RELATIONSHIP BETWEEN SOCIAL IMAGE, BRAND NAME, SUBJECTIVE NORMS AND SOUTH AFRICAN GENERATION Y STUDENTS' ATTITUDE TOWARDS WEARABLE ACTIVITY-TRACKING DEVICES

Ms. Chantel Muller
North-West University (Vaal Triangle Campus), South Africa
23488042@nwu.ac.za
Professor Natasha de Klerk
North-West University (Vaal Triangle Campus), South Africa
Natasha.DeKlerk@nwu.ac.za
Professor Ayesha Lian Bevan-Dye
North-West University (Vaal Triangle Campus), South Africa
Ayesha.Bevandye@nwu.ac.za

─Abstract ─

Wearable health-promoting technological devices such as chest straps, fitness bracelets, pedometers, smart wireless headphones known as hearables, smart clothing, fitness watches and the like have transformed health and sports monitoring. The wearable activity-tracking device market is expected to generate significant revenues in 2018. The demographic that dominates this market is the youth, with 33.7 percent of this market comprising individuals aged between 18 and 24 years, who form part of the Generation Y cohort (individuals born between 1986 and 2005). However, the literature pertaining to their attitude towards wearable activity-tracking devices, which explains their adoption behaviour thereof, is limited. As such, this study explores Generation Y students' attitude towards wearable activity-tracking devices, by examining the relationship between social image, brand name, subjective norms, and attitude towards such devices.

Following a descriptive research design, self-administered questionnaires were completed by a non-probability convenience sample of 480 students registered at the campuses of three registered public higher education institutions (HEIs) in South Africa's Gauteng province. The captured data were analysed using principle component analysis, internal-consistency reliability and nomological validity analysis, descriptive statistics, and correlation analysis.

The findings indicate a significant positive relationship between social image, brand name, subjective norms, and South African Generation Y students' attitude towards wearable activity-tracking devices. A device's brand name, social image, and the subjective norms pertaining to such a device relate significantly to Generation Y students' attitude towards wearable activity-tracking devices. It is therefore paramount for device manufacturers and marketing managers to emphasise the brand name and how such devices not only improve overall physical health, but also increase social image and promote approval amongst peers within this generation.

Keywords: Attitude, Generation Y students, wearable activity-tracking devices, South Africa

JEL Classification: M, M3, M31

1. INTRODUCTION

The global wearable device industry, comprising of consumer technology segments such as portable wireless speakers, Bluetooth headphones, wearable activity-tracking based watches, wrist bands, clothing and ear-wear, is growing rapidly (International Data Corporation, 2017; Richter, 2015). Wearable activity-tracking devices refer to any wearable device which is capable of measuring the user's fitness-related movement and metrics in real time, whilst being able to connect to an IT device for the purpose of displaying the recorded information (Kingston, 2015; Techopedia, 2018). Some of these devices use accelerometers, altimeters, sensors, and algorithms to track the number of steps taken, distance travelled, calories burnt (Beckham, 2012), and can record different sport sessions (Hong, 2015:94), static or optical heart rate data (Rettner, 2014), as well as patterns and quality of sleep (Haslam, 2016). The use of such devices is beneficial to the users as they can use the recorded information to improve lifestyle behaviours such as adjusting their levels of physical activity, well as their diet- and sleep regimen (Maher *et al*., 2017:1). Moreover, users have the opportunity to share their data with their social network on media platforms such as Endomondo, Strava, Facebook or WhatsApp. The advantage of this is that a user's competitive instinct drives increased performance which often leads to an improved self-image or an ego boost, particularly when the device praises the user for reaching daily goals (Livingston, 2017; Nield, 2017).

Owing to continuous technological innovation and increased consumer interest, the wearable activity-tracking device market is evolving both globally and in South Africa. Globally, the market penetration rate of wearable activity-tracking devices was 5.59 percent in 2017, generating revenue of $7 643.1 million (R101 806 092 000) and is estimated to increase to $8 592.4 million (R114 450 768 000) in 2020 (Statista, 2018a), based on the average exchange rate for 2017 of $1/R13.32 (Nedbank, 2018). South Africa, with a market penetration rate of 3.81 percent recorded for 2017 and a projected increase to 4.83 percent in 2020, ranks amongst the global leading economies (Statista, 2018b). To put this in perspective, of the total national population as recorded mid-year in 2017 which constitutes 56 521 900 individuals (Statistics South Africa, 2017), an increase of 576 523 individuals will be using a wearable activity tracker within the next three-years – resulting in a projected revenue equalling $48.4 million or R644 688 000. This figure shows an increase of $5.2 million (R69 264 000) over the three-year period from the $43.2 million (R575 424 000) generated in 2017 (Statista, 2018b). However, considering the global revenue of R101 806 092 000 generated in 2017 for this market, South Africa merely generated 0.006 percent of this revenue. As such, there are significant opportunities for improvement to be taken in order to increase the adoption rate of wearable activity-tracking devices amongst South African consumers which, in turn, would lead to exceptional increase in revenue for the country.

The demographic that has shown a significant interest in this market is the youth, particularly individuals who form part of the Generation Y cohort. Members of this cohort are also known as Millennials or Echo-boomers (Joubert *et al*., 2013:47), and are defined as individuals who were born between 1986 and 2005 (Markert, 2004:21). According to the 2017 mid-year population estimates in South Africa, an estimated 36.2 percent of the population – or 20 458 310 individuals – are members of this cohort (Statistics South Africa, 2017). Moreover, of the total South African population, 33.7 percent of the wearable activity-tracking device market comprise individuals aged between 18 to 24 years (Statista, 2018b). Various authors maintain that, within the Generation Y cohort, the university student portion is of particular interest, assuming that individuals from this cohort are in the process of attaining a tertiary qualification, which would result in a higher future earning capacity as well as an increased degree of consumption. As such, the Generation Y student cohort is an appealing segment for marketers of these devices to target (Bevan-Dye, 2013:158; Bevan-Dye & Surujlal, 2011:49; Valaei & Nikhashemi, 2017:523).

Consumer attitude is a particular behavioural aspect which has been proven to be significant in determining consequent behaviour (Azjen, 1991). In consumer behaviour, an attitude refers to a learned tendency to act either consistently favourable or unfavourable towards certain facets of the environment or an object (Joubert *et al.*, 2013:81). Venkatesh *et al.* (2003:455) define attitude towards technology as a person's overall affective or emotional reaction to the use of a particular system. Dean (2010) states that an attitude satisfies a personal motive while simultaneously affecting consumers' spending and purchasing behaviours. Therefore, a favourable attitude towards wearable activity-tracking devices can effectively lead to the future purchase of these devices. Previous research indicates indicate a significant association between consumer attitude and the intent to use new technologies such as smart watches (Choi & Kim, 2016:784; Kim & Shin, 2015:534; Wu *et al.*, 2016:388), wearable healthcare devices (Park *et al.*, 2016:726), and smart clothing, in which computer and electronic technology is combined and integrated with fashion items (Chae, 2009:28-29).

In addition to consumer attitudes, several studies based on new technology adoption indicate the importance of social image (Lin & Bhattacherjee, 2010), brand name (Valaei & Nikhashemi, 2017), and subjective norm (Hamari & Koivisto, 2015; Blut *et al.*, 2016; Kim *et al.*, 2013) and the role they play in attitude formation. Brand name is a crucial extrinsic cue that consumers use to evaluate product quality when confronted with uncertainty regarding a product of interest (Richardson, Dick, & Jain, 1994:29). A brand as a social indicator is generally a stimulating factor in consumer decision making, provides a way to both express and increase self-image (Yang *et al.*, 2016) as well as allow the consumer to align themselves with and express status and social identification (Del Río *et al.*, 2001:457). The latter is achieved by an increased social image, measured as the degree to which an individual perceives that using an innovation will improve his or her status in their social system (Moore & Benbasat, 1991:195) through respect and admiration from peers in their social network, all due to their choice in use of technological devices (Lin & Bhattacherjee, 2010:167). The desire to be accepted amongst peers means that individuals are guided by the opinions of their significant others in making certain decisions and rely on subjective norms when behaving in a certain way (Ajzen, 1991:188). Subjective norms denote a direct or indirect normative influence applied by perceived significant individuals such as friends, family or peers on a person's intention to perform a particular behaviour, which in turn affects the individual's attitude towards performing the behaviour (Hamari & Koivisto, 2015; Blut *et al.*,

2016; Kim *et al*., 2013). As such, a hypothetical association exists: As Generation Y students seek out a branded wearable activity-tracking device they will consider the opinion of significant others whilst anticipating being socially admired and respected, resulting in a positive attitude towards these devices in general.

Given the motivation and the opportunity to appeal to this segment, it is imperative to investigate the relationship between social image, brand name, subjective norms, and Generation Y students' attitudes towards wearable activity-tracking devices. This is all the more necessary owing to the limited research available that explain Generation Y students' attitude and subsequent factors that lead them to make certain purchasing decisions. The results of this investigation will provide valuable recommendations to marketing managers and device manufacturers to appeal to Generation Y students in order to expand the wearable activity-tracker market in South Africa.

2. METHODOLOGY

2.1 Research design
The descriptive research design following the single cross-sectional approach was used as the blueprint for this study.

2.2 Sampling method
The target population for the study was defined as Generation Y university students aged between 18 and 24 years, who were enrolled at registered public South African higher education institutions (HEIs). For the sampling frame, three campuses situated in South Africa's Gauteng province were selected: one from a traditional university, one from a university of technology and one from a comprehensive university. Data collection involved fieldworkers following the mall-intercept approach and distributing 600 questionnaires to a convenience sample of students across the three campuses who agreed to take part in the study.

2.3 Research instrument and data collection
Self-administered survey questionnaires were used to gather the required data. The survey questionnaire consisted of a section requesting the sample participants' demographic data and a section containing scales from published studies measuring the relationship between social image, brand name, subjective norms, and attitude towards wearable activity-tracking devices. The scale comprised the four factors and a total of 14 items.

Attitude towards wearable activity-tracking devices was measured using the scale developed from Kim and Shin (2015) which consisted of four items, namely, 'Using an activity-tracking device is a good idea', 'Generally, I have a favourable attitude towards using an activity-tracking device', 'I like the idea of using an activity-tracking device', and 'Overall, I think using an activity-tracking device is beneficial'. Social image was measured using the scale developed from Yang *et al.* (2016), which consisted of four items, namely, 'Wearing an activity-tracking device makes a good impression on your peers and friends', 'Wearing an activity-tracking device improves one's image amongst your peers and friends', 'Wearing an activity-tracking device gives you social approval', and 'Wearing an activity-tracking device helps you feel accepted amongst your peers and friends'. Brand name was measured using the scale developed from Yang *et al.* (2016), which consisted of three items, namely, 'A reliable brand name is one of the key factors when choosing an activity-tracking device', 'A reliable brand name reflects the quality of an activity-tracking device', and 'There is less risk of being disappointed if you buy an activity-tracking device with a reliable brand name'. The subjective norms construct was measured using the scale developed from Lee (2009), which consisted of three items, namely, 'People who are important to me think I should use an activity-tracking device', 'People whose opinions I value think I should use an activity-tracking device', and 'People who influence my decisions think that I should use an activity-tracking device'.

The sample's responses to the scaled-statements were captured using a six-point Likert-type scale that ranged from strongly disagree (1) to strongly agree (6).

2.4 Ethical considerations
Before the questionnaire was distributed, it was submitted to the Ethics Committee of the Faculty of Economic Sciences, North-West University (Vaal Triangle Campus) for ethical clearance. Ethical clearance was granted (Ethical Clearance Number: ECONIT-2017-033).

2.5 Data analysis
The captured data was analysed using the IBM Statistical Package for Social Sciences (SPSS), Versions 25.0 for Windows. Data analysis procedures comprised principle component analysis, internal-consistency reliability and nomological validity analysis, descriptive statistics and Pearson's Product-Moment correlation analysis.

3. RESULTS AND DISCUSSION

From the 600 questionnaires distributed to students, 480 usable questionnaires were received; that is, the study had an 80 percent response rate. In the sample, there were participants from each of the seven age categories defined as per the target population, as well as participants from eight of South Africa's nine provinces – unfortunately, there were no representatives from the Northern Cape in the sample. The sample comprised slightly more female (59.4%) than male (40.2%) participants, where 0.4 percent failed to indicate their gender. Furthermore, slightly fewer participants were enrolled at the comprehensive university (25.2%), than at the traditional university (37.5%) and the university of technology (37.3%). A description of the sample participants is outlined in Table 1.

Table 1. Sample description

	Frequency	Percent (%)		Frequency	Percent (%)
Gender			**Province**		
Male	193	40.2	Eastern Cape	19	4.0
Female	121	59.4	Free State	32	6.7
Missing	2	0.4	Gauteng	251	52.3
Age			Kwazulu-Natal	21	4.4
18	99	20.6	Limpopo	84	17.5
19	134	27.9	Mpumalanga	37	7.7
20	85	17.7	North West	31	6.5
21	83	17.3	Northern Cape	0	0
22	43	9.0	Western Cape	3	0.6
23	24	5.0	Missing	2	0.4
24	12	2.5			
Institution					
Traditional	180	37.5			
Technology	179	37.3			
Comprehensive	121	25.2			

Principle component analysis, using the varimax rotation was conducted on the scaled statements to check the factor structure of the constructs used in this study, for the South African context. The factorability of the data was assessed using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the Bartlett Test of Sphericity, where a KMO value exceeding 0.6 and a significant Bartlett's Test of Sphericity value are recommended (Pallant, 2010:183; Field, 2009:659). The results of these two tests yielded a KMO value of 0.813 and a significant Bartlett's test of sphericity (chi square = 4224.614, 91 dfs, $p \leq 0.01$), indicated the sampling adequacy and factorability of the data. In addition, the internal-consistency reliability of the extracted factors was measured by computing the Cronbach alpha values, where a value greater than 0.70 indicates acceptable reliability (Pallant, 2010:100). In Table 2, the varimax-rotated factors, communalities, eigenvalues, variance extracted and Cronbach alphas for the extracted factors are presented.

Table 2. Rotated factors, communalities, eigenvalues, percentage variance extracted and Cronbach alphas

Items	Factors				Communalities
	1	2	3	4	
1	.799				.667
2	.715				.580
3	.855				.770
4	.844				.731
5		.809			.737
6		.847			.777
7		.793			.724
8		.734			.653
9				.876	.795
10				.884	.809
11				.805	.683
12			.899		.892
13			.912		.918
14			.889		.879
Eigenvalue	5.04	2.49	1.73	1.36	
Percentage variance	36.01	17.78	12.34	9.70	
Cronbach alpha	.842	.853	.947	.839	

As per the literature, four factors were extracted that explained 75.82 percent of the variance. As shown in Table 2, each of the items had loadings of above 0.70,

thereby indicating that the loadings are both statistically and practically significant. Furthermore, each of the item's communalities exceeded 0.50, thereby suggesting that a sufficient portion of each of the item's variance is accounted for by the factor solution (Hair, Black, Babin & Anderson, 2010:117, 136). In terms of the reliability, the Cronbach alpha values for each of the four factors exceeded the recommended 0.70, thereby providing evidence of internal-consistency reliability.

Following this, the means and standard deviations for each of the constructs were computed, as presented in Table 3.

Table 3. Descriptive statistics

Constructs	Means	Standard deviations
Attitude	4.89	.87
Social image	3.53	1.21
Brand name	4.49	1.10
Subjective norms	3.27	1.53

Given the six-point Likert-type scale used to record responses, it is clear from Table 3 that Generation Y students have an overwhelmingly positive attitude towards wearable activity-tracking devices (mean = 4.89), and that the brand name is an important factor in selecting such devices (mean = 4.49). Furthermore, Generation Y students appear to agree that an activity-tracking device contributes to their social image in a positive manner (mean = 3.53). One caveat to their positive perception of activity-tracking devices is that a slightly lower mean was computed on the subjective norms construct (mean = 3.27). One possible explanation for this is the unacquainted perceived cost and financial value of such devices (Lee, 2015; Livingston, 2017), something that has potentially dampened the wide-spread uptake of these devices. Therefore, the wearing such devices may have some way to go before becoming a social norm.

Following the computation of the descriptive statistics, a correlation matrix of Pearson's Product-Moment correlation coefficients was constructed, as presented in Table 4.

Table 4. Correlation matrix

	Attitude	**Social image**	**Brand name**	
Attitude	1			
Social image	.275*	1		
Brand name	.304*	.157*	1	
Subjective norms	.286*	.508*	.207*	1
* $p \leq .01$ (2-tailed)				

The results shown in Table 4 indicate that there are statistically significant ($p \leq$ 0.01) positive relationships between each of the pairs of constructs. These statistically significant relationships, in the direction proposed by the literature, provide an indication of the nomological validity of the measurement theory outlined in this study. The strongest correlation occurred between social image and subjective norms ($r = 0.508$), followed by brand name and attitude ($r = 0.304$), subjective norms and attitude ($r = 0.286$), and social image and attitude ($r = 0.275$). The weakest correlation coefficient occurred between social image and brand name ($r = 0.157$). Given the lack of literature and subsequent evidence of a direct relationship between social image and subjective norms, Liébana-Cabanillas *et al.* (2013:314) opine that there is a conceptual relationship between the two constructs. This is consistent with the findings of this study, which indicates a significant positive relationship between Generation Y students' normative belief that their significant others think they should use a wearable activity tracker and their belief that they might receive respect and admiration from peers in their social network by using such a device. The significant positive relationship between brand name and attitude is substantiated by a related study concerning the adoption of fashion apparel amongst members of the Generation Y cohort (Valaei & Nikhashemi, 2017:531). In addition to these findings, Richardson *et al.* (1994) affirm the importance of brand name as an extrinsic indicator used to evaluate product quality, specifically with unfamiliar, new, and high-priced products. Therefore, the results of this study imply that Generation Y students have a significant positive attitude towards devices with a reliable brand name.

The significant positive relationship between subjective norms and attitude are consistent with previous research and indicates that there is a positive association between Generation Y students' significant others' opinion of their potential usage of a wearable activity-tracking device and their attitude towards such devices (Blut et al., 2016; Hamari & Koivisto, 2015; Kim et al., 2013. Additionally, in accordance with the results of a previous study (Lin &

Bhattacherjee, 2010), the relationship between social image and attitude is indicative of Generation Y students' propensity to seek social approval and respect, which in turn positively relates to their attitude towards wearable activity-tracking devices. As such, there is an increased probability of Generation Y students favouring the use of these devices if they are to receive peer admiration and respect. Similar to the findings of Yang *et al.* (2016), this study found a positive association between Generation Y students' desire for social image and brand name. This indicates the belief that a device with a reputable brand name will increase Generation Y students' social standing amongst friends and peers.

4. CONCLUSION

There is an opportunity to expand the wearable activity-tracking device market in South Africa, and subsequently contribute to the economy from generating additional revenue by it, which can be achieved by focusing marketing efforts on Generation Y students. The findings of this study show that it is paramount for device manufacturers and marketing managers to emphasise the brand name and how such devices improve overall physical health, increases social image and promote approval amongst peers within this generation. Given that there is a positive association between Generation Y students' subjective norms and their attitude towards activity trackers, it is important to appeal and aim marketing communication at their family members, peers, and friends. That is, when these individuals become aware of such devices and display positivity and become convinced of the importance of using these devices, it will directly influence members of the Generation Y student cohort, subsequently increasing their attitude towards and potential purchase of such devices.

Further opportunities for research are provided due to certain limitations of this study. For instance, this study reported on the relationship between social image, brand name, subjective norms and Generation Y students' attitude towards wearable activity-tracking devices by means of a quantitative approach, failing to deliver underlying motives for these relationships. As such, an opportunity exists to examine the underlying motives of these relationships by means of a qualitative research approach. Moreover, albeit the association between these variables is significantly positive, there is no evidence of the influence of the variables on the sample's attitude towards these devices. This leads to inconclusive speculation that social image, brand name and subjective norms significantly determine Generation Y students' attitude towards wearable activity-tracking devices. Future research could address this issue. Additionally, the sample characteristics in this

study were limited to the Gauteng province, although future research can examine these relationships across the nine South African provinces.

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