Normative Influence on Household Waste Separation: The Moderating Effect of Policy Implementation and Sociodemographic Variables

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Abstract

Background. With the increasing production of domestic waste in South African urban areas, household waste separation has become a crucial recycling activity for better management of domestic waste and a decrease in environmental pollution.

Focus of the article. This empirical study investigates how normative influences can shape the intention to separate household waste, and how these influences are moderated by sociodemographic attributes and upstream social marketing interventions (recycling policy implementation).

Research Hypotheses: The hypotheses stipulate that descriptive, injunctive and moral norms have an influence on the behavioral intention to separate household waste before disposal. Policy implementation and sociodemographic variables moderate the impact of these normative forces on behavioral intention.

Methods. A cross-sectional design was applied to this study. A survey was administered to collect quantitative data from 350 households residing in a city that is currently implementing a mandatory recycling policy (Johannesburg) and from 349 households in a city that is not doing

so (Tshwane). Structural equation modeling and moderation analysis were the main data analysis techniques applied to this study.

Results. The findings underline the importance of injunctive and moral norms in influencing the intention to separate household waste. Gender and age appeared to play an important moderating role in the relationships between norms and behavioral intention. Policy implementation had no effect on the reported influences of social and moral norms on the intention to separate household waste.

Recommendations for practice. Policymakers in emerging markets are encouraged to apply more persuasive and decisive actions such as financial incentives (or disincentives) that will motivate households to comply with recycling policies.

Limitations. One limitation of this study is the application of a cross-sectional design relying on self-reported measures of norms and behavioral intention.

Keywords: Social norms, moral norms, household waste separation, social marketing, policy implementation

Introduction

South Africa, an emerging African market, registered an estimated 42 million tonnes solid waste generation in 2017, of which only 4.9 million tonnes (11%) was recycled, and the remaining 89% was disposed of in landfills which are already full to capacity (DEA, 2018). To tackle this environmental problem, in 2018, the city of Johannesburg—the economic hub and the most populous city in South Africa—launched a mandatory separation at source program to

encourage households to separate their waste before disposal. This initiative requires a systematic separation of waste materials such as leftovers, plastic, garden waste, and recyclable materials for the purpose of reuse, recycling, composting or further processing (Department of Energy [DoE], 2018).

Through this upstream social marketing intervention, the management of the city of Johannesburg expects to bring about change in the manner in which households dispose of their domestic waste each day. The success of this social marketing initiative relies on the active participation of households in the initial act of separating their domestic waste before disposal (Bernstad, 2014). Effective social marketing strategies are thus needed to drive this shift in behavior.

Formative research to understand the factors underlying a given behavior is a prerequisite for successful social marketing programs (Lee & Kotler, 2016; Issock, Mpinganjira, & Duh, 2017). While several studies have investigated the factors influencing individuals to engage in household waste separation (HWS) (Alhassan, Asante, Oteng-Ababio, & Bawakyillenuo, 2018; Xu, Ling, Lu, & Shen, 2017; Stoeva & Alriksson, 2017), the extant literature has been dominated by the extensive application of the theory planned behavior (Ajzen, 1991) to understand HWS (Alhassan et al., 2018; Khalil, Abdullah, Abd Manaf, Sharaai, & Nabegu, 2017; Onel, 2017). Notwithstanding the popularity and the remarkable contribution of this theoretical framework, rational choice reasoning in the context of pro-environmental studies is limited by the fact that pro-environmental attitudes and perceived benefits do not always translate into actual eco-friendly actions as suggested by these two theories (Rettie, Burchell, & Barnham, 2014).

This study took a different angle and focused on the normative influences on behavior, that is what other people do and approve of, and an internal normative pressure to adopt HWS (Rettie et al., 2014; Burchell, Rettie, & Patel, 2013). This study thus drew from the focus theory of normative conduct (FTNC) (Cialdini, Reno, & Kallgren,1990) and the norm-activation model (NAM) (Schwartz & Howard, 1981) to uncover the normative influences on the intention to adopt HWS.

Moreover, although it is evident that the support received at the upstream level (government, policymakers) through effective policy implementation plays a crucial role in changing individual behavior (Dessart & van Bavel, 2017; Kelly & Stanley, 2014), there is a paucity of research on the role of policy implementation in promoting behavior change (French, 2011; Schuster et al., 2016; Gordon, 2013). This study thus examines how the current HWS policy could have a moderating effect on the impact that norms have on the intention to adopt HWS. Similarly, this study further investigates how sociodemographic characteristics such as gender, education level, and age, known as key moderating variables (Chekima et al., 2016a; Chekima, et al., 2016b; Frederiks, Stenner, & Hobman, 2015), could either amplify or inhibit individual commitment to engage in eco-friendly behavior

The paper proceeds with an overview of the current literature on normative influences and the theoretical underpinnings of the study. The proposed theoretical model and deriving hypothesis are then discussed, after which the methodology is outlined, and the findings are presented and discussed. The paper closes by considering the implications of the study and limitations/recommendations for future research.

Literature Review

The concept of social norms is anchored on the social-psychological concept of conformity, which suggests that human behavior is often modeled on and understood in terms of the behavior of other individuals (Burchell et al., 2013; Rettie et al., 2014). Various theories have been developed to understand the influence of norms on behavior (Farrow, Grolleau, & Ibanez, 2017; Rettie et al., 2014; Mabry & Mackert, 2014). This study discusses the following important normative theories: the social norms theory of Perkins and Berkowitz (1986), the focus theory of normative conduct (FTNC) of Cialdini et al. (1990), and the norm-activation model of Schwartz and Howard (1981).

Social Norms Theory

The social norms approach to behavior change was first suggested by Perkins and Berkowitz (1986) in their theory of social norms. The research was designed to tackle the issue of high alcohol use among students. The authors found that students were likely to engage in heavy drinking when they believed that heavy drinking was the norm and was approved and expected by other students. This finding suggests that the social influence of norms is based more on what an individual thinks his or her peers believe and do (the "perceived norm") than on their real beliefs and actions (the "actual norm"). The social norms theory thus states that an individual's behavior is influenced by correct or incorrect perceptions of how other members of their social groups (more especially peers) think and act (Perkins & Berkowitz, 1986; Lee & Kotler, 2016). This theory underlines the necessity to understand the connection between

perceived and actual behavior in a target audience and to correct misperceived norms (Lee & Kotler, 2016).

Focus theory of normative conduct (FTNC)

In arguing that social norms have a substantial influence on human behavior, the FTNC of Cialdini et al. (1990) is consistent with the work of Perkins and Berkowitz (1986). However, this influence can be appropriately appraised only when two distinct types of social norms are recognized, namely descriptive and injunctive norms (Cialdini et al., 1990). Injunctive norms reflect perceptions of what important others such as family, friends, and colleagues approve or disapprove of. Descriptive norms refer to an individual's perception of the prevalence of a given behavior (Kenny & Hastings, 2011; Cialdini et al., 1990).

Injunctive and descriptive norms represent distinct sources of motivation and should have separate influences on a given behavior (Cialdini et al., 1990; Smith et al., 2012; Schuster et al., 2016). Although some previous social marketing studies have used social norms as a unidimensional construct (Onel, 2017; Russell-Bennett et al., 2018; Onel, 2017), there is empirical research evidence that descriptive and injunctive norms have independent and distinct impacts on intentions and behavior (Cialdini et al., 1990; Geiger et al., 2019; Smith et al., 2012; Leoniak & Cwalina, 2019).

Social marketing interventions informed by the FTNC attempt to challenge the norms held by individuals and to motivate behavior change on the basis of the individual's tendency to conform to what is considered normal (Schuster et al., 2016; McKenzie-Mohr & Schultz, 2014). The FTNC could thus guide social marketers to consider people's tendency to

conform to norms by telling them about the behavior or perceptions of those engaging in desired behaviors (Kenny & Hastings, 2011; Burchell et al., 2013).

Influence of Social Norms

Social marketing interventions have relied heavily on social norms to bring about behavior change (Kenny & Hastings, 2011; Rettie et al., 2014; Mabry & Mackert, 2014; Kelly & Stanley, 2014; Onel, 2017; Schuster et al., 2016). For example, the community-based social marketing framework, which is widely used for environmental protection (McKenzie-Mohr & Schultz, 2014), outlines the strategic role of norms in the behavior change process, because what other people do and think matters to individuals, whether consciously or unconsciously (Farrow et al., 2017; Rettie et al., 2014). The separate influence of descriptive and injunctive norms has also been reported to have a significant impact on pro-environmental behavior. For example, Smith et al. (2012) identified the need to consider the interplay between injunctive and descriptive norms to understand how social norms influence the intention to adopt pro-environmental behavior. Also, in respect of recycling, Geiger et al. (2019) established that the more individuals think others act pro-environmentally or others expect them to act pro-environmentally, the higher the likelihood that they will recycle their waste. However, this influence of social norms on pro-environmental behavior is context-bound as it could vary from one country to the other. For example, a research by Mintz et al. (2019) reported that social norms have a stronger impact on HWS among Israelis than among Japanese. The same study also shows that social norms have a stronger effect on easy recycling actions such as separating garden waste when recycling bins are available compared to difficult recycling when there are no facilitating conditions enabling recycling.

Based on the foregoing account, the following hypotheses were formulated:

Hypothesis 1: People intend to engage in HWS when descriptive norms are high.

Hypothesis 2: People intend to engage in HWS when injunctive norms are high.

Norm Activation Model

The norm activation model (NAM) (Schwartz & Howard, 1981) stipulates that when individuals feel that they have an internal moral obligation to act prosocially, they are more likely to engage in prosocial behaviors. These feelings of moral obligation are captured as moral or personal norms. The NAM further suggests that this moral obligation is activated by a raised awareness of potential negative consequences caused by the failure to adopt prosocial behaviors and the attribution of these negative consequences to oneself (ascription of responsibility) (Song, Zhao, & Zhang, 2019; Schwartz & Howard, 1981). The theory thus positions moral norms as the proximal and key determinant to be activated in order to ensure the adoption of prosocial behaviors (Wang et al., 2019; Song et al., 2019).

While the model was initially developed to address prosocial behaviors, the original NAM and its extensions have been applied to understand various types of pro-environmental behaviors including recycling (Ofstad et al., 2017), green purchasing (Kim & Seock, 2019), electricity-saving (Song et al., 2019; Issock et al., 2017), and the separation of waste material(Wang et al., 2019; Yuan & Chan, 2016).

Influence of Moral Norms

Contrary to social norms, which are the result of what others do or approve of, moral norms emanate from intrinsic values and internalized expectations (Onel, 2017; Ofstad, 2017; Yuan & Chan, 2016). When moral norms are activated, an individual feels an internal pressure to act responsibly (e.g., adopt eco-friendly behaviors) (Song et al., 2019; Wang et al., 2019). Moral norms are an important driver of pro-environmental behavior and are often reported to have a stronger influence on this behavior than social norms (Onel, 2017; Kim & Seock, 2019; Yuan & Chan, 2016). The influence of moral norms is relevant to recycling actions because it results from the moral commitment to preserving the environment (Kim & Seock, 2019). Thus, many studies have investigated and provided empirical evidence on the impact of moral norms on various pro-environmental activities. For example, in investigating recycling activities, extant research (Khalil et al., 2018; Ofstad et al., 2017) has validated the strong influence of moral norms on recycling behavior. In the specific context of waste separation, Wang et al. (2019) found that when residents have a high internal obligation to separate electronic waste, they have an increased intention to separate this type of waste. Similar findings were echoed by Yuan and Chan (2016), who established moral norms as the strongest predictor of household kitchen waste separation. This led to formulate the following hypothesis:

Hypothesis 3: People intend to engage in HWS when moral norms are high.

Moderating Variables

Upstream social marketing intervention: Recycling Policy

The upstream level of social marketing intervention acknowledges the influence of structural and environmental changes initiated by legislative or policy changes (Dessart & van Bavel, 2017; Gordon, 2013; French, 2011; Schuster et al., 2016). Often, despite all social marketing efforts undertaken, behavior change may not occur simply because of the absence of proper policy and legislation to create an environment that will facilitate the decision to change behavior (French & Russell-Bennett, 2015; Gordon, 2013). If well implemented, the current mandatory HWS policy in the city of Johannesburg might be a game changer in the pursuit of environmental protection in the sense that it could help households to comply with the urgent need to separate domestic waste before disposal. Although the application of upstream social marketing has been generally welcomed amongst scholars and practitioners (French, 2011; Kelly & Stanley, 2014), there is still a dearth of empirical research on the role of upstream interventions in the extant social marketing literature (Gordon, 2013; Brennan et al., 2016).

The important role played by recycling policies in influencing recycling behavior is documented in the pro-environmental literature (Wan, Shen, & Yu, 2014; Halvorsen, 2012). While most of these previous studies have investigated policy implementation as a direct driver of the intention to adopt, or the actual adoption of eco-friendly behaviors, to the best of current knowledge limited attention has been given to the moderating influence of policy implementation on the relationship between normative forces and eco-friendly behavioral intention. This is surprising given that norms, especially injunctive norms related to a given behavior are shaped by the macro-environment in which the target audience performs the behavior (French, 2011; Kelly & Stanley, 2014). This study bridges this research gap by investigating the potential moderating effect of policy implementation on the impact of social

and moral norms on the intention to separate household waste. The following hypotheses were accordingly developed:

> **Hypothesis $4_{a, b, c}$:** Policy implementation moderates the effect of (a) descriptive norms, (b) injunctive norms, and (c) moral norms on the intention to separate household waste before disposal.

Sociodemographic characteristics

Most studies describe pro-environmental consumers as young females who are highly educated and in a high-income bracket (Frederiks et al., 2015; Issock et al., 2017). Previous research (Frederiks et al., 2015; Patel, Modi, & Paul, 2017) have associated sociodemographic characteristics with the extent to which individuals intend to engage in pro-environmental behavior or act in an eco-friendly manner. A review by Frederiks et al. (2015) reported on the linkage between sociodemographic characteristics such as gender, age, education, and energy conservation. In the same line, Patel et al. (2017) noted that mid-age consumers (36–50) demonstrate a higher concern for the environment compared to younger (below 36) and old-age (above 50) consumers.

In conceptual models designed to explain pro-environmental behaviors, sociodemographic variables have also been widely utilized as moderating variables that affect relationships (Chekima et al., 2016a, 2016b; Xu et al., 2017). In two different models examining green consumerism, Chekima et al. (2016a, 2016b) established that the drivers of green purchase intentions are greater among highly educated female individuals, suggesting that gender and education have a positive moderating effect in the model.

Concerning waste separation actions specifically, an extended theory of planned behavior model developed by Xu et al. (2017) showed that gender and age significantly

moderate the relationship between the behavioral intention and its antecedents. Specific to normative influence, Leoniak and Cwalina (2019) established that women comply equally with injunctive and descriptive norms, while men are less compliant with descriptive norms than women.

Based on the foregoing discussion, this study focused on the moderating effect of gender, age, and education on the structural relationships hypothesized in the proposed model, as there is sturdy empirical evidence of the potential moderating influence of these sociodemographic variables. The following hypotheses were formulated:

Hypothesis $5_{a,b,c}$: Gender moderates the effect of (a) descriptive norms, (b) injunctive norms, and (c) moral norms on the intention to separate household waste before disposal.

Hypothesis $6_{a,b,c}$: Age moderates the effect of (a) descriptive norms, (b) injunctive norms, and (c) moral norms on the intention to separate household waste before disposal.

Hypothesis $7_{a,b,c}$: Education moderates the effect of (a) descriptive norms, (b) injunctive norms, and (c) moral norms on the intention to separate household waste before disposal.

Figure 1. Conceptual model.

Research Methodology

A quantitative research method using a cross-sectional design was applied in this study. The data collection was carried out from November 2018 to January 2019. The population of this study

consisted of all households that used the waste collection service of a municipality in the South African province of Gauteng. These households represented the sampling units and elements of the study. A quota sampling technique was used to select respondents primarily on the basis of geographic location (Johannesburg and Tshwane), and a further selection was based on the gender, racial, and age groups which are important sociodemographic clusters in investigating consumer behavior in South Africa (Potgieter, Wiese, & Strasheim, 2013). As the use of quotas was aimed at ensuring that different respondent groups were represented in the sample, nonproportionate quotas were used. However, as per Table 1, the quotas were not fully aligned with official statistics of the country due to the unavailability of some groups. For instance, male respondents were unexpectedly keener to participate in the study than their female counterparts.

Respondents were selected from two major cities in South Africa in equal proportion: the city of Johannesburg, where a mandatory policy of separation of household waste has been implemented since July 2018, and the city of Tshwane (also known as Pretoria), which is currently not implementing a mandatory HWS policy. Before collecting the data, the questionnaire was pretested on samples from the two cities in order to ensure that questions were understood by respondents. The data was collected by trained fieldworkers hired from a research company. Face-to-face interviews were mainly used to collect the data from respondents, who were found in various settings including malls, places of work and worship, residential houses, etc. A number of measures were taken into consideration during the study to ensure ethical compliance including informing respondents of the fact that participation in the study was voluntary. Moreover, to ensure informed consent, respondents were told in advance the purpose of the study and the nature of their participation. Respondents were asked not to provide personal details that can be used to identify them at a personal level such as names in order to ensure

confidentiality. Out of the 900 respondents initially contacted from the two cities, 350 and 349 questionnaires from the cities of Johannesburg and Tshwane respectively were retained in the study, securing a response rate of 78%.

The questionnaire used in this study was divided into two sections. The first section recorded sociodemographic information of respondents such as gender, age group, household size, geographic location, education level, income level, and racial group. The second section captured the scores of the four constructs involved in this model. The questionnaire comprised pre-validated scales adapted from the literature. A five-point Likert scale ranging from "strongly agree" to "strongly disagree" was used to measure the four constructs. The injunctive and descriptive norms constructs were adapted from Schuster et al. (2016). As indicated in Table 2, four items were used to measure descriptive norms and three items to measure injunctive norms. The construct moral norms emanated from studies by Sorkun (2018) and Onel (2017), and four items were used to measure this construct. The intention to adopt HWS was measured through scale items adapted from Stoeva and Alriksson (2017) and Xu et al. (2017).

Results and Findings

Demographic Profile of Respondents

The demographic profile of the respondents presented in Table 1 shows that in total 699 household representatives participated in this study. The majority of respondents were males (57.9%) aged between 26 and 35 years. Most respondents in this study held either a degree or a diploma (54.5%). The most represented racial group was black (71.7%), and more than half

(54.2%) of the respondents earned less than 1666 USD. Table 1 also shows that 88.5% of respondents were not aware of the HWS policy.

Table 1. Demographic Profiles of Respondents.

Measurement Model

The study used structural equation modeling (SEM) to validate the hypothesized relationships using IBM Amos version 25. The measurement model was tested through confirmatory factor analysis (CFA). The measurement model fits the data as revealed by the model fit indices: X^2: (df = 141) = 388,951 $p < 0.0001$; CMIN/DF = 2.759; RMSEA = 0.050, CFI = 0.975; TLI = 0.969; GFI = 0.946. The results of the CFA summarized in Table 1 show that the convergent validity of each scale is established because the AVE is above 0.5 (Malhotra, Nunan, & Birks, 2017). The reliability of each construct is validated by the Cronbach's Alpha and the composite reliability (CR) being above 0.7. The hypothesized effects of norms on behavioral intention to adopt HWS were tested through the structural model.

Table 2. Assessment of Convergent Validity and Reliability.

As described in Table 3, discriminant validity is evaluated by a comparison between the $\sqrt{\text{AVE}}$ and the highest interconstruct correlation (Malhotra, Nunan, & Birks, 2017). The discriminant validity is established given that the square root of AVE is above the interconstruct correlation values for each construct. This result is confirmed by the MSVs, which are all below the AVE values.

Table 3. Discriminant Validity Assessment.

Structural Model

After testing the reliability and validity of scales through the measurement model, the hypothesized structural relationships were tested using IBM Amos version 25. The maximum likelihood estimation method was employed. The fit indexes reveal acceptable fit of the model X^2: ($df = 70$) = 231.366, $p < 0.0001$; CMIN/DF = 3.305; RMSEA = 0.057, CFI = 0.979; TLI = 0.972; GFI = 0.956. The model accounts for 33% of the variance in intention to engage in HWS. To validate the hypotheses, the *p* value, *t* value and standardized estimates were calculated and presented in Table 4 and Figure 2. The results indicate that injunctive norms (β = 0.151; *p* value < 0.05; value = 2.255) and moral norms (β = 0.425; *p* value < 0.01; *t* value = 8.166) have a statistically significant and positive effect on the intention to engage in HWS. However, the influence of descriptive norms is statistically nonsignificant (β = 0.059; *p* value > 0.05; *t* value = 1.122). Hypotheses H2 and H3 are therefore accepted, while H1 is rejected. `

Table 3. Path Coefficients.

Testing the Moderating Roles of Policy Implementation and Sociodemographic Variables: A Group Difference Analysis

The moderating effects of recycling policy implementation, gender, education level, and age group were examined by a multigroup analysis of structural equation modeling (Byrne, 2010). This analysis includes a first assessment of the invariance of the model to ensure that the structural relationships in the model are invariant between the groups. The chi-square difference test (ΔX^2) is a metric invariance test appropriate for this analysis (Yuan & Chan, 2016). To

determine the invariance across the groups, a fully constrained model was built, and the chi-square test of difference was considered to compare the fully constrained and unconstrained model across the groups (Byrne, 2010). The results of the chi-square test of difference presented in Table 4 show that the model varies significantly only across gender ($\Delta X^2 = 37.90$; $\Delta df = 5$; p value < 0.001) and age group ($\Delta X^2 = 22.6$; $\Delta df = 9$; p value < 0.007), given that the model invariance was not established across these groups.

Table 4. Metric Invariance Test (Chi-Square Difference Test).

Given that the structural paths in the model vary across the age groups and gender, the structural paths were constrained consecutively to identify the paths in which these demographic characteristics differ.

Table 5. Path by Path Moderation Effects.

The path by path analysis presented in Table 5 indicates that the influence of DN on INT varies significantly between male and female, suggesting that gender is a moderating effect on this specific path. Thus, males' intention to engage in HWS is significantly influenced by descriptive norms ($p < 0.05$; $\beta = 0.166$), as opposed to their female counterparts, for whom descriptive norms have no effect on intention ($p > 0.05$; $\beta = -0.071$). Hypothesis $H5_a$ is therefore validated. However, nonsignificant moderating effects ($p > 0.05$) were observed in the relationship between injunctive norms and moral norms respectively with the intention to engage in HWS. These results mean that the respective influence of injunctive norms and moral norms on the intention to separate household waste is not significantly different between male and female respondents. The hypotheses $H5_b$ and $H5_c$ are therefore rejected.

Figure 2. Research model estimates.

Note: Only the significant moderating effects (gender and age) have been represented in the model. *ns* = nonsignificant (p value > 0.05). *p value < 0.05. **p value < 0.01.

Concerning the moderation of age group on the relationships in the model, all the relationships hypothesized in the model are moderated by age groups. As shown in Table 5, age moderates the influence of injunctive norms on intention. This relationship is significant only for respondents aged 36–45 years ($p < 0.05$; $\beta = 0.195$). The relationship between descriptive norms and intention is also moderated by age group. It appears that the significant influence of descriptive norms on the intention to separate household waste applies only to the respondents above 45 years old. It also appears from the results that the intention to separate household waste is influenced by neither descriptive norms nor injunctive norms for respondents below 35 years old. The nexus of moral norms and intention to separate is moderated by age group. While this linkage is significant for all age groups, the results show that the impact of moral norms on the intention to separate household waste is stronger for respondents between 26 and 35 years old. Accordingly, hypotheses $H6_a$, 6_b and 6_c are validated.

The results presented in Table 4 and detailed in Table 5 indicate that the moderating effects of education level and policy were not statistically significant. This result denotes that irrespective of the level of education the normative influences on the intention to separate household waste are unchanged. The same applies to policy implementation, where the normative pressures experienced by respondents from the city of Johannesburg, which applies a mandatory HWS policy, do not differ significantly from those experienced by respondents from Tshwane, where no policy is implemented. Thus, the hypotheses $H4_{a,b,c}$ and $H7_{a,b,c}$ are rejected; policy implementation and education have no moderating effect on the relationships in the

model. However, although the differences are not statistically significant, it is important to highlight some differences in the relationships between the groups. For instance, while the impact of injunctive norms on the intention to separate household waste is significant for the city where the HWS mandatory policy is implemented ($p < 0.05$; $\beta = 0.245$), the same relationship is not significant where the mandatory policy is not implemented ($p > 0.05$; $\beta = 0.101$).

Discussion and Implications

This study explored the influential role of social and moral norms on the intention to separate household waste and the moderating effect of sociodemographic variables and policy implementation. The findings of this study have important theoretical and practical implications for the understanding and implementation of effective waste management systems.

From a theoretical perspective, the findings highlight the critical influence of normative drivers and confirm the role of both external (social) norms and internal (moral) norms in understanding the intention to engage in HWS, with moral norms having the greater impact on intention. This reflects the view that moral norms are stronger and more stable drivers of pro-environmental behaviors than social norms (Sorkun, 2018; Khalil et al., 2017; Onel, 2017; Stoeva & Alriksson, 2017). The finding thus confirms the central role of moral norms as highlighted in the NAM.

In addition, in applying the FTNC, this study provides important insights into the distinctive normative influence of both descriptive and injunctive norms, specifically in the context of HWS. While most studies investigating HWS have validated the influence of social norms as a unidimensional construct (Xu et al., 2017; Alhassan et al., 2018), this study provides

empirical evidence on the separate influence of injunctive and descriptive norms in the context of HWS. Surprisingly, the findings indicate that descriptive norms have a nonsignificant effect on behavioral intention, while injunctive norms appear to have a positive impact on behavioral intention. This finding is of interest considering that descriptive norms are often considered a stronger predictor of intention than injunctive norms (Schuster et al., 2016; Smith et al., 2012). A possible reason for this result is the fact that less than 26% of South African households in urban areas engage in HWS (Strydom, 2018). Descriptive norms are derived from what other people do. Given that in South Africa a minority of engage in HWS, people have limited or no reference for proper recycling practices to emulate.

Furthermore, this study advances understanding of the moderating roles of policy implementation and sociodemographic characteristics, which are important variables to consider when formulating social marketing strategies (Lee & Kotler, 2016; French & Russell-Bennett, 2015). In investigating the moderating effect of the mandatory HWS policy implementation, this study addresses the dearth of upstream level of social marketing interventions in the extant literature. The nonsignificant moderating effect of policy implementation indicates that the normative influence on the intention to adopt HWS does not rely on the mandatory HWS policy. This finding points to the fact that the current mandatory HWS policy has not yet been effective in driving the impact that the existing normative pressures have on individual's intention to separate household waste. A plausible explanation is the fact that most households (88.5%) are not aware of the HWS policy probably because this research was conducted only 6 months after the implementation of HWS policy in the city of Johannesburg.

In addition, concerning the moderating role of sociodemographic characteristics, this study's validation of the moderating role of gender and age group, which is consistent with

other pro-environmental studies (Hur et al., 2015; Chekima et al., 2016a, 2016b), confirms the need to consider these demographic characteristics in the context of HWS. For instance, the fact that the impact of descriptive norms is significant only in the group of males whereas injunctive norms significantly influence intention in the group of females provides an interesting perspective on the dimensions of social norms in connection to gender. It indicates that males are more likely than females to be influenced by the actions of other individuals, while females are more influenced by the approval of others when directing actions towards HWS. Concerning the variable education, the non-significant moderating effect of education on the relationships in the model points to the fact that irrespective of formal education, the normative effect on HWS remains the same. This is an interesting finding given that previous studies have demonstrated the influence of education on pro-environmental behaviors (Frederiks et al., 2015; Issock et al., 2017; Chekima et al., 2016a). This finding may be due to public education campaigns on recycling negating the effects of formal education. Knowledge of environmental issues is likely to have more influence on behavior than mere formal education unless such formal education covers knowledge on environmental issues. Accordingly, this study demonstrates that formal education has no effect on the linkage between norms and intention to adopt HWS.

From a managerial perspective, this study uncovers the shortcomings of the current mandatory HWS policy implemented in the city of Johannesburg and suggests that the current HWS policy implemented in the city of Johannesburg does neither enhance nor dampen the influence of norms on the intention to engage in HWS. It is however important to note that although this study was conducted only six months after the mandatory HWS policy was implemented, the policy has not been enforced rigorously as no disincentive or penalty has been

applied to persuade noncompliant households to adopt HWS and encourage those who already separate their domestic waste to continue doing so (DoE 2018). Given that social marketing programs are based on persuasion and not coercion (Dessart & van Bavel, 2017; French & Russell-Bennett, 2015), it is incumbent on the policymakers to apply more persuasive measures to bring about behavioral change. As policy implementation creates a macro-environment that shapes injunctive norms (Kelly & Stanley, 2014), it is imperative for policymakers to be decisive in enforcing HWS policy. Offering a reward for adopting HWS could be effective. Direct rebates on the monthly municipal waste collection fees could encourage households to engage in HWS. As reported by Halvorsen (2012), introducing such policy incentives may establish HWS as a norm. Apart from incentives, given that the majority of households are not even aware of the existing HWS policy, more action is required from the municipality waste management unit to ensure that the mandatory HWS policy is known, accepted and adopted as a norm. Educational programs at the community level could enhance acceptance of the HWS policy and demonstrate its importance for the wellbeing of the entire community.

Secondly, the variations observed in the relationships between norms and intentions across gender and age groups provide insightful guidelines for social marketing strategy design. When devising norm-based strategies, social marketers should acknowledge that, in the context of HWS, males are more likely to be influenced by what other people do (descriptive norms), and females are more likely to be guided by the approval of others (injunctive norms). Policymakers should therefore establish HWS through normative messages that highlight the number of individuals who already separate household waste materials, and the number of pledges supporting HWS in a neighborhood, a community, or a city should be communicated in order to establish HWS as a norm (McKenzie-Mohr et al., 2014). Practically, a

visible sticker can be affixed to the door and dustbin of the households that separate domestic wastes before disposal. This sticker should clearly mention that a specific house engages in HWS in order to acknowledge and appreciate those who already separate their domestic waste, and eventually prompt those lagging behind to emulate the good recycling behavior of their neighbors. Additionally, to increase the credibility of the message, social marketers should rely on television or social media advertisement, where an endorser who match the profile of the target audience can promote the benefits of HWS (Elgaaied-Gambier, Monnot, & Reniou, 2018). Therefore, an ordinary South African household that actively separates their waste could play the role of an endorser in an infomercial promoting HWS.

Thirdly, for respondents below 35 years old, descriptive and injunctive norms appear to have no influence on the intention to engage in HWS. Thus, to motivate HWS in this group (below 35), social marketers need to activate individuals' internal moral obligations that lead them to do the right thing. This can be done through increasing awareness of the detrimental consequences of their behaviors on the environment and ascribing responsibility for such actions (Onel, 2017; Sorkun, 2018). Guilt appeal messages on social media such as Facebook or Twitter could activate their intrinsic moral obligation to contribute to better waste management through HWS (Antonetti, Baines, & Jain, 2018).

Conclusions

This study sheds important light on social marketing theory and best practices. The empirical evidence on the role of moral and social norms points to the fact that, at this early stage of implementing HWS policy, behavior change is more likely to be shaped by the individual's

internal or moral obligations to protect the environment (moral norms) rather than the perceived influence of norms dictated by society (social norms). From an upstream social marketing perspective, this study corroborates that having a strategic policy intervention is not enough; the compliance of the target audience is crucial for effective behavior change (French & Russell-Bennett, 2015; French, 2011; Dessart & van Bavel, 2017). The study also highlights the need to integrate important sociodemographic variables such as gender and age in devising norm-based social marketing initiatives.

Despite the useful implications of this study, one of its main limitations was the reliance on self-reported measures of norms and behavioral intention. Self-reported measures could lead to social desirability biases. This is why this study is limited to behavioral intention which does not always translated to actual behavior. Future research could apply more direct approaches such as experiments in order to effectively measure actual HWS and its key determinants. The municipality waste collection unit could be involved to measure and monitor the amount of domestic waste separated by randomly selected households exposed to HWS policy compared to households that are not exposed to HWS policy. When conducting these experiments, other determinants of HWS such as the attitudes, feelings of guilt or knowledge could be considered as they are important drivers of pro-environmental behaviors (Issock et al., 2019). Another limitation is the fact that the sample population was selected through a nonprobability sampling without applying statistical power in determining sample size. Furthermore, the sample included households from urban areas only. This limits the generalizability of the results to other areas. Future research should therefore use statistical power analysis to determine the sample size and consider involving respondents from rural,

urban, and peri-urban areas and if possible, similar studies should be undertaken in other emerging countries.

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TABLES

Table 1. Demographic Profiles of Respondents and awareness of HWS policy assessment.

		Frequency	Percentage
Gender	Male	405	57.9
	Female	294	42.1
Age	18–25	201	28.8
	26–35	285	40.8
	36–45	116	16.6
	Above 45	97	13.9
Education	High school	183	26.2
	Diploma and degree	381	54.5
	Postgraduate	135	19.3
Race groups	Black	497	71.7
	White	131	18.9
	Colored	44	6.3
	Indian	20	2.9
Income	Below 1 666USD	379	54.2
	1 666– 3666 USD	193	27.6
	Above 3 666 USD	127	18.2

Awareness of HWS policy	Yes	616	88.5
	NO	80	11.5

Note. One 1 USD is equivalent to approximately 15 Rand (South African currency).

Table 2. Assessment of Convergent Validity and Reliability.

Constructs	Scale Items		Factor Loadings	CR	Cronbach's Alpha	AVE
Descriptive norms				0.929	0.928	0.767
	DN1	Most people who are important to me already separate waste in their household.	0.869			
	DN2	Most people in my circle engage in household waste separation.	0.913			
	DN3	Most of my friends separate the waste in their households.	0.896			
	DN4	My family members separate the waste in their household.	0.823			
Injunctive norms				0.811	0.810	0.589
	IN1	Most people who are important to me think I should separate my household waste before disposal.	0.828			
	IN2	Most people who are important to me would approve of my separation of household waste.	0.748			
	IN3	Most of my friends think that waste separation is a good thing to do.	0.728			
Intention to separate				0.925	0.925	0.805
	INT1	I intend to start/continue separating my household waste as much as possible within the next three months.	0.896			
	INT2	I want to start/continue participating in a household waste separation program within the next three months.	0.917			
	INT3	I will start/continue separating my household waste all the	0.880			

	time I have it for disposal.				
Moral norms			0.893	0.904	0.679
	MN1	Due to my personal values, I feel obliged to separate waste materials in my house.	0.914		
	MN2	No matter what other people think or do, I feel personally obliged to separate waste material in my house.	0.928		
	MN3	I feel that is important to separate household waste material for future disposal.	0.695		
	MN4	People like me should do everything they can to separate household waste.	0.733		

Note. CR = composite reliability. AVE = average variance extracted.

Table 3. Path Coefficients.

Hypotheses	Independent Variables		Dependent Variable	*t* Value	*p* Value	Path Estimate	Decision on the Hypotheses
H1	Descriptive norms	→	Intention to separate household waste	1.122	0.262	0.059	Rejected
H2	Injunctive norms	→		2.255	0.024	0.151	Accepted
H3	Moral norms	→		8.166	0.001	0.425	Accepted

Table 4. Metric Invariance Test (Chi-Square Difference Test).

Moderating Variables		**Chi-Square**	***df***	***p* Value**	**Group Difference**
Policy implementation	Unconstrained	331.10	140	0.260	Nonsignificant difference
	Fully constrained	335.10	143		
	Difference (Δ)	4	3		
Education level	Unconstrained	440.20	210	0.540	Nonsignificant difference
	Fully constrained	445.20	216		
	Difference (Δ)	5.00	6		
Age group	Unconstrained	512.2	280	0.007	Significant

	Fully constrained	534.8	289		difference
	Difference (Δ)	22.6	9		
Gender	Unconstrained	316.80	140	0.001	Significant difference
	Fully constrained	354.70	145		
	Difference (Δ)	37.90	5		

Table 5. Path by Path Moderation Effects.

	Groups		DN → INT	IN → INT	MN → INT
Policy implementation	Johannesburg (implementation)	*p* value	0.031	0.698	0.001
		β	0.245	−0.034	0.438
	Tshwane (no implementation)	*p* value	0.196	0.067	0.001
		β	0.101	0.116	0.47
	Conclusion on the moderation effect (ΔX^2)		$H4_a$ No moderation ($p > 0.05$)	$H4_b$ No moderation ($p > 0.05$)	$H4_c$ No moderation ($p > 0.05$)
Gender	Male	*p* value	0.023	0.315	0.001
		β	0.166	0.089	0.391
	Female	*p* value	0.345	0.037	0.001
		β	−0.071	0.215	0.461
	Conclusion on the moderation effect (ΔX^2)		**$H5_a$ Moderation ($p < 0.05$)**	$H5_b$ No moderation (p > 0.05)	$H5_c$ No moderation (p > 0.05)
Age group	18–25	*p* value	0.127	0.377	0.013
		β	0.192	0.134	0.237
	26–35	*p* value	0.663	0.286	0.001
		β	−0.036	0.107	0.533
	36–45	*p* value	0.048	0.709	0.002
		β	0.195	0.055	0.422
	Above 45	*p* value	0.108	0.003	0.001
		β	−0.194	0.448	0.41
	Conclusion on the moderation effect (ΔX^2)		$H6_a$ **Moderation ($p < 0.05$)**	$H6_b$ **Moderation ($p < 0.05$)**	$H6_c$ **Moderation ($p < 0.05$)**
Education level	High school	*p* value	0.722	0.006	0.001

		β	−0.035	0.336	0.377
	Degree/diploma	*p* value	0.265	0.363	0.001
		β	0.079	0.087	0.44
	Postgraduate	*p* value	0.872	0.202	0.001
		β	0.02	0.200	0.375
	Conclusion on the moderation effect (ΔX^2)		$H7_a$ No moderation ($p > 0.05$)	$H7_b$ No moderation ($p > 0.05$)	$H7_c$ No moderation ($p > 0.05$)