Personal Values and Electronic Waste Disposal Among Households in Cape Coast Metropolis

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Abstract

The study examined social values that accounted for electronic waste recycling and reuse behaviours. Via a cross-community survey of 193 of households in the Cape Coast Metropolis, a correlational design was employed in the study. Partial Least Squares-Structural equation modelling was used to analyse the data. Results from the analysis showed the influence of altruistic values ($\beta = 0.275$, $p < 0.05$) on reuse behaviour. Similarly, environmental awareness ($\beta = 0.213$, $p<0.05$) also showed significant influence on participation in recycling, whereas psychological ownership significantly influenced both reuse ($\beta = 0.319$, $p < 0.05$), and participation in recycling ($\beta = 0.339$, $p < 0.05$), The joint significance of altruistic values, environmental awareness and psychological ownership to explaining recycling participation was 21.3% ($R2 = 0.213$, $p < 0.05$) and that of reuse was 24.6% ($R2 = 0.246$, $p < 0.05$). The results of the study showed that individuals who are knowledgeable about the state of their environment were more likely to participate in recycling. On the other hand, individuals with altruistic values preferred giving unwanted electronic equipment to others for reuse. Altruistic values are particularly true of collectivist cultural orientation. Psychological ownership was significant in predicting both behaviours, however, the effect size on reuse was moderate. Psychological ownership due to waste aversion and frugality lead consumers to keep, and subsequently give to close relatives in their social network. It was recommended that individuals should be encouraged to patronize formal recycling services. as a way to show concern for the well-being of others by reducing pollution due to improper waste treatment. Again, like in developed economies, second-hand collection systems for unwanted electronic products can be developed, and made convenient for individuals with reusable items, who may be willing to donate or even resell.

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Introduction

The work of Dunlap and Van Liere (1978, 1984), on New Environmental Paradigm (NEP), propelled research in environmental studies distinguishing among behaviours and values that promote the general welfare of the biophysical environment. The NEP championed an ecological worldview called "environmentalism" which aimed to promote social progress and environmental welfare. Environmentalism attempts to encourage positive environmental behaviours, to avert environmental catastrophes popular among them is climate change which the entire globe is experiencing today. Bringing social order in human consumption and disposal related activities such as waste management has been a growing concern for both developed and developing economies.

Waste generation is a natural part of the biological life cycle of every living organism. The typical supply chain in a linear economy has been characterized by the one-way production system, where final goods end with consumers (Parajuly & Wenzel, 2017). Such production systems have been heavily criticized in the face of sustainability concerns across all circles. In contrast to the linear economy, end users are not only consumers of final products but, become the central and upstream suppliers of materials back into the production system in the circular economy. Circular economy practices at the household level have been codified into three main activities referred to as the waste hierarchy: reduce, reuse and recycle (Stahel, 2016; Geissdoerfer, Savaget, Bocken & Hultink, 2017). These activities have been popularised in the sustainability literature as the 3Rs. The 3Rs is conceptualised as a hierarchy where stakeholders are expected to "reduce" their waste generation or avoid waste where possible.

Waste cannot be avoided so far as we consume but can be reduced. Where one finds it impossible to reduce waste, the next most preferred option in the waste hierarchy is to "reuse" items or materials without any processing. For example, many household items can be cleaned or repaired to be reused, sold or gifted to other people. According to Parajuly & Wenzel (2017), such practices help to avoid the costs of energy and other resources required for recycling. In the stance where one cannot possibly reuse materials or items, the next option is to recycle. Recycling involves processing waste materials to make the same or different products. In the case where new items are of better quality, upcycling is used. St. James and Kent (2019), notes that upcycling, which is well resonated in the marketing literature as creative reuse, adds value to materials as they are created into new forms. Overall, reuse and recycling help keep materials in the productive economy, which benefits the environment by decreasing the need for new materials, consequently helping to conserve resources. Also, the 3Rs are not mutually exclusive. For instance, we can reduce waste generation by reusing items or associated components. Also, some materials recovered through recycling are used to refurbish or repair other items which are sold as second hand to be reused.

Within the space of electronic waste disposal, authors such as Alhassan et al., (2017); Echegaray and Hansstein (2017); Kianpour et al. (2017); Kumar (2019); Liu et al., (2019; Wang et al., 2019) have examined factors influencing individual's willingness to recycle from the perspective of the theory of planned behaviours. However, unlike, other types of solid waste such as plastic, owners of electronic products may still exercise possession even if it is not needed. Such feelings usually result from an attachment and emotional bonds created between the owner and the object over its lifecycle. Again, objects in our homes find themselves as part of our everyday routine. It is therefore important to consider the attachment processes and how it also influences reuse and recycling participation. Accordingly, empirical enquiry into electronic waste management should also examine the psychological ownership aspect.

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Meanwhile, Norm Activation Theory (Schwartz, 1977) and the Value-Belief-Norm theory of Environmentalism (Stern, 1999) has been used to predict environmentally significant behaviours such as an individual's willingness to participate in recycling and actual participation in recycling. Internalised normative values together with socially accepted standards of behaviour are linked to pro-environmental behaviours (Hedlund, 2011; Thøgersen, 2000). According to Schwartz, environmental awareness and helping values are important factors that influence pro-environmental behaviours. However, little is known on the interconnections among these social values, recycling and reuse behaviours. The purpose of the study was to examine the effect of environmental awareness, altruistic values and psychological ownership on recycling participation and reuse behaviour. The rest of the article is organized as follows: Literature review and hypotheses development, methods, analytical procedure and results, discussion, conclusion and policy contribution.

Literature review and hypotheses development

There is a growing awareness that disposal practices contribute to environmental problems such as air, land and water pollution (Kaplan, Henn, Park & Kurman, 2019; Alhassan, Asante, Oteng-ababio & Bawakyillenuo, 2017; Alhassan, Kwakwa, & Owusu-Sekyere, 2020), a decline in biodiversity (Cole et al., 2017; Parajuly et al., 2020b), and sustainability risk of rare earth metals (Ueberschaar & Rotter, 2015). Disposal practices are described as a consumer behaviour because, it is an immediate activity following consumption. In the waste management literature, individual perception towards waste disposal is described as a socio-psychological process, which is a consequence of the interplay of environmental, social, psychological and materialistic values. Accordingly, the Norm-Activation Theory of Altruism by Schwartz, (1970b, 1973, 1977 & 1994) is examined as basis for explaining disposal behaviour of individuals. Psychological ownership also explains the underlying theory behind the tendency to keep unwanted electronic possessions, especially when they are perceived to have some economic value, even when they are not in use. Consequently, Psychological Ownership Theory (Pierce, Kostova & Dirks 2001; 2003) is also examined.

Norm Activation

The Norm Activation Theory (NAT) by Schwartz (1973, 1977) has been adopted to examine pro-environmental behaviours such as adopting environmentally friendly transport, energy conservation and reuse behaviours. According to NAT, people in general, value environmental quality and accept the responsibility to care for it. Specifically, personal norms towards the environment lead to individual actions intended to ameliorate environmental quality. The activation of personal norms is largely known to occur through an internalisation mechanism involving awareness of the consequences of human activities on the biophysical environment. Personal norms, as described by Steg and Nordlund (2019), as the moral obligation to engage in or refrain from certain actions for the benefit of others.

Norm Activation Theory (Schwartz, 1977; Schwartz & Howard, 1984) holds that pro-environmental actions follow from the activation of personal norms. Personal norms are a product of awareness of consequences of behaviour and ascription of responsibility. Personal norms are stronger when people are aware of the problems their behaviour have contributed to and the moral obligation to reduce such negative impact. Again, it is stronger when people believe they have what it takes (i.e time, skills and resources) to contribute to reducing environmental problems.

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Drawing from the Value theory by Schwartz, (1992, 1994) and the New Environmental Paradigm (NEP; Dunlap, Van Liere, Mertig, & Jones, 2000), individuals exhibit a range of values. Out of these, four human values namely egoistic, bio spheric, altruistic and hedonic have been found to motivate individuals' consumption and disposal patterns. While egoistic and hedonic values are about the pursuit of self enhancement, bio spheric and altruistic values emphasise self-transcendence (Schwartz, 1994). Self-transcendence refers to state of treating others as equal and showing concern for their welfare. Altruistic values are socially cantered, where individuals pursue social and environmental goals. Armed with this assumption, the Norm Activation Model by Schwartz connects pro-environmental behaviours to altruistic value orientation (Stern, Dietz, & Kalof, 1993).

Altruistic value orientation was defined by Schwartz and Howard (1984, p. 229) as "self-sacrificial acts intended to benefit others regardless of material or social outcomes for the actor" In that study, arguments were put across as to what motivates helping behaviour. Schwartz & Howard (1981) maintains that an act that is motivated by the concern for the welfare of others is said to be an altruistic behaviour, to the extent that individuals take actions to contribute to such need. Described by Schwartz as helping value, individuals exhibit altruistic values, by donating unwanted electronic objects for the benefit of others. In the pro-environmental discourse, altruistic and bio spheric values accounted for significant pro-environmental actions. Beliefs about the impact of human activities on the environment and the effectiveness of one's action come into play between values and norms. Environmental norms influence sustainable actions. The Norm activation theory brings to fore the importance of environmental norms and altruistic behaviours to promote pro-environmental behaviours.

Empirical studies such as Barr (2007); Berglund, (2006); Hage et al., (2008); Miafodzyeva et al., (2013); Bissing-Olson et al., (2013) and Miliute-Plepiene et al., (2016) find moral norms to be a strong predictor of household recycling behaviour. Other studies have shown that altruistic value orientation influence people to engagement in pro-environmental behaviour. In Bissing-Olson et al., (2013) the authors investigate relationships between employees' daily affect, pro-environmental attitude, as well as daily task-related pro-environmental behaviour and daily proactive pro-environmental behaviour. Fifty-six employees working in small businesses completed a baseline survey and two daily surveys over ten workdays. They found that pro-environmental attitude positively predicted daily task-related pro-environmental behaviour. According to the authors, the results of their study suggest that fostering pro-environmental attitudes, and to some extent, positive affect among employees, could help organizations promote pro-environmental behaviour in the workplace. Similar findings are reported by Miliute-Plepiene et al., (2016), who found that depending on the growth of the recycling industry, the type of norms that influence behaviour differs. Specifically, they found that strong environmental norms are key when factors that make waste management convenient are under-resourced.

In Bissing-olson et al., (2016) an experiment conducted to test university students' engagement in pro-environmental behaviours over a three-day period found that pro-environmental behaviours such as avoiding littering and engaging in recycling were found among those who felt proud when engaging in environmentally friendly behaviours. Similarly, Onwezen et al., (2017) extending the Norm Activation Theory examined the role of anticipated pride and guilt, which is the basis of altruistic behaviours. From the analysis of 617 responses, collected through an online survey, it was

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reported that anticipated pride and guilt was confirmed by their study, and anticipated emotions mediated the effects of personal norms on behaviour.

Also, Park and Ha (2014), found that awareness of consequences influenced intentions to recycle, and also contributed to a positive attitude towards recycling. According to Miliute-Plepiene et al. (2016), an individual's fear of guilt and a bad conscience acts as a deterrent for behaviour that does not conform with his/her internal moral norms or to behave in a certain way. The authors state that people are generally more prone to think about themselves as socially responsible and, thus, are more likely than not to act in an altruistic way (Schwartz, 1977). Thus, it is expected that awareness of consequences of disposal practices will influence recycling and reuse behaviours.

Zhang, Liu and Zhao (2018) studied environmental complaint behaviours of selected citizens using the Norm Activation Model. Their findings are consistent with Miliute-Plepiene et al., (2016). According to the authors, the immediate predictor of environmental complaints was personal norms, whiles awareness of consequences was found to either directly trigger personal norm or to indirectly influence personal norm through the mediation of ascribed responsibility. In a related study by Wang, Wang, Zhao and Yang (2019), resident's awareness of consequences of not separating waste is positively and significantly associated with ascription of responsibility, and both of them are positively and significantly related to personal norm. Personal norm is positively associated with resident's waste separation intention. Similar to Wang, Zhao & Yang (2019), it was revealed that the association between awareness of environmental consequences of behaviour and personal norms was the strongest, and personal norm was the most influential determinant of pro-environmental binning behaviour (Esfandiar et al., 2020). From the discussions one can conclude that altruistic values and awareness influence recycling and reuse behaviours. Therefore, non-directional hypotheses were developed as follows:

Ha 1: Altruistic values has effect on recycling participation

Ha 2: Altruistic values affects reuse behaviours

Ha 3: Environmental awareness influences recycling participation.

Ha 4: Environmental awareness influences reuse behaviour.

Psychological ownership

Psychological Ownership Theory by Pierce, Kostova and Dirks (2001; 2003), entails the development of possessive feelings for targets of psychological attachment. This phenomenon has been cited to cause possessive feelings towards inanimate objects, and cause people to keep objects even when they longer need them. Waste aversion behaviours have been examined in the literature to be caused by frugality, creative reuse and general concern for the environment (Haws et al., 2012). Individuals who keep their objects even when they are not reusable usually have the desire to be careful with the use of economic resources, think about new ways of reuse and general concern for the environment. The logic behind it is that so long as people become attached to their possessions, they are more likely to handle the product with care, postpone its replacement or disposal, and repair it when it breaks down (Van Nes & J. Cramer 2006, Mugge 2007, Ramirez, Ko & Ward 2010; Cole, Cooper & Gnanapragasam, 2016).

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The purchase of electronic appliances for our homes and personal use leads to both legal and psychological ownership. It is believed that the "mine" feeling causes individuals to temporary or permanently store their waste electronic appliances. However, in line with the frugality argument of Haws et al., (2012) the tendency to keep waste objects could also be motivated by creatively reusing parts for other purposes or passing on to others for reuse. Again, concern for the environment may cause individuals to keep waste objects awaiting an opportunity to properly discard. The relationship between consumers and their possessions creates psychological and social resonance which requires physical and emotional detachment once disposal intentions ignite (Cherrier, 2009). Disposal of possessions is considered as fundamental activity and critical for subsequent purchase.

Reuse and recycling have implications for businesses, society, and the environment. These methods of disposal lead to the flow of possessions from one to another that generates positive social, economic and environmental impact. Disposal of unwanted products from households increases the orderliness of closets and promote the individual's psychological wellbeing (Cherrier, 2009). Besides, disposal leads to the purchase of new products (Cruz-Cardenas, Gonzalez, & del Val Nunez, 2016; Lang, Armstrong, & Brannon, 2013), which is important from a marketing perspective. Finally, the choice of disposal methods determines whether the product continues to circulate among other consumers or relegated to garbage dumps and landfills (Bianchi & Birtwistle, 2010; Cole et al., 2017). The relationship between psychological ownership and reuse behaviours have been documented. Jussila et al., (2015) found psychological ownership leads to positive evaluations about a product which also influences preference for continued use of a product or a brand. When consumers express psychological ownership of an object, their evaluations of that object increase (Kwok et al., 2018; Steketee et al., 2003). Based on these arguments, the following hypotheses were developed for empirical examination.

Ha 5: Psychological ownership influences recycling participation

Ha 6: Psychological ownership influences reuse behaviours

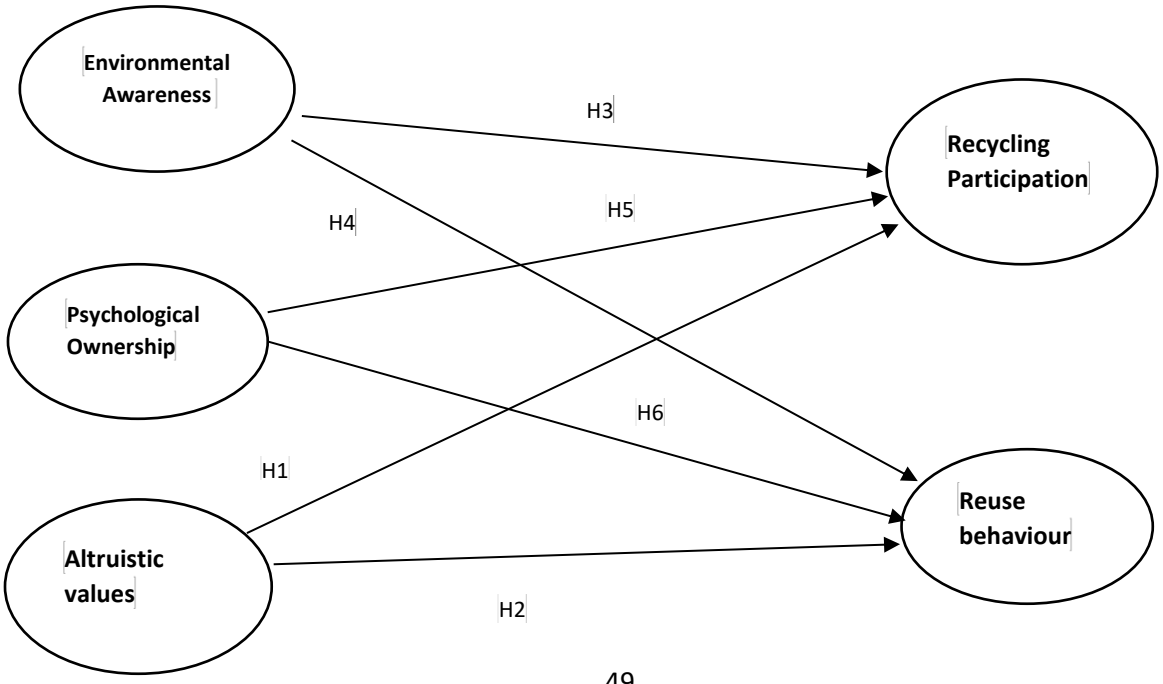

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Figure 1: Conceptual framework constructed based on review of the literature.

Materials and Methods

The study employed a correlational design. The population of the study comprised households in the Cape Coast Metropolis. The map in figure 2 shows the areas where the data was collected. Some of the questionnaires were administered by research assistants because of the language barrier. Consequently, rigorous checking of scores was done to ensure researcher biases and social desirability did not affect the data and the results. The statistical technique used was Partial Least Squares-Structural Equation Modelling (PLS-SEM).

The choice of this technique was based on its exploratory nature by allowing researchers to explore patterns in data to contribute to theory (Wong, 2013). In addition, PLS-SEM performs relatively well when a study is 'limited' by a smaller sample and data failing to meet normal distribution which is required in CB-SEM (Hair, Hult, Ringle & Sarstedt, 2017). The technique is more relaxed with distributional assumptions of data (Hair et al. 2014). Minimum sample size requirement for partial least squares structural equation modelling is relatively lower because of the technique high statistical power even for smaller sample size (Hair Jr et al., 2014; Sarstedt et al., 2014). The data was processed with SmartPLS 3 (Ringle, Wende, & Becker 2015).

The minimum sample size was determined by considering a significance level of 5%, a statistical power of 80%, an R2 value of at least 25% and the maximum number of arrows pointing at each dependent variable, which in this case were three (Hair et al. 2014). From Cohen (1992) sample size table, the minimum sample required, considering all the assumptions, was 37. However, the sample size was increased to cater for non-response as proposed by scholars in consumer research (Baruch & Holtom, 2008). A total of 300 questionnaires were subsequently sent out of which 193 usable questionnaires were used for the final analysis. A response rate of 64.3% was achieved.

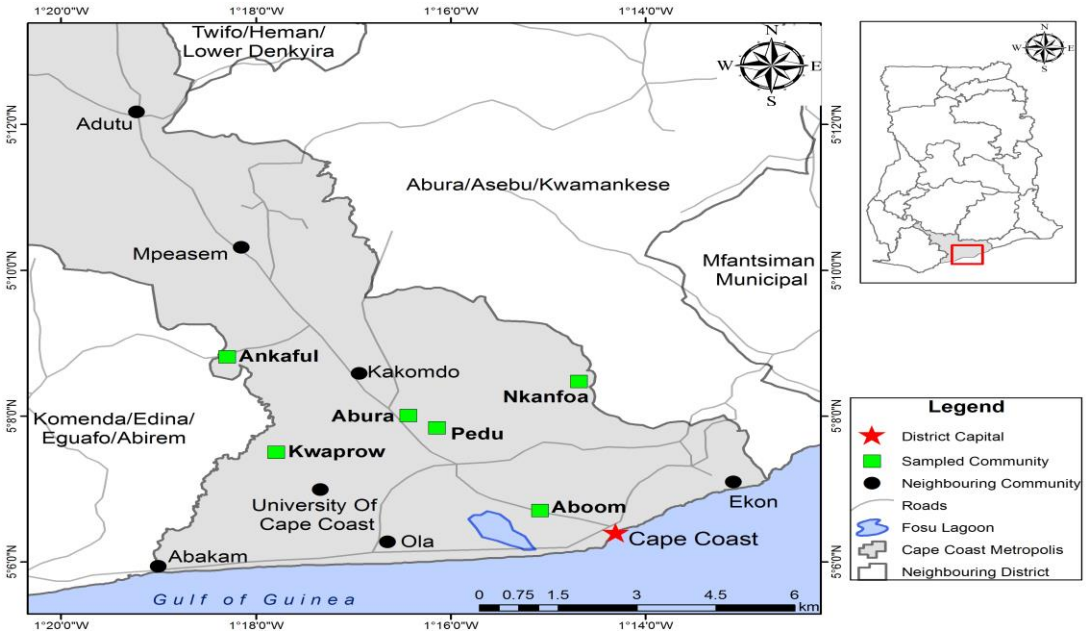

Figure 2: Map showing areas in the Cape Coast Metropolis where data was collected.

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Results and Discussion

Descriptive Statistics of Respondents

The descriptive statistics of the respondents include sex, type of residence and occupation. The sample included 96 (49.7%) males and 89 (46.1%) females. The rest did not indicate their sex. Also, respondents with tertiary educational status were 148 (76.7%). Those with no formal education were 11 (5.7%), primary 4 (2.1%), senior high school and vocational 26 (12.9%). In terms of occupation, 61 (31.6%) were professionals including lawyers, lecturers, accountants etc. The next highest category was service and sales workers which recorded 25 (13.0%). 18 (9.3%) are clerical support workers. Others are elementary occupations 20 (10.4%), craft and related trade 16 (8.3%), technicians and associate professionals 13 (6.7%) and skilled Agric/fisheries workers 18 (9.3%). About 22 (11.4) respondents did not indicate their professions. These categories of occupation are guided by the Ghana Living Standards Survey, (2014).

Table 1: Data distribution characteristics

Items	Mean	Standard Deviation	Excess Kurtosis	Skewness
ATT1	4.896	1.923	-0.902	-0.525
ALT9	5.534	1.651	0.958	-1.249
ALT10	6.031	1.318	2.962	-1.69
ALT19	5.803	1.816	1.274	-1.577
EA1	5.677	1.762	0.658	-1.325
EA2	5.796	1.523	1.242	-1.371
EA4	5.848	1.539	1.698	-1.479
EA5	5.503	1.669	0.373	-1.08
EA7	5.853	1.472	0.723	-1.213
EA8	6.058	1.444	1.83	-1.584
EA9	5.853	1.508	1.681	-1.447
OA2	4.267	2.069	-1.178	-0.248
OA3	4.09	2.087	-1.26	-0.201
OA5	4.217	2.086	-1.283	-0.175
OA6	4.476	1.944	-0.931	-0.441
OA7	4.272	1.922	-0.964	-0.241
OA8	4.257	2.11	-1.225	-0.285
SD3	4.305	1.881	-0.875	-0.372
SD7	4.900	1.834	-0.389	-0.728
SD8	5.011	1.817	-0.489	-0.736
SD9	4.526	2.074	-1.132	-0.396

Table 1 also presents the distribution of data. Although, normality assumption is not required for PLS-SEM analysis, one must also ensure data possess acceptable characteristics such as absence of outliers and collinearity (Hair et al.,

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2010). The table shows the mean, standard deviation, excess kurtosis and skewness. The skewness of a normally distributed data is 0 and kurtosis equal to 3. Excess kurtosis is determined by deducting 3 from the kurtosis. So essentially, excess kurtosis of a normally distributed data should also be 0. The data did not deviate so much from a normal distribution, which is usually the case with most primary data-based surveys in social sciences.

Assessment of measurement model

The quality and predictive power of the model was assessed via indicator reliabilities, AVE, Fornell-Larcker, R-square (R2), Q-square (Q2) and F-square (f2) values. Table 1 presents the reliability and quality indicators of the measurement model. The threshold value for composite reliability is 0.7 and 0.5 for the average variance extracted (AVE) (Hair et al., 2014; Henseler, Hubona, & Ray (2016)

Table 2: Quality assessment: Construct reliability, Validity, R square (R2), Q-square (Q2) and F-square (F2) values.

	Composite Reliability	**Average Variance Extracted (AVE)**	***Adj. R^2***	***F^2***		***Q^2***	***Collinearity***	
				Recycling participation	***Reuse***		***Recycling participation***	***Reuse***
Altruistic Behaviour	0.827	0.614		0.020	0.063		1.589	1.589
Environmental awareness	0.931	0.628		0.036	0.015		1.586	1.586
Psychological ownership	0.892	0.580		0.128	0.151		1.009	1.009
Recycling Participation	0.805	0.582	0.213			0.106		
Reuse	0.740	0.587	0.246			0.112		

The traditional criterion, which has been used for assessing internal consistency of an instrument is Cronbach's Alpha (CA). However, PLS-SEM offers a more intuitive approach because CA is sensitive to the number of items in the scale. Cronbach Alpha assumes that all the indicators have equal outer loadings on the construct which is not always the case (Hair et al, 2017). Composite reliability overcomes this limitation by ranking the indicators according to their reliability in the model estimation. The threshold value for composite reliability is 0.7 and 0.5 for the average variance extracted (AVE) (Hair et al., 2014; Henseler, Hubona, & Ray (2016). From table 2, the minimum threshold was achieved for all the constructs. Average variance extracted is an indication of how well the indicators measure their underlying construct.

Table 3: Fornell-lacker

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	Altruism	Environmental Awareness	Psychological ownership	Recycling	Reuse
Altruism	**0.784**				
Environmental awareness	0.605	**0.793**			
Psychological Ownership	-0.054	0.029	**0.762**		
Recycling	0.272	0.319	0.317	**0.763**	
Reuse	0.338	0.312	0.328	0.482	**0.766**

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Table 3: Fornell-lacker

	Altruism	Environmental Awareness	Psychological ownership	Recycling	Reuse
Altruism	**0.784**				
Environmental awareness	0.605	**0.793**			
Psychological Ownership	-0.054	0.029	**0.762**		
Recycling	0.272	0.319	0.317	**0.763**	
Reuse	0.338	0.312	0.328	0.482	**0.766**

**Numbers in bold are the square root of AVE, non-bold numbers are the correlations among the constructs.

Table 3 also presents another test of discriminant validity as proposed by Fornell Larcker (Fornell & Larcker, 1981). With the Fornell Larcker criteria, the square root of the AVE should be higher than the highest correlation between the underlying construct and other constructs. This was achieved as all numbers in bold were above the correlations between the construct and other constructs.

Assessment of the Structural Model

Assessment of the structural model in PLS-SEM is aimed at establishing a model's ability to predict the endogenous variables or constructs. It followed a procedure suggested by Hair et al (2017). In the first stage, the structural model was examined for collinearity. Then the significance of the path coefficients was determined. The predictive power

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of the model (coefficient of determination, R2) followed by an assessment of the effect size (f 2), and the predictive relevance (Q2) were assessed. As a measure of the overall goodness of fit of the structural equation, an overall coefficient of determination, R2, f2 and Q2 was used to assess the stability of the model. This is shown in Table 2

PLS-SEM is a non-parametric, so it relies on a nonparametric bootstrap procedure to test the significance of various results such as path coefficients, Cronbach's Alpha, HTMT, and R^2 values (Hair et al., 2011; Hair Jr et al., 2014; Wong, 2013). In this study, the bootstrapping procedure was used to assess the significance of the path coefficients and R2 values (Hair et al. 2017). The estimations from the bootstrap subsamples are used to derive standard errors for the PLS-SEM results. With this information, t-values, p-values, and confidence intervals are calculated to assess the significance of the structural model relationships. The results of the bootstrap procedure are shown in table 4.

Following the structural model assessment procedure, there is a need to check the model for collinearity. Multicollinearity is observed when there are several correlations of sufficient magnitude which together would predict a large percentage of the variance in the dependent variable. The inner VIF values checked for collinearity issues. Multi collinearity was measured by variance inflation factors (VIF). VIF values exceeding 4.0 or tolerance < 0.2 is an indication of multicollinearity (Hair et al., 2010). The data did not have multicollinearity.

Figure 3: Path Model

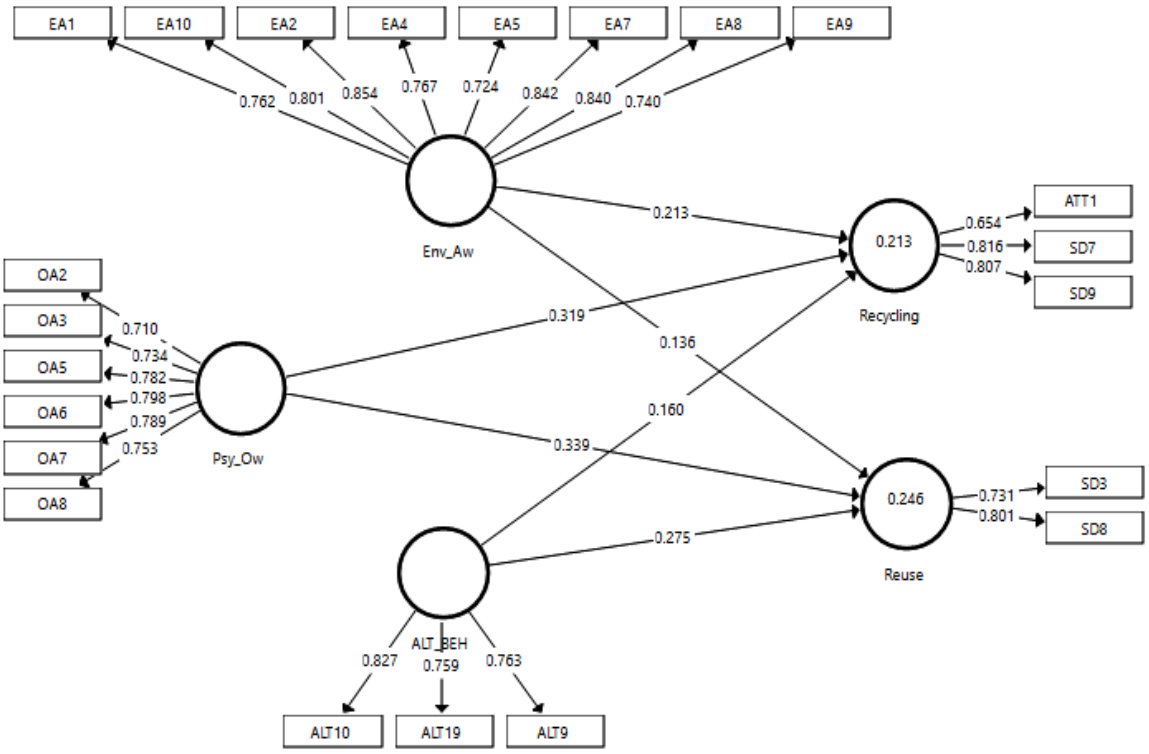

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Table 4: T-Statistics of Path Coefficients

	Path coefficient	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	95% Confidence intervals	Significance (P<0.05)
Altruism -> Recycling Participation (H1)	0.160	0.082	1.945	0.052	[-0.023, 0.303]	No
Altruism -> Reuse (H2)	0.275	0.098	2.805	0.005	[0.056, 0.448]	Yes
Environmental awareness -> Recycling Participation (H3)	0.213	0.086	2.487	0.013	[0.044, 0.383]	Yes
Environmental awareness -> Reuse (H4)	0.136	0.104	1.297	0.195	[-0.068, 0.342]	No
Psychological ownership -> Recycling participation (H5)	0.319	0.074	4.296	0.000	[0.153, 0.448]	Yes
Psychological ownership -> Reuse (H6)	0.339	0.076	4.442	0.000	[0.156, 0.467]	Yes

Source: Ofori, 2020

The path coefficients have standardised values approximately between -1 and +1. The closer the estimated path coefficient to 1, the stronger the predicted relationship. On the other hand, the closer the estimated coefficients are to 0, the weaker the relationships. Observation of the coefficient shows positive relationships among all constructs, and the statistical significance of these relationships are confirmed by the P values and confidence interval estimates. Table 4 presents the results of bootstrapping procedure. Out of the six alternative hypotheses, four of them: H2 (0.005, $p<0.05$), H3 (0.013, $p<0.05$), H5 (0.000, $p < 0.05$) and H6 (0.000, $p < 0.05$) were statistically significant.

The Adj. R2 shows the amount of variance in the endogenous construct explained by the exogenous constructs. From table 1, the joint significance of the three exogenous factors in explaining recycling participation was 21.3% ($R2 = 0.213$, $p < 0.05$) and that of reuse was 24.6% ($R2 = 0.246$, $p < 0.05$). Overtime, research reports have mainly

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emphasized on statistical significance by examining P values and overlooking the magnitude of effects. Effect size represented as f2 shows how much variance each exogenous variable contributes to a model. Assessment of effect size is important for policy and resource allocation implications. f2 is interpreted according to Cohen (1988) effect size threshold which is given as: $0.02 \leq f2 \leq 0.15$ as weak effect, $0.15 \leq f2 \leq 0.35$ is moderate effect, $f2 \geq 0.35$ shows a strong effect. From table 1, psychological ownership was the only construct that achieved a medium effect size on reuse behaviours. Altruistic behaviour and Environmental awareness achieved small effect size on the endogenous construct.

Discussion

Circular resource management include practices aimed at reducing, reusing and recycling (Stahel, 2016; Geissdoerfer, Savaget, Bocken & Hultink, 2017). The Norm Activation and Psychological Ownership Theories were used to examine how households managed their electronic waste through recycling and reuse. Electronic waste management has dire consequences on our environment, however, the extent of individuals' environmental actions such as engaging in proper recycling depends on the awareness of the problems their behaviour has contributed to and the acceptance of personal responsibility. It was also found that the extent to which people value and attach meanings to their possessions also influence their willingness to relinquish unwanted electronic possessions.

So, in this study, the effect of awareness of the environmental consequences of waste management behaviours on recycling participation and reuse were examined. Environmental awareness ($\beta = 0.213$, $p<0.05$) showed significant influence on participation in recycling. These findings were supported by Miliute-Plepiene et al., (2016). Wang, Wang, Zhao and Yang (2019), who found that awareness of consequences of not separating waste is positively and significantly associated with ascription of responsibility and both were positively and significantly related to personal norms towards waste separation intention. Thus, awareness is key to generating pro-environmental behaviours as hypothesised by the Norm Activation Theory. Again, Environmental awareness ($\beta = 0.136$, $p>0.05$) did not influence reuse behaviours. The results of the study showed that individuals who are knowledgeable about the state of their environment were more likely to participate in recycling than to give out old or reusable electronic appliances to other people to reuse. Similar to Wang, Zhao & Yang (2019), it was revealed that the association between awareness of environmental consequences of behaviour and personal norms was the strongest, and personal norm was the most influential determinant of pro-environmental binning behaviour (Esfandiar et al., 2020).

Second, the influence of psychological ownership on recycling and reuse was also tested. Recall that psychological ownership brings out the emotional attachment aspect of the human-object relationship (Haws et al., 2012). The results showed that psychological ownership (PO) significantly influenced both reuse ($\beta = 0.319$, $p < 0.05$), and recycling participation ($\beta = 0.339$, $p < 0.05$). According to Pierce, Kostova, & Dirks, (2003), psychological ownership refers to a state in which an individual perceives that an object is "theirs" regardless of actual physical or legal ownership. When consumers express psychological ownership of an object, their evaluations of that object increase. This is evidenced by empirical studies by Peck and Shu (2009); and Jussila et al. (2015).

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Therefore, it was not surprising when psychological ownership showed a significant influence on reuse behaviours because the positive evaluation of electronics appliances even when it is broken causes consumers to spend time and efforts trying to fix it or keeping them for the benefit of others. Haws, Naylor, Coulter and Bearden (2012) describes such individuals who keep unwanted possessions most likely are frugal and creatively finds new ways of using unwanted materials. On the other hand, high psychological ownership would normally be expected to delay the channelling of unwanted items for recycling. Recycling refers to conscious effort to separate electronic waste and channel to right collection point perceived as safe for handling such waste. So essentially, consumers who exhibit psychological ownership, that lead to product retention, will keep unwanted electronic appliances even if they do not find current use (Haws, Naylor, Coulter and Bearden, 2012). However, from table 4, psychological ownership positively and significantly influenced recycling participation. The argument is that respondents viewed recycling as proper means of preventing their waste from ending on the dumpsite. Parting away with possessions that are still perceived to be valuable was likely to occur when respondents perceived the disposal process as satisfactory. In Ghana and other developing countries, waste management has been characterized by house-to-house collections and openly dumping collected waste at designated landfill sites, and so consumers with more valuable, yet unwanted possessions will prefer divesting to formal recycling centres, where they trust personal data and private information, for example, would not be compromised.

Finally, altruistic behaviours were also examined in light of reuse and recycling behaviours. Altruism has been defined by Schwartz & Howard, (1984, p. 229) as "self-sacrificial acts intended to benefit others regardless of material or social outcomes for the actor". When personal norms reflect in positive behaviours, it has been described as altruistic behaviour. These are values that have been described by Schwartz, (2012) as "others-centred" and not "self-centred". Altruism is also referred to as self-transcendence. The effect of altruism on recycling participation was not supported ($\beta = 0.160$, $p > 0.05$). Meanwhile, effect of altruism on reuse was statistically significant ($\beta = 0.275$, $p < 0.05$). These findings, perhaps, is a further reflection of the sharing and donation culture associated with collectivists societies (Paez & De-juanas, 2015).

Policy implications

The study sought to contribute to disposal practices of households, return of reusable products and reuse literature. It also provided manufacturers to leverage consumers' psychological ownership behaviours to improve the collection of reusable products. As part of policy implication, awareness programmes should be developed to help people understand the effect of their disposal practices on the environment. Also, to boost electronic waste recovery programmes, especially for reusable products, (either by state government or manufacturers) adequate incentives can boost disposal of products that are attractive for reuse. Again, like in developed economies, second-hand collection systems for unwanted electronic products can be developed, and made convenient for individuals with reusable items, who may be willing to donate or even resell. Again, where products still work, people should be motivated to extended use of products by sending to manufacturers for refurbishment, thus reducing the need for

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further purchases. This could be achieved through incentive schemes such as rebates or discounts for future purchases.

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