	1.248	6.873	.000
	Overall Cleanliness	**455**	**79.5**	**3.973**	**0.699**	**29.672**	**.000**

*1=strongly disagree (1-20%), 2=disagree (21-40%), 3=slightly agree (41-60%), 4=agree (61-80%), 5=strongly agree (81-100%)
** test value=3

Attitude on Recycling

The attitude of respondents on recycling is shown in Table 5. A majority of the respondents prefer communal (88.0%) and family (85.8%) support towards recycling programmes, and wished to have recycling facilities outside the city (83.7%). They also like the benefits obtained from recycling (84.9%), the idea of government reinforcement on recycling (82.9%), and recycling because it reduces pollution (80.6%). In addition, the respondents also prefer to have recycling facilities in their homes (79.7%) to recycle according to colored containers (76.6%), and prefer to separate recyclable waste (75.4%). The overall t value for attitude is 34.386 (p=.000). All items are positive and significant. It can be assumed that almost all KL youths have a positive attitude toward recycling and such an attitude should be maintained.

Table 5 One sample t-test for attitude on recycling

No.	Variable	N	%	Mean*	SD	t**	p
1	I prefer the community to support recycling.	455	88.0	4.398	0.767	38.880	.000
2	I prefer my family to support recycling.	455	85.8	4.288	0.801	34.297	.000
3	I like the benefits from recycling.	455	84.9	4.247	0.809	32.841	.000
4	I prefer to have recycling facilities outside the city.	455	83.7	4.187	0.879	28.786	.000
5	I like the idea of government reinforcement on recycling.	455	82.9	4.143	.8678	28.099	.000
6	I like recycling because it reduces pollution.	455	80.6	4.029	0.918	23.899	.000
7	I prefer to have recycling facilities in my home.	455	79.7	3.987	0.984	21.384	.000
8	I prefer to recycle according to colored containers.	455	76.6	3.829	1.018	17.359	.000
9	I like to recycle.	455	76.0	3.800	1.014	16.829	.000
10	I prefer to separate recyclable waste.	455	75.4	3.771	1.018	16.169	.000
	Overall Attitude	**454**	**81.4**	**4.068**	**0.653**	**34.836**	**.000**

Table 6 One sample t-test for behavior on recycling

No.	Variable	N	%	Mean*	SD	t	p
1	I do purchase recycled items at the store.	455	88.0	3.325	1.378	5.036	.000
2	I encourage my family members to recycle.	454	74.5	3.727	1.151	13.456	.000
3	I separate the recycled waste at the designated place.	455	73.2	3.659	1.154	12.191	.000
4	I recycle.	455	72.0	3.602	1.162	11.055	.000
5	I also recycle at my work/study place.	455	71.0	3.550	1.214	9.658	.000
6	I give away my recycled materials at recycling center.	455	68.2	3.409	1.342	6.496	.000
7	I provide separate containers for recycled materials (paper, plastic, glass, etc.) at home.	455	65.8	3.290	1.276	4.848	.000
8	I have joined recycling program(s) in the past.	455	64.9	3.244	1.311	3.970	.000
9	I only started recycling recently.	454	64.1	3.204	1.344	3.248	.001
10	I started recycling since I was a kid.	454	62.7	3.137	1.295	2.247	.025
	Overall Behavior	**303**	**70.8**	**3.542**	**1.020**	**9.261**	**.000**

*1=strongly disagree (1-20%), 2=disagree (21-40%), 3=slightly agree (41-60%), 4=agree (61-80%), 5=strongly agree (81-100%)
** test value=3

Behavior on Recycling

The highest number of respondents (88.0%) mentioned that they purchase recycled items to support recycling (Table 6). In terms of behavior, this practice is not that widespread. Most

of the respondents agree with the following statements:- they encourage their family to practice recycling (74.5%); they separate recycled wastes at the designated places (73.2%), they recycle (72.6%) at work/study place (71.0%) and give away recycled materials at recycling centres (68.2%). In addition, the respondents also provide separate containers for recycled materials at home (65.8%), have joined recycling programme(s) in the past (64.9%), and admit that they only started recycling recently (64.1%). Only 62.7% of respondents have been practising recycling since childhood. The overall t value is 9.261 (p=.000) with all items positive and significant. It can be implied that youths in Kuala Lumpur do recycling but only to a certain extent.

Table 7 Zero-order and partial correlations among awareness, perception, cleanliness-related issues, attitude and behavior on recycling

Control Variable	Variable	N	Mean	SD	Behavior	Awareness	Perception	Cleanliness-related issues	Attitude
none	Behavior	302	3.543	1.021	1				
	Awareness	302	3.827	0.613	r=.411, p=.000	1			
	Perception	302	4.312	0.514	r= .494, p= .000	r=.434, p=.000	1		
	Cleanliness-related issues	302	4.036	0.645	r= .659, p= .000	r=.518, p=.000	r= .667, p= .000	1	
	Attitude	302	4.174	0.559	r= .631, p= .000	r=.417, p=.000	r= .706, p= .000	r=.646, p=.000	1
Attitude on recycling	Behavior	302	3.543	1.021	1				
	Awareness	302	3.827	0.613	r=.209, p=.000	1			
	Perception	302	4.312	0.514	r=.088,	p= .129 p=.000	1		
	Cleanliness-related issues	302	4.036	0.645	r= .425, p= .000	r=.359, p= .000	r=.390, p= .000	1	

Correlations between Awareness, Perception and Perceived Cleanliness-related Issues and Attitude with Recycling of Waste Products

The analysis for the mediating effect of attitude on awareness, perception and perceived cleanliness-related issues on recycling of waste products is done using a partial correlation. Both the zero-order and the controlled variable results of attitude are performed simultaneously. This is done to see the direct and indirect effect of attitude on the independent variables concerned

and on the dependent variables. Results (Table 7) show that perceived cleanliness-related issues obtain the highest correlations (r=.659, p=.000) with behavior. It shows a positive and strong relationship between perceived cleanliness-related issues and behavior. Therefore, the direct effect on perceived cleanliness-related issues exists. The second highest correlation is between attitude and behavior (r=.631, p=.000) which is also significant; thus, attitude and behavior also have positive and strong relationships with each other. In this case, H4 is supported. On the other hand, the lower two correlations are between perception (r=.494, p=.000) and awareness (r=.411, p=.000) with recycling of waste products. However, the requirement for performing the mediating effect of attitude is met for both awareness and perception. In addition, there are strong positive relationships among the independent variables. This means that they are positively related to one another. Therefore, H1, H2, H3, and H4 are supported and the criteria for doing the mediating effect of attitude can be performed.

When attitude is controlled for the correlation between awareness, perception and perceived cleanliness-related issues, only the perception relationship with recycling of waste products is found to be insignificant. Hence, attitude is able to fully mediate the relationship between perception and the recycling of waste products. Thus, SH5.2 is supported. However, the relationships between awareness and the recycling of waste products has been reduced from r=.411 to r=.209, giving a reduction of r=.202, yet the relationship is still significant. Similarly, in the relationship between perceived cleanliness-related issues on recycling and the recycling of waste products, the relationship is also being reduced from r=.631 to r=.424, giving a reduction of r=.207, yet the relationship remains significant. Therefore, it can be concluded that attitude is able to partially mediate the relationship between awareness and perceived cleanliness-related issues with recycling of waste products. Hence, SH5.1 and SH5.3 are partially supported.

DISCUSSION AND CONCLUSION

The study raises interesting findings that correspond with the objectives and hypothesis highlighted earlier. Most of the youths are aware of the recycling programme through the traditional media (TV, newspapers, radio and magazines) and social media. They also know about recycling through government campaigns, schools, interpersonal communication (family members and friends). A majority of youths agree that recycling can help maintain cleanliness. This signifies that youths prioritize cleanliness as it motivates them to recycle. The results show that a majority of youths support recycling as an initiative to balance nature, and they agree that recyclable waste should undergo proper separation. Their perception on this matter is beneficial as these results would provide the impetus for the government to take further action to strengthen the recycling programmes. It is noted that youths have a positive perception toward the government's recycling programmes. They strongly believe that the recycling activity is important and should start at an early age. Recycling is also perceived as an effort to keep the earth safe and clean. With good perception, youths have a positive attitude on recycling whereby they strongly prefer the community (especially their families) to support recycling. They are also in favor of the numerous recycling efforts undertaken by the government. Furthermore, it can be seen that youths are considerably participative and receptive to recycling, regardless of wherever they may be, whether at home, school or at work. These recycling programmes will be accomplished by youths as they are potential leaders, and if their behavior, attitude and perception are congruent, then Malaysia will experience a cleaner environment, devoid of waste products. The above findings are in line with the Social Learning used in this study, where a

positive perception on recycling of waste products influences attitude, which in turn, influences the behavior of recycling.

At the same time, attitude is able to mediate the relationship between perception and recycling of waste products. Therefore, attitude plays an important role in recycling of waste products. Thus, liking, preference and willingness to practice recycling is meaningful for the success of the government's recycling programme, as reflected by their behavior. In practice, in order for any campaign to be successful, a positive attitude should be instilled as part of the culture so that behavior and habit work in tandem for the best possible outcomes. Hence, relevant authorities should create this sense of preference for the public to willingly participate in their programmes to ensure their successful implementation.

It is learnt that cleanliness is the concern of youths and it explains why they support the recycling programme. The result shows that it marks the highest influence on behavior towards recycling, followed by attitude. However, liking an action does not guarantee performance of the action. This is apparent in cases where they did not start recycling from young and hence, would rather persuade others (family member, relatives and friends) to recycle although they themselves are less likely to practice it. It is also noted that awareness has the least contribution towards behavior on recycling among youths. Therefore, we would suggest that the government undertake to motivate youths to recycle waste materials. There should be more publicity and promotional campaigns to educate youths on ways to increase recycling participation besides motivating society on the importance of solid waste management. Above all, the sense of appreciating cleanliness can go far in making Malaysia an advanced and developed country in the near future.

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