Youth and environmentally responsible consumer behaviour: The case of plastic bag usage in Botswana

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Abstract

Plastic bags are versatile, lightweight and flexible, and this has led to consumers having an insatiable appetite for the consumption of plastic shopping bags. To influence consumer behaviour, the Government of Botswana introduced a plastic bag levy. This study analyses the use of plastic bags among the youth of Botswana in order to determine the youth's willingness to pay (WTP) for continued plastic bag usage and their willingness to accept (WTA) to shift to eco-friendly alternatives. The results build on and extend previous research on plastic bag utilisation using Maun and Gaborone as case studies. This study shows that the majority of the youth purchase plastic bags frequently and are more willing to pay for the bags than to accept to shift to eco-friendly alternatives. The willingness to pay for a plastic bag decreases as the price increases. This study concludes that the plastic levy should not be seen as an end in itself, but a means to an end. It should be used to increase environmental awareness, promote recycling and encourage a shift to eco-friendly alternatives, especially when it is coupled with public education.

Keywords: Plastic bags, consumer behaviour, youth, environmental awareness

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Introduction

Globally, about 5 trillion plastic bags are produced annually (Ellis et al., 2005; Sharp et al., 2010). This is mainly due to their attractive features such as strength, affordability, convenience, versatility and moisture resistance (Hopewell et al., 2009; Sharp et al., 2010). Despite their extensive use, plastic bags are not environmentally friendly because they are highly durable and non-biodegradable (Hopewell et al., 2009). This is because plastic bags are from petrochemical by-products (Thompson et al., 2009). The negative environmental externalities associated with plastic waste have prompted researchers and policy-makers to call for the development of eco-friendly behaviour among consumers and for pro-environmental interventions (Austin et al., 1993; Asari et al., 2014).

In response to the negative environmental externalities, the government of Botswana introduced a ban on plastic bags with a specified minimum thickness and introduced the plastic bag levy concomitantly. This was to discourage the excessive use of plastic bags in order to curb plastic waste and its inherent effects on the environment, livestock and arable agricultural productivity (Dikgang and Visser, 2010). Following the introduction of the plastic levy, the Government of Botswana implemented certain initiatives geared at inculcating environmentally responsive behaviour amongst the youth and other demographic groups. The youth are an important section of any society and future custodians of the environment (Nguyen, 2017). This responsibility obligates the current generation to be responsible for the environment and to engage in environmentally responsible behaviour. This is appropriate because in the United Kingdom, the government introduced an online information tool suggesting appropriate and socially responsible plastic usage targeting grocery shoppers ranging from young working adults to housewives in order to create awareness of the policy objectives behind their ban of plastic bags (Chib et al., 2009). This article thus seeks to contribute to documenting environmental behaviour by and/or amongst the youth at a national level. Since the early 1970s, the youth have grown up in a world where certain pro-environmental behaviours have become the norm and therefore there is a perception has been that young people are taking the lead in their commitment to make the world cleaner and greener (Wray-Lake et al., 2010).

In Botswana, the Revised National Youth Policy of 2010 tasks the youth with the responsibility of the maintenance of natural resources, and contribution to environmental sustainability and sustainable development (Government of Botswana (GoB), 2010). Tasking the youth with the responsibility of contributing meaningfully to environmental sustainability is significant given the fact that "Botswana is a youthful country" (GoB, 2010: 7). In Botswana, the adolescents and youth account for 43% of the national population (Baakile, 2012). Therefore the youth have a moral obligation to embrace environmentally friendly behaviour in order to preserve the natural environment for future generations. As Ari and Yilmaz (2016) have observed, consumers who have a sense of social responsibility often reduce their consumption of plastic bags

There is a dearth of research on factors that shape youth environmental behaviour generally and consumer demand for plastic bags in Botswana specifically. Therefore, this article aims to determine whether there is variation between demographic and socio-economic variables of the youth in respect to the use of plastic bags (variation measures the degree or level of change while variables are indicators). Further this article aims to evaluate plastic bag use intensity and reasons for use among the youth, and also determine the youth's willingness to pay (WTP) for continued plastic bag usage and their willingness to accept (WTA) to shift to eco-friendly alternatives. The findings will contribute to the debates on the

green sector by providing an extensive empirical understanding of the behaviours and attitudes of the youth towards green products.

Literature review

According to neoclassical economists, consumers are economic agents whose choices are driven by utility maximisation (Pollitt and Shaorshadze, 2011). Pollitt and Shaorshadze are of the view that consumers have free and complete access to information, which informs their utility-maximisation choices. Neoclassical economics assumes that consumers are rational agents whose preferences are given exogenously (Simon, 1955; Pollitt and Shaorshadze, 2011). These assumptions are believed to have the 'anti-behavioural' description attached to neoclassical economics.

Over the years, behavioural economists have questioned some of the assumptions of neoclassical economists and offered alternative models with higher predictive power than models based exclusively on neoclassical economics' assumptions (Pollitt and Shaorshadze, 2011). One of the main propositions of behavioural economics is that consumers have finite rationality (Simon, 1958; Thaler and Sunstein, 2008). An element of irrationality introduced by behavioural economics acknowledges that consumers do not always choose what is best for them (Ariely, 2008; Thaler and Sunstein, 2008).

While there is a consensus between both neoclassical economics and behavioural economics that the government has a duty to influence consumer choices to ensure welfare-maximisation, the instruments proposed for such intervention seem to differ. Neoclassical economics proposes prices as the main driver of consumer choices (Simon, 1958). On the other hand, behavioural economics leans towards the use of non-pecuniary interventions.

The introduction of plastic levies and/taxes in such countries as Botswana, Ireland and South Africa were premised on neoclassical economics foundations. According to neoclassical economics, environmental taxes such as plastic taxes, can be grouped into three broad classifications, namely; cost-recovering environmental taxes, incentive taxes and revenue-raising taxes (Gamerman, 2008; Jakovcevic et al., 2014; Muralidharan and Sheehan, 2016). It is argued that such taxes should directly target agents and/or substances related to a given environmental problem (Gamerman, 2008).

Over the years, scholarship has defined how consumer choices affect the utilisation of plastic bags (Convery et al., 2007; Dikgang et al., 2012; Hasson et al., 2012; Jakovcevic et al., 2014; Muralidharan and Sheehan, 2016). However, the results obtained by these studies vary. For instance, Muralidharan and Sheehan (2016) concluded that the plastic taxes can only lead to short-term reduction in the demand for plastic bags due to the short-term commitment momentarily spurred by the introduction of the taxes. On the other hand, other studies reported significant and sharp reductions in the demand for plastic bags due to the negative relationship between demand and prices (Convery et al., 2007; Dikgang and Visser, 2012). Thus, while some studies have observed a strong elasticity in the demand for plastic bags, others have reported relatively less elasticity on the demand for plastic bags.

It is argued that, generally, taxes on economic goods promote consumer awareness of the environmental consequences of using and/or producing such goods (Dunn, 2012). Such awareness can influence consumer purchasing decisions (Solomon et al., 2006). According to Solomon et al. (2006), consumers go through four main steps in their purchase decision-making process, namely; problem recognition, information search, evaluation of alternatives, and product choice.

While a large number of studies have been conducted to investigate the influence of human and/or consumer behaviour on the environment (Stern et al., 1999; Chan, 2014; Han,

2014, 2015 and 2017), fewer studies have attempted to establish and define the relationship between the youth and their pro-environmental decision-making processes (Han, 2017). The theoretical and empirical research on the youth's behaviour towards the environment is scanty. Using a multivariate analysis, Buttel (1979) argues that the age of the consumer is closely related to the behavioural indicators of environmental concern. Therefore, there is a need to conduct site-specific, theoretical and/or empirical studies to understand youth consumer attitudes within ecologically vulnerable environments.

One of the frequently used tools for the analysis of consumer choices for environmentally friendly goods is the Contingent Valuation Method (CVM) (Haq et al., 2008; Mustafa et al., 2009, 2010). The CVM is a questionnaire-based direct valuation technique which derives hypothetical willingness to pay (WTP) and willingness to accept (WTA) values from the consumers (Turpie, 2003; Whittington, 2004; Mustafa et al., 2014). Dichotomous choice questions, bidding games and open-ended questions are some of the types of data gathering strategies used in CVM surveys (Mmopelwa et al., 2005). Compared to indirect valuation methods, the CVM is grounded on the economic marketed environmentally friendly goods and services (Perman et al., 2003; Mmopelwa et al., 2005). However, the method is often associated with various types of biases such as hypothetical, strategic, information and starting point biases (Pearce and Turner, 1990; Mmopelwa et al., 2005; Madigele et al., 2017). Nonetheless, the CVM is still the only method which can be applied universally for the determination of non-marketed environmentally friendly goods and services (Perman et al., 2003).

Materials and methods

Study and survey design

This is a cross sectional study premised on a descriptive research design. Descriptive research design is used in exploratory studies designed to address questions concerning a phenomenon (Bodgom, 1992). The set of steps involved in descriptive research include the formulation of study objectives, designing data collection methods, selecting the sample, data collection and analysis (Borg, 1989).

This study builds on previous research on plastic bag utilisation in Botswana, using Maun and Gaborone as case studies. The population of the study consisted of male and female food and grocery shoppers aged 18 and above in Gaborone and Maun. The choice of the study areas was informed by the theoretical basis of the study. Gaborone is an urban area and Maun is a semi-urban area. The levels or rates of literacy are often high in urban and semi-urban settings compared to rural areas (Kruger, 1998). It is argued that people that are more literate are likely understand CVM compared to illiterate people (Mmopelwa et al., 2005).

The data were collected through the administration of 367 semi-structured questionnaires to randomly selected shoppers at 4 shopping malls in Gaborone and 2 shopping malls in Maun. The malls were geospatially and purposively selected due to the presence of retail outlets. Out of the 367 sampled respondents, this study focused on the responses from 229 respondents aged between 18 and 35 years. According to the Revised National Policy of 2010, in Botswana youth are defined as persons aged 15 to 35 years.

In order to reduce hypothetical bias, a brief talk on the background of the plastic levy, its intended purposes and the importance of truthful responses was given to the respondents. Furthermore, the starting point bias was eliminated by first asking binary choice closed questions because they are easier to respond to and they often avoid "incentive compatibility problems inherent in open-ended questions" (Herriges and Shogren, 1996: 112).

Subsequently, open-ended questions requiring "yes" responses were asked to elicit specific information related to the cost of plastic bags.

The study used bidding games to encourage respondents to arrive accurately at the economic value of their preferences (Hoevenagel, 1994). The bidding games use hypothetical data to estimate the *ex-ante* WTP. In a bidding game, the data collection instrument follows on iterative questioning procedure to elicit responses, which enable the ranking of the consumers' preferences given a particular phenomenon. Two bids were presented to the respondents in order to determine their WTP for continued use of plastic bags. The first bid had to be set lower than the second bid, implying contingency of the second bid upon the response to the first bid. In the second scenario, the second bid was set lower than the first bid (Madigele et al., 2017). The respondents were asked whether they were willing to pay if there was a BWP1.00[i] increase in the price of a single 25 litre plastic bag in the first scenario. This was a closed question requiring a "yes" or "no" response. Subsequently, the respondents with "yes" answers in the first scenario were asked whether they were willing to pay if there was a BWP2.00 increase. The formulation used in WTP was applied in WTA. The study assumed linear functional equations for both WTP and WTA as follows:

$$\text{WTP} = \alpha + X_i\beta_i + \varepsilon i \quad (1)$$

$$\text{WTA} = \alpha + Y_i\beta_i + \varepsilon i \quad (2)$$

Where Y_i and X_i = vector of explanatory variables such as demographic features of the respondents; β_i = corresponding coefficients; and ε_i = error term to account for any unexplained or unobserved variation in respondents' estimated WTP and WTA. ε_i is assumed to be normally distributed.

Method of analysis

In order to analyse demographic and socio-economic variables of the youth in respect of the use of plastic bags and environmental awareness, Pearson's Chi square (χ^2) test was used. Furthermore, the study assumed linear functional equations for both WTP and WTA as follows:

$\text{WTP} = \alpha + X_i\beta_i + \varepsilon_i$ …… (1)

$\text{WTA} = \alpha + Yi\beta i + \varepsilon_i$ …….. (2)

Where: Y_i and X_i = vector of explanatory variables such as demographic features of the respondents;

β_i = corresponding coefficients; and

ε_i= error term to account for any unexplained or unobserved variation in respondents' estimated WTP and WTA. ε_i is assumed to be normally distributed, that is, $N(0, \sigma^2)$.

Results and discussions

Respondents' demographics

The consumers' demographical features (n=229) were analysed to determine the consumers' socio-economic status and other variables in relation to their choices (Table 1). Sixty-one percent (61%) of the respondents were females. This shows that majority of the shoppers are females in both of the study areas. The average age of the respondents was 27 years and a significant proportion of the respondents (55.5%) from both study areas were aged between

25 and 35 years. In both study sites, only a minority (~7%) of the respondents had never attended any formal or informal education. This finding justifies the assumption of high literacy rates and supports the choice of the study areas in this study. While the majority (139, *n*=229) of the respondents were employed across various sectors of the economy, about 55% of the respondents earned up to BWP2500.00 monthly. The results suggest that the majority of the respondents are low income earners earning below Botswana's tax threshold.

Table 1: Distribution of consumers by demographic variables

	Gaborone (*f*)	Maun (*f*)	Total (*f*)
Gender			
Female	79	61	**140**
Male	59	30	89
Total	138	91	229
Age			
18-24	52	50	102
25-35	86	41	127
Total	138	91	229
Employment status			
Employed	88	51	**139**
Not employed	50	40	90
Total	138	91	229
Monthly income (BWP)			
<1200	49	42	**91**
1200-2500	24	10	34
2501-5000	23	16	39
>5000	42	23	65
Total	138	91	229
Education			
None	9	6	15
Primary	12	5	17
Secondary	59	58	**117**
Tertiary	58	22	80
Total	138	91	229

Source: Field survey 2016

Plastic use intensity and reasons for use among the youth

All of the respondents indicated that they purchase and use plastic bags at least once monthly. The majority of the respondents (49.3%) indicated that they buy plastic bags every shopping trip and 21% purchase plastic bags daily (Figure 1). Conversely, only a small fraction of the respondents (3.5%) indicated that the buy plastic bags once a month. The frequency of purchase in Gaborone were mirrored by youth consumers in Maun. In other words, the youth in Maun had similar frequency of plastic bag purchase patterns as those in Gaborone.

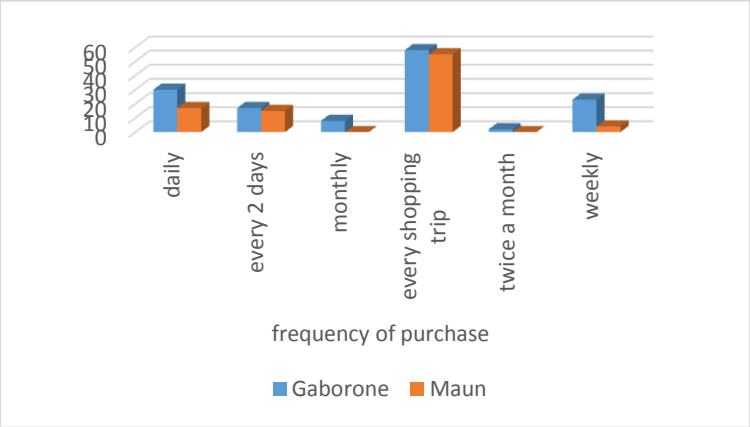

Figure 1: Frequency of purchase of plastic bags

The majority of the respondents (76.9%) use plastic bags daily (Figure 2). The varied uses included packaging of grocery items, storage of household items and packaging of kitchen solid waste among other uses. By implication, plastic bags have secondary uses beyond the primary use of packaging of items from supermarkets. The findings are in line with those of a study by Ayalon et al. (2009) wherein it was observed that only 25% of plastic bags purchased by consumers are disposed of as trash immediately after the first use, while 75% of the bags are used either as trash bags or reused for packing other products in or outside the homes. While the correlation between consumers' location and frequency of use is insignificant ($p>0.05$), the correlarion coefficient ($r=0.385$, $p<0.05$) for frequncy of use and gender is both positive and significant. These findings suggest that there is a weak and positive relationship between gender and frequency of use of plastic bags.

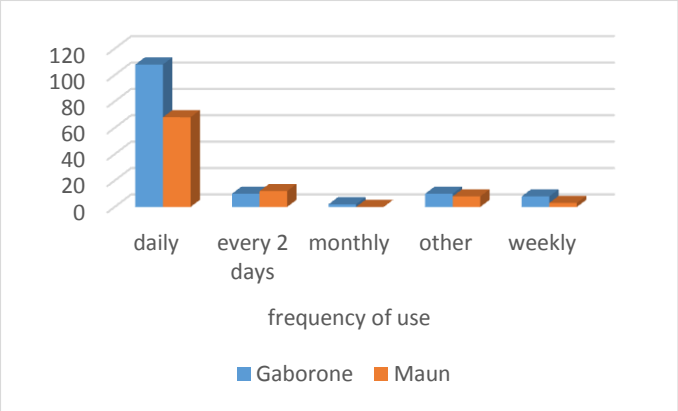

Figure 2: Frequency of use of plastic bags

There are various reasons why respondents choose to use plastic bags. In addition to the multiple household uses of plastic bags highlighted above, the respondents indicated that plastic bags possess various features that attract consumers to buy them as summarised in Table 2. Most (42.8%, $n=229$) of the respondents reported that they buy plastic bags because the latter are readily available. Thirteen and a half percent (13.5%) of the consumers indicated that lack of convenient alternatives or substitutes for plastic bags at retail shops forces them to buy plastic bags. According to Hayabuchi et al. (2005), one of the main reasons for common usage and/or purchase of plastic bags is convenience. In Botswana and other countries where environmental taxes such as the plastics levy are in effect, consumers

are offered store-provided plastic bags for sale and paid-for alternatives such as branded or unbranded 'green bags' designed for multiple uses.

Table 2: Reasons for purchase

		Gaborone	Maun	Total
Why buy	Cheap	30	31	61
	Readily available	57	41	98
	Light weight	6	0	6
	Used to it	22	11	33
	No convenient alternatives	23	8	31
Total		138	91	229

Source: Field survey 2016

In this study, all of the respondents stated that the long-term benefits of 'green bags' are outweighed by the immediate satisfaction of buying and using plastic bags. Furthermore, 14.4% of the respondents indicated that they buy plastic bags because the practice of buying them has become a custom. Such respondents reflect path dependency and a degree of status quo paralysis. It is suggested that path dependency takes place when behaviours that once proved to be effective and efficient are adapted in new tasks and challenges (Streeck and Thelen, 2005; Heinmiller, 2009) and/or when the cost of alternative behaviour increases while the benefits derived from staying on the same path increase (Pierson, 2000; Sehring, 2009).

The youth's willingness to pay (WTP) for continued plastic bag usage and their willingness to accept (WTA) to shift to eco-friendly alternatives

Prior to the introduction of bid values, consumers were asked how much they were willing to pay for a single 25 litre plastic shopping bag. The results are presented in Table 3. The average price the youth are willing to pay for a 25 litre plastic bag is BWP 0.17. The youth's average WTP level is below the estimated average price of a single 25 litre plastic bag estimated to be BWP0.44 (Madigele et al., 2017). Some respondents are not willing to pay any amount at all for the plastic bags. The maximum amount that the youth are willing to pay is BWP3.00.

Table 3: C**onsumers' WTP and WTA statistics**

	WTP	**WTA**
Mean	.1707	.7803
Median	.1000	.5273
Std. Deviation	.3921	.2551
Range	3.00	2.50
Minimum	.00	.50
Maximum	3.00	3.00

N = 227, Missing = 0

The youth are willing to accept a minimum amount of BWP0.50 to shift to eco-friendly alternatives. Hypothetically, if a financial incentive of at least BWP0.50 were offered to

individual consumers that use green shopping bags, such consumers would make a complete shift and use green bags in every shopping trip. Sixty-seven percent (67%) of the respondents proposed that retailers should shoulder the burden of shifting the consumers' preferences towards green products as they have failed over the years to educate the consumers about the benefits of environmental consciousness.

In this study, youth consumers' knowledge about plastic use and its inherent damage to the environment and their levels of education were treated as separate variables. Likert scale questions to assess the consumers' knowledge about the effects of plastic usage on the environment were assigned corresponding responses ranging from "strongly agree" to "strongly disagree". The questions were used to capture the consumers' level of knowledge and awareness about environmental issues. The results show that the youth consumers who are more knowledgeable about environmental impacts of plastic usage are less willing to continue plastic usage. In other words, the more knowledgeable the consumers, the more likely they would be more environmentally conscious. Similarly, the standardised regression coefficient of education is negative and significant at 10% level of significance. This implies that youth consumers with higher education levels tend to be less willing to pay for continued plastic use.

Table 4: Models results

Variable	**WTP**	**WTA**
α	-0.301	0.326
Knowledge (1-5 ranking)	-0.003*	0.027*
Gender (1 =male)	-0.112	-0.239**
Education (1=tertiary)	-0.534*	0.134
Income	0.176*	-0.220
Tax bid	-0.532*	-
Incentive bid	-	0.238**
Recycle plastic bags	-0.02117*	0.189
N	229	229
$\mathbf{R^2}$	0.593	0.502
* significant at 10% level of significance ** significant at 5% level of significance χ^2 / df= 1.52		

The negative and significant coefficient of tax bid suggests that high levels of taxes act deterrents to the purchase of plastic bags. By implication, the tax should be high enough to effect a desired shift in consumers' attitudes, choices and behaviour. Similarly, the positive and significant coefficient of the incentives bid suggests that the youth are more willing to accept to shifts to greener alternatives if high levels of incentives are offered by either the retailers or the government.

Conclusion

This study aimed to assess whether there is variation between demographic and socio-economic variables of the youth in respect to the use of plastic bags. The study also aimed to evaluate plastic bag use intensity and reasons for use among the youth, and to determine the youth's willingness to pay (WTP) for continued plastic bag usage and their willingness to accept (WTA) to shift to eco-friendly alternatives. The study builds on previous research on

plastic bag utilisation in Botswana, but focused only on respondents aged between 18 and 35 years.

The results of this study show that there is a wide-spread use of plastic bags among the youth. Hundred percent (100%) of the respondents perceive the long-term benefits of 'green bags' as outweighed by the immediate satisfaction of buying and using plastic bags. However, when the price of plastic bags is high, there is a decline in the overall willingness to pay for a single plastic bag among the youth. This implies that high plastic levies may deter youth consumers from buying plastic bags. Similarly, an increase in incentives may lead to an increase in the willingness to shift to eco-friendly alternatives among the youth. In light of these findings, it is recommended that the government should increase the plastic levy as this could potentially trigger a decrease in the use of plastic bags and promote pro-environmental behaviour among the youth. However, there is a need for the government of Botswana to establish efficient and effective institutions to ensure that the levy is collected from the retailers and directed to its mandated use.

The results also show that youth consumers with higher education levels tend to be less willing to pay for continued plastic use. Similarly, youth consumers who are more knowledgeable about environmental impacts of plastic usage are less willing to continue plastic usage. It is recommended that the government should mobilise environmental awareness campaigns to sensitise the youth about such issues as the dangers of improper disposal of plastic bags and the benefits of practicing eco-friendly behaviour. Despite its meaningful practical and empirical contributions, this research has some limitations that offer good opportunities for future research. Firstly, the current study is cross-sectional and does not trace the changes in youth consumer behaviour overtime. Secondly, it employed a convenience sampling approach in two areas. Future research should include a larger and systematically selected sample to enable better generalisations.

Notes:

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[1] 1 BWP = US$ 0.10 (as at January 17, 2017)

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