

Locus of control, Hardiness, and Emotional Intelligence as Predictors of Waste Prevention Behaviours

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Given that waste generation is an economic and environmental problem for nations and governments, it is necessary that we advance our knowledge on the etiology of waste prevention behaviours. This study aimed to investigate about the relationships between the locus of control, hardiness, emotional intelligence, and waste prevention behaviours. Four hundred and forty participants (226 females and 214 males) from Universiti Putra Malaysia completed a survey questionnaire. Structural Equation Modeling (SEM) estimated that individuals who were high in emotional intelligence and hardiness showed better waste prevention behaviours as well as those individuals with internal locus of control. Also, the results showed that older students tend to have better waste prevention behaviours. These findings reinforce the importance of personality traits and emotional intelligence in waste prevention behaviours.

Keywords: Locus of control, Hardiness, Emotional intelligence, Waste prevention behaviours

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Introduction

Over the past decade, Malaysia has enjoyed tremendous growth in its economy. This resulted in an increase in the amount of waste generated. Currently, an average of 2500 tons of municipal solid waste (MSW) is collected every day for the city of Kuala Lumpur (Johari, Ahmed, Hashim, Alkali, & Ramli, 2012; Kathirvale, Muhd Yunus, Sopian, & Samsuddin, 2004). The Ministry of Housing and Local Government, Malaysia has reported that from an estimated 17,000 tons of solid waste generated, only 1 to 2 percent was recycled sending the rest to landfill and open dumping (Budhiarta, Siwar, & Basri, 2011). The highest amount of waste was generated at the state of Selangor: an estimated 3,923 tons per day (Saheri, Mir, & Basri, 2012). Interestingly, a study showed that the amount of waste productions increased with increasing number of students in the universities (Karbalaei, Abdollahi, Momtaz, & Abu Talib, 2014). University students are of special importance to the future as decision-makers and socially responsible citizens. Hence, a study was conducted using university students.

Waste prevention behaviours include maintaining public cleanliness and preventing environmental pollution.

Apart from public hygiene, waste prevention behaviours contribute to the reduction in greenhouse gases as well. Waste prevention begins at people's purchasing behaviours: for example, one's preference for disposable and reusable items to 'use and throw away' items. Additionally, routine recycling activities among residents reduce the garbage tremendously (Kurusu & Bortoleto, 2011). It is widely acknowledged that, in spite of positive involvement of packaging industry in waste reduction, the role of individual in waste prevention is undeniable (Barr & Gilg, 2007; Vicente & Reis, 2008). Generally, the solution to waste reduction is seen in two aspects: (a) reducing consumption and (b) reusing, reselling or sharing products (Oskamp, 2000). Obviously, individual characteristics play an important role in waste prevention (Kurusu & Bortoleto, 2011). This is in line with Oskamp's request to psychologists to play a more active role in promoting behavioral modifications that contribute to conserve the environment. As a follow up, increasing psychological researches are conducted in order to conserve the environment. There are several psychological factors involved in pro-environmental behaviours. On the one hand, individuals with high self-efficacy are pro-environmental (Barr, 2007) while on the other hand,

egoistic individuals are less likely to be pro-environmental (Stern, Dietz, & Guagnano, 1995). Thus, consumer's intention and subsequent behaviours predict his/her environmental concerns (Carrus, Passafaro, & Bonnes, 2008; Markowitz, Goldberg, Ashton, & Lee, 2012; Swami, Chamorro-premuzic, Snelgar, & Furnham, 2010). For example, Swami et al. (2011) have highlighted the positive association between age and psychological traits such as conscientiousness in household Waste Management. In the same vein, self-efficacy has been identified as an important predictive element in recycling behavior of people (Barr & Gilg, 2005; Kim, Jeong, & Hwang, 2012). Similarly, emotional stability and conscientiousness are positively correlated with waste prevention (Swami et al., 2010). In addition, Karbalaei, Abdollahi, Abu, Nor, & Ismail (2013) found that effective problem-solving skills and internal locus of control predicted waste prevention behaviors among university students. Ojedokun (2011) has identified altruism and internal locus of control as powerful predictors of pro-environmental behaviour among Nigerians.

Barr (2007) points out that situational variables, environmental attitudes and psychological traits are substantial factors in waste prevention behaviour. Situational variables such as contextual, structural, or socio-demographic factors influence pro-environmental decision making. Environmental attitudes are also related to an individual's orientation towards, or concern for the preservation, restoration, or improvement of the environment. The previous study displayed that conservative individuals (that is, a concern for the self vs environment or biospheric concerns) are less likely to be environmentally-friendly (Swami et al., 2011). It is likely that individuals who are more open to change and who are altruistic are more likely to be environmentally-friendly (Barr, 2007). Thus, individuals with environmental concerns are more likely to pursue pro-environmental behavior (Dunlap, Van Liere, Mertig, & Jones, 2000; Swami et al., 2011).

For better or for worse, individual behavior has a considerable impact on waste production. Psychological and personality factors may impact on individuals' likelihood to produce pro-environmentally behaviors. Undoubtedly, with personality being such a core part of what motivates our beliefs, values and attitudes, it seems reasonable to expect that basic differences in personality may influence environmental engagement. Therefore, it is clear that awareness of psychological and personality factors help in shaping positive waste prevention behaviors in individuals. Therefore, it is necessary to identify psychological factors that shape appropriate waste prevention behaviours. In this research, we focused on the links between locus of control, hardiness, emotional intelligence and waste prevention behaviours among Malaysian university students.

Present Study

Although the available literature has identified a few situational and psychological factors on pro-environmental behaviours, in our view, these studies are limited to a confined range of psychological variables such as self-efficacy, subjective norms, consciousness, openness to experience and egoistic behavior. Therefore, we want to test whether emotional intelligence, hardiness, and locus of control contribute in waste prevention. Particularly, we want to examine whether a) a positive relationship exists

between internal locus of control and waste prevention behaviours, b) between hardiness and waste prevention behaviours and c) between emotional intelligence and waste prevention behaviours. We also examined whether gender moderates the relationship between exogenous variables and waste prevention behaviours. Most importantly, this type of study has not been conducted in Malaysia, especially among students.

It is clear that, this list does not exhaustive psychological variables that influence on waste prevention behaviours. However, these variables attempt to more, our understanding of psychological traits and emotional intelligence in the waste prevention behaviours. Below, reasonable grounds for choosing the variables are briefly explained.

Firstly, we examined the association between the locus of control and waste prevention behaviors. The locus of control was introduced by Rotter (1990) from experience in social-learning theory. Rotter (1990) postulated that individuals with an internal locus of control are more likely to believe that they can control events in life. Conversely, individuals with an external locus of control are more likely to believe that external powers, such as destiny, chance and luck influence affairs in their lives (Rotter, 1990). Individuals with an internal locus of control typically show personal responsibility, participatory skills, problem-solving skills, desirable choices, persistence, self-efficacy and altruism (Burroughs & Mick, 2004; Corbett, 2005; Joo, Joung, & Sim, 2011; Ojedokun, 2011). In addition, research findings have shown that individuals with an internal locus of control are more likely to engage in conscious actions to reduce waste (Ojedokun, 2011). When individuals have control over the environment and the self, the environment and the self could be changed to the best condition. Previous studies have reported that an external locus of control may lead to frustration, which may contribute to an environmentally destructive behavior (Mehrabian & Diamond, 1971; Ojedokun, 2011). Thus, the locus of control plays an important role in prevention or generation of waste. It seems conceivable that an internal locus of control would be positively associated with better waste prevention behaviors.

Secondly, we examined the association between hardiness and waste prevention behaviors. Kobasa, Maddi, & Kahn (1982) defined hardiness as an ability with three components (commitment, control, challenge) that help individuals while handling problematic life events (Klag & Bradley, 2004). Hardy individuals are more optimistic than individuals with low hardiness and are more flexible in facing problems (Abdollahi, Abu Talib, Yaacob, & Ismail, 2014; Abbas Abdollahi, Talib, Yaacob, & Ismail, 2015). They use rationally based coping styles rather than emotionally based coping styles (Delahaij, Gaillard, & van Dam, 2010). Other characteristics of "hardiness" include: self-efficacy, self-esteem, self-management, self-discipline, optimism, commitment, personal responsibility, conscientiousness, and positive emotions (Abbas Abdollahi, Talib, Yaacob, & Ismail, 2014; Erbes et al., 2011). Consistent with hardiness theory, hardy-attitude individuals are engaged in more self-care and environmental-care behaviours (Hannah, 1988), that would lead to waste prevention behaviours. Thus, individuals with higher levels of hardiness may have proper environmental concerns. It is conceivable that these individuals apply effective solutions for environmental problems as environmental degradation will ultimately have negative

outcomes for themselves and others (Hannah, 1988). Thus, they positively engaged in waste prevention behaviours. Therefore, we wanted to test whether hardiness has an association with proper waste prevention behaviours.

Thirdly, we examined the association between emotional intelligence and waste prevention behaviours. Mayer & Salovey (1993) defined emotional intelligence as a kind of social intelligence that includes the ability to monitor one's own emotions and other's emotions thereby managing one's own thoughts and actions and regulate emotions in self and others; utilize suitable emotions for solving daily difficulties and obstacles actively and effectively. Several studies have shown that positive associations existed between greater emotional intelligence with altruism, empathy, conscientiousness, optimism, happiness, independence, flexibility, and social responsibility (Abdollahi & Talib, 2015; Bar-On, 2000; Carmeli & Josman, 2006). Individuals with high emotional intelligence show greater respect for the self, others, and environment (Côté, Lopes, Salovey, & Miners, 2010). The goal of this study is to examine whether emotional intelligence has a relationship with waste prevention behaviours. Thus, we wanted to know whether emotional intelligence explains variance in waste prevention behaviours.

Method

Ethical Statement

Universiti Putra Malaysia ethics committee approved the study. Written informed consent was obtained from the participants in this study for their involvement in the research. The participants were informed about this research, particularly, on voluntary participation and anonymity of this study. Students had the freedom to withdraw from this study at any time.

Participants

Participants in this study were 226 females, and 214 males studying at Universiti Putra Malaysia (age from 17-46 years, $M \pm SD = 25.53 \pm 5.37$). They belonged to the following races: Malay (43.7%), Chinese (28.2%), Indian (20.3%), and Others (7.8%). Among the participants 55.6% were single, 35.3% were married, and 9.1% were separated or widowed.

Procedure

The survey was conducted during February - April 2013. Permission from Graduate Students Office of Universiti Putra Malaysia was obtained for collecting information from the students. Students from three faculties were considered for this study, namely, science, social science and technical faculties. Then, a faculty was chosen randomly for data collection. After that, two classes from each faculty were randomly selected. From the selected class, data was collected during regular class hours. A package was initially distributed to students. Each package contained an introductory letter explaining the purpose the survey and five questionnaires. A total of 470 packages were distributed, but, only 440 (93%) usable questionnaires were received back from students, and 20 students (4.2%) refused to complete the questionnaires. As a token of appreciation, each participant was given a booklet on waste generation and its impact.

Materials

Waste Prevention Behaviors (Kurusu & Bortoleto, 2011). This is an 18 items that measure waste prevention behaviours. All questions were in 5-point Likert scales from 1 (Never), 2 (Rarely), 3 (Sometimes), 4 (Often), and 5 (Always). A high score indicates greater waste prevention behaviours. The waste prevention behaviours include shopping behaviours that are hard to change including one's preference for purchasing an item without noticing it's reusability and concern for recycling and garbage reduction (Kurusu & Bortoleto, 2011). In the present study, the convergent validity (AVE) of WPB was 0.51, and the construct reliability (CR) of AES was 0.70.3.

Assessing Emotions Scale (Mayer & Salovey, 1993). There are 33 items that measured emotional intelligence in self and others. All questions were in 5-point Likert's scales from 1 (strongly disagree) to 5 (strongly agree). Total scores were calculated by reverse coding items 5, 28 and 33, and then summing all items. The total score was from 33 to 165. The higher score indicates greater ability of emotional intelligence. AES was divided into three sub scales, appraisal of emotions, utilization of emotions and regulation of emotions. Schutte et al. (1998) suggested using the total scores of AES rather than scores of sub scales. The AES had a good internal consistency with α : 0.90, and test-retest reliability was α : 0.87 (Schutte et al., 1998). Several studies have revealed that this questionnaire has powerful convergent and divergent validity (Bastian, Burns, & Nettelbeck, 2005; Brackett & Mayer, 2003). In the present study, the convergent validity (AVE) of AES was 0.60, and the construct reliability (CR) of AES was 0.73.

Personal Views Survey, Third Edition Revised (Maddi et al., 2006). There are 18 items that measured three elements of hardiness: commitment, control and challenge. The sum of three components is hardiness. The range of scores was from 0 to 54. All questions were in the three-point likert scale from 0 (not at all true), 1 (somewhat true), 2 (true), and 3 (very true). Studies have shown the PVS III-R had an acceptable internal consistency (0.70– 0.75 for commitment, 0.61– 0.84 for control, 0.60– 0.71 for challenge, and 0.80–0.88 for total hardiness (Maddi et al., 2006). In addition, the validity of PVS III-R reported α : 0.70 to 0.84 (Okun, Zautra, & Robinson, 1988). The validity of the challenge was α : 0.62, commitment α : 0.59, and control was α : 0.46 (Patton & Goldenberg, 1999). In the present study, the convergent validity (Average Variance Extracted) was 0.60, and the construct reliability (CR) was 0.75.

Locus of Control of Behavior Scale. There were 17 items that measured the locus of control. All questions were in 5-point Likert's scales from 1 (strongly disagree) to 5 (strongly agree). Total scores were calculated by reverse coding items 2, 3, 4, 6, 9, 10, 11, 12, 14, and 17 and then summing all items. The total score was from 0 to 85. So that higher score indicates the external locus of control, and lower score indicates the internal locus of control. The LCB had a good internal consistency from α : 0.75 to 0.79 (Taiwo, Olapegba, & Adejuwon, 2005). In the present study, the convergent validity (Average Variance Extracted) was 0.56, and the construct reliability (CR) was 0.70.

Demographics. A self-report questionnaire was provided to get demographic information, such as gender, age, race, and marital status.

Translation of the Questionnaires

The questionnaires were translated into Bahasa Malay. In order to ensure that the Malay translation properly reflected the meaning of the English version, back-translation was attempted with three experts who are bilingual and necessary adjustments were made based on their evaluation. In order to assess the face validity and content validity, and to ensure its adaptability to the local cultural context, the instrument was reviewed by three members from the Faculty of Human Ecology, Universiti Putra Malaysia.

Pilot Study

A pilot study was conducted on forty university students to determine the reliability of the tools. The Cronbach's Alpha coefficients for the questionnaires in the pilot study were as follows: (1) Waste Prevention Behaviours α : 0.76; (2) Personal Views Survey, Third Edition Revised α : 0.75; (3) Assessing Emotion Scale α : 0.78; and (4) Locus of Control of Behaviour Scale α : 0.78. In addition, after reading a survey letter of consent and completing the questionnaires, the respondents were asked to indicate any difficulties or ambiguities in the questionnaires. In general, the respondents of the pilot study gave positive feedback towards the general structure and presentation of the questionnaire. Those university students who participated in the pilot study were excluded from the main study sample.

Analysis

We employed Structure Equation Modeling (SEM) mainly because it provides a balance of Type I error rates and statistical power when testing the relationships among variables (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Also, Structure Equation Modeling (SEM) makes it possible for researchers to estimate relations among constructs that are corrected for biases attributable to random error and construct-irrelevant variance by providing separate estimates of relations among latent constructs and their manifest indicators (Tomarken &

Waller, 2005). Furthermore, the multi-group (SEM) was used to compare male and female groups (R B Kline, 2005). Convergent Validity includes of Average Variance Extracted (AVE), and Construct Reliability (CR) was performed. Convergent Validity refers to set of indicators (items) that presume to measure a construct (R B Kline, 2005).

Data Preparation

The missing data for parcels and items (range from 0.78% to 3.86%) was addressed with the series mean method in SPSS software. Structural Equation Modeling (SEM) was used for analysis of data and answers the research hypotheses. The data considered to be normal, because the skewness values were from (-0.78 to 0.95), and the kurtosis values were from (-1.25 to 0.88) for all variables. Byrne (2010) stated that, if the skewness value is between -2 to +2, and the kurtosis value is between -7 to +7; data was considered normal. For model fit, the goodness of fit indices, such as the chi square/degree of freedom ratio (CMIN/DF), the comparative-fit index (CFI), the goodness-of-fit index (GFI), and The Tucker-Lewis Index (TLI) was used. The indices have to equal or greater than 0.90 (Kline, 2010). Furthermore, when the root mean squared error of approximation (RMSEA) is between 0.03 and 0.08 (Rex B Kline, 2010), the model has an acceptable goodness of fit. In addition, the group value SEM was used for comparison between Males and females groups. The AMOS 20 software was used for analyzing the data.

Results

Descriptive Statistics

Table no.1 reports the inter-correlations among the waste prevention behaviours, emotional intelligence, locus of control, and hardiness for male and female students, as well as age, standard deviations, and the means.

Table 1. Correlation between study variables for male and female students, and the mean, SD and actual range

Variables	1	2	3	4	5
(1) Emotional intelligence		-.241**(-.161*)	.261**(.291**)	.331**(.231**)	.151(.112)
(2) Locus of control			-.384**(-.434**)	-.263**(-.282**)	.080(.123)
(3) Hardiness				.221**(.316**)	.119(.124)
(4) Waste prevention behaviors					.213**(.097)
(5) Age					
M	96.10(92.48)	52.06(49.01)	34.95(36.85)	51.27(41.12)	25.54(27.11)
SD	9.21(10.11)	8.18(7.98)	11.77(10.11)	9.52(8.89)	5.36(4.87)
Actual range	40-128(35-125)	26-61(25-58)	11-47(10-51)	21-60(20-61)	17-46(18-46)

Note: ** $p < .001$, * $p < .05$. Results for female are presented first, and results for male are presented in a parenthesis.

Goodness of Fit

This model included the waste prevention behaviours, emotional intelligence, locus of control, hardiness as latent variables, and age as an observed variable. The model showed good fit indices: CMIN/DF= 2.46, $p < .01$, CFI= 0.915, GFI= 0.904, TLI= 0.90, RMSEA= 0.078. According to Kline (2010) the model provided acceptable fit for sample.

Structural Equation Model

This model included emotional intelligence, locus of control, hardiness, and age as exogenous variables, and waste prevention behaviours as an endogenous variable. As it can be seen from the Figure 1, emotional intelligence, locus of control, hardiness, and age had the significant effect on waste prevention behaviours.

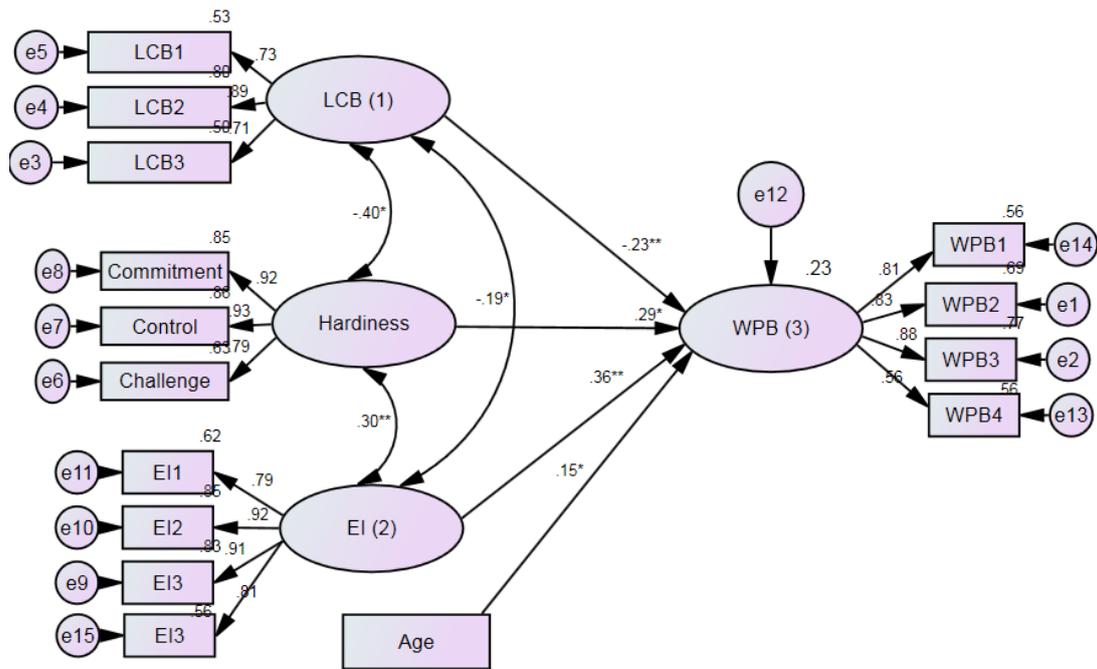


Figure 1. Path analysis of all the study variables
 1: Locus of control behavior, 2: Emotional intelligence, 3: Waste prevention behaviour
 Note: ** P<.001, * P<.05

It can be seen from the data in Figure 1 that, greater emotional intelligence was associated with better waste prevention behaviours, and greater hardiness and internal locus of control were associated with better waste prevention behaviours among university students. These variables explained 23.0% of the variance in waste prevention behaviors. In addition, positive associations existed between emotional intelligence with hardiness (0.30), and a negative association existed between emotional intelligence with hardiness (-0.19), also a negative association existed between hardiness and external locus of control behavior (-0.40).

Tests of Group Differences (Gender)

Invariance Test of Measurement Model

The comparison between the unconstrained model and the measurement residual's model showed that the unconstrained model with ($\Delta \chi^2 (309.13)$, $df = 166$, $p < 0.01$, $RMSEA = 0.060$, $CFI = 0.903$, $GFI = 0.891$, $NFI = 0.901$), and the measurement residuals model with ($\Delta \chi^2 (368.82)$, $df = 203$, $p < 0.01$, $RMSEA = 0.058$, $CFI = 0.891$, $GFI = 0.863$, $NFI = 0.785$) were significant; however, the unconstrained model was better than the measurement residual's model, because chi-square was smaller (Hair, Black, Babin, Anderson, & Tatham, 2006). According to the measurement residual's model ($\chi^2 = 54681$, $df = 37$, and $p < 0.05$) in "The Assuming Model

Unconstrained to be correct," The findings indicated that the impact of likely differences across gender was significant.

Invariance Test of Structural Model

As it can be seen from the Figure 2, female students showed higher emotional intelligence and waste prevention behaviours, whereas male students showed higher hardiness and internal locus of control. In addition, older females revealed more waste prevention behaviours.

Discussion

We speculate that the associations found between hardiness, locus of control, emotional intelligence, and waste prevention behaviors can be linked to theoretical developments in environmental attitudes. There is a point worth noting before we progress to the discussion of the key findings. The overall variance explained the attitude towards waste prevention behaviors by the locus of control, hardiness, and emotional intelligence was 0.23%, indicating that other variables not assessed in this study (e.g., values, norms, identity issues, situational factors) are also important in explaining the attitude towards waste prevention behaviors.

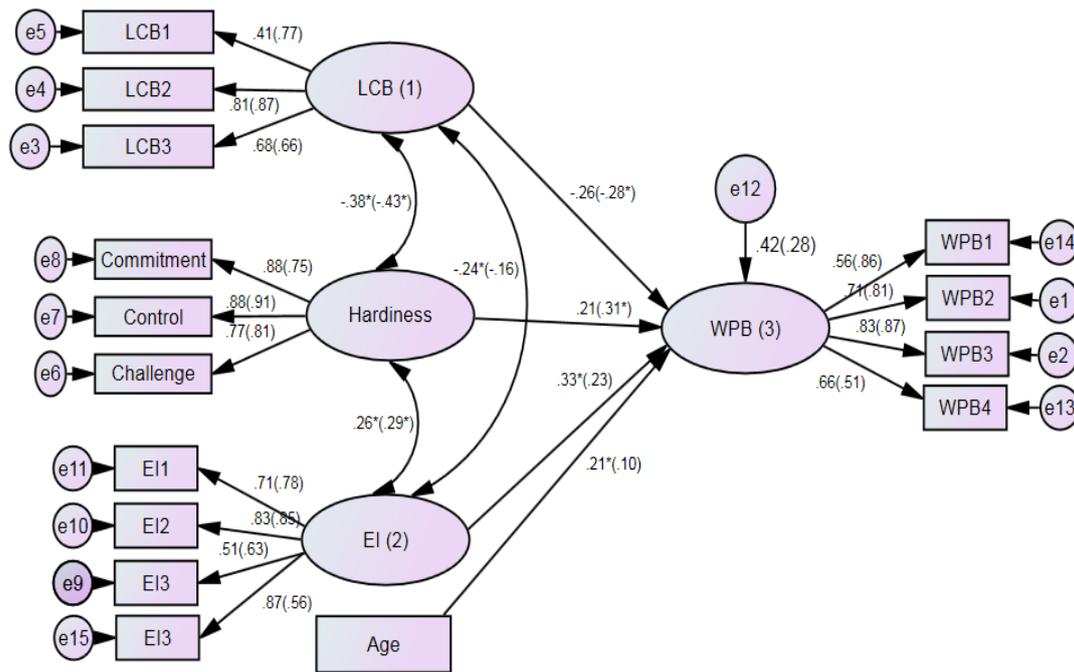


Figure 2. Standardized estimates of multigroup for female, and male.
 Note: * p < .05, without * = not significant; Results for female are reported first, and results for male are in parenthesis.
 1: Locus of control behavior, 2: Emotional intelligence, 3: Waste prevention behaviour

Particularly, our findings demonstrated that greater hardiness, greater emotional intelligence, internal locus of control, and older age significantly predicted better waste prevention behaviours. A deeper inspection of our results underscores a number of noteworthy findings (Barr, 2007). First, hardiness, emotional intelligence, and internal locus of control positively and independently associated with waste prevention behaviours. The positive association between hardiness and waste prevention behaviours may be related to the extreme health concern of hardy individuals. The study showed that the positive link existed between hardiness trait and physical health and mental health via constructive interactions with environment (Taylor, Pietrobon, Taverniers, Leon, & Fern, 2013). Therefore, hardy-attitude individuals may show responsible environmental behaviours than individuals with low in this trait. Similarly, the association between emotional intelligence and waste prevention behaviours may be correlated with altruistic concerns. This moves them to be more pro-environmental with a constructive social behaviour.

In addition, the positive association between internal locus of control and waste prevention behaviours may be linked to the social responsibility (Ojedokun, 2011). Our results show that hardiness significantly and positively predicts waste prevention behaviours. This is because hardiness goes hand in hand with commitment, self-control, and responsible environmental behaviour. Therefore, highly hardy individuals recycle, reuse, and reduce their waste production. In addition, hardy individuals show more self-efficacy, self-esteem, self-management, optimism, commitment, personal responsibility, conscientiousness, and positive emotions (Erbes et al., 2011). In addition, they respect human rights.

Interestingly, our results showed that male's scores were higher on hardiness than females.

Another significant point to note is that emotional intelligence is significantly and positively correlated with waste prevention behaviours. In addition, individuals with greater emotional intelligence may also show self-management, efficient collaborative skills, good judgment, decision-making skills, altruism, empathy, conscientiousness, optimism, happiness, independence, flexibility, and social responsibility (Abdollahi, Yaacob, Talib, & Ismail, 2015; Craig et al., 2009; Pauquet, 2012; Sparrow, 2011; Sunindijo, Hadikusumo, & Ogunlana, 2007; Vermeulen, 2012). The above-mentioned factors are thus related to waste prevention as well. Our results revealed that female scored higher than males on emotional intelligence. This finding is consistent with the observation that females had slightly greater emotional intelligence than males (Katyal & Awasthi, 2005). Finally, the results demonstrated that female and older students are more likely to engage in waste prevention behaviours (Kurusu & Bortoleto, 2011).

Our results showed that a positive association existed between internal locus of control and waste prevention behaviours. Several studies have shown that locus of control is associated with personal responsibility, participatory problem solving, desirable choices, persistence, self-efficacy and altruism (Burroughs & Mick, 2004; Corbett, 2005; Joo et al., 2011; Ojedokun, 2011). In general, waste prevention behaviour is a social responsibility and individuals with internal locus of control show greater respect for fellow humans and fight for societal rights. Thus, individuals with internal locus of control are motivated to engage in waste prevention behaviours (Ojedokun, 2011). Additionally, our results showed that males have better internal locus of control than

females. This is in agreement with Lim, Teo, & Loo, (2003).

Participant's age significantly predicted waste prevention behaviours, with older females having more likelihood on waste prevention behaviours. Interestingly, Barr (2007) indicated in his study that younger individuals were engaged more in waste prevention activities.

Overall, the current results rightly highlighted the personality traits involved in waste prevention behaviour. It is important to point out here that Barr (2007) discounted psychological variables such as hardiness, locus of control, and emotional intelligence in his model while working on environmental protection frameworks. In fact, incorporating psychological variables into pro-environmental behaviour models will improve the efficiency of those models and help to bridge the gap between psychological and behavioural studies (for a discussion, see Barr, 2007).

Implications of this Study

Hardiness, locus of control, and emotional intelligence could significantly predict waste prevention behaviours. This shows that personality traits and emotional intelligence should be considered when environmental theories and models are constructed. This will have positive implications if a program incorporates behavioural modification and intervention targeting a particular group. Thus, psychological training to improve environmental responsibility can be suggested along with behavioural modifications. Therefore, it is implied that psychologists need to be involved in planning waste prevention strategies.

To conclude, the focus on traits of people in predicting waste prevention behaviours is noteworthy, as in our view, waste reduction requires interventions at multiple levels to be effectively addressed. Theoretical models of the behaviour of people as individuals, and the behaviour of aggregate individuals are necessary if we are to attempt to change the behaviour of both individuals and groups of individuals. To maximize change specific behaviour and attitudes, it is necessary to understand the network of more general behavioural tendencies in which the specific behaviours of interest are embedded. This is important because different appeals may work for different people, or for citizens within nations, depending upon differences in personality. By documenting how stable regularities in overall behavioural tendencies (i.e., personality) are related to more specific environmental attitudes and behaviour; we hope to provide important baseline information that may be useful in the ongoing collaborative effort to build models of the psychology underpinning environmental engagement for both individuals and nations.

Limitations and Recommendations

A noteworthy limitation in this kind of studies is that the respondent may overstate to answer the questionnaires for reasons of social desirability. Therefore, future research may attempt to measure behaviours using peer-reports and direct observation methods. Other psychological traits and cognitive abilities need to be studied in order to understand waste prevention behaviours. Personality traits are closely linked with demographic characteristics, which influence the waste prevention behavior. For example, future studies may focus on spiritual intelligence and well-being on waste prevention behaviors. Obviously, the existing pro-

environmental models need improvement incorporating factors mentioned in this paper for better efficacy.

Declaration of Conflicting Interests

The authors declare no potential conflicts of interest.

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