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Using Theory in Social Marketing to Predict Waste Disposal Behaviour among Households in Ghana

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ABSTRACT

The study sought to examine how a behavioral change theory (theory of planned behavior) could be used in social marketing to predict households' waste disposal behavior in Ghana. A quantitative approach using self-administered questionnaires was used for this study. Empirical data was drawn from 343 respondents in the Greater Accra Region. Structural Equation Modelling was used to analyze the hypothesized paths/relationships. The study found that attitude was the strongest predictor of behavior, followed by subjective norm and then intention. In relation to waste disposal behavior, this paper provides evidence for issues of potential research and managerial interest. Practically, the study findings will help social marketing implementers and policy-makers to develop effective waste disposal intervention programs using variables that are applicable in our context. This study appears to be the first to systematically and quantitatively apply the Theory of Planned Behavior (TPB) in social marketing to investigate waste disposal behavior in an emerging economy context, thus providing empirical evidence for academics, practitioners and public service practises.

Introduction

Globally, the issue of indiscriminate waste disposal is a major problem as it leads to the outbreak of waste-related diseases (including cholera and malaria), flooding, water and soil pollution, global warming and environmental degradation which have adverse effects on human health (Sankoh, Yan, & Tran, 2013; World Health Organisation [WHO], 2015). WHO (2015) statistics suggest that about 35% of waste related problems in Sub-Saharan Africa emanates from improper waste disposal behaviors. The situation in Ghana is not different from the rest of Sub-Saharan Africa. For instance, in 2015 Ghana was ranked the seventh worst performing country in the world regarding improper waste management practises (UNICEF & WHO, 2015).

Consequently, to change Ghana's status as one of the worst performing countries regarding sanitation issues, the government in collaboration with corporate institutions as well as non-governmental organizations have put forward a number of interventions to help promote proper waste management practises in Ghana (Adu-Boahen, Atampugre, Antwi, & Osman, 2014). For instance, the government through the Ministry of Local

Government and Rural Development has declared the first Saturday of every month for clean-up exercises (Ghana News Agency, 2014). This initiative was introduced with the aim of sensitizing the citizenry about health-related benefits associated with proper waste disposal practises. In addition, the government in its quest to reduce waste in the country, spends an average of $290 million annually distilling choked gutters and creating aware-ness of waste management (Abalo, Peprah, Nyonyo,Ampomah-Sarpong, & Agyemang-Duah, 2018). This is a worrying situation considering that this huge expenditure on waste management deprives the country of resources that could have been directed towards other developmental programs.

Despite the aforementioned interventions, reckless littering attitudes and environmen-tally unfriendly practises among most Ghanaian households have dwarfed efforts to improve the sanitation position across the country (Graphic Online, 2013). There seems to be no desirable result because little or no effort has been made to understand and subsequently change the attitude or behavior of individuals/households towards adopting acceptable waste disposal practises. Meanwhile, improper waste disposal prac-tises have behavioral underpinnings, and, thus, demand behavioral change techniques towards their prevention (Adu-Boahen et al., 2014); arguably, even where trash bins and containers with lids are provided people still litter the roads, stream channels, bushlands and open spaces (Fobil, Armah, Hogarh, & Carboo, 2008) and these practises result in environmental problems such as flooding, disease, loss of valuable materials and even death (Puopiel, 2010). For instance, on June 3, 2015, during a downpour, there was an explosion of a gas filling station which cost the country the lives of 159 people and left 60 injured as a result of choked gutters due to littering and poor waste disposal behaviors (Graphic Online, 2017). However, households appear to be uninformed about the linkage between their actions and human health (Bortoleto, Kurisu, & Hanaki, 2012).

Consequently, understanding the behavioral and psychological mechanisms that influ-ence waste disposal activities among households could lead to a better and more effective household waste intervention program (Pakpour, Zeidi, Emamjomeh, Asefzadeh, & Pearson, 2014) in Ghana. Excitingly, that is the objective of social marketing (SM), to understand and change the behavior of the target audience. The SM discipline has been applied and seen enormous success in diverse areas in the developed world (e.g. Wolburg, 2006; Wymer, 2011). In the Ghanaian setting, SM has been used to address issues such as malaria prevention (Tweneboah-Koduah, Braimah, & Otuo, 2012); HIV/AIDS; (Adu-Mireku, 2003; Tweneboah-Koduah, 2014) and condom usage (Tweneboah-Koduah & Owusu-Frimpong, 2013), among others. However, despite the successful contributions of SM interventions to the aforementioned areas, it appears this area (social marketing on waste disposal behavior) of research has been silent in the literature.

Similarly, research works on waste: e-waste, plastics waste, medical waste and solid waste have all focused on education and awareness campaigns (Amfo-Otu & Doo, 2015; Amoyaw-Osei et al., 2011; Quartey, Tosefa, Danquah, & Obrsalova, 2015) to the neglect of the behavioral change aspect of waste disposal practises. These interventions have not seen a corresponding change in waste related behaviors because the human behaviors facilitating improper waste disposal behavior have been neglected. To this end, the successful management and marketing of any household waste disposal intervention program demands both national and governmental efforts to encourage high levels of

public participation. To achieve this requires strategies that will encourage and influence the public to voluntarily partake in the proposed waste disposal behavior (see Ma, 2016).

In addition, some SM theorists have argued that SM programs can be enhanced by using a behavioral change theory, as it provides the framework for understanding the target group (Luca & Suggs, 2013). In an attempt to address the foregoing research gaps, the current study employs the theory of planned behavior to predict a social marketing phenomenon (i.e. proper waste disposal behavior among households) in Ghana.

The current paper presents implications useful for both theory and practise. From the theoretical perspective, the paper provides a validated model that depicts the relationship between the TPB constructs and waste disposal behavior, thereby contributing to the theoretical perspectives of the growing body of knowledge. With regard to practise, the study provides policy makers and implementers of social intervention programs strategies such as focusing on improving the positive attitudes, subjective norms and intention of households towards the behavior in order to achieve a successful waste disposal campaign. The remainder of the paper is organised as follows: theoretical context and hypotheses development; conceptual framework; methodology; discussion of findings; and implications.

Theoretical context and hypotheses development

The current paper draws on the theory of planned behavior (TPB) propounded by Ajzen (1991). The TPB was developed in an attempt to predict and explain human behavior, and the model argues that attitudes towards the proposed behavior, subjective norm, and perceived behavioral control influence behavioral intention, which subsequently influences actual behavior (Ghani, Rusli, Biak, & Idris, 2013). The TPB has been extensively applied to various application contexts including recycling, reuse, composting and many other environment related issues (Pakpour et al., 2014; Wan, Shen, & Yu, 2014). The constructs of the TPB are further discussed in the sub-sections.

Attitude and intention to engage in behaviour

According to Bezzina and Dimech (2011), attitude is the psychological emotion that an individual attaches to a behavior which determines whether performing the behavior will yield positive or negative outcomes. As Hagger, Chatzisarantis, and Harris (2006) put it, an individual's positive attitude towards behavior influences his/her performance of the behavior. Thus, in advancing the argument, Rex, Lobo, and Leckie (2015) aver that the adoption of a sustainable behavior is preceded by positive attitudes. To this end, positive attitudes towards behavior become the starting point for achieving a behavioral outcome.

In a study by Tonglet, Phillips, and Read (2004) it was established that recycling attitudes influence intentions towards e-waste and recycling behavior. A similar study conducted by Nixon and Saphores (2007) reported environmental attitudes to be a significant predictor of one's readiness to pay advanced process fees for hardware or electronics. A study by Rex et al. (2015) to determine the intention of individuals towards adopting sustainable behavior found attitude to have a positive significant relationship with sustainable behavior. For proper waste disposal behavior adoption, we postulate that households' positive attitudes towards waste disposal influence intentions towards adopting the recommended behavior. We therefore state the first hypothesis of the study as follows:

H₁: Households' attitude towards waste disposal has a positive significant relationship with actual waste disposal behavior.

Subjective norms and intention to engage in behaviour

Subjective norms according to Bezzina and Dimeach (2011) constitute a set of normative beliefs that put an individual under perceived social pressure to behave in a certain way that is socially acceptable. The social pressure could emanate from the family, referent others, friends, social groups, among others (Bortoleto et al., 2012). The perception a person holds regarding the expectations of others serves as a motivation to comply with these expectations (Norman & Cooper, 2011). Rex et al. (2015) found subjective norms as a significant predictor of consumer's intention to engage in recycling household waste behavior and as such have proposed the use of this construct for sustainable behavior studies. The social marketing literature has also recognized subjective norms as a major predictor of waste management behavior. For instance, Hasan, Harun, and Hock (2015) conducted a study to ascertain subjective norms' effect on students' intention to use plastic. They found subjective norm to be the strongest predictor. Similarly, a study by Pakpour et al. (2014) on household waste behavior also established that subjective norm is a significant predictor of recycling behavior. In this current study, we propose that households are more likely to incorporate significant others' (friends, family, referent others) expectations while making decisions to engage in proper waste disposal behavior. Based on the foregoing discourse, the following hypothesis was formulated:

H₂: Household's normative beliefs towards waste disposal have a positive significant relationship with their actual waste disposal behavior.

Perceived behavioural control and intention to engage in behaviour

Perceived behavioral control according to Tonglet et al. (2004) relates to the individuals' beliefs regarding their capabilities to perform the behavior (Ajzen, 1991). In this present study, perceived behavioral control relates to the opportunities and constraints associated with proper waste disposal (such as availability of waste bins, cost for waste collection, convenience, time etc.) that is needed to successfully perform the behavior; and the strength of each of these beliefs determines behavioral control (Wang, Guo, & Wang, 2016). Ajzen (2002) emphasizes that perceived behavioral control (PBC) is the ease with which his individual beliefs could help him perform the behavior base on an assessment of whether the individual has the required skills, resources and opportunity to engage in the behavior. These beliefs may be formed based on past experience, information from friends and acquaintances, or by other factors that increase or reduce the perceived difficulty of performing the behavior in question (Ajzen, 1991; Verbeke & Vackier, 2005). Ajzen (1991) argues that if individuals believe that they have more resources and opportunities, and fewer obstacles or barriers, their perceived control over the behavior will be greater. This view was corroborated by Rex et al. (2015) who affirm that individuals are likely to adopt sustainable behaviors if they perceive that they have control over it. Based on the discourse above we hypothesise that:

H₃: Respondent's behavioral control towards waste disposal has a positive significant relationship with their actual waste disposal behavior.

Behavioural intention and behaviour

The TPB posits that behavioral intention (BI) is the strongest determinant/predictor of behavior. According to Ajzen (1991), intention is the motivation, willingness and the effort individuals exert to perform a given behavior. TPB posits that there is a positive and significant relationship between intention and behavior (Ajzen, 1991). Thus, if households form an intention to perform a behavior, then they will be more likely to take steps to perform that behavior; however, if no intention is formed, there will be no performance. The stronger the intention, the greater the likelihood that the behavior will be performed (Grønhøj, Bech-Larsen, Chan, & Tsang, 2012). From an empirical perspective, for instance, Mun and Hwang (2003) found that behavioral intention facilitated the actual usage of a web-based environment. To this end, we propose that (Figure 1):

H₄: Households' behavioral intention mediates the relationship between attitude and their waste disposal behavior.

H₅: Households' behavioral intention mediates the relationship between subjective norm and their waste disposal behavior.

H₆: Households' behavioral intention mediates the relationship between perceived behavioral control and their waste disposal behavior.

Methodology

Research design and procedure

In an attempt to test the theorized relationships in the study, a quantitative research method was employed. Quantitative research is appropriate when conducting a study with a larger sample size; and the objective is to test relationships among variables (Malhotra, 2010). Through a cross-sectional approach, data was collected using structured questionnaires. The questionnaire was divided into two sections; sections A and B. Section A contained the background information of the respondents, whereas section B contained statements on attitude, subjective norm, perceived behavioral control and waste disposal behavior. Attitude was measured with five items: Subjective norm, five items; Perceived behavioral control, five items; Intention, five items, and Actual behavior (proper waste disposal behavior), five items. All the scale items were adapted from Ghani et al. (2013). These were examined using a Likert-style five-point rating scale ranging from '1' = strongly disagree to '5' = strongly agree.

Respondents of the study included households (a household was defined as a person or a group of persons, who lived together in the same house or compound and shared the same house-keeping arrangements) within Greater Accra Region. The selection of the specific areas for the survey was based on the observed prevalence of waste. We used random sampling to select the densely populated communities (Madina, Chorkor, and Nima). Four hundred and fifty households in these communities were conveniently
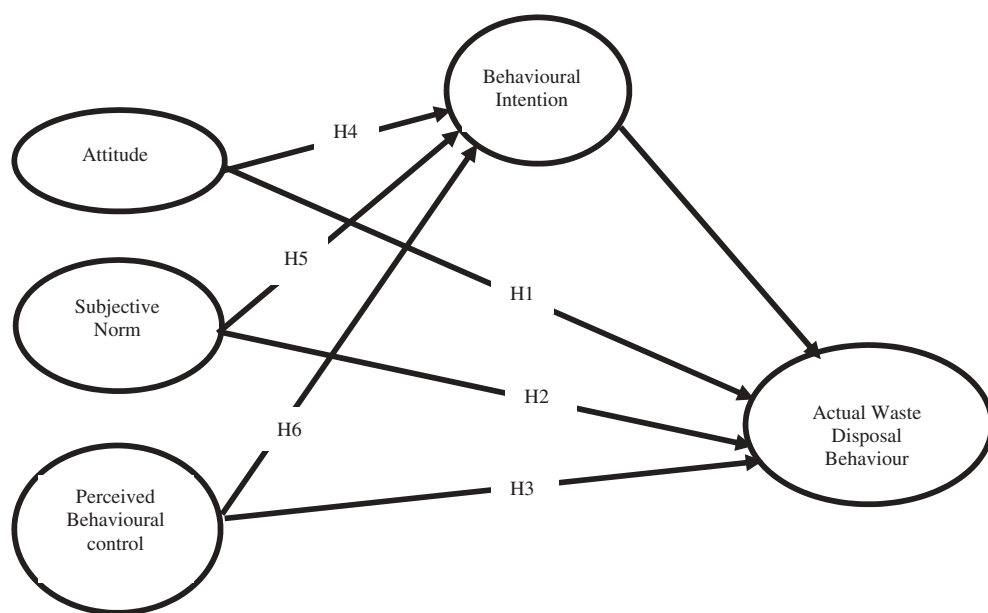
Figure 1 Research model.

selected, since only those who were available and willing to partake in the study were interviewed. The convenience sampling technique was also appropriate because the sampling frame for the households is unknown (Saunders, Lewis, & Thornhill, 2012). To avoid common method bias (Podsakoff, MacKenzie, & Podsakoff, 2012) we obtained the information from key persons who were involved in managing the households' waste since they are presumed to know more about the waste disposal activities of their households.

Prior to the questionnaire administration, we pilot tested the initial questionnaires using two faculty members and three doctoral students from the Department of Marketing and Entrepreneurship to assess the scale items for face and content validity of the constructs. Furthermore, to achieve the best comprehension and clarity of the scale items, it was pretested using 20 people who lived in communities that bore similar characteristics as the study communities. Based on the feedback received the question-naire was revised and finally distributed to the study sample for response.

In all, 450 questionnaires were distributed and after eliminating unengaged responses, outliers and missing data, the number dropped to 343 representing 76% valid responses and this was used for further analysis. All statistical data were analyzed using IBM SPSS version 21 and Structural equation modeling (SEM) Amos version 22.

Results and analysis

The data analysis was performed using a two-step approach of structural equation modeling (SEM) (Anderson & Gerbing, 1988). Before testing the structural model, we first assessed construct validity by conducting a confirmatory factor analysis for all the measurement scales. Using the proposed criterion by Fornell and Lacker (1981) we tested for scale reliability, convergent and discriminant validity. First, we assessed the reliability

and validity of the items for the measurement model using the maximum likelihood estimation. Furthermore, goodness-of-fit indices such as Chi-square (x^2/df), Goodness of Fit Index (GFI), Normed Fit Index (NFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI) and the Root Mean Squares Error of Approximation (RMSEA) were used to assess the overall model fit. The cut-off points for the goodness-of-fit indices are; x^2/df = ≤ 3 (Schreiber, Nora, Stage, Barlow, & King, 2006); GFI = > .90 (Hu & Bentler, 1999); NFI = >.90 (Hu & Bentler, 1999); TLI = > .90 (Schreiber et al., 2006); CFI = > .90 (Hooper, Coughlan, & Mullen, 2008) and RMSEA = ≤ .08 (Hu & Bentler, 1999).

Assessing the measurement model

The initial results for the measurement model did not have a good model fit, hence, the model was subjected to some modifications (Bagozzi & Yi, 2012). To this end, nine items (ATT3, ATT4; SN4, SN5; BI1, BI2; PBC2; BEH2, BEH3) were removed in order to improve the measurement model's fitness. Based on the deletions/refinement, the initial 24 items were reduced to 14 items for the final modified measurement model which was significantly improved (x^2/df = 2.75; GFI = .926; NFI = .921; TLI = .933; CFI = .948; RMSEA = .0072) see Table 3.

In testing the reliability and discriminant validity of the final measurement model, we used the criterion proposed by Fornell and Lacker (1981). They recommend three procedures when assessing convergent validity of the measurement items: 1) the item reliability of each measure, 2) the composite reliability of each construct, and 3) the average variance extracted. The item reliability test was examined using the factor loadings of the underlying construct, and all the loadings are above 0.5 for all the scales, indicating adequate convergent validity for all the latent constructs. The composite reliabilities (CR) of the measures and the Cronbach alphas (α) included in the model were all greater than the acceptable threshold of 0.7 recommended by Fornell and Lacker (1981) (see Table 1). This shows that the specified measurement model was reliable and fitted the data collected. The average variance extracted for all the measures also exceeded the recommended threshold of 0.5 and the square root of the AVEs was greater than the correlation coefficients of the constructs indicating that each construct was unique, thus providing support for discriminant validity as shown in Table 2 (Figure 2).

Table 1 Final measurement model.

Construct	Variable code	Factor loadings	CR	AVE	α
Attitude	ATT1	0.69	0.82	0.60	0.82
	ATT2	0.80			
	ATT3	0.84			
Subjective Norm	SN1	0.79	0.85	0.66	0.87
	SN2	0.83			
	SN3	0.81			
Perceived Behavioral Control	PBC1	0.69	0.75	0.51	0.71
	PBC3	0.81			
	PBC4	0.62			
Intention	BI3	0.76	0.74	0.59	0.72
	BI4	0.78			
Behavior	BEH1	0.83	0.92	0.80	0.92
	BEH4	0.93			
	BEH5	0.92			

x^2/df = 2.75; GFI = .926; NFI = .921; TLI = .933; CFI = .948; RMSEA = .0072

Table 2 Discriminant validity.

CONSTRUCTS	ATUDE	SNORM	BECONT	BEHINT	BEHAVE
ATUDE	**0.78**				
SNORM	0.72	**0.81**			
BECONT	0.19	0.56	**0.71**		
BEHINT	−0.05	0.06	−0.01	**0.77**	
BEHAVE	0.56	−0.02	−0.04	0.25	**0.90**

Note. Average variances extracted (AVE) are on the diagonal while the squared correlations are off-diagonal.

Table 3 Fit indices for the final measurement model.

Fit Indices	Recommended Threshold	Obtained value	Literature Support
x^2/df	≤3	2.75	Schreiber et al. (2006)
GFI	≥0.90	0.93	Hu and Bentler (1999)
NFI	≥0.90	0.92	Hu and Bentler (1999)
TLI	≥0.90	0.93	Schreiber et al. (2006)
CFI	≥0.90	0.95	Hooper et al. (2008)
RMSEA	≤0.08	0.07	Hu and Bentler (1999)

Note. RMSEA (root mean square error of approximation); GFI (goodness of fit index); NFI (normed fit index); RFI (relative fit index); IFI (incremental fit index); TLI (Tucker-Lewis index); CFI (comparative fit index).
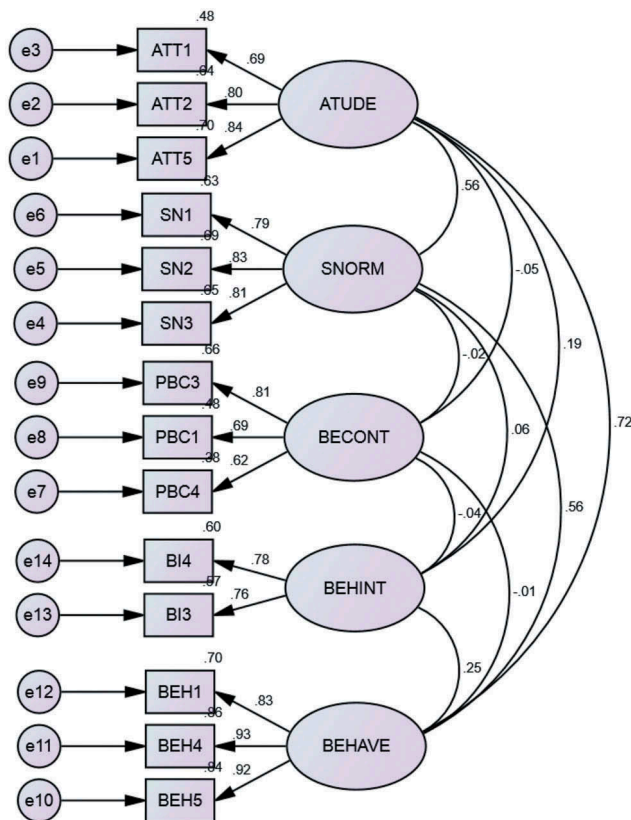

Figure 2 Final measurement model.

Table 3 illustrates that all values satisfied the recommended level of acceptable fit; thus, the research model has a good fit (Hair, Black, Babin, Anderson, & Tatham, 2006).
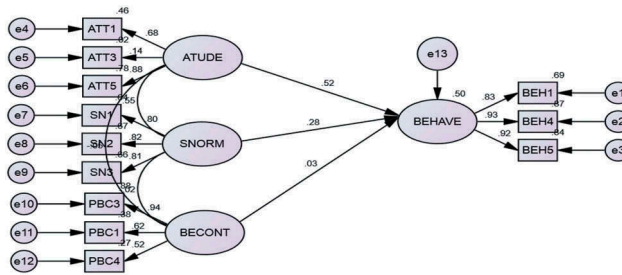
Figure 3 Analysis of hypothesized direct paths.

Hypotheses testing using structural equation modelling (SEM)

In attempting to test the various hypotheses of the study, the SEM approach was employed. We employed the SEM approach for the testing of the causal relationships because, according to Bagozzi and Yi (2012), it is the most preferred analytical method. Furthermore, researchers can use it to control for measurement error; provide information on the degree of fit of the tested model, and also test for multiple relationships simultaneously (Byrne, 2013). The results for the structural model in Table 4 shows the fit indices as well as the R^2 of the hypothesized direct model as x^2/df = 2.59; GFI = .944; NFI = .940; TLI = .946; CFI = .961; RMSEA = .068 indicating an acceptable model fit

Morespecifically as shown in Figure 3, the study proposed in model1 that attitude towards waste disposal behavior has a positivesignificant relationship with actual behavior (H1). The study found support for this as attitude was positively and significantly related to actual behavior (β = 0.52, t-value = 6.64, p < 0.001). Thus, the households' positive attitude towards waste disposal significantly influences their actual behavior towards it.

In H2, we argued that subjective norm towards waste disposal behavior would positively and significantly influence actual behavior (H2). We found support for H2 as subjective norms' effect on actual behavior was found to be both positive and significant (β = 0.28, t-value = 4.30, p < 0.001). This indicates that the positive normative beliefs of the respondents towards waste disposal behavior is important to them and likely to influence their actual behavior.

Finally, in H3, we proposed that perceived behavioral control (PBC) will positively influence actual waste disposal behavior. Inconsistent with TPB, our finding disconfirms H3, as there was no significant relationship between them (β = 0.03, t-value = 0.63, p > 0.53). This seems to suggest that in the Ghanaian context, the sample may not view the degree of control they have towards the behavior to significantly influence them to

Table 4 Analysis of hypothesized structural paths.

Hypotheses	Standardised Regression Paths	β Estimates	T-value	P-value	Result
H1	Attitude → Actual behaviour	0.52	6.64	***	Supported
H2	Subjective norm → Actual behaviour	0.28	4.30	***	Supported
H3	Perceived behavioural control → Actual behaviour	0.03	0.63	0.53	Not supported

R^2 = .50

RMSEA = .068 GFI = .944, NFI = .940, TLI = .946, CFI = .961, x^2/df = 2.59

engage in proper waste disposal behavior. Another reason could possibly be due to what Armitage and Conner (2001) stipulated. The authors suggest that often perceived behavioral control does not capture the real or actual control, thus, they conclude that PBC can be a significant predictor of behavior only when the perceptions of controls are accurate (Armitage & Conner, 2001).

Notably, the independent variables (i.e. attitude, subjective and perceived behavioral control) explained a substantial variance ($R^2 = 0.50$) in the dependent variable (waste disposal behavior) (Table 4).

Tests for mediation

The study sought to establish the mediating effect of behavioral intention on the relationship between attitude → waste disposal behavior (H4); subjective → waste disposal behavior (H5); and perceived behavioral control → waste disposal behavior (H6). It is particularly important to mention that the direct path between perceived behavioral control and actual behavior was not mediated, due to non-significant relationship (Baron & Kenny, 1986). Thus, H6 was not supported. Following Preacher and Hayes (2004) as well as MacKinnon, Lockwood, and Williams (2004), the mediation analysis was carried out using the bootstrapping method, since the causal steps approach recommended by Baron and Kenny (1986) has been highly criticized in the literature in recent times (Hayes, 2013). Thus, the study employed a bootstrapping sample of 2000 for testing the mediation effect of H4 and H5.

The results in Table 5 indicate that the relationship between attitudes and actual waste disposal behavior was partially mediated by behavioral intention (i.e. attitude → behavioral intention in path 1: β = 0.26, t-value = 3.33, p < 0.001; behavioral intention → actual behavior in path 2: β = 0.13, t-value = 2.27 p = 0.02) as well as the indirect effect (β = 0.035, p = 0.007) providing support for H4. On the other hand, there was no mediation effect regarding subjective norm and actual behavior through behavioral intention (i.e. subjective norm → behavioral intention in path 1: β = −0.11, t-value = −0.30 p > 0.05; behavioral intention → actual behavior in path 2: β = 0.13, t-value = 2.27 p = 0.02). As the results suggest, the path between subjective norm and behavioral intention was not significant, thus mediation was not possible (Baron & Kenny, 1986). Hence, H5 was unsupported. Table 5 presents a summary of the results of the mediation analyses using the indirect effect.

The findings of the current study further indicate that the direct and indirect link between attitude and actual waste disposal behavior remained significant when the intervening variable (intention) was introduced into the relationship. This signifies

Table 5 Summary of mediation test.

H	Relationships	Direct without mediator	Direct with mediator	Indirect Effect	Results	Outcome
H4	Attitude→ Intention→ actual behaviour	0.52(***)	0.48 (***)	0.035 (.007)	Partial Mediation	Supported
H5	Subjective norm→ Intention → actual behaviour	0.29(***)	.029 (***)	−.014 (.060) ns	No mediation	Not supported

Note. R^2 = 0.52 (52%); *** = p < 0.001; ns = 'not significant'; H = 'hypotheses'.
H6 was not tested because the relationship between perceived behavioural control and actual waste disposal behaviour was not significant (Baron & Kenny, 1986). Hence, H6 was not supported.

a partial mediating effect. This means that, when households have positive attitudes towards waste disposal, it influences actual behavior adoption but having positive intentions towards the behavior increases performance. The partial mediation model explained 0.52 (52%) of the variance in waste disposal behavior. Consequently, we can say that the structural model in Figure 1 estimated as a baseline model with all the hypothesized paths (partial mediation) was better.

Discussion and conclusions

This study attempts to examine the salient beliefs (attitude, subjective norm and perceived behavioral control) influence on households' waste disposal behavior, and the mediating effect of behavioral intention on the relationship between the salient beliefs and actual waste disposal behavior. The initial hypothesis posited that the attitude of households towards waste disposal would positively affect actual waste disposal behavior. This was supported in the Ghanaian context. Thus, the authors conclude that households which have positive attitudes towards waste disposal are more likely to dispose of their waste properly. This study finding does not support existing research which found that attitudes did not significantly influence friendly environmental behavior (Cordano & Frieze, 2000)

In hypothesis 2, we proposed that the normative beliefs of the households' referent others would significantly influence their waste disposal behavior. Supporting H2, the results revealed that Ghanaian households' subjective norms have a positive and significant effect on their waste disposal behavior. Based on the results of the study, the authors conclude that households' families, friends and referent others' normative beliefs influence them to properly dispose of waste. This finding corroborates the findings of previous studies (Mancha & Yoder, 2015; Norman & Cooper, 2011; Rex et al., 2015). For instance, Norman and Cooper (2011) aver that generally, an individual will be under social pressure to perform a behavior if he believes that most of the referents with whom he complies think that he should perform the said behavior.

Disconfirming hypothesis 3, the study results found that perceived behavioral control among Ghanaian households does not significantly influence their actual waste disposal behavior. This implies that households in the Ghanaian context do not believe they have firm control over their ability to properly dispose of waste, which is an indication that the households do not believe it is easy for them to engage in proper waste disposal behavior. This finding could be attributed to the lack of accessible waste bins, the cost for waste collection as well as the time and convenience involved in locating waste bins to dispose of refuse. This finding concurs with Ajzen (2002) as well as Rex et al. (2015) who argue that individuals will only perform a behavior if they perceive that the behavior is easy to perform and that they possess the requisite skills, opportunities and resources to engage in it.

For the mediation analysis, we hypothesized in H4, H5 and H6 that behavioral intention will mediate the relationships between the salient beliefs and actual waste disposal behavior. The finding reveals a partial mediation effect. As mentioned earlier, we did not include perceived behavioral control in the mediation analysis, since it recorded a non-significant relationship with actual waste disposal behavior and so did not meet the first condition for mediation analysis (Baron & Kenny, 1986). However, attitude and subjective norms' relationship with actual behavior were significant and as a result qualified for mediation

analysis. Supporting H4, the result of this study found that, in the Ghanaian context, behavioral intention partially mediates the relationship between attitude and actual waste disposal behavior. This suggests that the positive attitudes of households towards waste disposal behavior influence them to perform the behavior. However, when intentions based on positive attitudes are formed it enhances their actual behavior adoption.

Despite subjective norm having a direct effect on actual behavior, it does not have a significant indirect effect on actual behavior through behavioral intention. Thus, the study found no mediation effect between subjective norm and actual waste disposal behavior. Therefore, hypothesis 5 is not supported. This implies that in the Ghanaian context, regarding proper waste disposal behavior, the households rely solely on the normative beliefs of the important people in their lives to influence their decision to engage and not on their intentions. This finding disconfirms several studies that found subjective norm to influence intention which in turns lead to actual behavior (Hasan et al., 2015; Mahmud & Osman, 2010). In summary, the mediation analysis demonstrates that behavioral intention is only determined by households' attitudes towards waste disposal behavior. Factors such as the opinions of referent others and the resources and abilities they possess do not influence their intentions to adopt proper waste disposal behavior.

Implications for theory and practice

The results from this study have theoretical and managerial implications for marketing practitioners in the area of sanitation. By way of theory extension, this study found that TPB is applicable in the developing country context such as Ghana to understand a social marketing phenomenon (waste disposal behavior), thus contributing to knowledge in this area. In particular, the study found attitude, intention, and subjective norm to be the most significant predictors of proper waste disposal behavior. However, the study found no significant relationship between perceived behavioral control and proper waste disposal behavior.

Practically, attitudes towards waste disposal behavior have proven to be the most important variable that informs households' decision regarding proper waste disposal behavior. This was followed by subjective norm towards the behavior. To this end, it is important for implementers of social marketing intervention programs aiming to promote proper waste disposal behavior among households to focus on building households' positive intentions towards waste disposal by increasing the positive attitudes and subjective norm of the behavior. This is very important as social marketing interventions that focus on these variables are more likely to achieve better intervention result in the Ghanaian context.

Finally, we recommend that policy makers or the government should introduce policies that will help reduce the barriers in the environmental setting which prevent households to properly dispose of their waste. For instance, they can provide accessible waste bins, inexpensive waste collection fee, among many others to help remove the barriers to proper waste disposal adoption.

Limitations and direction for future research

First, this current study was limited to only households in the Greater Accra Region. Hence, the results cannot be generalized to other Regions. Future studies should replicate the study in other Regions in order to confirm the results of our findings. Secondly, the findings of this study are based on cross-sectional data, which may suggest static correlations among the variables used at a single point in time. Future researchers may need to adopt a longitudinal approach to determine the pattern of change and the extent to which intentions that are based on positive attitudes influence waste disposal behavior over time.

Thirdly, promoting the positive attitudes and intentions of the behavior have the potential to improve households' waste disposal behavior. However, attitude, subjective norm and intention only explained a portion (52%) of the variance in the actual behavior. Therefore, future research should include factors beyond the TPB (such as households' average income, availability of waste bins and other environmental factors) as possible mediators or moderators in the model to help improve the predictive ability of the TPB.

Finally, the current study employed TPB constructs to predict and understand households' waste disposal behavior. Future research should focus on the application of other behavioral change 'models or integrate models to predict the adoption of proper waste disposal behavior.

Disclosure statement

No potential conflict of interest was reported by the authors.

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