

The Threat of Counterfeit Devices: Complicity vs Vigilance

Tirelo Modise Moepswa

*Graduate School of Policy and Management
Department of Technology and Innovative Management
Doshisha University
Kyoto, 602-8580, Japan*

kbk1052@mail3.doshisha.ac.jp

Abstract

Challenges that arise as a result of high mobile phone penetration in developing countries such as counterfeiting and increasing product complexity, have largely been tackled from the supply side. This study explores this issue from the demand side by investigating the relationship between socio-demographic characteristics and levels of Intellectual property vigilance as well as brand and quality awareness among urban mobile technology consumers in Botswana. Implications for both corporate and public policy are discussed at the end of this paper.

Keywords: Consumer Sophistication, Mobile technology, Counterfeiting, Botswana.

1. INTRODUCTION

The increasing ubiquity of mobile phone devices around the world brings with it a great number of innovative solutions to everyday predicaments. In developing economies, where the fastest growth is recorded, mobile phones have been a welcome opportunity for the previously unconnected to now enjoy access to information at the click of a button. The leap from relative obscurity to connectivity does come with its negatives however. One of the major challenges facing both developing and developed countries is the continued proliferation of what are known as counterfeit and/or substandard mobile phone products. The International Telecommunication Union (ITU) defines counterfeit mobile phones as products which explicitly infringe the trademark or design of an original or authentic product, whilst substandard mobile phones as those that are different enough to not be categorized as counterfeit but still resemble existing authentic products. The cost of this proliferation as this study will explain further, is not only borne by the manufacturers or service providers, consumers are paying a heavy price too by continuing to use these devices. With regard to the manufacturers the ITU (2014) estimates the combined annual losses at about \$ 6 billion, to the consumers the costs could be more serious. Apart from financial loss, the consumers a facing health risks too as this study will further elaborate. Botswana is home to one of the highest mobile phone penetration rates in the Southern African region (ITU, 2013), even higher than some of the technologically advanced economies like Japan. The higher penetration rate therefore brings with it an increased risk of counterfeit device proliferation, thus indicating a greater cost for both manufacturers and consumers.

As aforementioned, developing economies are almost synonymous with mobile technology penetration in light of the impact it has had on everyday life and the rate at which it has been accepted by consumers. One classic example of such countries is Kenya with their runaway success in mobile money (M-Pesa). However, a report by the Business Day (2013) estimated the number of counterfeit mobile phones in Kenya at 3 million from a total of about 30.4 million devices at the time. In Tanzania, the trademark infringements of mobile phone devices are estimated at between 10% to 20% of market share. In Nigeria, the communications Commission (Today, 2015) reports that 250 million counterfeit ICT products find their way into the Nigerian market annually, the majority of which are mobile phone devices. They quote the figure at 15% of the global counterfeit market. Asia pacific, the region with the highest proliferation of counterfeit devices stood at 125 million counterfeit mobile phones in 2011 and was expected to rise to 148 million in 2013 For large economies like India the statistics are more profound, with an estimated

counterfeit industry of about 1.5 billion dollars, direct tax losses estimated at 85 million dollars and indirect tax losses at 460 million dollars (ITU, 2014).

1.1 What Does Counterfeiting Mean for the Consumer?

One of the major threats posed by counterfeit mobile phones is the fact that they enter the market through underhand or backdoor strategies and therefore escape the rigour of regulation and testing that legitimate products are subjected to. Taking Europe as an example, there is what is called the Restriction of Hazardous Substances or RoHS which restricts the use of Lead, Cadmium and other hazardous substances in the manufacture of electronic products. Similar restrictions exist in many regions of the world. Tests conducted by various other regional bodies of a similar kind in Brazil. China and India have found an alarmingly high presence of Lead and Cadmium in both the internal and external components of multiple counterfeit mobile phone devices. In some cases, the values of the lead and Cadmium were thirty to forty times higher than acceptable levels (ITU, 2014). The impact of such exposure to humans is not receiving much coverage as more focus is given to increased penetration and ubiquity of mobile devices. However, there is a clear risk presented by the high level of hazardous substances present in many of these counterfeit devices, the true cost of which, particularly with regards to increased disease burden and healthcare costs is presently unknown.

A study by Qualcomm (GSMA, 2014) on behalf of the GSM Association revealed that counterfeit mobile devices are not only hazardous but are of low quality too. Of the 18 devices that were tested, 16 failed the transmit performance requirements and 11 of them were 6-13db below requirements. According to the study, these two performance indicators point to a high level of degraded performance and therefore these devices carry with them a higher percentage of call dropouts when used by the consumer. Another negative aspect of counterfeit mobile phones on the consumer side is the fact that they are sold without warranty. When issues of functionality start to arise with these devices, it leaves the consumers with no room for recourse. Counterfeit and substandard mobile devices are also susceptible to malware and other malicious viruses. This therefore makes consumers using these devices very soft targets for cyber criminals. Considering the increasing amount of confidential information people carry around in their mobile devices, it's safe to say that provides great incentive for cyber criminals. Since there is no certainty as to the strength and capacity of the software installed in these devices, hackers are constantly circulating sophisticated malware to detect weak devices and remotely access important information including banking details, social security numbers, and other data that they deem useful to their cause.

1.2 Situation in Botswana

With a population of around 2.1 million, the Botswana Communications regulatory authority (BOCRA) puts the number of active devices on the market at 3.1 million, which translates into more than 150% penetration. As aforementioned, the high penetration rate carries with it higher chances of proliferation of counterfeit devices. In 2013, BOCRA was transformed through an Act (Communications Regulatory Act, 2013) that compelled all licensees, suppliers and distributors of equipment to register for type approval. The deadline for this exercise was set at August 31st, and if violated the party in question would be liable to a civil penalty amounting to P2 million (US\$ 200,000) (BOCRA, 2013). The authority further reiterated its prohibition of the use of any equipment which had not been type approved in either telecommunications, broadcasting or postal services. The type approval was said to be done with the intention to ensure that all communications equipment in the country was electrically safe, electromagnetically compatible and capable of interworking with other devices without causing interference (Africa business, 2013).

No reliable statistics have been availed in terms of the number of counterfeit mobile devices in the Botswana market. However, reports and communication from the authority (BOCRA) still indicate existing, continuous retailing and consumption of counterfeit mobile devices. In fact, both retailers and consumers hold differing views about the initiative to stem the flow of counterfeit devices (Mmegi, 2013). A retailer interviewed said they would "lose a number of customers who

prefer cheaper phones” (ibid). Another retailer expressed more enthusiasm about the act, “I’m happy with it. It means our customers will only get quality equipment” (ibid). As far as the consumers are concerned the counterfeit devices are cheaper and still look stylish. Some of the devices receive positive reviews for their ability to accommodate four sim cards, carry internet platforms and all the other high tech specifications found in genuine brands like iPhone, Nokia and Samsung.

What the aforementioned reveals is the fact that marketers and government agencies are more favourable to the idea of clamping down on manufacturers, distributors and retailers in an attempt to stem the flow of counterfeit devices. As previous studies have demonstrated (Albers-Miller 1999, Hart et al, 2004; Wilcox et al 2009; Gamble, 2011), as long as there is demand and consumption of these products, there will be continued illicit manufacturing, distribution and retailing of them. Counterfeiting is often referred to as a victimless crime (Hart et al, 2004) and the consumers remain somewhat of a mystery. On that note, the central objective of this research is to identify those within the consumer base who are likely to support proliferation of illicit goods either knowingly or otherwise. Using demographic and psychographic variables, this study attempts to profile mobile technology consumers in urban Botswana on the basis of their vigilance to intellectual property infringements when making their purchases. The study also attempts to establish the extent to which the environment, especially the marketing mix plays a role in these purchases. Understanding the consumer subgroups, their levels of vigilance, their complicity to counterfeiting, and factors that influence their behaviour is a good starting point to formulate strategies to combat counterfeiting from the demand side, for both marketers and policy makers.

2. LITERATURE REVIEW & HYPOTHESES

2.1 Consumer Sophistication

Two major schools of thought have emerged over the years in this area of study. Sproles, Geistfeld and Badenhop (1978) as well as Barnes and McTavish refer to consumer sophistication as the relevant knowledge, education and experience which facilitate efficient decision making. Hirschman (1980) prefers to highlight the problem solving capability of consumers, referring to it as consumer creativity; a factor he considers key in increasing the probability of selecting superior products.

Wu and Titus (2000) as well as Titus and Bradford (1996) however posit that alternatively there is a need to expand the focus of the concept beyond the mere possession of knowledge and experience (i.e. potential) in wise purchase practices. In a more recent study (Wu, Titus, Newell and Petroschius, 2011) they further argued that; although it is interesting and beneficial to identify sophistication potential, it may be argued that it is the actual practice which impacts consumers wellbeing and that policy should be behaviour driven rather than ability driven.

The core of sophistication is related to the information search orientation of the consumer. Sophisticated consumers are more proactive in seeking information on products before actual consumption. According to Beatty and Smith (1987) consumers who are more active show a great level of involvement than those that are passive. Higher search effort is associated with higher purchase involvement. Further to that, Sproles (1980) associates extensive information search as a behaviour exhibited by consumers with higher product involvement and motivation. In summary, one could say that sophisticated consumers display a higher level of external information search than just relying on the internal.

Based on previous studies (Lambert, 1972; Dychtwald and Gable, 1990; Rice, 1990), the assumption is that increased consumer sophistication should mean an increased ability to accurately judge product quality. That being said however, marketplace developments can aggravate consumer sensory limitations and leave the consumer with lesser ability to make accurate judgement of product quality. Lambert (1972) posited that consumers with higher levels of sophistication are more likely to select products with high quality rather than low price.

Quality and Brand are sub-factors of knowledge and experience. Knowledge as a factor influences the consumer as to the type of brand to search for and what features to examine (Alba and Hutchinson, 1986; Brucks, 1985; Biehal and Chakravarti, 1986; Holbrook and Maier, 1978). Due to the high level of investment by companies in advertising and brand building, a lot of choice is availed to the consumer. Liu (2010) makes an interesting contribution that even though investment influences consumers, it's difficult to gauge how many of them can be regarded as sophisticated. It is complicated to clearly define the relationship between values and product use when it comes to sophisticated consumers. While Amaldos and Jain (2005) demonstrated a certain degree of sophistication in relation to conspicuous consumption, there is largely no evidence to suggest that brand consumption is a characteristic of consumer sophistication. Based on the IPS consumer sophistication index (2008), this is basically the level of reluctance by the consumer to accept illegally copied products. The argument is that sophisticated consumers will always opt for authentic products rather than counterfeit. However, there is no study to establish whether that is driven by the potential quality concerns or the knowledge and reluctance of violation with regards to intellectual property.

2.2 Why do People Consume Counterfeit Goods?

What this study acknowledges, that other previous studies have highlighted (Albers-Miller 1999, Hart et al, 2004; Wilcox et al 2009) is the fact that the proliferation is driven by demand and consumption. The demand in other instances is created by the desire to consume existing luxury brands but due to inability to afford an authentic product the consumer settles for a counterfeit. According to Wilcox et al (2009), there are two classifications to the consumption of counterfeit products; Non-deceptive counterfeiting which implies unknowingly consuming a counterfeit product with the assumption that it is authentic, and then there is deceptive counterfeiting, a situation whereby a consumer knowingly consumes a counterfeit product. Hart et al (2004) break it down further by stating that within the deceptive consumption there is active deception and passive deception; Passive deception is when a consumer acquires a counterfeit product and allows it to communicate its associated meaning non-verbally. Active deception on the other hand implies the acquisition of a counterfeit product and then verbally claiming that it is genuine when it is not or acting in a way that implies it is genuine.

This study draws on principles of consumer sophistication to explore the levels of quality judgement and IP vigilance among mobile phone consumers in Botswana. The study further uses demographic variables to identify subgroups within the consumer base. Central to the study is an aim to establish the relationship between various demographic variables and the levels of quality judgement and IP vigilance. The independent variables for the study are Age, Gender, Income and Education. The dependent variables are IPvigilance1, IPvigilance2, Brandquality2 and Brandquality4. All dependent variables are single-item and measured on a 5-point Likert scale ranked from 1 = Agree Strongly to 5 = Disagree Strongly.

2.3 Socio-Demographic Factors

2.3.1 Age

Previous studies on counterfeiting have revealed a generally consistent outcome in relation to age. A study exploring consumer ethics and morality in Japanese society (Erffineyer et al, 1999) revealed that younger male students among the Japanese population were more likely to passively benefit from counterfeiting. Gamble (2011) also found a correlation between younger people and the consideration to purchase counterfeit fashion items. Swami et al (2009) also found instances where age displayed a strong correlation with consumption of counterfeit products. This evidence is also supported by formative work done by Kohlberg (1969, 1984) in cognitive moral development, which suggests that as people mature and gain experience they are more likely to exercise reasoning patterns that demonstrate a higher level of morality.

2.3.2 Gender

Using gender as a predictor in counterfeiting research has proven fragmented in many previous studies. For example, a study in India (Kumar et al, 2015) reported insignificant relationships between consumer's gender and their attitude towards counterfeiting. However, earlier studies in

the United States Beltramini et al 1984; Ferrel and Skinner, 1988) however reported that females are more concerned with ethics when shopping than their male counterparts. In Japan, the male consumer is linked with being significantly more receptive of actively benefiting from questionable consumption including counterfeiting (Erffineyer et al, 1999). DeMente (1994) links this behaviour to the stereotype of the 'ruthless' Japanese businessman.

2.3.3 Income

The general consensus around income and counterfeiting is that genuine brands are relatively expensive, therefore because of the prohibitive nature of the pricing, people with lower income attempt to bridge that gap by consuming counterfeit goods (Hart et al, 2004). The IMF points to the income disparities in developing economies as another factor that contribute to counterfeiting (Scandizzo, 2001). The emphasis is put on less income variance as encouraging only two types of consumption; the highest and most expensive by the wealthy and the lowest and cheapest by the poor. The gulf that is left in between provides incentive for counterfeiting, Juggessur and Cohen (2009) cite societal factors like identifying with certain lifestyles as motivating factors for people outside the price range to turn to counterfeit consumption in order to achieve the image regardless. Pre-existing research (Bian & Moutinho, 2009) also report that high income levels have a negative influence on the purchase of counterfeit fashion products.

2.3.4 Education

With regards to education, comparison is primarily between college-educated consumers and non-college educated consumers (Goolsby and Hun, 1992; Kelley et al, 1990; Erffineyer et al, 1999). These studies point to a predisposition towards ethical consumption among college-educated consumers. The general consensus is that those that are older and more educated tend to make more ethical decisions. Gamble (2011) introduces the concept of 'enjoyment' and concludes on the basis of results that people with higher education are less likely to enjoy purchasing counterfeit products, which is an implication that they are less likely to engage in the practice. A study in China by Kramer (2006) reveals a positive correlation between low education level and unethical behaviour including purchasing counterfeit products.

2.4 Hypotheses

On the basis of the discussion above, the following hypotheses were arrived at.

1. IPvigilance1 – "I can immediately tell the difference between authentic (original) and counterfeit (fake) mobile phone devices"

H1a: Younger consumers are more likely to tell the difference between authentic and counterfeit mobile phone devices as compared to older ones

H1b: Male consumers are more likely to tell the difference between authentic and counterfeit mobile phone devices compared to their female counterparts

H1c: Consumers with higher income levels are more likely to tell the difference between authentic and counterfeit mobile phone devices as compared to those with lower levels of income

H1d: Consumers with higher levels of education are more likely to tell the difference between authentic and counterfeit mobile phone devices as compared to those with lesser education

2. IPvigilance2 – "I always go for authentic (original) mobile phone devices rather than counterfeit (fake)."

H2a: Older consumers are more likely to go for authentic mobile phone devices as compared to their younger counterparts

H2b: Female consumers are more likely to go for authentic mobile phone devices as compared to male counterparts

H2c: Consumers with higher income levels are more likely to go for authentic mobile phone devices as compared to those with lower levels of income

H2d: Consumers with higher education levels are more likely to go for authentic mobile phone devices as compared to those with lesser education

3. Brandquality2 – “I use brand to judge the quality of my mobile phone”

H3a: Older consumers are more likely to use brand to judge the quality of their mobile phones as compared to their younger counterparts

H3b: Female consumers are more likely to use brand to judge the quality of their mobile phones as compared to their male counterparts

H3c: Consumers with higher income levels are more likely to use brand to judge the quality of their mobile phones as compared to those with lower income

H3d: Consumers with higher education levels are more likely to use brand to judge the quality of their mobile phone as compared to those with lesser education

4. Brandquality4 – “When I want a certain phone brand I don’t worry much about the price”

H4a: Older consumers are more likely to display lesser regard for mobile phone prices as compared to their younger counterparts

H4b: Male consumers are more likely to display lesser regard for mobile phone prices as compared to their female counterparts

H4c: Consumers with higher income levels are likely to display lesser regard for mobile phone prices as compared to those with lower income

H4d: Consumers with higher levels of education are likely to display lesser regard for mobile phone prices as compared to those with lesser education

3. METHODOLOGY

This study profiles urban mobile technology consumers in Botswana. In total 307 people completed the survey. With more than 150% mobile penetration rate in Botswana (ITU, 2014), this constituency is excellent as a choice not only because it captures a variety of demographic subgroups but also because they represent a higher likelihood of familiarity with the variables of interest in the study. Discourse on issues such as health and environment in relation to consumption start in urban centres, even though such discourse exists simultaneously in rural areas, an urban centre such as Gaborone represented a good starting point for this study and for subsequent studies as well. Data was collected both online and offline using a questionnaire survey tool. The online questionnaire was disseminated via email, whilst the offline survey was administered via an assigned device (tablet) using the mall intercept approach. The study was conducted over a four-week period from August 21st 2014 to 21st September 2014.

The survey was completed by 307 individuals. The following provides a basic overview of the study sample. 55.9% were male while 44.1% were female. 36.9% of the respondents were between the ages of 16-25, 47.8% were between the ages of 26-35, 10% were between 36-45, 3.4% were between 46-55 and only 1.9% were over the age of 56. 11.5% of the respondents reported no income while 6.3% said they were unemployed. 42% were regular employees whilst 12% reported as self-employed.

4. RESULTS

Age Group	N	Mean	Standard deviation	Skewness	Kurtosis
16-25	115	3.65	1.15	-.77	-.43
26-35	145	3.53	1.23	-.60	-.76
36-45	30	3.27	1.29	-.329	-1.07
46-55	11	2.82	1.54	.17	-1.45
Over 55	6	2.33	1.03	.67	.57

TABLE 1: H1a Descriptive Statistics.

The control statement for IPvigilance1 was “I can immediately tell the difference between authentic (original) and counterfeit (fake) mobile phone devices”

Table 1 represents descriptive statistics associated with IP vigilance levels in five age groups of mobile phone consumers in Botswana. What emerges is that the youngest age group (16-25) was associated with a numerically higher mean of IP vigilance ($M = 3.65$) and the oldest age group (Over 55) is associated with numerically the lowest mean of IP vigilance ($M = 2.33$). To test the hypothesis that the age group one belongs to had an effect on their level of IP vigilance, a between the groups ANOVA was performed. Before the ANOVA, an evaluation of the assumption of normality was undertaken and determined to be satisfied as all five groups displayed a Skew and Kurtosis less than $|2.0|$ and $|9.0|$ (Schmider, Ziegler, Danay, Beyer, Buhner, 2010; see Table 1). Further to that, a homogeneity of variance test was performed using Levene’s F test, $F(4, 302) = 1.43$, $p = .229$.

The effect yielded from the one way ANOVA proved to be statistically significant, $F(4, 302) = 302$, $P = .018$, $\eta^2 = .798$. This means the null hypothesis of no difference between the means was rejected, and 79.8% of the variance was accounted for by age groups. In an attempt to establish the difference between the five means, ANOVA was followed up by Tukey’s HSD post hoc tests (Hayter, 1986). The difference between the youngest age group (16-25) and the oldest age group (Over 55) was statistically significant, $t(301) = -3.35$, $p = .078$, $d = 1.319$. The final conclusion is that IP vigilance decreases as you go up the age groups.

Education level	N	M	SD	Skewness	Kurtosis
Junior Secondary	12	3.75	1.36	-1.03	-.047
Senior Secondary	47	4.13	.924	-1.13	.748
Vocational School	25	3.84	1.15	-1.48	1.72
Diploma	64	4.27	.859	-1.13	.927
Bachelors	117	4.21	.918	-1.26	1.26
Graduate School	42	4.45	.832	-1.57	1.98

TABLE 2: H2a Descriptive Statistics.

The statement of measure for IPvigilance2 was “I always go for authentic products rather than counterfeit products”. This was measured on a 5-point Likert scale.

Table 2, above is a representation of descriptive statistics associated with IPvigilance2 and education levels of mobile consumers in Botswana. As denoted in Table 3, the least educated group (junior secondary) was associated with a lower numerical mean of IPvigilance2 ($M=3.75$) and the most educated group (Graduate school) was associated with a numerically higher mean of IPvigilance2 ($M = 4.45$). In order to test the stated hypothesis that the level of education a consumer has completed has a statistically significant effect on their level of IPvigilance2, which is explained above, a one way ANOVA test was performed. All six groups satisfied the assumption of normality as they displayed skewness and Kurtosis of less than $|2|$ and $|9|$. A Levene's test for assumption of homogeneity was also satisfied with the following $F= (5,301) = 2.03$ $p= .511$.

The results from the ANOVA reveal a statistically significant association between the level of consumers' education and the variable IPvigilance2, $F (5,301) = 2.71$, $p= 0.74$, $\eta^2= .676$. This therefore means that we reject the null hypothesis and conclude that the variable IPvigilance2 tends to increase as a function of education level. 67.6% of the variance in the variable IPvigilance2 was accounted for by the level of education.

Gender	N	M	SD	SK	KUR
Male	171	4.33	.716	-1.63	3.09
Female	136	4.03	1.03	-1.002	.235

TABLE 3: H2b Descriptive Statistics.

H2b the statement used to assess IPvigilance2 in the second set of hypotheses was, "I always go for authentic than counterfeit mobile phone products" The 5-point Likert scale ranged from "Disagree strongly" to "Agree strongly"

This hypothesis sought to establish a relationship between the consumer's gender and the variable IPvigilance2, whose statement is explained above. Male consumers ($N = 171$) were associated with a numerically higher mean of $M = 4.33$ ($SD = .846$), while the female consumers ($N = 136$) were associated with a numerically lesser mean of $M= 4.03$ ($SD = 1.032$). An independent t-test was employed to test the hypothesis that the gender of the mobile technology consumer is associated with their IP vigilance in a statistically significant way. The assumption of normality was satisfied as groups displayed a Skew and Kurtosis less than $|2.0|$ and $|9.0|$. The result of Levene's test satisfied the assumption of the homogeneity of variance with $F (305) = 1.87$, $p = .172$. The t-test results then revealed a statistically significant association at $t (305) = 2.78$ $p= 0.06$. The result confirms the hypothesis that male consumers are more likely to possess higher IP vigilance than their female counterparts.

Education level	N	M	SD	Skewness	Kurtosis
Junior Secondary	12	3.75	1.55	-1.10	-.271
Senior Secondary	47	3.74	.943	-1.08	.894
Vocational School	25	4.00	.816	-.998	1.402
Diploma	64	4.09	.988	-1.418	-2.03
Bachelors	117	4.25	.655	-.680	1.05
Graduate School	42	4.21	.813	-.994	

TABLE 4: H3d Descriptive Statistics.

H3d, the control statement for the variable Brandquality2 was 'I use brand to judge the quality of my mobile phone.'

Table 4 provides the descriptive statistics related to this question. Consumers who have only gone as far as junior secondary school (N = 12) and senior secondary school (N = 47) are associated with the lowest numerical means M= 3.75 and M = 3.74 respectively. On the other hand, consumers who have completed bachelor's degree (N = 117) and some form of Graduate school (N= 42) are associated with the highest numerical means M= 4.25 and M = 4.21 respectively. In an attempt to test the hypothesis that the level of education the consumer has completed has a statistically significant association with their level of quality judgement (Brandquality2), a one way ANOVA was performed. All sets of groups satisfied the assumption of normality because their skewness and Kurtosis fell under |2| and |9| respectively. The homogeneity of variance assumption was tested using Levene's test. $F(5,301) = 2.92$, $p = 0.02$. Due to the significance of the p value. The data was adjusted using Welch and Brown-forsythe, they gave $p = .034$ and $p = .088$ respectively, which allows us to proceed with the analysis.

The ANOVA test revealed a statistically significant association with $F(5,301) = 2.72$, $p = 0.014$. Therefore, the null hypothesis of no difference between the means is rejected. The result confirms a statistically significant association between the variable Brandquality2 and the level of education.

Gender	N	M	SD	SK	KUR
Male	171	3.57	.970	-.407	-.534
Female	136	3.43	1.066	-.309	-.745

TABLE 5: H4b Descriptive Statistics.

The control statement for Brandquality4 was 'When I want a certain phone brand I don't worry much about the price.'

The hypothesis sought to establish the relationship between gender and Brandquality4 which was measured using the statement above. Table 6, above represents the descriptive statistics associated with this question. The Male consumers (N = 171) were associated with a numerically higher mean M = 3.57 (SD = .970), whilst the female consumers were associated with a numerically lesser mean of M = 3.43 (SD = 1.066). An independent samples t-test was undertaken to test the hypothesis that the variable Brandquality4 is associated in a statistically significant way to the gender of the consumer. Both groups displayed Skewness and Kurtosis less than |2| and |9| respectively, which means the assumption of normality was satisfied. The assumption of homogeneity of variance was tested using Levene's test. It was satisfied by $F(305) = 4, 34$, $p = 0.38$. The t-test results reflected a statistically significant association by $t(305) = -2.22$, $p = 0.027$. This confirms that male consumers have less regard for mobile phone pricing than their female counterparts.

5. DISCUSSIONS AND CONCLUSIONS

The results of H1a reveal a high level of self-reported IP vigilance (IPvigilance1) from the youngest age and decreasing as the age increases. This could be due to the familiarity of younger people with mobile phone brands, their higher level of technological savviness gives them an edge over their older counterparts. What this also means is that consumers in the higher age groups are more likely to purchase counterfeit mobile phone devices unaware. This therefore identifies a subgroup which is likely to engage in what prior studies referred to 'non-deceptive counterfeiting'.

As mentioned earlier in this study, counterfeiting is driven by consumption therefore this study calls for both public and corporate strategies to be formulated on the basis of evidence from the demand-side. The finding above identifies a subgroup that engages in 'non-deceptive counterfeiting', therefore taking into account the fact that this trend increases with age, what

would be the best way to sensitise this group of consumers - and enhance their vigilance when it comes to their purchase decisions? An example of a strategy by retailers of authentic products could be to give customers from a certain age category, whenever they come for a purchase, a full explanation of where to locate the International Mobile Equipment Identity (IMEI) number in order to authenticate their mobile phone device. A strategy like that would mean they are well equipped for their next purchase, especially with the continued shortening life span of mobile phone devices.

Variable IPvigilance2 was measured using the statement, 'I always go for authentic rather than counterfeit mobile phone devices'. Hypothesis H2a reveals a statistically significant link between the level of IP vigilance and the level of education the consumer has completed. People with lower education demonstrated lower levels of IP vigilance. There are multiple ways of looking at this outcome. One of the reasons could be that the purchase of counterfeit mobile phone devices is both deceptive counterfeiting and non-deceptive. People with lower levels of education tend to belong to the lower income groups as well, therefore the consumption of counterfeit products could be a result of economic challenges and the inability to afford authentic brands. This counts as deceptive counterfeiting since they do so knowingly. Another possible explanation behind this consumption could be a genuine inability to tell the difference between the bogus devices and the authentic brands, which in turn is a form of non-deceptive counterfeiting.

H3d reveals a statistically significant association between the level of education and the use of brand to judge quality of mobile phones (Brandquality2). This outcome is linked with the outcome of H2a that reveals a link between higher IP vigilance and a higher level of education. Functionality and affordability may be issues that people with lower education levels are primarily concerned with, especially in a developing country setting. Awareness about branding and brand value are issues associated with those with a certain level of education. Another interesting perspective is regarding the authenticity of the said brands. Counterfeit devices are increasingly appearing more authentic, therefore if judgement of quality is based solely on the brand then that judgment should be accompanied by the ability to authenticate the brand in the first place. If not, then it is a case of misplaced brand trust by the consumer. In summary, quality and brand are sub-factors of knowledge and experience, therefore it does not come as a surprise that people with a higher level of education are more equipped to judge quality on the basis of brand.

In addressing the outcome of H2a and H3d, a good number of authentic smartphones are starting to come into the market at around the \$50 retail mark, and the pricing is slowly becoming less of an issue. For public policy, this again is a subgroup within the consumer constituency that is defined by levels of education. The group readily admits to objective counterfeiting by admitting they do not always go for authentic products. Strategies formulated should aim to sensitise this group of consumers about the possible price they are likely to pay in terms of the health risks and economic losses accruing to them as a result of the objective counterfeiting. Ideally the strategy should also point them in the direction of alternative solutions in the form of cheaper, type-tested solutions in the market. The first step however involves identifying them demographically as this study advocates, and packaging the information to go with the defining demographic variable.

H2b outcome shows a statistically significant association between gender and the commitment to purchase authentic mobile phones (IPvigilance2). Male consumers are associated with a higher commitment to purchase authentic mobile phones as compared to their female counterparts. This is an interesting outcome in that it goes against pre-existing research which had reported male consumers as the more likely to behave unethically including the purchase of counterfeit products. This could once again be linked to the income dynamics of a developing economy setting, where there is an income disparity in favour of males and therefore the purchasing power lies predominantly with them. Another view of it could be the way the statement was structured. If one is faced with a control statement like the one used for H2b, and they don't have total confidence in their ability to tell apart authentic and counterfeit products, there could be an apprehension in fully affirming one's consumption of authentic products. Or it could simply be a

case of objective counterfeiting from the female segment of consumers in comparison with the male consumers.

H4b reveals a statistically significant link between disregard for mobile phone pricing and gender. Male consumers display a higher disregard for pricing in comparison with their female counterparts. There are several reasons that could explain this outcome, especially in a developing economy setting such as Botswana. In the income groups, the bottom 12%, which consist of people who did not report any income, 56% of them were female while 44% of them were male. In the top 12%, a group which consists of people who earn about US\$2000 or more, 38% of them were female whilst 62% of them were male. Therefore, the outcome of H4b is hardly surprising in light of these statistics. Income disparities between males and females is a global issue but it is even more of an issue in developing economies. The traditional household roles could also have played a part in the outcome of this hypothesis in that males as predominantly the primary income sources in households tend to enjoy a greater freedom in terms of how they use their money as compared to females. In relation to consumer sophistication in general, this could be interpreted as women applying due diligence to their purchasing process and looking to get value for their money, a characteristic associated with higher consumer sophistication.

What the gender based outcomes above reveal is an inability by current strategies to reach the female population. Existing corporate and public policy strategies are gender blind in that they fail to recognise the difference in preferences or consumer needs based on gender. This demonstrates a clear need to formulate strategies geared towards enhancing awareness among the female consumer group. Particular attention needs to be paid to the female consumers in the lower income bracket since that is where more demand and consumption is recorded.

Of the remaining hypotheses, only H1c proved marginally significant ($p = 0.097$) but failed to satisfy both the assumption of normality and the assumption of homogeneity of variance. H1b, H1d, H2c, H2d, H3a, H3b, H3c, H4a, H4c and H4d did not prove any statistical significance despite their numerically varying means. It is interesting that Income as a variable isn't more influential despite this being a developing country context. Another interesting outcome that proved insignificant is the association between age and brand awareness. The expectation on the basis of past research was that the younger consumers would report a higher level of brand awareness than their older counterparts.

In summary the study reveals the existence of a counterfeiting problem among consumers in urban centres in Botswana. The counterfeiting comes across as both deceptive and non-deceptive. The most influential demographic variables that define the subgroups are education level and gender of consumers. In light of failing supply-side initiatives to curb counterfeiting, this study calls for a reverse approach to the issue, evidence from the demand side must be used as a basis for formulating strategies. Counterfeiting after all is fuelled by demand and consumption. As long as there is demand for counterfeit products the perpetrators will always find underhand ways of bringing them into the market. Attempting to curb the supply only heightens the demand due to the existence of poorly aware and less vigilant consumers.

The study does not take into consideration the role of the family and its specific influence on the consumer's level of consumer sophistication. Variables like marital status and number of people in the household were not incorporated in this study, and they have proven influential in socio-demographic analyses before. Further to that, this study was only limited to urban mobile phone consumers and future research can look to incorporate a more holistic sample population in order to be able to draw differences in consumer sophistication levels on the basis of geographic location. That is necessary because the household composition of urban dwellers in vastly different from that of rural dwellers in terms of the economics, education, gender, marital status of household heads and many other socio-economic factors. Therefore, due to the fact that a select group of socio-demographic factors utilised in this study have proven to have an effect on the level of consumer sophistication, it would be interesting to further analyse the effect of more.

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