MEASURING BRAND LOYALTY IN THE MEDICAL DEVICE INDUSTRY OF SOUTH AFRICA

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MEASURING BRAND LOYALTY IN THE MEDICAL DEVICE INDUSTRY OF SOUTH AFRICA

A study across the Public and Private Health-care system

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DECLARATION

I, Veliswa Celestine Rozani, student number 198041220, hereby declare that the treatise for Masters in Business Administration (MBA) to be awarded is my own work and that it has not previously been submitted for assessment or completion of any postgraduate qualification to another University or for another qualification.

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A three-year journey full of lessons learnt has come to completion. This journey has been one of the best investments I have made in myself; and it was definitely worth it. My journey could not have come to this point, where I can stand and look back and acknowledge that I have made it to the end, without the continuous support, encouragement of the following people:

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ABSTRACT

Brands are major role-players in the organisational business strategy; and they are recognised as one of the most valuable assets a company can possess. The entry of low-cost competitors has redefined the entire competitive landscape of the health-care industry through their ability to transform their value chain, in order to drastically reduce prices. With the fierce rivalry amongst the competitors, and a quest for companies to achieve competitive advantage, companies must design their strategies better than their competitors. For a company to be successful in such an environment, customer-brand loyalty is a critical issue.

The main objective of this study was to measure brand loyalty in the medical-devices industry of South Africa, and to establish the key influencing factors of brand loyalty in this industry. The measurement of brand loyalty in the medical devices industry is founded on a conceptual brand-loyalty framework for the Fast Moving Consumer Goods (FMCG) industry developed by Moolla (2012). The 12 brand loyalty factors identified by Moolla are: customer satisfaction; switching costs or risk aversion; brand trust; involvement; repeat purchases; relationship proneness; commitment; perceived value; brand relevance; brand affect; brand performance and culture.

The empirical study was conducted among 250 medical practitioners across the private sector and public sector health-care system of South Africa. The methodology adopted in the study included the sampling procedure, the data collection, the questionnaire development and the statistical techniques used to analyse the results. The results were analysed with regard to: Factor analysis; Cronbach’s Alpha coefficients, mean values and inferential statistics.

The results were presented in a conceptual framework, in order to measure brand loyalty in the medical devices industry of South Africa.

The results of this study concluded that the brand loyalty influences, as identified by Moolla, are important for measuring brand loyalty in the medical devices industry. The empirical results focused on the demographic profile of the respondents, the validity of the questionnaire, the reliability of the results obtained, as well as the importance of the research variables.
The analysis enabled certain conclusions to be drawn relating to the significant factors of brand loyalty in the medical devices industry in South Africa.

A comparison was conducted relating to age group, gender profile, the health-care sector and the medical specialization – to determine whether there were any significant differences in the influence of the brand-loyalty factors identified. The chapter concluded with a conceptual framework for the medical-devices industry adapted from Moolla (2012) framework.

**Keywords**: Brand loyalty; medical-devices industry
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CHAPTER ONE

1. NATURE AND SCOPE OF THE STUDY

1.1 INTRODUCTION

One of the most valuable assets that can be owned by an organisation is its brand (Wang, Wei and Yu, 2008). The value possessed by this intangible asset indicates that a brand is more than just a name; it is an experience (Fjeld, 2001). Organisations invest extensively to make their brand popular and widely accepted in the hearts and minds of their consumers (Khan and Mahmood, 2012). Many organisations have recognised the importance of building strong brands in increasing the competitive strengths (Ojasalo, Natti and Olkkonen, 2008) on three levels of product identification: loyalty through repeat purchases; and the enhancement of new products (Lamb et al., 2008).

In an increasingly competitive era, these levels highlight the importance and benefits of customer retention, as opposed to seeking new customers and the long-term financial success of organisations. On a broader level, a brand can indicate explicit and implicit associations that are distinctive, advantageous and strong; and furthermore, they can reveal the powerful consumer brand judgements and feelings of their consumers (Harward and Kerin, 2013).

Brand recognition for the health-care industry is very low, as evidenced in the 13th Annual Best Global Brands Report (Waaga, 2013), with only one health-care industry brand making it into the top one hundred. It could be argued that it is peculiar for organisations, which provide life-saving medicines and devices, to have less brand recognition than Coca-Cola or Apple, which were the top two organisations in the global report. According to Waaga (2013), with decision-making power split between three groups – the doctor, the funders and the patients – the customer profile of the health-care industry is complex.

This highlights the importance and challenge of building a strong brand within the health-care industry – even more so than in many other industries.

The current economic landscape that exists in the South African health-care industry drives the buying behaviour and purchasing decision of the health-care stakeholders.
The pressure encountered by health-care institutions to drive down costs has led to a dramatic change in the procuring of highly technical medical devices (Crago, 2002).

Over the years, this has resulted in some of the decision-making powers being transferred from clinical stakeholders to non-clinical stakeholders (Lindgreen, Antioco, Palmer and Heesch, 2009).

There are a number of other factors and players that continue to put pressure on the hospitals and medical practitioners to drive down costs and to contain prices (Waaga, 2013). These players include medical insurance providers that govern and dictate the reimbursement limits and “prioritize the maximization of operational efficiency, as well as the reduction of unnecessary costs, while maintaining or improving quality” (Hamrock et al., 2013).

The entry of low-cost competitors has redefined the entire competitive landscape, through their ability to transform their value chain to drastically reduce prices (Gorrell, 2008). With the aim of retaining their customers, organisations tend to cut their pricing; and they are soon fighting a price war, based on the new competitors’ terms. One of the major concerns to a competitive landscape that is driven mainly by costs is the possibility that it provides an incentive to hold back on the care (Hibbard, Slovic and Jewett, 1997) provided to the patients, who are the ultimate end-users of the products.

With the cost of health-care products being a social issue, all payers believe the market is highly priced; and they continue to put pressure on the suppliers of the products to justify their pricing structures (Burns, 2007).

The South African health-care industry can be divided into the public and private sector. In the public sector, treatment is either free, or a minimal fee is charged to patients. Medical devices used in the government sector are procured through the tender process; and they are often chosen on the basis of the cost of the the products required. In the private sector, treatment procedures are mainly paid for by the medical aids, or by the patient – thereby giving a patient a better choice of quality and branded products.
Therefore it is of utmost importance to prove if the above research is still applicable in brand loyalty with regards to the medical devices industry of South Africa.

Almost half of South Africa’s health-care expenditure is accounted for by private insurance schemes, despite the fact that the private sector accounts for only 20% of the South African population. The public sector provides health care for up to 80% of the South African population – because of their lack of access to private care for most South Africans, and to the increase in private health-care costs. Consequently, this is no longer financially viable for many people (BMI, 2013).

1.2 THE RESEARCH PROBLEM

The entry of low-cost competitors has redefined the entire competitive landscape of the health-care industry, through the inability to transform their value chain to drastically reduce prices (Gorrell, 2008). With the aim of retaining their customers, the organisations tend to cut their pricing; and they are soon fighting a price war based on any new competitor’s terms.

The aim of the price reductions is to reduce consumers’ costs (Sharrad and Hassali, 2011) on prescribed therapy, and ultimately to remain a player in a highly competitive industry. However, the price war and the increased competitiveness in the industry should not be to the detriment of the patient, who is the ultimate consumer – to a point where the cost overrides the quality of the products. The low-cost products should be able to “prioritise the maximisation of operational efficiency and the reduction of unnecessary costs, while maintaining or improving quality” (Hamrock et al., 2013).

Brand-loyal consumers generally do not compromise quality for lower prices (Arranz et al., 2004); while other consumers are price-sensitive and would purchase the cheapest brand (Jensen and Drozdenko, 2008), in order to drive the costs down.

Although some research has been done to identify and establish the brand loyalty of consumers in the Fast Moving Consumer Goods (FMCG) and pharmaceutical industries, there is a need for research to ascertain the existence of brand loyalty within the medical-devices industry.
1.3 PURPOSE OF THE RESEARCH

The purpose of this study is to measure the brand loyalty of medical-device brands and to determine the factors influencing this concept. The problem statement highlights the need for further research to determine consumer loyalty to branded products. The research objectives are proposed and divided into primary and secondary research objectives.

1.4 THE RESEARCH OBJECTIVES

1.4.1 Primary objectives

With the fierce rivalry amongst the competitors, and a quest for companies to achieve competitive advantage, the main aim of this study is to measure brand loyalty in the South African medical-devices industry – by applying the model developed by Moolla (2012).

1.4.2 Secondary objectives

The secondary objectives are to determine:

- The key influential factors of brand loyalty;
- The influence of price on brand loyalty;
- Whether any significant relationship exists between brand loyalty and repurchasing;
- Whether there are significant differences in the brand-loyalty factors, based on age group, health-care sector, gender profile and medical specialisation.

1.5 THE RESEARCH METHODOLOGY

1.5.1 Literature and theoretical review

A literature review was completed, in order to determine the factors influencing consumer-brand loyalty. Furthermore, the literature was reviewed, in order to determine whether consumers are brand loyal to their original brands, and the impact of generic brands on the brand loyalty of the consumer.
1.5.2 The empirical study

The study’s emphasis is on the measurement of medical device-brand loyalty. A quantitative empirical research approach was followed, based on the research problem and the research objectives.

The quantitative research was conducted by using a questionnaire as the measuring instrument to test the existence of brand loyalty in medical-device brands with the generic equivalents. With the complexity of the South African health-care stakeholders, the research was conducted on the basis of a sample of medical practitioners across the private and the public sector in South Africa.

Moolla and Bisschoff (2012) developed a questionnaire grounded on marketing literature, and through consultations with academics specialising in the field of marketing.

The questionnaire measured brand loyalty, on the basis of a brand-loyalty framework, which proposed 12 influencers on the level of brand loyalty of a consumer through 50 closed questions, based on the factors identified in Moolla’s study.

1.6 LIMITATIONS

Firstly, the research was conducted on only one of the groups of decision-makers, focusing more on the clinical stakeholder’s perspective than that of the non-clinical stakeholder. Additionally, the study was conducted in the South African culture and not from a global perspective. Thirdly, the other key influencers on brand loyalty, such as the decision powers of the non-clinical stakeholders in the private sector and the tendering system in the public sector were not taken into account.

Thus, the study should be interpreted with these limitations in mind.

1.7 DEFINITION OF THE MAJOR CONCEPTS

**Brand:** A distinct sign, term, symbol, name, design or combination of these that differentiates and identifies the product or service of a supplier from those of its competitors (Kotler and Armstrong, 2012).

**Brand affect:** The aggregate or positive valuation of a brand (Matzler et al., 2006).
**Brand commitment**: The preference by a consumer to resist change, and to continue to maintain a relationship with a particular brand (Jang *et al.*, 2008).

**Brand equity**: Net consequence of the assets and liabilities associated with a brand, which could increase or decrease the value delivered by a product or service to its customers (Ambler *et al.*, 2002).

**Brand involvement**: An interest directed to a particular brand, which is invisible and relates to its purpose and behaviour (Moolla and Bisschoff, 2012).

**Brand loyalty**: Measure of the inclination of a customer to switch brands – due to a change in brand features or in its price (Roy, 2011).

**Brand performance**: The measure of the success of a brand (O'Cass and Ngo, 2007).

**Brand relevance**: The alignment of the brand to the needs of its target market, and the ability to satisfy those needs of the consumer (Moolla and Bisschoff, 2012).

**Brand trust**: The trustworthiness, benevolence and integrity assigned to a brand by the consumer, based on the brand’s ability to achieve its indicated function (Louis and Lombart, 2010).

**Competitive advantage**: An advantageous position gained by a company over its competitors, due to offering superior value through either the lowering of prices, or by providing a greater benefit that justifies premium prices (Kotler and Armstrong, 2012).

**Competitive marketing strategies**: Strategies that provide the company with a powerful competitive advantage against its competitors (Kotler and Armstrong, 2012).

**Consumer buyer behaviour**: The purchase behaviour of consumers acquiring goods or services (Kotler and Armstrong, 2012).

**Consumer involvement**: The perception of the relevance of a product or brand of the consumer, grounded on the consumers’ needs, interests and intrinsic values (Boisvert and Ashill, 2011).
**Culture**: The collective mentality that distinguishes one group of individuals from another (Lam, 2007).

**Customer equity**: The combined value of a company’s customers over a lifetime (Kotler and Armstrong, 2012).

**Customer satisfaction**: The extent to which the buyers’ needs and expectations are satisfactorily met by the perceived performance of the product (Kotler and Armstrong, 2012).

**Customer share**: The amount that a customer spends with a selected provider, as a percentage of the total amount available to spend on similar products (Anderson and Narus, 2003).

**Market share**: Share of the company’s sales, as a percentage of the total market (Kotler and Armstrong, 2012).

**Marketing**: The process that the company uses to build a strong relationship with the customer, in order to obtain value from the customer (Kotler and Armstrong, 2012).

**Marketing strategy**: The marketing logic that the company uses in the hope of achieving a beneficial relationship with the customer and of creating value for the customers (Kotler and Armstrong, 2012).

**Perceived value**: The resultant of the valuation of the product features (Sanyal and Datta, 2011).

**Medical-device market**: Total revenues generated by medical devices within the South African public and private sectors (Espicom, 2013).

**Relationship proneness**: The constant and thoughtful tendency of a consumer to connect and have a relationship with a particular product (Bloemer et al., 2003).

**Religiosity**: The magnitude of commitment towards a religious group (Stark and Glock, 1968).

**Repeat purchase**: The measurement of repetitive purchase of the same brand by the consumer over a particular length of time (Punniyamoorthy and Raj, 2007).
**Switching costs**: The value of the costs that the customer incurs when switching between different brands of the same product (Rhodes, 2012).

### 1.8 ETHICAL CONSIDERATIONS

This study has at all stages of the research process conformed to all written conventions and the etiquette of academic research, according to Lewis and Thornhill (2009). The academic research etiquette comprised the following:

- Information must not be distorted in any way, leaving the public with an erroneous impression;
- The research conducted does not contain unnecessary information, or information directed at irrelevant or wrong problems;
- The literature used in the study was referenced and sourced from the source from which it was obtained; and this was clearly indicated;
- The identity of the respondents will at all times remain protected before, during, and after the completion of the study;
- The participants have the right to withdraw from the study at any time;
- The data collected and the results obtained will be held in the strictest confidence. No propriety data will be released to competitors;
- The results of the study clearly indicate the actual research results obtained in their entirety;
- There was no intentional or deliberate misrepresentation of the research methods or results. An adequate description of the methods employed and of the original questionnaires used, was made available to the promoter.

In addition, the study was registered at the Ethics Committee of the Nelson Mandela Metropolitan University (NMMU). The necessary Form E for Ethical Clearance has been completed; and the research was approved by the Ethics Committee. (The approved Form E is to be found in Annexure 3 of this study.)
1.9 CHAPTER OUTLINE

CHAPTER 1: NATURE AND SCOPE OF THE STUDY

The introductory chapter highlights the relevance and significance of the study of brand loyalty in the medical-device industry in South Africa. The research problem to be investigated is stated, as well as the primary and secondary research objectives. The chapter further outlines the research methodology to be used in the study, and defines the major concepts in the study. It also highlights the limitations within which this particular study was conducted.

CHAPTER 2: THE SOUTH AFRICAN HEALTH-CARE INDUSTRY

This chapter focuses on the overview of the South African health-care industry and the medical-device industry of South Africa.

CHAPTER 3: THE LITERATURE REVIEW

Brand loyalty is a concept that has been researched extensively in the academic field, resulting in a number of models to measure brand loyalty. Chapter Three focuses on the literature relevant to brand loyalty, and the key variables that drive and impact the loyalty of consumers to a particular brand. The chapter also highlights the brand-loyalty frameworks developed over the last decade, and the brand-loyalty framework developed by Moolla that was used to develop the research instrument for this study.

CHAPTER 4: THE RESEARCH METHODOLOGY

Chapter Four provides justification for the use of the chosen research methodology for the study. Due to the nature of the study, it was established that a quantitative research, together with the use of a proven research instrument to measure brand loyalty, would be the most appropriate for the study. The chapter further constructs the questionnaire that is to be used as the research instrument for the study; and it evaluates the objectives and the results obtained from the pilot study.
CHAPTER 5: THE RESEARCH FINDINGS AND DISCUSSION

Chapter Five focuses on the analysis of the research findings of the study undertaken. The analysis enables certain conclusions to be drawn specific to brand loyalty in the medical-device industry in South Africa. The findings from this study are compared with the findings of the various other studies upon which the research instrument is based, in order to draw some similarities or differences between this study and the various other studies conducted across similar industries.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

This chapter consolidates the literature review, and the analysis of the previous chapters. The results were reviewed in the light of their relevance to the research problems and the hypothesis tested for the determination of the validity of the study.

The chapter further highlights recommendations for further research studies in the field of brand loyalty in the medical-device industry in South Africa.

1.10 SUMMARY

This chapter has established the nature and the scope of this study; and it has identified the following:

- The purpose of this study;
- The problem statement and the need to measure brand loyalty in the medical-device industry of South Africa;
- The primary and secondary objectives that were identified, based on the problem statement;
- The research methodology, including a review of the literature, and the empirical study used to conduct this study were both highlighted;
- The limitations of the study were identified and stated;
- The ethical considerations for the study have been highlighted, as well as reference made to the approved Form E for the ethical clearance of the study;
- A structure of this study with a brief overview of the areas of research covered in each chapter; and
- Definitions of the major concepts in the study.
CHAPTER TWO

2. THE SOUTH AFRICAN HEALTH-CARE INDUSTRY

2.1 INTRODUCTION

The status of the South African health-care system is of particular importance in this study, especially given the inequalities perceived between the two main systems of health-care in the country, namely: the private and the public sector. This chapter reflects on the current status of the South African health-care system; and it highlights the key variables affecting the quality of the provision of health-care services in the private and the public sectors. The overview of the medical-device industry in South Africa is included in the chapter; as it forms a significant component of the health-care spending in the country.

2.2 SOUTH AFRICA’S HEALTH-CARE SYSTEM

South Africa is among the top 30 most-popular countries in the world, with an estimated population of 50.7 million (Espicom, 2013). The population is relatively young; and the prevalence of HIV/AIDS continues to have a negative impact on the growth of the population, in spite of South Africa having one of the highest birth rates in the world. This is estimated at 24 live births for every thousand in the population (Espicom, 2013).

The provision of health services is extremely inconsistent across the two main health-care systems. The affluent sections of society, representing the minority of the population, have access to highly advanced secondary and tertiary facilities; but the majority of the population have limited access to grossly inadequate services (Espicom, 2013). South Africa has, in particular, a low provision of medical doctors, with only 30% of the doctors or medical practitioners employed in the public sector, and the rest working in the private sector (Espicom, 2013). The health-care sector in South Africa is often categorized as a split between the public and the private sector. The country’s health expenditure, as a percentage of the Gross Domestic Product (GDP), is the highest in the African region, at 8.9% of GDP; and this is similar to the spending of many developing countries and well-developed health-care systems like that of Australia (World Bank, 2013).
However, there is a huge disparity in the spending between the public and private sector; as 4% of GDP is spent by the public sector, which meets the health-care needs of approximately 85% of the country’s population (BMI, 2013). The two systems are seemingly closely interdependent, due to the clinical workforce operating in both sectors of the health-care industry and the progressively more sections of the society merging limited health-insurance packages with public sector provision, in order to cover the rest of their health-care needs (KMPG, 2013).

This interdependence is expected to increase in the future, with the large-scale private sector provision of publicly funded health care, and joint regulation under the National Health Insurance (NHI) umbrella (KPMG, 2013). Health-care pricing is currently unregulated in South Africa; however, the Minister of Health has recently promulgated an enquiry into the competitive aspects of the health-care sector via the Competition Commission Enquiry (KMPG, 2013).

**FIGURE 1: THE SOUTH AFRICAN HEALTH-CARE SYSTEM**

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<th>Total market</th>
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<td><strong>Health spend:</strong></td>
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<td><strong>Nurses:</strong></td>
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<td><strong>Pharmacists:</strong></td>
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**Source:** *The New Age, 2013*
2.2.1 Public sector health-care services

The public sector system has typically been regarded as suffering from a lack of resources, particularly in relation to human resources, remedies and medical-device technology (KPMG, 2013). These basics coupled with a poor infrastructure and backlogs in capital projects severely underpin the challenges relating to service delivery, as is quite evident to the media and the public (KPMG, 2013).

The human resources issues is evidenced by the statistics, as depicted in Figure 1 above. Within the public sector, the ratio of patients to doctors is 17.3 times that of the private sector (The New Age, 2013). The ratio of patients to nurses stands at 6.0 times that of the private sector, and the pharmacist ratio at 12.3 times that seen in the private sector (The New Age, 2013). These statistics indicate the enormity of the challenges of the public sector. And this creates strong public perceptions that the sector lacks capacity and is seriously under-resourced (Espicom, 2013).

Amongst many concerns relating to the public sector, medical-device companies have highlighted the lack of transparency in the government-tendering processes, and the delayed payments from major public-sector clients (KPMG, 2013). The Government is increasingly becoming vocal about the private health-care expenditure, and the impact these costs have on the South African citizens who use, or aspire to have access to, the private sector health-care facilities (The New Age, 2013).

2.2.2 Private sector health-care services

In contrast to the public sector, the private sector is well-funded and well-equipped, serving 15% of the population of the country (KPMG, 2013), in comparison to the public sector, which serves 85% of the South African citizens. The ratios, as depicted in Figure 1 above, are highly favourable when compared with those of the public sector (The New Age, 2013).

A major challenge for the private sector currently relates to the enormous pressure the sector faces from the government, consumers and health-care funders in relation to the cost of private health care (KPMG, 2013).
To further exacerbate the challenge, there seems to be an increase in the relative power of the private sector health-care funders, on whether or not to approve reimbursement for medical devices (KPMG, 2013).

### 2.3 MEDICAL DEVICES

Global organisations have made use of different definitions to describe and define the medical-device industry. The European Confederation of Medical Suppliers Association (EUCOMED) defines medical devices as “devices, *in vitro* diagnostics, imaging equipment, and e-health solutions used to diagnose, monitor, assess predispositions and treat patients suffering from a wide range of conditions” (KMPG, 2013). The product ranges identifiable in medical devices have been classified by EUCOMED into the general categories displayed in Figure 2 below (KPMG, 2013).

**FIGURE 2: THE PRODUCT RANGES IN THE MEDICAL-DEVICE INDUSTRY**

![Pyramid Diagram](source: KPMG Report, 2013)
Class A represents low-hazard products, such as bandages, tongue depressors, hospital beds, splints, stethoscopes, syringes without needles, handheld mirrors, impression trays, reusable scalpels, forceps, wheelchairs, patient chairs, corrective glasses and frames, incision drapes, conductive gels, non-invasive electrodes. (KPMG, 2013).

Class B represents low-moderate products, such as hypodermic needles, suction equipment, tracheal tubes, orthodontic wires, needles for suturing, suckers, staplers, spinal needles, clamps, bridges and crowns, muscle stimulators, cryosurgery equipment, powered drills, hearing aids, and ultrasound equipment (KPMG, 2013).

Class C represents moderate high-hazard products. Examples are lung ventilators, bone-fixation plates, blood bags, urethral stents, insulin pens, ligaments, internal closure devices, shunts, warming blankets, blood warmers, surgical lasers, and suction equipment (KPMG, 2013).

Lastly, class D represents high-hazard products, such as heart valves, implantable defibrillators, cardiovascular catheters, neurological catheters, cortical electrodes, cardiac output probes, biological adhesives, spinal stents, intra-aortic balloon pumps, absorbable sutures, bioactive implants (surface coatings), breast implants, and infusion pumps (KPMG, 2013).

2.4 THE SOUTH AFRICAN MEDICAL-DEVICE MARKET

The South African medical equipment and supplies market was estimated at US$ 1.2 billion in 2012, ranking South Africa among the top-thirty (30) biggest medical-device markets in the world (Espicom, 2013). There are currently limited medical devices produced in South Africa, with an estimated 95% being supplied by imports (Espicom, 2013). The United States of America (USA) remains the main supplier of medical devices in the country, accounting for 27.9% of the South African medical device exports in 2012, followed by Germany with a 13.7% share (Espicom, 2013). An increase in the shipments from China has been noted, to such an extent that the shipments have doubled in value over the past five years, thereby boosting China’s share to 8.4% of the market in 2012 (Espicom, 2013).
The revenue generated in the industry, graphically illustrated in Figure 3, can generally be split between multinationals, representing 79% of the revenue, and the remainder being generated by local companies (KPMG, 2013). On average, 70% of the revenue is generated through sales in the private sector, and 30% through the public sector (KPMG, 2013).

Multinationals are defined as all companies that operate in South Africa and distribute their own products manufactured abroad and/or in South Africa (KPMG, 2013). Local companies are defined as all companies that originate and are based in South Africa, and which distribute locally manufactured products, and/or act as distributors/agents for multinational companies that do not operate in South Africa (KPMG, 2013). The local firms are mainly small or medium-sized businesses; and they often combine distribution and manufacturing.

Multinational companies present in South Africa often operate in a joint-venture capacity with local firms. Multinational enterprises with a direct presence in South Africa include 3M, Arrow, Boston Scientific, Convatec, Covidien, Drager, Johnson and Johnson, Medtronic, Phillips, Siemens Medical, SIMS Portex and Smith and Nephew. Most South African manufactures focus on producing basic medical equipment and supplies (KPMG, 2013).
The South African health-care market is complex and fragmented; and consequently, foreign companies require extensive representation, in order to gain a footing in the country’s medical-device market (KPMG, 2013). The procurement procedure within the public sector is disorganized and confusing – due to the tendering systems in place at both the national and provincial level of government (KMPG, 2013).

In comparison with international standards, the South African process is somewhat old-fashioned and formal (KPMG, 2013). The Broad Base Black Economic Empowerment (BBBEE) code and levels play a major role in the public-sector tendering system, usually contributing to 30% in the scoring of tenders, with price accounting for the remaining 70%. Local companies tend to score higher in the BBBEE ratings than multinational, due to multinationals’ reluctance to sell company equity, based on their business-model structures (KPMG, 2013).

The split of the market segment for South Africa Medical devices is illustrated in the figure below.
Although the South African medical devices have lobbied over the years for a coherent regulatory system, the health-care system continues to have no comprehensive system of medical-device regulation. Such a system of regulation would prevent sub-standard products from entering the market; and it would help develop a domestic industry capable of competing on international markets (KPMG, 2013). The South African government has pronounced its intentions to re-introduce a modified South African Medicines and Medical-Device Regulatory Authority (SAMMDRA); but, it is not yet known when, if at all, this will take place (KPMG, 213). As it stands today, medical devices that can demonstrate United States Food and Drug Administration (FDA), European Union (EU) or Japanese Ministry of Health, Labor and Welfare (MHLW) approval have little difficulties or challenges in entering the South African market (Espicom, 2013).

Source: KPMG Report, 2013
The South African medical-device market is expected to grow at a CAGR of 8.7% in the 2012-2017 period to an estimated US$1,933 (Espicom, 2013). The projected annual growth of 8.7% is comparable to the growth rates expected in the North American markets, but lower than that in most of the less-developed markets in Sub-Saharan African countries like Nigeria, Ethiopia, Angola and Uganda (Espicom, 2013).

In the long term, the prospects of the South African medical-device market will be highly influenced by the policies of the government with regard to the envisaged NHI scheme (Espicom, 2013). The NHI will aim to promote and foster public-private partnerships to develop and upgrade hospitals, the serious shortage of medical practitioners, and to address the AIDS crisis in the country (Espicom, 2013). However, even with the proposed NHI implementation, the best prospects for advanced medical-device technology and equipment remain in the private sector (KPMG, 2013).

2.5 CONCLUSION

Chapter Two reflects on the status of the South African Health-care System; and it includes an overview of the medical-device industry in the country. Chapter Three will discuss the literature on brand loyalty and the development thereof from a single-dimensional to a multi-dimensional construct. The chapter will also highlight the brand-loyalty frameworks of the last decade and the conceptual framework developed by Moolla for the FMCG (fast-moving consumer goods) industry, on which the study will be based.
CHAPTER 3

3. THE LITERATURE REVIEW

3.1 BRAND LOYALTY

Loyalty can be defined as the state or quality of being loyal, and as a feeling or attitude of devoted attachment and affection (Oxford Dictionary, 2006). According to the business dictionary, brand loyalty is the extent of the faithfulness of a consumer to a particular brand, expressed through repeat purchases, irrespective of marketing pressures generated by the competing brands. Essentially, consumers purchase and use a variety of brands, thereby making brand loyalty a relative measure (Moolla, 2010). According to Matzler, Grabner-Krauter and Bidmon (2008), brand loyalty is a function of both behaviour and attitudinal reaction.

The source of loyalty and the process through which it is established have long been of central concern to the marketing literature. Brand loyalty has been a subject of intense research during the past two decades (Pomirleanu and Chennamaneni, 2011). Brand loyalty has been extensively cited in the literature, as “representing measures of customer loyalty towards a particular brand of product or product range” (Siala, 2013).

A number of studies have been dedicated to overall satisfaction, as the key determining factor of loyalty, either intellectualised as a repurchase intention, or as an emotional or psychological bond, which offers a competitive edge to companies (Rai and Medha, 2013). Recent studies present brand trust as one of the central elements of brand loyalty (Chaudhuri and Holbrook, 2001). Demonstrating one of the most central factors for consumer-brand choices, the concept of brand loyalty has awakened an enormous curiosity in academics and practitioners in the field of consumer behaviour and marketing (Jensen and Hansen, 2006).

Ghodeswar (2008) defines a brand as a product or service by a specific supplier, which is differentiated from its competitors by its presentation, name and/or symbol. Brands are important, as they bring stability into businesses, and assist in safeguarding against competition imitation: in both the domestic and the global marketplace (Bianchi, Drennan and Proud, 2014). According to Sevier (2001), a brand represents a warrant, a trust mark and a promise to consumers.
As a general strategy to reduce the perceived risk, consumers are becoming more loyal to a particular brand (Zheng et al., 2012). When consumers do not view a product as a brand, they view it as a commodity; and it will be differentiated from alternatives on price and convenience (Sevier, 2001). One of the most important market assets a company can possess is having a share of the consumers’ mind used in a buying situation (Romaniuk and Gaillard, 2007).

As outlined by Sevier (2001), if the consumers have no knowledge of the brand and the attributes thereof, the brand would not be included in the consumers’ choice set. The purpose of marketing for any company should be to “build a brand in the mind of a prospective consumer” (Sevier, 2001).

Assael (1991, cited in Yusuf and Shafru, 2013) further outlines that once customers decide on a brand and its associations, they often develop loyalty to that brand, make repeat purchases of it in the future, endorse it, and choose that product over others, even products with lower prices or better features. Brand loyalty induces a degree of commitment towards the product quality, which is a function of repetitive purchases and positive attitudes (Touzani and Temessek, 2009). Brand loyalty is an indication of the consumers’ preference for brands that are familiar (Sevier, 2001).

Loyal customers usually display these common behaviours: making repeat purchases, exploring other product ranges of the company, displaying resistance to competitors’ pull strategies, giving recommendations on the brand, serving on advisory boards, and providing publicity for the brand (Fiol et al., 2009). Brand risk is a major predecessor of brand commitment and brand love, implying a positive causal relationship between brand risk and consumer loyalty (Fetscherin and Heinrich, 2014). As highlighted by Jensen and Hansen (2006), brand loyalty leads to positive word-of-mouth and greater reluctance among loyal consumers to the strategies of competitors.

Brand loyalty has become central to the tactics and marketing strategies of companies, due to the highly competitive markets with decreasing product differentiation and increasing unpredictability (Matzler, Grabner-Krauter and Bidmon, 2008). In today’s world of tense competition, customer satisfaction is only the baseline; and this may not be enough to sustain a company (Hu et al., 2009).
The competitive environment has increased the need for companies to enhance the development of customer relationships through quality relationships (Ndubisi et al., 2012). Long-term relationships founded on customer loyalty are a fundamental asset of any company (Fiol et al., 2009).

Due to this fierce competition across various markets, consumers are faced with choosing amongst similar products and services; and they are sometimes overwhelmed by conflicting marketing strategies and messages. Consumers are thus motivated to reduce the perceived risks and look for ways to simplify their buying decisions; and one of these decision-drivers is brands (Matzler, Grabner-Krauter and Bidmon, 2008).

Companies with a number of loyal customers possess a large share of the market; and they are likely to realise higher rates of return on their investment (Reichheld, Markey and Hopton, 2000). A trusted product, which is trusted by the consumers has the ability to charge premium prices (Sevier, 2001). The importance of consumer brand loyalty is further highlighted by the fact that many industries in the mature stage of their lifecycle barely derive higher levels of profitability by gaining new customers (Hur et al., 2011). As highlighted by Osarenkhoe and Komunda (2013), loyal customers form the backbone of the company; as it is less expensive to keep existing customers than to recruit new ones.

Consumers’ brand loyalty is a strategic component for companies to derive and obtain a sustainable competitive advantage, giving the companies some protection from competition (Gounaris and Stathakopolous, 2004). Given the increasing market globalisation, competing companies continuously seek to project their superior quality products or services, image and perceived value, in order to gain customer loyalty (Hu et al., 2009). Therefore, the fundamental objective of any company should be the achievement of customer loyalty (Fiol et al., 2009).

Due to the market share of loyal consumers, leading companies derive repeat purchases from their loyal consumers, in contrast to the late-starter companies, which fight to drive down the brand-switching rate. The efforts of these leading companies are often directed towards enhancing customer loyalty, as increased consumer loyalty leads to favourable behaviours towards the companies (Hur et al., 2011).
Brand loyalty yields a number of benefits, such as substantial entry barriers to competitors, the improved ability to respond to competitor threats, higher sales volumes and revenues, and lower consumer sensitivity of consumers to the marketing efforts of competitors (Matzler, Grabner-Krauter and Bidmon, 2008).

3.2 MODELS TO MEASURE BRAND LOYALTY

Brand-loyalty development and measurement have evolved over the years from a one-dimensional concept to a multi-dimensional concept. The concept of brand loyalty is wider than the concept of co-operation or the retention of consumers, which is only referencing to the behavioural aspects of loyalty (Fiol et al., 2009). Many researchers consider loyalty on a multi-dimensional basis, by adding attitudinal components (Lee and Lee, 2013). According to Siala (2013), brand loyalty manifests in two forms, namely: attitudinal and behavioural brand loyalty.

Behavioural loyalty talks to repeated purchases of a brand; while attitudinal loyalty refers to an amount of dispositional commitment (Anisimova, 2007; Jarvis et al., 2006; Osarenkhoe and Komunda, 2013).

3.2.1 Brand loyalty as a one-dimensional concept

In the early decades, brand loyalty was defined as a one-dimensional concept, with the focus only on consumer behaviour. Over the years, several researchers have argued and proven that brand loyalty cannot be measured by one dimension only, and this realisation has developed multi-dimensional frameworks whereby to measure the concept of brand loyalty.

Punniyamoorthy and Raj (2007) identified that emotion and attitude attest for 75% of consumers’ purchase decisions. Behavioural and attitudinal measures cannot be singularly used as a measure. Both these measures are crucial in determining consumer-brand loyalty: thus, the root of the basis of brand loyalty as a two-dimensional concept.

3.2.2 Brand loyalty as a two-dimensional concept

According to the definition by Xu and Chan (2010), both the attitudinal and behavioural aspects are important in the measurement of brand loyalty.
Chahal and Bala (2010) define brand loyalty as “a function of behaviour (i.e. repeat purchases of the brand) and attitude (i.e. dispositional commitment in terms of some unique value associated with the brand)".

This view of brand loyalty as a two-dimensional concept has been re-enforced in a research by Jacoby and Chestnut, as quoted by Punniyamoorthy and Raj (2007). These researchers maintain that brand loyalty is an “influenced, behavioural response, which occurs over a period of time, by a decision-making unit, with a wide range of brands; and it is a function of psychological processes”.

3.2.3 Brand loyalty as a multi-dimensional concept

In the latest views on the development of the brand loyalty concept, brand loyalty is viewed as a multi-dimensional construct, which embraces a number of psychological processes and measurements (Punniyamoorthy and Raj, 2007).

3.2.4 Musa (2005)

Musa (2005) proposes a multi-dimensional brand-loyalty model by means of a moderating variable and chaining process. Musa (2005) concluded that the findings of his study in the health-care and beauty industries attribute brand loyalty to performance, satisfaction, perceived value, attitudinal loyalty, behavioural loyalty and trust.

**FIGURE 5: BRAND LOYALTY CONCEPTUAL FRAMEWORK – MUSA (2005)**

![Brand Loyalty Conceptual Framework](source: Musa (2005))
In his conceptual framework, depicted in Figure 5, Musa hypothesizes that the overall customer satisfaction with the product and direct seller may possibly have a positive effect on overall customer satisfaction, with the direct sales channel; and these qualities subsequently influence the customers’ loyalty intentions. This, in turn, influences the customer loyalty behaviour, such as recommending the product, repurchase of the product, and being more price-tolerant towards the product.

Musa proposes that the behavioural loyalty, attitudinal loyalty and overall satisfaction should be accompanied by trust in the brand.

3.2.5 Maritz (2007)

Maritz (2007) proposes a multi-dimensional brand-loyalty model for evaluating behavioural and attitudinal loyalty. The model observes the effects of attitudinal factors, such as marketplace factors, individual psychographic differences, customer experience, and brand image and equity.

**FIGURE 6: BRAND-LOYALTY CONCEPTUAL FRAMEWORK – MARITZ (2007)**

Source: Maritz (2007)
The conceptual framework, as depicted in Figure 6, studies the behavioural perspective of intentional loyalty, which has been shown to be more predictive of customer loyalty. The model constructs a loyalty view – by breaking it down into recognised loyalty elements – including customer-experience attributes, brand image and brand-equity factors, marketplace factors, as well as individual psychographic differences. Behavioural information has been combined in the model, in order to present a holistic view of customer loyalty.

3.2.6 Punniyamoorthy and Raj (2007)

Punniyamoorthy and Raj (2007) propose a multi-dimensional brand-loyalty model by means of evaluating behavioural-purchase loyalty and attitudinal commitment. The model observes the effects of attitudinal factors, such as marketplace factors, individual psychographic differences, customer experience, in addition to brand image and equity. Punniyamoorthy and Raj (2007) concluded that the findings of their study in the newspaper industry attribute brand loyalty to nine influences, as illustrated in Figure 6 below.


Source: Punniyamoorthy and Raj (2007)
The conceptual model, as depicted in Figure 7, identifies nine factors that influence brand loyalty: to include involvement, functional value, price worthiness, emotional value, social value, brand trust, satisfaction, commitment and repeat purchasing.

3.2.7 Kim, Morris and Swait (2008)

Kim et al. (2008) have proposed a multi-dimensional brand-loyalty model by means of a five-factor underlying construct model. The model concluded that brand loyalty should be attributed to five distinctive antecedents, namely: cognitive conviction, brand credibility, attitudinal strength, affective conviction and brand commitment.


Source: Kim, Morris and Swait (2008)

The conceptual model, as depicted in Figure 8, focuses on the factors leading to changes in true brand loyalty:

- Brand credibility relates to the past experiences of the consumer, with the particular brand;
- Affective conviction relates to the emotional response, such as dominance, arousal and feelings of pleasure towards a particular brand;
- Attitudinal strength relates to the knowledgeable, extreme, certain, intense and personally important consumer attitudes;
- Cognitive conviction relates to the subjectivity of the consumers’ certainty, cognitive elaboration and ego pre-occupation; and
- Brand commitment relates to consumers’ commitment to purchasing a particular brand.
3.3 MOOLA’S CONCEPTUAL FRAMEWORK TO MEASURE BRAND LOYALTY


Based on his studies, Moolla identified 12 key influences of brand loyalty, as shown in Figure 9 below (Moolla and Bisschoff, 2012).

The conceptual framework model, as depicted in Figure 9, identified the 12 factors that influence brand loyalty. These factors include: culture, brand trust, customer satisfaction, repeat purchasing, switching costs, involvement, brand affect, relationship proneness, brand performance, commitment, brand relevance, and perceived value.

The aim of Moolla’s study was to identify the most significant factors that play a key role, when measuring brand loyalty in the fast-moving consumer goods industries (FMCGs). Moolla conducted an empirical study among a sample of 550 consumers, who all had access to a diverse range of fast-moving consumer goods (Moolla and Bisschoff, 2012). The empirical study measured the 12 factors that influence brand loyalty, as well as the interrelationship between these factors (Moolla and Bisschoff, 2012).

The results of Moolla’s study established that in the FMCG industry, brand loyalty is influenced in a different way by each of the 12 factors. The study also found that the psychological influences had a greater effect on brand loyalty than the brand-performance influences (Moolla and Bisschoff, 2012). The importance of this study lies in the development of a conceptual framework to measure, and subsequently manage, consumer-brand loyalty. The conceptual framework is appropriate for marketing and managing in determining the specific brand-loyalty influences most important for their products, and to identify where their products fall short (Moolla and Bisschoff, 2012).

Source: Moolla and Bisschoff (2012)
3.4 CUSTOMER SATISFACTION

Customer satisfaction, as defined by Fullerton (2005), is the overall measurement of a customer’s experience of consuming or owning a product. Customer satisfaction is also viewed as the total influence of numerous encounters over a period of time between the brand and the consumer (Moolla and Bischoff, 2012). Satisfactory experiences are highly related to the consumers’ positive emotional relation with the brand (Fullerton, 2005).

Kotler and Armstrong (2012) further highlight the fact that delight and customer satisfaction are dependent on the product’s supposed performance, when measured against the customers’ expectations. Customer satisfaction has, thus, been identified as one of the major drivers of brand loyalty (Moolla and Bischoff, 2012).

Many companies globally use the customer satisfaction index in their Balanced Score Card as a strategic goal (Mittal and Kamakura, 2001). Companies drive huge investments, both financially and resourcefully, trying to improve customer loyalty by maintaining and measuring metrics, such as satisfaction and net-promoter scores (Keiningham et al., 2011). This behaviour is driven by the notion that customer behaviour in the long term is fundamentally determined by the post ad hoc evaluation of consumer experience (Lee and Lee, 2013).

The indications from many researchers have supported the view that a higher level of customer satisfaction leads to the retention of customers and positive word-of-mouth, thereby resulting in higher levels of profitability (Adams, 2003; Lee and Lee, 2013). The supremacy of satisfaction lies in its ability to strengthen brand loyalty formation (Ha, Janda and Park, 2009).

Customers that are satisfied with a brand are willing to pay premium prices; and this act results positively on the financial performance of companies (De Chernatony et al., 2004). Dissatisfied customers are likely to engage in negative word-of-mouth to jeopardize the brand image; and this also serves to discontinue their patronage towards the brand (Svari et al., 2010).
However, the relationship between brand loyalty and customer satisfaction is not always direct; as satisfied customers can sometimes defect to competitors, thereby indicating that not all satisfied customers are consistently loyal and retained as customers (Poku, Zakari and Soali, 2013).

Customers may experience high levels of satisfaction with a brand and be happy to recommend it to others; however, they might also experience the same level of satisfaction with the competitors’ products, and end up switching to competitor brands (Keiningham et al., 2011). This is in line with the findings of Afzal et al. (2013) that brand-switching may occur, due to the influences of price, quality and availability – even when a consumer is currently satisfied with a brand.

Most frameworks and models frequently make use of customer satisfaction as a variable to measure brand loyalty; however, as research has shown, it is not the only variable that should be considered when determining brand loyalty. Simply concentrating on satisfaction may result in an incomplete picture of brand loyalty formation (Ha, Janda and Park, 2009). Fullerton (2005) found that commitment intercedes in the relationship between the repeat-purchase intentions of consumers and customer satisfaction. Customer satisfaction is seen as an attitude-like measurement, subsequent to a customer’s purchase of a brand, and the impact of customer expectations, perceived quality and perceived value (De Chernatony et al., 2004).

The perception on the quality of the product, leads to customer satisfaction towards that product (Sanyal and Datta, 2011).

On the basis of the literature review, the following research hypothesis is proposed:

H1: Customer satisfaction has a significant influence on the development of brand loyalty in the medical-device industry.

3.5 BRAND TRUST

The marketing fraternity regards the development of a trustworthy brand as one of the fundamental tasks in brand-loyalty formation (Hur, 2014). Consumers’ trust in a brand is driven by the high expectancy of the brand to bring about a positive outcome (Delgado-Ballester and Munuera-Aleman, 2005).
Brand trust is recognised as an antecedent of both brand loyalty and strong brand equity, critical in positive word-of-mouth, repeat purchasing, advertising and premium pricing (Delgado-Ballester and Munuera-Aleman, 2005).

Trust has been defined as the readiness to rely on another party, based on the beliefs of the behaviour and characteristics of that party in the face of risk (Jevons and Gabbott, 2000). This is because trust enables the creation of highly valued exchange relationships by both parties (Morgan and Hunt, 1994; Delgado-Ballester and Munuera-Aleman, 2005).

Brand trust speaks of “the willingness of the average consumer to rely on the ability of the brand to provide its stated function” (Chaudhuri and Holbrook, 2002).

Brand trust is the confidence that the consumer will find what is desired, and not what is dreaded; and that there would be no exploitation of the customer’s vulnerability (Delgado-Ballester and Munuera-Aleman, 2005).

For most successful brands, the role of brand trust is often taken for granted; as the assumption is that the brand reputation is sufficient to substantiate their trustworthiness (Hur, 2014). As a result, brand reputation is conceded, due to companies under-cutting the time to design, manufacture and deliver a quality product (Lantieri and Chiagouris, 2009). Added quality-control procedures can assist in the development or enhancement of reputation; as such processes can reduce the probability of a product recall (Lantieri and Chiagouris, 2009).

A trustworthy brand preserves the promise of value to customers; and this is impacted by product development, service offered, advertisement, production and selling (Delgado-Ballester and Munuera-Aleman, 2005).

Companies must be acquainted with the fact that brand trust has an essential role to play in building and maintaining long-term relationships between suppliers and consumers in the presence of high perceived risk (Sichtmann, 2007). Brand trust acts as a major antecedent of the customer’s commitment towards a brand, and subsequent customer loyalty (Phan and Ghantous, 2013).
The credibility of the brand increases loyalty commitment; as consumers can justify their reliance and trust in the brand (Sweeney and Swait, 2008). The increase in trust for the brand is the result of cumulative consumption experience; and it leads to repurchasing behaviour (Hur, 2014).

Brand trust is a multi-dimensional concept, including psychological variables that depict a collection of combined opinions, which relate to the benevolence, integrity and brand trustworthiness (Louis and Lombart, 2010). Brand trust consists of cognitive beliefs and affective perceptions of the brand (Delgado-Ballester et al., 2003; Elliot and Yanno-Poulou, 2007). Cognitive brand trust beliefs take into account the expectations of brand competence, reliability, consistency, and/or the predictability of performance across the product portfolio under that brand (Becerra and Korgaanker, 2011).

The affective or emotional elements leading to brand trust include expectations of brand integrity, honesty and/or benevolence, which embrace expectations that the brand would act with the consumer’s best interests across the product portfolio under that brand (Becerra and Korgaanker, 2011). Brand trust impacts positive brand referral intention and purchase intentions (Becerra and Badrinarayanan, 2013).

On the basis of the literature review, the following research hypothesis is proposed:

**H2:** Brand trust has a significant influence on the development of brand loyalty in the medical-device industry.

### 3.6 SWITCHING COSTS / RISK AVERSION

Rhodes (2012) defines switching costs as the costs incurred by the consumer as a result of switching from one brand to another. These comprise the costs related to searching, evaluating and learning about new products, and the perceived uncertainty of the psychological costs involved in terminating a relationship with the existing supplier (Burnham et al., 2003).

According to Scott Morton (2000), switching costs is one of the key influences, which would define how rapidly low-cost competitors could gain a market share from the original medical-device brands.
The variance in the price of two brands can be used as an indication for the repurchase of a brand, and determine whether the consumer has a high brand loyalty towards a particular brand, especially in the presence of low-cost alternative products in the market (Rizzo and Zeckhauser, 2009).

Generally, consumers tend to switch to a cheaper brand – if their attitudinal loyalty towards the current brand is low (Molina-Castillo et al., 2012). When consumers are brand loyal, they are less likely to switch brands, despite small price fluctuations occurring within their preferred brand (Rizzo and Zeckhauser, 2009).

In order to increase consumer commitment to their brand, companies can increase the perceived risk associated with brand substitution and increase brand trust associated with their brand (Akpan and Etuk, 2014). Consumers regularly face switching costs because of their commitment to using a specific product (Molina-Castillo, 2012). Switching costs can be used a barrier, when consumers contemplate switching to another brand, particularly if the consumer anticipates high switching costs (Moolla and Bischoff, 2012).

Risk-averse consumers are hesitant to try new brands, due to the perceived risk; as the performance of these brands is relatively uncertain and unknown in comparison with the established brands (Khandelwal et al., 2012). As a consequence, consumers are inclined to stay with well-established brands, in order to avoid any possible losses associated with trying unknown brands (Matzler et al., 2008). It must be noted that switching costs does not always lead to higher levels of customer retention (deMatos et al., 2013); since this could also lead to frustration and a sense of entrapment – in cases where consumers are dissatisfied (Park et al., 2014).

Consumers create long-term commitments, in order to reduce the uncertainty risk (Ndubisi et al., 2012). However, consumers vary in their appetite for the risk they are willing to incur in any given situation (Mandrik and Bao, 2005). This basic attitude towards risk is called risk-aversion, which relates to the uncertainty of the outcome and the significance of any possible negative consequences associated with the outcome (Matzler et al., 2008). Certainty avoidance also differs across boundaries, or is due to cultural diversity (Ndubisi et al., 2012).
The cultural aspect of uncertainty-avoidance has a significant influence on the association of relationship quality with loyalty (Ndubisi et al., 2012).

On the basis of the literature review, the following research hypothesis is proposed:
H3. Switching costs has a significant influence on the development of brand loyalty in the medical-device industry.

3.7 INVOLVEMENT

A significant proportion of consumer-purchase choices can be explained by brand loyalty and consumer involvement (Sritharan et al., 2008). The extent of consumer involvement in a brand category has been identified as a major influence pertinent to the building of strong brands and strategy (Swoboda et al., 2009). The development of brand loyalty is preceded by high levels of product involvement (Russell-Bennett et al., 2007).

Knox and Walker (2001) define consumer involvement as the level of personal importance of a brand to the consumer. Consumer involvement is also recognized as the consumer’s perceived significance of the product, based on the interests, needs and intrinsic values of the consumer (Boisvert and Ashill, 2011).

Involvement includes a continuous commitment by the consumer, incorporating behaviour, emotions and thoughts towards a product; and it is a multi-dimensional construct (Quester and Lim, 2003). Involvement exposes the perceived relevance of the product to the consumer on a constant basis (Quester and Lim, 2003). The importance of customer involvement lies in its influence to prevent brand-switching by consumers (Shukla, 2004).

Consistently adding new features that offer unique benefits to consumers is a key persuader to buy a particular brand of products (Sritharan et al., 2008). Numerous research studies have shown that consumer involvement enhances loyalty to a brand, and that consumers demonstrate a low level of brand loyalty when brand involvement is low, and vice versa (Moolla and Bischoff, 2012). Consumers that are involved with a particular brand are more committed, and as a result, more loyal to that brand (Quester and Lim, 2003).
Product involvement and brand loyalty are two important concepts understood to explain a substantial proportion of consumer-purchase behaviour and choices (Quester and Lim, 2003). Highly involved customers gather extensive and broad information before purchasing; and as a result, they require less information during the service process (Homburg and Giering, 2001).

These customers will place more importance in the service performance than less involved customers; and they would subsequently base their decision to repeat purchase on satisfaction (Dagger and David, 2012). Therefore, customer involvement can be utilised as a way of increasing satisfaction and rapport (Fatima and Razzaque, 2013).

The finding by Dagger and David (2012) that customer loyalty intensifies, as customer involvement increases, is of high importance to companies driving to create a loyal customer base (Dagger and David, 2012).

On the basis of the literature review, the following research hypothesis is proposed: H4. Customer involvement has a significant influence on the development of brand loyalty in the medical-device industry.

### 3.8 COMMITMENT

Commitment and satisfaction are essential antecedents of loyalty (Lariviere et al., 2014). Commitment refers to the state of developing partner-relationships that are stable, accepting short-term sacrifices, in order to maintain sustainable, stable relationships, and customer loyalty (Ural, 2007). Commitment is vital to the development of successful relationships; and it has a significantly positive effect on loyalty (Hamid et al., 2013).

Commitment may be the basis of a competitive advantage for a company; as it offers reduction in costs, enhanced profits, positive word-of-mouth and the prospect of premium pricing (Hur, Park and Kim, 2010). When a consumer is committed to a specific brand, there is less likelihood that the consumer would actively co-operate and be easily attracted to competitors’ products (Hur et al., 2011).
Commitment can, therefore, be established as a result of affective and cognitive motives experienced by the consumer towards the brand (Fullerton, 2005). Affective commitment includes emotional attachment to the brand; while calculative commitment includes cognitive attachment, or consists of motives, such as changes, or the perceived risk in the acceptance of competing brands (Jones et al., 2010).

Affective commitment relates to the inclination to continue stable in the long-term through the utilization of familiar relations and social ties with partners (Hamid et al., 2013). Affective commitment is thus psychological (Hur, Park and Kim, 2010); as it relates to “wanting” to maintain a relationship (Kelly, 2004).

Affective commitment can also be used to describe the process of consumer loyalty towards a particular brand; as the consumer is a regular buyer, and has a favourable attitude towards the brand (Louis and Lombart, 2010). Affective commitment has a direct positive effect on customer loyalty (Wu et al., 2012); since higher levels of affective commitment result in higher loyalty to the suppliers (Ruyter et al., 2001). Affective commitment also has an impact on the switching intentions of the consumers; since higher affective commitment results in lower switching intentions, and a greater willingness to pay premium prices (Fullerton, 2003).

Enhancing and improving affective commitment has an upwards impact on the relationship curve of satisfaction and loyalty (Wu et al., 2012).

Calculative commitment is purely based on the value that a consumer attaches to a brand, thus remaining loyal for as long as the benefits exceed those offered by the competitors (Hamid et al., 2013). Calculative commitment relates to ‘having’ to maintain the relationship (Kelly, 2004). Calculative commitment develops through a cognitive calculation of the gains and emotional attachment (Alhabsji et al., 2013). The motivation for calculative commitment is thus fundamentally economic (Hur, Park and Kim, 2010).

When a consumer reasonably evaluates the alternatives and the switching costs, and fails to find a better alternative, or the switching costs are too high, that consumer tends to stay with their current brand choice (Wu et al., 2012). Calculative commitment only drives more consumer loyalty – due to the lack of alternatives and the high switching costs (Wu et al., 2012).
It is for this reason that calculative commitment is linked to opportunistic behaviour; and consumers would continuously search for more valuable or better alternatives (Louis and Lombart, 2010).

Brand commitment explains the attitudinal strength or relationship between the consumer and the brand; and this leads to brand loyalty, rather than the behavioural occurrence of the repeated purchase of a brand (Touzani and Temessek, 2009). Commitment from an attitudinal perspective can be used to differentiate between true brand loyalty and other buying behaviours (Touzani and Temessek, 2009). Consumers with a low level of brand commitment would be more prone to switching to a brand, which is offering a better deal, discount, or a brand more visible from the point of purchase (Knox and Walker, 2001).

Committed consumers, however, would make the short-term sacrifice to preserve the durability of their long-term use of the product (Louis and Lombart, 2010). Companies should have the strategic goal to preserve such relationships, and to retain their loyal consumers, thereby enhancing customer commitment, and thus ensuring customer loyalty (Vuuren et al., 2012).

On the basis of the literature review, the following research hypothesis is proposed: H5. Commitment has a significant influence on the development of brand loyalty in the medical-device industry.

### 3.9 PERCEIVED VALUE

Perceived value has a fundamental role to play in the explanation of customer behaviour and loyalty (Fiol et al., 2009). Perceived value has an indirect relationship and effect on loyalty via customer satisfaction (Roig et al., 2009). It is a key component in the formation of satisfaction; and it results in customer loyalty (Fiol et al., 2009). Thus, the higher the perceived value by customers, the higher the level of brand loyalty towards that particular brand (Punniyamoorthy and Ray, 2007).

For companies to create and maintain long-term partner-relationships with customers, they have to offer superior value in their products or services (Fiol et al., 2009). Consumers perceive product value as a dominant component in their decision-making process (Beneke et al., 2013).
Perceived value is a product of the benefits received (economic, social and relational) and of the sacrifices made (price, time, effort, risk and convenience) by the consumer (Hinterhuber, 2004). The perceived value of a particular brand is a resultant of the trust consumers have in that brand, and the belief that other alternative brands would not deliver that same quality or value (Delgado-Ballester and Munuera-Aleman, 2005).

When assessing the value of a product, consumers take into consideration the transaction-specific attributes, as well as the quality and price of the product (Sanchez-Fernandez and Iniesta-Bonillo, 2007).

Most of the positive benefit drivers of consumer value are related to factors related to quality, thus higher the product quality leads to higher perceived value (Hu et al., 2009). Perceived product value is highly influenced by the perceived relative price and perceived product quality (Beneke et al., 2013).

According to Fiol et al. (2009), perceived value is characterised by cognitive factors (functional value), interpersonal relations (emotional) and social factors (social reputation and image).

### 3.9.1 Functional value

Punniyamoorthy and Raj (2007) found that functional value plays a significant role in the purchase behaviour and decisions; and this is a value that is established by factors, such as trustworthiness and robustness.

Functional value is defined by the value, efficacy and performance of the product, which are the factors that influence consumer-purchase decisions. Research has found that the greater the degree of functional value, the greater the degree of brand loyalty towards a brand (Punniyamoorthy and Raj, 2007).

### 3.9.2 Emotional value

Emotional value is the result of feelings of affection that the consumer has towards a brand; and hence, this influences the purchase decisions of the consumer. Research has found that the greater the emotional value that a consumer feels towards a brand, the higher the level of brand loyalty (Punniyamoorthy and Raj, 2007).
3.9.3 Price-worthiness factor

Punniyamoorthy and Raj (2007) maintain that the price-worthiness factor is a result of the decrease in the perceived cost of a brand. The price-worthiness factor is a factor when the value of a purchased product appears to be greater than the price paid; and the product is thus viewed as being good value for money. Research has found that the greater the level of the price-worthiness factor, the higher the degree of brand loyalty (Punniyamoorthy and Raj, 2007). In competitive markets, such as the health-care industry, companies should not only pay attention to the quality of the product; but they should take into account price competition, as it would be perceived in the value assessment made by the consumer (Hu et al., 2009).

Even though low pricing erodes the image of a product, it generates the perception that the lower-priced product is one of superior value (Beneke et al., 2013).

3.9.4 Social value

The social value of a brand or product enhances the self-concept of the consumer; since it involves the self-concept of the consumer who purchased the brand. Punniyamoorthy and Raj (2007) showed that the higher the social-value level, the greater the degree of brand loyalty.

On the basis of the literature review, the following research hypothesis is proposed:
H6: Perceived value has a significant influence on the development of brand loyalty in the medical-device industry.

3.10 REPEAT PURCHASE

The success of a company is highly dependent on existing customers re-purchasing that brand on a continuous basis (Mann and Rashmi, 2010). Consumer loyalty is built on a great level of commitment – leading to the consumer repurchasing that brand (Jang et al., 2008).

Loyal customers are not as price-sensitive; and therefore, they are willing to pay higher prices for such products (Zeithaml et al., 2001). It is contended that customer retention is cheaper than customer acquisition (Mihai, 2008); since customer retention involves less marketing resources and investment than the recruitment of new customers (Knox and Walker, 2001).
Repeat-purchase behaviour is the degree of willingness of the consumer to purchase the same product, which is a simple, observable and objective predictor of future buying patterns and the behaviour of the consumer (Lin and Liang, 2011). Brand trust has emerged as a key measure in influencing repeat purchases (Mann and Rashmi, 2010). Customer satisfaction also positively impacts the repeat purchase intention of consumers (Kuo et al., 2013). Consumers have a greater intent to repatronize companies with the products of which they are most satisfied (Kuo et al., 2013).

A brand alliance is a tool that can be used, not only to keep the brand alive, but also to extend or reinforce its position in the market (Hariharan et al., 2012). The consumer establishes a habit of purchasing a particular brand after a series of frequent repeat purchases, leading to the establishment of brand loyalty.

Once this behavioural brand loyalty has been established, it is less probable for the consumer to switch to any alternative brand (Punniyamoorthy and Raj, 2007).

An increase in the rate of repeat purchases of a company results in enhanced profitability as, on one hand, it increases revenue, and on the other hand, it reduces costs (Mann and Rashmi, 2010). Incremental revenue is driven in the form of an increase in purchase spending and price premiums by repeat consumers (Mann and Rashmi, 2010). The effect of quality and price on repeat purchase-behaviour probability differs across brands (Baidya and Ghosh, 2014).

Companies, especially those who supply the health-care sector, are not only interested in acquiring customers via trial purchases but are exploring ways to retain them via repeat purchases to derive higher profitability levels (Adams, 2003; Lee and Lee, 2013). One of the aims and objectives of a company’s marketing strategy is to drive and assist the process of consumers repurchasing a brand (Knox and Walker, 2001).

On the basis of the literature review, the following research hypothesis is proposed: H7: Repeat purchases have a significant influence on the development of brand loyalty in the medical-device industry.
3.11 BRAND AFFECT

Chaudhuri and Holbrook (2001) define brand affect as “the potential in a brand to elicit a positive emotional response in the average consumer, as a result of its use”. Emotions can be defined as a response to a stimulus; and they are commonly powerful and long-lasting, as opposed to mere feelings, which are perceived to be temporary and less intense (Matzler et al., 2006). As a result of the positive mood induced, brand affects can lead to brand loyalty, and capturing a share of the heart of the consumers (Ong et al., 2012).

Brand affect plays an important role in brand recognition and recall (Sung et al., 2010). Brand affect is more dominant than brand cognition – in the formation of brand loyalty (Kim et al., 2008).

Brands perceived to possess either competent or sincere personality characteristics are more likely to have an influence on the level of brand trust and brand affect (Sung et al., 2010). Branding strategies, which derive their emphasis from brand image and personality assist in increasing levels for brand trust, brand affect and brand loyalty (Sung et al., 2010).

Chaudhuri and Holbrook (2001) contend that high consumer-affect brands have a greater consumer purchase and attitudinal loyalty, and ultimately have higher market share; and such companies can, consequently, charge premium prices for their brands. Consumers should not only purchase a brand repeatedly; but they should also develop a positive attitude towards the brand – if they are to be considered truly brand loyal (Louis and Lombart, 2010).

Research shows that brand affect leads to a higher level of brand commitment, which can lead to an increase in the usage frequency of that brand (Chaudhuri and Holbrook, 2001). Brand affect is thus an important component that can lead to brand loyalty (Matzler et al., 2006).

On the basis of the literature review, the following research hypothesis is proposed: H8: Brand performance has a significant influence on the development of brand loyalty in the medical-device industry.
3.12 RELATIONSHIP PRONENESS

Relationship proneness can be defined as an individual attribute of the consumer, and the consumer’s propensity to build a partner-relationship with the sellers of a brand (Moolla and Bischoff, 2012). Proneness refers to the belief that consumers have an inclination towards some something, a particular activity, or an “increased likelihood” (Parish and Holloway, 2010). According to Kim et al. (2012), relationship-prone consumers have a higher level of commitment and trust, as opposed to those who are less relationship-prone. Customers who engage in partner-relationships with suppliers tend to develop higher levels of commitment and trust (Hedrick et al., 2007).

Consumer-relationship proneness is descriptive of a consumer’s propensity to engage in supplier relationships (De Wulf et al., 2001).

For some consumers, developing and maintaining a relationship with a supplier can cause them to be reluctant to defect – even after a product failure, because of their higher levels of commitment and trust (Hedrick et al., 2007). Customer-relationship proneness has a direct impact on the consumer intention to remain with the company, customer share and adherence, behaviour that is highly crucial in the context of medical services, to a supplier (Parish and Holloway, 2010). Relationship proneness applies a significant influence on the resistance to change; and it enhances customer-brand loyalty (Kim et al., 2012).

Companies have to improve the quality of customer relationships, in order to be able to elicit higher customer satisfaction and eventually customer confidence (Naoui and Zaiem, 2010). This in, due course, would impact customer loyalty positively (Naoui and Zaiem, 2010). Relationship quality would consequently correspond, and drive genuine competitive advantage (Naoui and Zaiem, 2010).

The seller’s expertise rather than frequency and duration of contact, lead to a higher level of relationship quality (Naoui and Zaiem, 2010), especially in the health-care industry.

The relationship proneness has a huge effect on the behavioural intentions of the consumer, evidenced by the need for both parties to sustain the relationship (Bloemer et al., 2003).
Relationship proneness has a positive effect on brand satisfaction, trust, commitment and brand loyalty (Cater and Cater, 2009; Nath and Mukherjee, 2012; Olsen et al., 2013). Consumers’ relationship proneness is also perceived as an antecedent for commitment; and it impacts positively on the consumer-purchase behaviour (Bloemer et al., 2003).

Relationship proneness can also be defined as a consumer’s thoughtful and constant propensity to connect with a particular product by means of a relationship with that product (De Wulf et al., 2001). It is also highlighted that this relationship is not merely based on convenience, but is as a result of a conscious decision (De Wulf et al., 2001).

On the basis of the literature review, the following research hypothesis is proposed: H9. Relationship proneness has a significant influence on the development of brand loyalty in the medical-device industry.

3.13 BRAND RELEVANCE

The essential attributes of an effective brand are relevance and awareness (Savier, 2001). To ensure brand loyalty, brands have to be relevant amongst consumers (Moolla and Bisschoff, 2012). Brand relevance is hence the alignment of a brand, its personality and brand identity – to the needs and wants of the target market; and thus, it must satisfy a specific need of the consumer (Moolla and Bisschoff, 2012).

Aaker (2012) states that a critical way that companies can achieve real growth is to win the brand-relevance competition by developing product offerings that are innovative, and subsequently make the competitors irrelevant.

New categories of a brand should be developed by incorporating a unique benefit, which the competitors lack. Aaker (2012) defines these “must-have” benefits as the uniqueness of the product, which includes personality, company values or community benefits. The offering must be so attractive to a target segment that any alternative offering that lacks these benefits would not even be considered by the consumers. Products should thus be chosen by consumers, as a result of the irrelevance of competitors’ products – and not just because they are not preferred.
Customers recognise brands that are appealing, visible and trustworthy, and thus of relevance to the specific product category (Aaker, 2012). If consumers are not aware of a company’s brand, the chance of being relevant in the market is thereby reduced (Savier, 2001). The brand-relevance strategy involves a combination of substantial and transformational innovation, in order to create new offerings for the consumers. In order to realize brand relevance, companies should be willing to support more risky innovations that would be able to satisfy the unmet needs of the consumers (Aaker, 2012).

On the basis of the literature review, the following research hypothesis is proposed:

H10. Brand relevance has a significant influence on the development of brand loyalty in the medical-device industry

3.14 BRAND PERFORMANCE

According to Wong and Merrilees (2008), brand performance can be defined as a measurement of the accomplishment of a brand in the marketplace. Brand performance can also relate to the evaluation of the product by the consumer after usage thereof (Moolla and Bischoff, 2012). Customer-based brand equity is highly related to brand awareness, brand image, brand reputation and customer-brand loyalty (Hirvanen and Laukkonen, 2014). As it is, the consumer-based brand equity is significantly associated with an increase in the market share (Oliveira-Castro et al., 2008). Better brand performance is associated with a greater share of brand or product uniqueness in comparison to alternative brands (Romaniuk and Gaillard, 2007).

Wong and Merrilees (2008) define brand performance as the measure of success of the brand in the market. Factors which pertain to the concept of brand performance include customer-brand loyalty, brand image, brand reputation, and brand awareness (Hirvanen and Laukkonen, 2014).

Consumers are increasingly purchasing brands for experiential benefits, as opposed to functional benefits (Ismail et al., 2011). Companies are as a result changing their focus and placing their effort on creating unique customer experiences (Rahman, 2014).
Accomplishing brand differentiation is a prerequisite for providing a unique customer experience (Rahman, 2014). Brand parity is present in many product categories (Labrecque and Milne, 2013) – thereby resulting in customers being unable to differentiate between the competing brands, and thus expecting the same brand experience from alternative brands (Rahman, 2014).

Brand success can also be measured from a financial perspective; as this is usually referred to as company-based brand equity (Hirvanen and Laukkonen, 2014). Through the enhancement of brand performance, companies can realise greater business performance (De Chernatony et al., 2004). Companies can increase their markets share, and be in a position to charge premium prices, by establishing an enhanced brand performance, compared to their competitors (Chaudhuri and Holbrook, 2001). It has been established that brand loyalty drives profitable brand performance results (Chaudhuri and Holbrook, 2001).

On the basis of the literature review, the following research hypothesis is proposed:

**H11**: Brand performance has a significant influence on the development of brand loyalty in the medical-device industry

### 3.15 CULTURE

Hofstede (1997, cited in Seock and Lin, 2011) defined culture as “the collective programming of the mind, which distinguishes the members of one group or category of people from another”. According to Lam (2007), there is a shortage of research aimed at determining the influence of culture on consumer-brand loyalty. Culture is regularly thought to be a critical determining factor in the explanation of heterogeneous consumer behaviour (Seock and Lin, 2011).

Exploring cultures and the impact of relationship quality on customer loyalty would provide a view on whether the effectiveness of a company strategy should be generic or culture-based (Ndubisi et al., 2012).

Culture can be categorized, according to five dimensions, namely: individualism or collectivism, power distance, uncertainty avoidance, masculinity or femininity, and long-term orientation (Hofstede, 2001).
Culture can be a strong influence on consumers’ perceptions, values and actions (Deng and Ho, 2000), which have an impact on consumers’ purchase behaviours and decision-making styles (Lam, 2007). Numerous characteristics of consumer behaviour are bound by culture (de Mooij and Hofstede, 2011). Consumers participate in a purchase experience with definite fundamental decision-making styles, which include consciousness and rational procurement regarding a particular brand, its price and brand quality (de Mooij and Hofstede, 2011).

Each culture has inherent cultural traditions, which are deeply entrenched in the social norms and values, thereby having a strong impact on the behaviours and attitudes of its followers (Seock and Lin, 2011). Trust, for instance, plays a crucial role in establishing customer loyalty in cultures with high certainty avoidance compared to those with low certainty avoidance (Ndubisi et al., 2012). Consumers with higher uncertainty avoidance and individualism are more prone to be brand loyal (Lam, 2007). A change in the societal, political and economic environments has an influence on the cultural values; and it can have an impact on consumer-buying patterns and behaviour (Seock and Lin, 2011).

The extent of religious obligation can have a significant effect on the consumer-buying behaviour in broad range of services and products (Schiffman and Kanuk, 2009). Trust in religious groups is generally fostered by cultural values, which have been passed on and strengthened through the teachings of the older generation, parents and by the preaching of senior religious leaders (Siala, 2013).

Culture plays an important role in companies, which are operational in international and global markets; and it has an influence on the product development, pricing, distribution, and communication strategies of those companies (Lam, 2007). The cultural aspect of brand loyalty, therefore, is highly important; and companies should consider this aspect in the identification of consumer proneness to brand loyalty (Lam, 2007).

On the basis of the literature review, the following research hypothesis is proposed:

H12: Culture has a significant influence on the development of brand loyalty in the medical-device industry.
3.16 CONCLUSION

This chapter has concluded the literature review; and it has reported on the following:

- The literature review of the history of brand loyalty and how it has developed from a single-dimension to a multi-dimensional construct.
- An overview of the brand-loyalty models developed by Musa (2005), Maritz (2007), Punniyamoorthy and Raj (2007) and Kim, Morris and Swait (2008) has been provided.

The conceptual framework developed by Moolla identified 12 factors, which have an influence on brand loyalty. These factors relate to customer satisfaction, switching costs, brand trust, repeat purchase, involvement, commitment, relationship proneness, brand affect, brand relevance, brand performance and culture.

Chapter Four will discuss the research methodology, which includes the data analysis and the statistical techniques used to conduct this study. The empirical results must validate the questionnaire before it can be used to measure brand loyalty for the medical-device industry. This validation is required because the questionnaire was initially developed by Moolla for the FMCG industry; and it would now need to be adapted for the medical-device industry (Annexure 2).
CHAPTER 4

4. RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

The research problem in this study relates to the identification of the relevant factors that influence brand loyalty in the medical-device industry in South Africa. Chapter 3 focused on the literature review, on brand loyalty, and on those factors that influence brand loyalty. These factors were identified from the numerous existing research findings.

This chapter focuses on the research design and methodology – in order to empirically test the factors that influence brand loyalty – and their relevance in the medical-device industry in South Africa. With the research objectives defined, an appropriate research paradigm would assist in gathering the data for analysis, the referencing of the literature review, and would result in conclusions drawn from the study with regard to the research objectives. The process of conducting the research included: sampling; the development of the research instrument; the conducting of a pilot study, administering the research instrument, as well as assessing the reliability and the validity of the research project.

Mouton and Babbie (2000) identified four steps that constitute good research, namely: conceptualisation, instrumentation, information-gathering and closure. The four-step process was used as a guide, as follows:

- Conceptualisation: The chapter examines the 12 influences supported by the literature review, and on which the conceptual framework is based.
- Instrumentation: The measuring instrument used for this study was based on one developed by Moolla (2010) in his study that measures brand loyalty.
- Data gathering: The process of questionnaire development, sampling and the accumulation of data followed, along with the required statistical tests to ensure validity and reliability. A pilot study was conducted to determine the feasibility of the study and the reliability of the research instrument.
- Closure: A description of factor analysis and the statistical analysis process to be undertaken was outlined.
4.2 THE RESEARCH PARADIGM

Collis and Hussey (2009) define a research paradigm as a logical framework, which provides guidance on how to conduct a scientific research project. Williams (1998) maintained that in organisational research, a paradigm encompasses three stages:

- The philosophical level, which is based on basic beliefs about the world;
- The social level, which encompasses guidelines on how a researcher should conduct the study; and lastly
- The technical level, highlighting the methods and techniques that ideally should be adopted when conducting research.

There are two research paradigms, namely: the qualitative or anti-positivist paradigm; and the quantitative or positivist paradigm. List (2006, cited in Brikkels, 2010) indicates that a differentiation has to be made between a quantitative and qualitative research paradigm, and that the different aspects are found in the researcher’s approach to the study.

4.2.1 The Qualitative Paradigm

The anti-positivism paradigm emphasises that the social reality is observed and understood by the individual, according to the conceptual positions possessed. Therefore, knowledge is personally experienced, rather than acquired or imposed from outside (Dash, 2005). List (2006, cited in Brikkels, 2010) further asserts that a qualitative approach should be adopted when depending on the following conditions:

- That research data on the topic do not yet exist;
- That a measure of uncertainty prevails on the appropriate unit of measurement to be used;
- The concept is assessed on a nominal scale, having no clear demarcation points; and
- Research exploration is confined to what people’s objectives or reasons are for performing the research.

Van Maanen (1979, cited in Shah and Corley, 2006) indicates that qualitative methods are “a set of data collection and analysis techniques that can be used to provide description, build theory and test theory”.

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The main benefits of qualitative methods are that they are tolerant of the researcher discovering new variables and relationships to expose and appreciate complex processes, and to demonstrate the influence of the social context.

4.2.2 The Quantitative Paradigm

The positivist paradigm for exploring social reality is based on the logical ideas of August Comte, a French philosopher, who emphasised observation as means of understanding human behaviour (Dash, 2005). The positivistic paradigm thus emphasises the knowledge-generation process with the assistance of quantification, which essentially enhances precision in the descriptive parameters and the judgment of the relationship among these parameters.

Krauss (2005) states that, according to the positivist epistemology, science is appreciated as a way to get truth, in order to have a sound understanding of the world – so as to foresee its predictability and take control. The world and the universe operate via the laws of cause and effect that are discernible when applying the scientific method; and they are, therefore, deterministic in nature. The positivists believe in empiricism, in the idea that the core of scientific endeavour comprises objective observations and the measurement thereof.

4.2.3 The paradigm to be followed in this study

Having considered the two paradigms; and based on the aims of the study, this research is to be grounded on the quantitative paradigm. The aim of this study is to gather evidence from a sample, the results of which can be used to predict brand loyalty in the medical-device industry of South Africa.

4.3 Conducting the Research

This study will follow an analytical approach by means of a survey design. According to Collis and Hussey (2009), in a positivist study, a survey methodology is intended to collect primary or secondary data from a sample, with the view of analysing them statistically – and subsequently extrapolating these results to a population.

The analytical survey also assists in determining whether there is a relationship between the dependent and the independent variables.
4.3.1 The sample

Collis and Hussey (2009) define a population as any collection of items, or a body of individuals under consideration for research purposes. A sample is defined as a subset of a population. To establish a population for research purposes, and subsequently a sample that is representative of the population, a sampling process must be utilised.

The selection of a sample is a fundamental component of any positivistic study. In a positivist study, the sample is selected to be representative of the population from which it is drawn (Collis and Hussey, 2009). A good sample should be selected at random; it must be big enough to meet the needs of the research undertaken; and it should be unbiased. A good sample for the purposes of research is a subset of the population that is representative of the research population within a certain level of accuracy. To draw a sample representative of the population, a sampling process, according to Table 2 below, should be followed (Webb, 2002).

For the purposes of this study, the population comprises those individuals identified as medical practitioners in the public and the private sector health-care system in South Africa. The sample frame will be constructed to include only those medical practitioners who have an email address. These medical practitioners are the ultimate users; and they are effectively the people with significant influence in the procurement of medical devices in the health-care facilities where they work.

In order to extrapolate the findings from this sample to the entire population, it is assumed that this sample is representative of the population.

There are two main sampling procedures, namely: non-probability sampling, which includes: Quota sampling, judgmental sampling, convenience and snowball sampling, as well as probability sampling – focusing on simple random, cluster, systematic, stratified, and multi-stage sampling methods. As the population was unknown to the researcher, simple random sampling was utilised in the study.
### TABLE 2: THE SAMPLING PROCESS

<table>
<thead>
<tr>
<th>STAGE 1 : Define the population</th>
<th>Establish the element from which the research is required.</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAGE 2 : Define a frame for the population</td>
<td>Establish the boundaries of the research population.</td>
</tr>
<tr>
<td>STAGE 3 : Select a sampling unit</td>
<td>This is the entity which holds the elements of the sample population so that the information may be extracted.</td>
</tr>
<tr>
<td>STAGE 4 : Choose a sampling method</td>
<td>In probability samples, all the elements have a known, non-zero chance of selection and are selected randomly. In non-probability samples, specific elements are selected in a non-random manner for convenience.</td>
</tr>
<tr>
<td>STAGE 5 : Decide on the size of the Sample</td>
<td>Establish how large the sample drawn from the population should be so that the variability is not too high and that the valid analysis of subgroups of the population is possible.</td>
</tr>
<tr>
<td>STAGE 6 : Define the sampling Plan</td>
<td>This is the decision on the method as to how the maximum and most relevant information is selected with minimal possibility of error.</td>
</tr>
<tr>
<td>STAGE 7 : Select the sample</td>
<td>The process of selecting the sample.</td>
</tr>
</tbody>
</table>

*Source: Webb (2002)*

A randomly selected sample of 250 medical practitioners was selected, which included participants from the public and the private sector. The sample size was considered adequate to perform factor analysis, as the ratio of respondents should be 14 observations per variables identified. The product of the 12 independent variables with the 14 observations recommended a sample size of 168. Therefore, the sample size selected exceeds the suggested sample size (by Hair, as quoted by Moolla and Bischoff, 2012).
The sample included medical practitioners across all provinces in South Africa, namely: Gauteng, North West, KwaZulu-Natal, the Free State, Mpumalanga, Limpopo, Western Cape and the Eastern Cape.

4.3.2 Development of the research-measuring instrument

Collis and Hussey (2009) recognized the interview and the questionnaire as the two most widely used methods for data collection in positivist studies. As a result of the size of the sample under study, a decision was made to make use of a questionnaire as a method for the collection of the data.

4.3.2.1 Questionnaire

A questionnaire is a list of carefully structured questions, which have been chosen with a view to eliciting reliable responses from a particular group of people (Collis and Hussey, 2009). The aim is to find out what they do, think or feel, as this would assist in addressing the research questions (Collis and Hussey, 2009).

According to Collis and Hussey (2009), there are two main problems associated with using questionnaires in a survey. The first problem relates to questionnaire fatigue. This refers to the reluctance of participants to respond to questionnaire surveys – because they are inundated with unsolicited requests by telephone, mail, post, and in the street. The second problem relates to non-response bias, which can be existent if some questionnaires are not returned. Non-response bias is critical in a survey; as the research design should be based on the fact that the results would be extrapolated from the sample to the entire population. This is known as the generalisation of the results to the population, as a whole.

Moolla and Bischoff (2012) developed a questionnaire to show the relevance of 12 influences of brand loyalty. Each respondent had to evaluate the scale of these factors by using a 7-point Likert scale as the measuring instrument (Moolla and Bischoff, 2012). The Likert scale ranges from strongly agree to strongly disagree. (The adapted questionnaire is attached, and is marked as Annexure 2.) The number of items per influence, as displayed in Table 3, ranged from a minimum of three influences, to a maximum of five (Moolla and Bischoff, 2012).
TABLE 3: NUMBER OF ITEMS PER INFLUENCE

<table>
<thead>
<tr>
<th>No</th>
<th>Dimension</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Customer Satisfaction</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Switching Costs / Risk Aversion</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Brand Trust</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Relationship proneness</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Involvement</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Perceived Value</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Commitment</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Repeat Purchase</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>Brand Affect</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>Brand Relevance</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>Brand Performance</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>Culture</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total number of items</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Moolla and Bisschoff (2012)

The measuring instrument adopted was according to a study conducted by Moolla and Bischoff (2012). In this study, Moolla and Bischoff (2012) constructed the measuring instrument from the brand loyalty influences identified in several studies and self-constructed measures. Table 4 below depicts the detailed list of items to measure brand loyalty and the source of the items.

TABLE 4: ORIGINS OF QUESTIONNAIRE ITEMS

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Code</th>
<th>Question</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Satisfaction</td>
<td>CUS01</td>
<td>I am very satisfied with the listed Medical Devices brands I purchase</td>
<td>Delgado et al. (2003)</td>
</tr>
<tr>
<td></td>
<td>CUS02</td>
<td>Distinctive product attributes in Medical Devices keep me brand loyal</td>
<td>Saaty (1994).</td>
</tr>
<tr>
<td></td>
<td>CUS03</td>
<td>My loyalty towards a particular Medical Devices brand increases when I am satisfied about that brand</td>
<td>Anderson and Sullivan (1993)</td>
</tr>
<tr>
<td></td>
<td>CUS04</td>
<td>I do not repeat a purchase if I am dissatisfied about a particular Medical Devices brand</td>
<td>Chen and Lue (2004)</td>
</tr>
<tr>
<td></td>
<td>CUS05</td>
<td>I attain pleasure from the Medical Devices brands I am loyal towards</td>
<td>Leuthesser &amp; Kohli (1995)</td>
</tr>
<tr>
<td>Switching Costs / Risk Aversion</td>
<td>SCR01</td>
<td>I do not switch Medical Devices brands because of the high cost implications</td>
<td>Klemperer (1987)</td>
</tr>
<tr>
<td></td>
<td>SCR02</td>
<td>I do not switch Medical Devices brands because of the effort required to reach a level of comfort</td>
<td>Beggs and Klemperer (1992)</td>
</tr>
<tr>
<td></td>
<td>SCR03</td>
<td>I avoid switching Medical Devices brands due to the risks involved</td>
<td>Moolla &amp; Bischoff (2012)</td>
</tr>
<tr>
<td></td>
<td>SCR04</td>
<td>I switch Medical Devices brands according to the prevailing economic conditions</td>
<td>Kim et al. (2003)</td>
</tr>
<tr>
<td></td>
<td>SCR05</td>
<td>I prefer not to switch Medical Devices brands as I stand to lose out on the benefits from loyalty programmes</td>
<td>Klemperer (1995)</td>
</tr>
<tr>
<td>Dimension</td>
<td>Code</td>
<td>Question</td>
<td>Source</td>
</tr>
<tr>
<td>---------------</td>
<td>------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td><strong>Brand Trust</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTS01</td>
<td></td>
<td>I trust the Medical Devices brands I am loyal towards</td>
<td>Halim (2006)</td>
</tr>
<tr>
<td>BTS02</td>
<td></td>
<td>I have confidence in the Medical Devices that I am loyal to</td>
<td>Morgan and Hunt (1994)</td>
</tr>
<tr>
<td>BTS03</td>
<td></td>
<td>The Medical Devices brands I purchase has consistently high quality</td>
<td>Reast (2005)</td>
</tr>
<tr>
<td>BTS04</td>
<td></td>
<td>The reputation of a Medical Devices brand is a key factor in me maintaining brand loyalty</td>
<td>Raimondo (2000)</td>
</tr>
<tr>
<td><strong>Relationship proneness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPR01</td>
<td></td>
<td>I prefer to maintain a long term relationship with a Medical Devices brand</td>
<td>Dwyer (1987)</td>
</tr>
<tr>
<td>RPR02</td>
<td></td>
<td>I maintain a relationship with a Medical Devices brand in keeping with my personality</td>
<td>Bloemer (1999)</td>
</tr>
<tr>
<td>RPR03</td>
<td></td>
<td>I maintain a relationship with an Medical Devices brand that focuses and communicates with me</td>
<td>Davis (2002)</td>
</tr>
<tr>
<td>RPR04</td>
<td></td>
<td>I have a passionate and emotional relationship with the Medical Devices brands I am loyal to</td>
<td>Reast (2005)</td>
</tr>
<tr>
<td><strong>Involvement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INV01</td>
<td></td>
<td>Loyalty towards a Medical Devices brand increases the more I am involved with it</td>
<td>Quester and Lim (2003)</td>
</tr>
<tr>
<td>INV02</td>
<td></td>
<td>Involvement with a Medical Devices brand intensifies my arousal and interest towards that brand</td>
<td>Knox and Walker (2001)</td>
</tr>
<tr>
<td>INV03</td>
<td></td>
<td>I consider other Medical Devices brands when my involvement with my Medical Devices brand diminishes</td>
<td>Moolla &amp; Bischoff (2012)</td>
</tr>
<tr>
<td>INV04</td>
<td></td>
<td>My choice of a Medical Devices brand is influenced by the involvement others have with their Medical Devices brand</td>
<td>Reast (2005)</td>
</tr>
<tr>
<td><strong>Perceived Value</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVL01</td>
<td></td>
<td>My Medical Devices brand loyalty is based on product quality and expected performance</td>
<td>Olson (2008)</td>
</tr>
<tr>
<td>PVL02</td>
<td></td>
<td>I have an emotional attachment with the Medical Devices brands I am loyal towards</td>
<td>Petromilli, Morrison &amp; Million (2002)</td>
</tr>
<tr>
<td>PVL03</td>
<td></td>
<td>Price worthiness is a key influence in my loyalty towards Medical Devices brands</td>
<td>Punniyamoorthy and Raj (2007)</td>
</tr>
<tr>
<td>PVL04</td>
<td></td>
<td>The Medical Devices brands that I am loyal to enhances my social self concept</td>
<td>Punniyamoorthy and Raj (2007)</td>
</tr>
<tr>
<td><strong>Commitment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM01</td>
<td></td>
<td>I have pledged my loyalty to particular Medical Devices brands</td>
<td>Kim et al. (2008)</td>
</tr>
<tr>
<td>COM02</td>
<td></td>
<td>I do not purchase/sample other Medical Devices brands if my Medical Devices brand is unavailable</td>
<td>Moolla &amp; Bischoff (2012)</td>
</tr>
<tr>
<td>COM03</td>
<td></td>
<td>I identify with the Medical Devices brands that I consume and feel as part of the brand community</td>
<td>McAlexander et al. (2002)</td>
</tr>
<tr>
<td>COM04</td>
<td></td>
<td>The more I become committed to a Medical Devices brand, the more loyal I become</td>
<td>Fullerton (2005)</td>
</tr>
<tr>
<td>COM05</td>
<td></td>
<td>I remain committed to Medical Devices brands even through price increases and declining popularity</td>
<td>Foxall (2002)</td>
</tr>
<tr>
<td><strong>Repeat Purchase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPS01</td>
<td></td>
<td>My loyalty towards Medical Devices brands is purely habitual</td>
<td>Gordon (2003)</td>
</tr>
<tr>
<td>RPS02</td>
<td></td>
<td>I do not necessarily purchase the same Medical Devices brands all the time</td>
<td>Moolla &amp; Bischoff (2012)</td>
</tr>
<tr>
<td>RPS03</td>
<td></td>
<td>I always sample new Medical Devices brands as soon as they are available</td>
<td>East and Hammond (1996)</td>
</tr>
<tr>
<td>RPS04</td>
<td></td>
<td>I establish a Medical Devices brand purchasing pattern and seldom deviate from it</td>
<td>Heskektt (2002)</td>
</tr>
<tr>
<td>RPS05</td>
<td></td>
<td>Loyalty programmes are reason I repeat Medical Devices brand purchases</td>
<td>Sharp et al. (2003)</td>
</tr>
<tr>
<td><strong>Brand Affect</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAF01</td>
<td></td>
<td>I attain a positive emotional response through the usage of a Medical Devices brand</td>
<td>Chaudhuri and Holbrook (2001)</td>
</tr>
<tr>
<td>BAF02</td>
<td></td>
<td>The Medical Devices brands that I am loyal towards makes a difference in my life</td>
<td>Moorman et al. (1992)</td>
</tr>
<tr>
<td>BAF03</td>
<td></td>
<td>I am distressed when I am unable to use/purchase a particular Medical Devices brand</td>
<td>Matzler (2006)</td>
</tr>
<tr>
<td><strong>Brand Relevance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRV01</td>
<td></td>
<td>The Medical Devices brands that I am loyal towards stands for issues that actually matters</td>
<td>Mininnini (2005)</td>
</tr>
<tr>
<td>BRV02</td>
<td></td>
<td>The Medical Devices brands that I am loyal towards has freshness about them and portray positive significance</td>
<td>Henkel, Tomczak, Heitmann &amp; Herrmann (2007)</td>
</tr>
<tr>
<td>BRV03</td>
<td></td>
<td>I know that an Medical Devices brand is relevant through the brand messages communicated</td>
<td>Moore, Fernie &amp; Burt (2008)</td>
</tr>
<tr>
<td>BRV04</td>
<td></td>
<td>The Medical Devices brands that I am loyal towards are constantly updating and improving so as to stay relevant</td>
<td>Moolla &amp; Bischoff (2012)</td>
</tr>
</tbody>
</table>
4.3.2.2 Customer survey

With the options considered, and having taken note of the problems highlighted above, it was decided by the researcher that as a result of the size of the sample, the best way to complete the study would be by conducting a survey through the use of a self-completion questionnaire.

The questionnaire relating to the survey was delivered to the identified sample by email. The email contained an introduction, and an explanation of the reason for conducting the survey. (A sample of the supporting letter is attached and marked Annexure 1.)

The length of the questionnaire was kept to a minimum, in order to improve the response rate. For all the main questions, the Likert scale was used, in order to make the time to complete the survey as short as possible. The estimated time needed to complete the questionnaire was 10 minutes. This is not excessive, according to the researcher.

4.3.3 The Pilot study

A pilot study relates to a trial run or small-scale version completed in preparation of the main study (van Teijlingen and Hundley, 2001). This is conducted with the aim of refining the design of the study, evaluating the acceptability and the feasibility of the main study (Almirall et al., 2012).
Pilot studies can be based on quantitative and/or qualitative methods; and large-scale studies might engage in numerous pilot studies prior to conducting the main research (Thabane et al., 2010). One of the advantages of a pilot study is that it can give an advance warning in relating to where the main research project could fail, where research protocols may not be followed, or whether the proposed methods or research instruments are inappropriate or too complicated (van Teijlingen and Hundley, 2001).

Conducting a pilot study in advance of the main study can enhance the likelihood of success of the main study (Thabane et al., 2010).

Pilot studies are undertaken for a variety of reasons dependent on the objective of the researcher. Table 5 below highlights the various reasons for conducting a pilot study.

An important feature of a pilot study relates to the fact that the data collected are not used to test a hypothesis (Almirall et al., 2012), but rather the feasibility of the study intended to guide the planning of the large-scale investigation (Thabane et al., 2010).

According to Thabane et al. (2010), the sample for the pilot study should be representative of the entire population. The respondents from the pilot study should also be excluded from the sample of the main study (Peat et al., 2002); as the piloted respondents would have been familiar with the research instrument (van Teijlingen and Hundley, 2001).
TABLE 5: REASONS FOR CONDUCTING PILOT STUDIES

- Developing and testing adequacy of the research instrument
- Assessing the feasibility of a (full-scale) study / survey
- Designing a research protocol
- Assessing whether the research protocol is realistic and workable
- Establishing whether the sampling frame and technique are effective
- Assessing the likely success of the proposed recruitment approaches
- Identifying logistical problems which might occur when using proposed methods
- Estimating variability in outcomes to help determine an appropriate sample size
- Collecting preliminary data
- Determining what resources (finance, staff) are needed for a planned study
- Assessing the proposed data analysis techniques to uncover potential problems
- Developing a research question and research plan
- Training a researcher in as many elements of the research process as possible
- Convincing funding bodies that the research team is competent and knowledgeable
- Convincing funding bodies that the main study is feasible and worth funding
- Convincing other stakeholders that the main study is worth supporting

Source: van Teijlingen and Hundley, 2001

For this study, the main objective of the pilot study was to assess the feasibility of the research instrument. Ten respondents were selected for the pilot study, with an equal representation of the private and public sector health-care industry. The questionnaire was distributed to the pilot respondents by means of the electronic questionnaire hosted on the web-based questionnaire service: survey-monkey. The pilot study focus areas, the objectives assessed, and the feedback obtained, are highlighted in Table 6 below.
### TABLE 6: PILOT STUDY OBJECTIVES AND FEEDBACK

<table>
<thead>
<tr>
<th>Focus</th>
<th>Pilot study objectives</th>
<th>Feedback and Recommendations</th>
</tr>
</thead>
</table>
| Instructions and cover page| Are the instructions clear and concise?                                                      | • The cover page contained clear objectives of the study and was considered to be clear and concise.  
• Inclusion of the contact details made it easy for the respondents to address their queries. Queries received related to the relevance of the ethnicity of the respondent. The research instrument was amended to include “other” to cater for the concern noted. |
| Layout                     | Is the layout of the questionnaire appropriate and user-friendly?                           | • Generally, the layout of the questionnaire was considered appropriate. The fact that the questionnaire on the online survey tool, survey-monkey, was limited to 2 pages made it easier for the respondents. |
| Length                     | Is the length of the survey acceptable to the respondent – especially in terms of time taken to complete the survey? | • The average time taken for the respondents to complete the questionnaire was 8 minutes, despite the fact that the questionnaire consisted of 50 questions, which was considered acceptable to the respondents. This was critically important for the respondents, given that they do not have time to complete surveys due to the nature of their profession. |
| Content                    | Is the content of the questions appropriate and relevant to the research?                   | • It was established that the questions were appropriate and relevant to the research and would be able to provide adequate information to statistically analyze the study.  
• Recommendations were received to include an additional demographic variable to indicate whether the respondent was a “General Practitioner” or a “Specialist” in his/her field of Medicine. |
| Questions                  | Are the questions clear or ambiguous?                                                      | • It was established that the questions were clear, and no ambiguity was reported. The consensus was that the questions were in simple English that could be easily understood. |
4.3.4 The data collection

The questionnaire relating to this survey was distributed to the identified sample electronically via email. This method of delivery was preferred; since it guaranteed that the questionnaire would be delivered in an efficient manner to the chosen respondents. The participants would not be contacted prior to sending the questionnaire.

The email correspondence to the respondents included an introduction and an explanation of the purpose of the study. A link to the electronic questionnaire hosted on web-based questionnaire service, survey-monkey was included in the e-mail correspondence. This selected method of data collection provided the responses to the survey in a comma-delimited file, which enabled the data analysis.

4.3.5 The data analysis

The responses obtained from the electronic questionnaire were submitted to the Nelson Mandela Metropolitan University (NMMU) Unit for Statistical Consultation. The data analysis for this study is to be conducted through the use of the Statistica software.

The existence of patterns within the data collected were determined through the use of descriptive statistics; this comprised statistics used to summarise the data. It was envisaged that statistical analysis would be used to calculate and determine the dispersion of the measures within the sample; it would also be used to measure the central tendency and the frequency distribution.

Thereafter, the research hypotheses were assessed; and an inferential statistical analysis was conducted. The inferential statistics allowed for conclusions to be inferred for the study population, based on the sample selected for the study. Based on both the descriptive and inferential statistics, conclusions were drawn for the primary and secondary research objectives of the study.

4.3.6 Validity of the measuring instrument

Validity is concerned with the extent to which the research findings accurately represent what is happening in the situation: in other words, whether the data collected represent a true picture of what is being studied (Collis and Hussey, 2009).
According to Switzer et al. (1999), three broad types of validity are central to any validity argument, namely: content validity, criterion validity and construct validity. These three types of validity are discussed in more detail below.

4.3.6.1 Content validity

Content validity concerns the extent to which the items in a measure accurately reflect the full breadth of the construct of interest (Switzer et al., 1999). It addresses the match between the questions and the content they were intended to assess (Collis and Hussey, 2009). In assessing content validity for surveys and tests, each question is given to a panel of expert analysts; and they rate the question, giving their opinion on whether the question is essential, useful or irrelevant to measuring the construct under study.

Based on the results, the survey or test is modified to improve the validity thereof (Shuttleworth, 2009a).

4.3.6.2 Criterion validity

Criterion validity, also known as correlational validity, is the extent to which the measure correlates with a “gold standard” of the intended construct. The “gold standard” can be another accepted measure of the same construct. Criterion validity is typically established by examining the correlation of each item with the criterion score. Low correlations suggest that particular items, or the scale as a whole, may not adequately measure the intended construct (Switzer et al., 1999).

4.3.6.3 Construct validity

According to Switzer et al. (1999), construct validity requires that an instrument be:

- Viewed as measuring an underlying construct; and
- Tested to see whether its hypothesized or theoretical relationships with other variables can be established.

Construct validity is valuable in the social sciences, where there is a lot of subjectivity of concepts (Shuttleworth, 2009c); but, it has, for the purposes of this study, not been assessed.
The validity of the instrument was assessed using an exploratory-factor analysis of the independent variables.

In this study, the exploratory factor analyses – a Varimax rotation of the original factor matrix was used – and the Principal Component Analysis was utilised as the technique for factor extraction. In the factor analysis of the independent variables, the extraction of 12 factors was specified. These 12 factors included: culture, brand trust, customer satisfaction, repeat purchase, switching costs, involvement, brand affect, relationship proneness, brand performance, commitment, brand relevance and perceived value.

It was proposed that each of the 12 variables is a distinct and separate construct; but that their "separateness and distinctiveness " should be empirically verified. Factor analysis was used to determine the interrelationships among variables in this study. Factor loadings of 0.40 are regarded as satisfactory (Bisschoff and Kade, 2010; Field, 2005).

4.3.7 Reliability of the measuring instrument

Reliability is concerned with the findings of the research. The findings can be said to be reliable if the research is repeated; and the same result is then obtained (Collis and Hussey, 2009). In research, the term ‘reliability’ means the “repeatability” or “consistency”. A measure is considered reliable if it would give the same result over and over again; assuming that what is being measured is not changing (Trochim, 2006). Collis and Hussey (2009) state that reliability can be tested in one of three ways, namely:

- The “Test Re-Test method” utilised to determine if consistent results are obtained when a specific measuring instrument is used more than once;
- The “Split-halves method”, which gives equal weighting to the questionnaire or interview, and the results are reconciled accordingly; and
- The “internal-consistency method”, which is used to determine the similar nature of all conclusions by comparison of the items.

In this study, the “the internal-consistency method", in the form of the Cronbach alpha coefficient, was used to determine the reliability of the measuring instrument and scales.
When a Likert scale is used to respond to a questionnaire, the ideal measuring tool for reliability is the Cronbach-alpha coefficient (Cook, 2009). Zikmund et al. (2010) suggest that a Cronbach alpha of 0.60 indicates fair reliability; while 0.70 indicates good reliability.

4.4 SUMMARY

This study has addressed the primary research objective to measure brand loyalty in the South African medical-device industry.

A primarily quantitative approach was followed; as this would allow for the gathering of information with brand loyalty in the medical-device industry of South Africa, and the key behavioural or attitudinal factors that drive loyalty. A research instrument was developed, based on Moolla’s brand-loyalty framework instrument used to measure brand loyalty in FMCG. A pilot study was conducted, which confirmed the feasibility of the research and the research instrument to be used for the study.

The primary data were gathered by means of questionnaires, which were tested for both validity and reliability – so as to ensure that the findings, to be discussed in Chapter 6, could be relied on.
CHAPTER 5

5. EMPIRICAL RESULTS

5.1 INTRODUCTION

The literature review identified 12 factors that have an influence on brand loyalty. These factors relate to customer satisfaction, switching costs, brand trust, repeat purchase, involvement, commitment, relationship proneness, brand affect, brand relevance, brand performance and culture. The literature further highlighted a conceptual framework to measure brand loyalty, on which the research instrument for the study was formulated.

Chapter 4 described the research design and methodology to be followed to conduct this study. The chapter further identified the statistical methods and analyses to be employed during the empirical phase of this study, based on the data collected using the research instrument.

The purpose of this chapter is to analyse and report the results of the empirical study on the following research objectives:

- Whether Moolla’s brand loyalty model can be applied to measure brand loyalty for medicine in the pharmaceutical industry;
- The key influential factors of brand loyalty in the consumer’s choice of medical devices;
- The influence of price on brand loyalty;
- Whether a significant relationship exists between brand loyalty and the repurchasing for consumers of medical devices;
- Whether there are significant differences in the brand loyalty factors between age groups, health-care sector, gender profile and medical specialisation.

This chapter presents the results of the empirical study, namely: to validate the research instrument; and then, by means of the validated questionnaire, to analyse the data on brand loyalty in the South African medical-device industry.
More specifically, this chapter reports on the demographic analysis; the statistical analysis to validate the questionnaire, which includes factor analysis and Cronbach-Alpha coefficients; and the empirical measurement of the brand-loyalty factors, which is performed by means of descriptive statistics and the analysis of the results. The chapter will present the brand-loyalty framework adopted for the medical-device industry of South Africa.

5.2 THE EMPIRICAL RESULTS

The empirical results are presented in two distinct sections, namely: descriptive and quantitative analysis. The demographic profile of the respondents will be provided. This will followed by the quantitative analysis of the data. The quantitative analysis will include the results on the validity of the research instruments, the reliability of the results obtained, the importance of the research variables, and a summary of the mean values.

5.2.1 Response rate of target samples

The sample for this study consisted of medical practitioners across the public and the private sector health-care system of South Africa. A total number of 250 questionnaires were distributed in a direct approach to the identified sample; and this was done electronically via email. A link to the electronic questionnaire hosted on web-based questionnaire service, survey-monkey, was included in the e-mail correspondence.

A total of 97 survey responses were received, of which 88 were completed and could be used in the analysis of the results. This represented a 35.2% response rate and the data collected from these responses were considered to be sufficient to perform the required statistical analysis.

5.2.2 The demographic profile

The demographic profile of the survey respondents is represented in Figures 10 to 15. The respondents were classified, according to their age, gender, health-care sector in which they were working, geographic location, ethnicity, and their medical specialisation.
As shown in Figure 10, 90.8% of the respondents were between 31 and 60 years of age. The majority of the respondents were aged between 50 and 60 years, with a 33% representation; this was followed closely by the respondents between the ages of 41 to 50 years, with a 32% representation; and this was followed by 25.5% of the respondents between 31 and 40 years of age.
Figure 11 shows that 57.7% of the respondents were males and 42.3% of the respondents were females. The split between the gender groups displays a good representation of both gender groups in South Africa.

**FIGURE 12: HEALTH-CARE SECTOR OF RESPONDENTS**

![Healthcare Sector of respondents](image)

As shown in Figure 12, 67% were operating in the Private Sector, with 21.6% operating in the Public Sector system, and 11.3% providing their services across both sectors of the South African health-care system.

**FIGURE 13: GEOGRAPHIC DISTRIBUTION OF RESPONDENTS**

![Geographic distribution of respondents](image)
The geographic distribution of the respondents is highlighted in Figure 13 above. The respondents were a representation across the 9 South African provinces. The majority of the respondents were from Gauteng – at 46.4% representation; 11.3% were from the Western Cape; 15.5% from the Eastern Cape; 10.3% from the Free state province; with the remaining provinces’ representation ranging between 1% and 6.2%.

**FIGURE 14: ETHNICITY PROFILE OF RESPONDENTS**

As shown in Figure 14, the majority of the respondents were Whites (58.8%), followed by the other ethnic groups: Blacks (37.1%), Asians (1.0%), Indians (1%) and Others (2.1%).

As shown in Figure 15, most of the respondents were General Practitioners at 57.7% representation; and the remainder of the 42.3% were Specialists in the medical fraternity file.

In a summary of the demographic profile of the respondents, it is clear that these were mostly representative of the respondents between 50 and 60 years of age, female gender, providing services in the Private Sector system of the health-care system, residing in the province of Gauteng, White, and Medical Practitioners in their chosen field of medicine.
5.2.3 Quantitative analysis

5.2.3.1 Validity of research instruments

5.2.3.1.1 Customer Satisfaction (CUS)

The customer satisfaction analysis is summarised in Table 7 below.

**TABLE 7: FACTOR ANALYSIS OF CUSTOMER SATISFACTION**

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUS01</td>
<td>I am very satisfied with the listed Medical-Device brands I purchase</td>
<td>0.62</td>
<td>0.70</td>
</tr>
<tr>
<td>CUS02</td>
<td>Distinctive product attributes in Medical-Device keep me brand loyal</td>
<td>0.69</td>
<td>0.68</td>
</tr>
<tr>
<td>CUS03</td>
<td>My loyalty towards a particular Medical-Device brand increases when I am satisfied about that brand</td>
<td>0.63</td>
<td>0.70</td>
</tr>
<tr>
<td>CUS04</td>
<td>I do not repeat a purchase if I am dissatisfied about a particular Medical-Device brand</td>
<td>0.22</td>
<td>0.82</td>
</tr>
<tr>
<td>CUS05</td>
<td>I obtain pleasure from the Medical-Device brands I am loyal towards</td>
<td>0.62</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Cronbach Alpha 0.77
The research questions for the customer-satisfaction variable relate to one factor, as indicated by the factor analysis of the influence of customer satisfaction. The factor loadings of CUS01, CUS02, CUS03, CUS04 and CUS05 are above the required minimum of 0.4; and they are therefore adequate to measure the customer-satisfaction variable. The factors indicate a good reliability, as their respective Cronbach Alpha coefficient exceeds 0.7.

5.2.3.1.2 Switching Costs/Risk Aversion (SCR)

The switching costs / risk aversion analysis is summarised in Table 8 below.

TABLE 8: FACTOR ANALYSIS OF SWITCHING COSTS / RISK AVERSION

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCR01</td>
<td>I do not switch Medical-Device brands because of the high cost implications</td>
<td>0.41</td>
<td>0.38</td>
</tr>
<tr>
<td>SCR02</td>
<td>I do not switch Medical-Device brands because of the effort required to reach a level of comfort</td>
<td>0.57</td>
<td>0.19</td>
</tr>
<tr>
<td>SCR04</td>
<td>I switch Medical-Device brands, according to the prevailing economic conditions</td>
<td>0.14</td>
<td>0.60</td>
</tr>
<tr>
<td>SCR05</td>
<td>I prefer not to switch Medical-Devices brands, as I stand to lose out on the benefits from loyalty programmes</td>
<td>0.20</td>
<td>0.55</td>
</tr>
</tbody>
</table>

The research questions for the switching costs / risk aversion variable relate to one factor, as indicated by the factor analysis of the influence of switching costs / risk aversion. The factor loadings of SCR03, SCR04 and SCR05, are below the required minimum of 0.4; and they are, therefore, inadequate for measuring the switching costs / risk aversion variable. SCR03 and SCR04 were subsequently omitted from the analysis, due to the Cronbach Alpha coefficient of below 0.6 – if included this would result in poor reliability.

With the omission of SCR03 and SCR04, the remaining factors indicate a fair reliability, as the resulting Cronbach Alpha coefficient is 0.6.
5.2.3.1.3 Brand Trust (BTS)

The brand trust analysis is summarised in Table 9 below.

The research questions for the brand-trust variable relate to one factor, as indicated by the factor analysis of the influence of brand trust. The factor loadings of BTS01, BTS02, BTS03 and BTS04 are above the required minimum of 0.4; and they are, therefore, adequate to measure the brand-trust variable. The factors indicate a good reliability, as their respective Cronbach Alpha coefficient exceeds 0.7.

**TABLE 9: FACTOR ANALYSIS OF BRAND TRUST**

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTS01</td>
<td>I trust the Medical-Device brands I am loyal towards</td>
<td>0.89</td>
<td>0.90</td>
</tr>
<tr>
<td>BTS02</td>
<td>I have confidence in the Medical Devices that I am loyal to</td>
<td>0.90</td>
<td>0.90</td>
</tr>
<tr>
<td>BTS03</td>
<td>The Medical-Device brands I purchase have consistently high quality</td>
<td>0.85</td>
<td>0.91</td>
</tr>
<tr>
<td>BTS04</td>
<td>The reputation of a Medical-Device brand is a key factor in my maintaining brand loyalty</td>
<td>0.78</td>
<td>0.94</td>
</tr>
<tr>
<td>Cronbach Alpha</td>
<td></td>
<td></td>
<td>0.93</td>
</tr>
</tbody>
</table>

5.2.3.1.4 Relationship Proneness (RPR)

The relationship proneness analysis is summarised in Table 10 below.

The research questions for the relationship-proneness variable relate to one factor, as indicated by the factor analysis of the influence of relationship proneness. The factor loadings of RPR01, RPR02, RPR03 and RPR04 are above the required minimum of 0.4; and they are, therefore, adequate for measuring the relationship-proneness variable. These factors indicate a good reliability, as their respective Cronbach Alpha coefficient exceeds 0.7.
### TABLE 10: FACTOR ANALYSIS OF RELATIONSHIP PRONENESS

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPR01</td>
<td>I prefer to maintain a long term relationship with a Medical-Device brand</td>
<td>0.68</td>
<td>0.88</td>
</tr>
<tr>
<td>RPR02</td>
<td>I maintain a relationship with a Medical-Device brand in keeping with my personality</td>
<td>0.80</td>
<td>0.83</td>
</tr>
<tr>
<td>RPR03</td>
<td>I maintain a relationship with a Medical-Device brand that focuses and communicates with me</td>
<td>0.78</td>
<td>0.84</td>
</tr>
<tr>
<td>RPR04</td>
<td>I have a passionate and emotional relationship with the Medical-Device brands to which I am loyal</td>
<td>0.82</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td><strong>Cronbach Alpha</strong></td>
<td><strong>0.88</strong></td>
<td></td>
</tr>
</tbody>
</table>

5.2.3.1.5 Involvement (INV)

The involvement analysis is summarised in Table 11 below.

### TABLE 11: FACTOR ANALYSIS OF INVOLVEMENT

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>INV01</td>
<td>Loyalty towards a Medical-Device brand increases the more I am involved therewith</td>
<td>0.75</td>
<td>0.77</td>
</tr>
<tr>
<td>INV02</td>
<td>Involvement with a Medical-Device brand intensifies my arousal and interest towards that brand</td>
<td>0.76</td>
<td>0.77</td>
</tr>
<tr>
<td>INV03</td>
<td>I consider other Medical-Device brands when my involvement with my Medical-Device brand diminishes</td>
<td>0.53</td>
<td>0.86</td>
</tr>
<tr>
<td>INV04</td>
<td>My choice of a Medical-Device brand is influenced by the involvement others have with their Medical-Device brand</td>
<td>0.71</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td><strong>Cronbach Alpha</strong></td>
<td><strong>0.84</strong></td>
<td></td>
</tr>
</tbody>
</table>

The research questions for the involvement variable relate to one factor, as indicated by the factor analysis of the influence of involvement. The factor loadings of INV01, INV02, INV03 and INV04 are above the required minimum of 0.4; and they are, therefore, adequate to measure the involvement variable. These factors indicate a good reliability, as their respective Cronbach Alpha coefficient exceeds 0.7.
5.2.3.1.6 Perceived Value (PVL)

The perceived value analysis is summarised in Table 12 below.

**TABLE 12: FACTOR ANALYSIS OF PERCEIVED VALUE**

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVL01</td>
<td>My Medical-Device brand loyalty is based on product quality and expected performance</td>
<td>0.12</td>
<td>0.40</td>
</tr>
<tr>
<td>PVL02</td>
<td>I have an emotional attachment with the Medical-Device brands to which I am loyal</td>
<td>0.17</td>
<td>0.35</td>
</tr>
<tr>
<td>PVL03</td>
<td>Price-worthiness is a key influence in my loyalty towards Medical-Device brands</td>
<td>0.03</td>
<td>0.44</td>
</tr>
<tr>
<td>PVL04</td>
<td>The Medical-Device brands to which I am loyal enhances my social self-concept</td>
<td>0.51</td>
<td>0.00</td>
</tr>
<tr>
<td>Cronbach Alpha</td>
<td></td>
<td></td>
<td>0.38</td>
</tr>
</tbody>
</table>

The research questions for perceived value variable relate to one factor, as indicated by the factor analysis of the influence of perceived value. The factor loadings of PVL01, PVL02 and PVL03, are below the required minimum of 0.4; and they are, therefore, inadequate to measure the perceived value variable. The Cronbach Alpha coefficient of the factors is 0.38, thereby indicating a poor reliability. The resultant Cronbach Alpha coefficient indicates that the instrument to measure perceived value is of poor reliability.

5.2.3.1.7 Commitment (COM)

The commitment analysis is summarised in Table 13 below.

The research questions for commitment variable relate to one factor, as indicated by the factor analysis of the influence of commitment. The factor loading of COM02 is below the required minimum of 0.4; and it is, therefore, inadequate to measure the commitment variable. However, COM02 was not subsequently omitted from the analysis due to the Cronbach Alpha coefficient of all factors exceeding 0.7 – thus indicating a good reliability factor.
TABLE 13: FACTOR ANALYSIS OF COMMITMENT

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM01</td>
<td>I have pledged my loyalty to particular Medical-Device brands</td>
<td>0.57</td>
<td>0.65</td>
</tr>
<tr>
<td>COM02</td>
<td>I do not purchase/sample other Medical-Device brands if my Medical-Device brand is unavailable</td>
<td>0.22</td>
<td>0.78</td>
</tr>
<tr>
<td>COM03</td>
<td>I identify with the Medical-Device brands that I consume and feel as part of the brand community</td>
<td>0.63</td>
<td>0.64</td>
</tr>
<tr>
<td>COM04</td>
<td>The more I become committed to a Medical-Device brand, the more loyal I become</td>
<td>0.57</td>
<td>0.66</td>
</tr>
<tr>
<td>COM05</td>
<td>I remain committed to Medical-Device brands even through price increases and declining popularity</td>
<td>0.52</td>
<td>0.68</td>
</tr>
<tr>
<td>Cronbach Alpha</td>
<td></td>
<td>0.73</td>
<td></td>
</tr>
</tbody>
</table>

Cronbach Alpha

5.2.3.1.8 Repeat Purchase (RPS)

The repeat purchase analysis is summarised in Table 14 below.

TABLE 14: FACTOR ANALYSIS OF REPEAT PURCHASE

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPS01</td>
<td>My loyalty towards Medical-Device brands is purely habitual</td>
<td>0.37</td>
<td>0.32</td>
</tr>
<tr>
<td>RPS02</td>
<td>I do not necessarily purchase the same Medical-Device brands all the time</td>
<td>0.41</td>
<td>0.30</td>
</tr>
<tr>
<td>RPS03</td>
<td>I always sample new Medical-Device brands, as soon as they are available</td>
<td>0.22</td>
<td>0.44</td>
</tr>
<tr>
<td>RPS04</td>
<td>I establish a Medical-Device brand-purchasing pattern and seldom deviate from it</td>
<td>0.30</td>
<td>0.38</td>
</tr>
<tr>
<td>RPS05</td>
<td>Loyalty programmes are the reason I repeat Medical-Device brand purchases</td>
<td>0.00</td>
<td>0.57</td>
</tr>
<tr>
<td>Cronbach Alpha</td>
<td></td>
<td>0.47</td>
<td></td>
</tr>
</tbody>
</table>

The research questions for the repeat-purchase variable relate to one factor, as indicated by the factor analysis of the influence of repeat purchasing. The factor loadings of RPS01, RPS03, RPS04 and RPS05 are below the required minimum of 0.4; and they are, therefore, inadequate to measure the repeat-purchase variable.
RPS05 was subsequently omitted from the analysis, due to the Cronbach Alpha coefficient of below 0.6 – if included, this would have resulted in poor reliability. With the omission of RPS05, the remaining factors indicate a fair reliability; as the resulting Cronbach Alpha coefficient was 0.57.

5.2.3.1.9 Brand Affect (BAF)

The repeat-purchase analysis is summarised in Table 15 below.

The research questions for the brand-affect variable relate to one factor, as indicated by the factor analysis of the influence of brand affect. The factor loadings of BAF01, BAF02 and BAF03 are above the required minimum of 0.4; and they are, therefore, adequate to measure the brand-affect variable. The factors indicate a good reliability, as their respective Cronbach Alpha coefficient exceeds 0.7.

TABLE 15: FACTOR ANALYSIS OF BRAND AFFECT

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAF01</td>
<td>I attain a positive emotional response through the usage of a Medical-Device brand</td>
<td>0.70</td>
<td>0.81</td>
</tr>
<tr>
<td>BAF02</td>
<td>The Medical-Device brands to which I am loyal make a difference in my life</td>
<td>0.75</td>
<td>0.76</td>
</tr>
<tr>
<td>BAF03</td>
<td>I am distressed when I am unable to use/purchase a particular Medical-Device brand</td>
<td>0.72</td>
<td>0.79</td>
</tr>
<tr>
<td>Cronbach Alpha</td>
<td></td>
<td></td>
<td>0.85</td>
</tr>
</tbody>
</table>

5.2.3.1.10 Brand Relevance (BRV)

The brand relevance analysis is summarised in Table 16 below.

The research questions for the brand relevance variable relate to one factor, as indicated by the factor analysis of the influence of brand relevance. The factor loading of BRV03 is below the required minimum of 0.4; and it is, therefore, not adequate to measure the brand relevance variable. However, BRV03 was not subsequently omitted from the analysis, because the Cronbach Alpha coefficient of all factors exceeded 0.69, thus indicating a fair reliability factor.
TABLE 16: FACTOR ANALYSIS OF BRAND RELEVANCE

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRV01</td>
<td>The Medical-Device brands to which I am loyal stand for issues that actually matter</td>
<td>0.56</td>
<td>0.56</td>
</tr>
<tr>
<td>BRV02</td>
<td>The Medical-Device brands to which I am loyal have freshness about them and portray positive significance</td>
<td>0.58</td>
<td>0.56</td>
</tr>
<tr>
<td>BRV03</td>
<td>I know that a Medical-Device brand is relevant through the brand messages communicated.</td>
<td>0.32</td>
<td>0.72</td>
</tr>
<tr>
<td>BRV04</td>
<td>The Medical-Device brands that I am loyal towards are constantly updating and improving, in order to stay relevant</td>
<td>0.45</td>
<td>0.64</td>
</tr>
<tr>
<td>Cronbach Alpha</td>
<td></td>
<td><strong>0.69</strong></td>
<td></td>
</tr>
</tbody>
</table>

The research questions for the brand-performance variable relate to one factor, as indicated by the factor analysis of the influence of brand performance. The factor loading of BPF02 is below the required minimum of 0.4; and it is, therefore, not adequate to measure the brand relevance variable. BPF02 was subsequently omitted from the analysis – due to the Cronbach Alpha coefficient of below 0.6. With the omission of BPF02, the remaining factors indicate a fair reliability, as the resulting Cronbach Alpha coefficient is 0.72.

5.2.3.1.11 Brand Performance (BPF)

The brand performance analysis is summarised in Table 17 below.

TABLE 17: FACTOR ANALYSIS OF BRAND PERFORMANCE

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPF01</td>
<td>I evaluate a Medical-Device brand based on its perceived performance</td>
<td>0.58</td>
<td>0.07</td>
</tr>
<tr>
<td>BPF02</td>
<td>I will switch Medical-Device brand loyalty should a better performing Medical-Device brand be available</td>
<td>0.11</td>
<td>0.72</td>
</tr>
<tr>
<td>BPF03</td>
<td>I am loyal only towards the top-performing Medical-Device brands</td>
<td>0.48</td>
<td>0.24</td>
</tr>
<tr>
<td>Cronbach Alpha</td>
<td></td>
<td><strong>0.55</strong></td>
<td></td>
</tr>
</tbody>
</table>
The culture analysis is summarised in Table 18 below.

### TABLE 18: FACTOR ANALYSIS OF CULTURE

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>FACTOR</th>
<th>Cronbach Alpha if deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUL01</td>
<td>My choice of Medical-Device brands is in keeping with the choice made by other members in my racial group</td>
<td>0.47</td>
<td>0.80</td>
</tr>
<tr>
<td>CUL02</td>
<td>My loyalty towards a Medical-Device brand is based on the choice of Medical-Device brand used by my family</td>
<td>0.71</td>
<td>0.67</td>
</tr>
<tr>
<td>CUL03</td>
<td>Religion plays a role in my choice and loyalty of Medical-Device brands</td>
<td>0.63</td>
<td>0.73</td>
</tr>
<tr>
<td>CUL04</td>
<td>Family-used Medical-Device brands indirectly assure brand security and trust.</td>
<td>0.61</td>
<td>0.73</td>
</tr>
</tbody>
</table>

The research questions for the culture variable relate to one factor, as indicated by the factor analysis of the influence of culture. The factor loadings of CUL01, CUL02, CUL03 and CUL04 are above the required minimum of 0.4; and they are, therefore, adequate to measure the culture variable. The factors indicate a good reliability, as their respective Cronbach Alpha coefficient exceeds 0.7.

### 5.3 RELIABILITY OF RESEARCH INSTRUMENT

Reliability is concerned with the findings of the research. The findings can be said to be reliable if the research is repeated, and the same result is again obtained (Collis and Hussey, 2009). In research, the term reliability means “repeatability” or “consistency”. A measure is considered reliable if it would give the same result over and over again; assuming that what is being measured is not changing (Trochim, 2006).

In this study, the “the internal consistency method” in the form of Cronbach alpha coefficient was used to determine the reliability of the measuring instrument and scales.
Table 19 below summarises the reliability of the factors of brand loyalty in the medical-device industry of South Africa. The table highlights the item code, the factor description, the Cronbach Alpha coefficient and the number of items per influence.

As seen in Table 19 below, the majority of the factors had a Cronbach Alpha coefficient of 0.6 and above. According to Zikmund et al. (2010), a Cronbach alpha of 0.60 indicates fair reliability; while 0.70 indicates good reliability. Therefore; it can be concluded that all factors with Cronbach Alpha coefficients above 0.7 indicate good reliability, and those above 0.6 indicate fair reliability in measuring brand loyalty.

Based on the results of the Cronbach Alpha coefficients, the following conclusions can be made in relation to the measurement of brand loyalty in the medical-device industry of South Africa:

- Customer satisfaction, brand trust, relationship proneness, involvement, commitment, brand affect, brand performance and culture had Cronbach Alpha coefficient values of higher than 0.7; and consequently, they indicate good reliability in measuring brand loyalty.
- Switching costs / risk aversion and brand relevance had Cronbach Alpha coefficient values higher than 0.6, but lower than 0.7; and they, therefore, indicate a fair reliability, and are thus acceptable for measuring brand loyalty.
- Perceived value and repeat purchase had Cronbach Alpha coefficient values lower than 0.6; and they could, therefore, indicate poor reliability in measuring brand loyalty.
### TABLE 19: RELIABILITY OF INFLUENCES AND THEIR FACTORS

<table>
<thead>
<tr>
<th>CODE</th>
<th>Factor Description</th>
<th>QUESTIONS</th>
<th>Initial Cronbach Alpha</th>
<th>Items deleted</th>
<th>Final Cronbach Alpha</th>
<th>Number of items in analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUS</td>
<td>Customer Satisfaction</td>
<td>ALL</td>
<td>0.77</td>
<td>None</td>
<td>0.77</td>
<td>5</td>
</tr>
<tr>
<td>SCR</td>
<td>Switching Costs / Risk Aversion</td>
<td>ALL</td>
<td>0.37</td>
<td>SCR03, SCR04</td>
<td>0.60</td>
<td>3</td>
</tr>
<tr>
<td>BTS</td>
<td>Brand Trust</td>
<td>ALL</td>
<td>0.93</td>
<td>None</td>
<td>0.93</td>
<td>4</td>
</tr>
<tr>
<td>RPR</td>
<td>Relationship proneness</td>
<td>ALL</td>
<td>0.88</td>
<td>None</td>
<td>0.88</td>
<td>4</td>
</tr>
<tr>
<td>INV</td>
<td>Involvement</td>
<td>ALL</td>
<td>0.84</td>
<td>None</td>
<td>0.84</td>
<td>4</td>
</tr>
<tr>
<td>PVL</td>
<td>Perceived Value</td>
<td>ALL</td>
<td>0.38</td>
<td>None</td>
<td>0.38</td>
<td>4</td>
</tr>
<tr>
<td>COM</td>
<td>Commitment</td>
<td>ALL</td>
<td>0.73</td>
<td>None</td>
<td>0.73</td>
<td>5</td>
</tr>
<tr>
<td>RPS</td>
<td>Repeat Purchase</td>
<td>ALL</td>
<td>0.47</td>
<td>RPS05</td>
<td>0.57</td>
<td>4</td>
</tr>
<tr>
<td>BAF</td>
<td>Brand Affect</td>
<td>ALL</td>
<td>0.85</td>
<td>None</td>
<td>0.85</td>
<td>3</td>
</tr>
<tr>
<td>BRV</td>
<td>Brand Relevance</td>
<td>ALL</td>
<td>0.69</td>
<td>None</td>
<td>0.69</td>
<td>4</td>
</tr>
<tr>
<td>BPF</td>
<td>Brand Performance</td>
<td>ALL</td>
<td>0.55</td>
<td>BPF02</td>
<td>0.72</td>
<td>2</td>
</tr>
<tr>
<td>CUL</td>
<td>Culture</td>
<td>ALL</td>
<td>0.79</td>
<td>None</td>
<td>0.79</td>
<td>4</td>
</tr>
</tbody>
</table>

#### 5.4 THE IMPORTANCE OF RESEARCH VARIABLES

Each respondent had to evaluate the scale of the 12 factors of brand loyalty in the medical-device industry of South Africa by using a 5-point Likert scale as the measuring instrument (Moolla and Bischoff, 2012).

The Likert scale ranged from strongly agree to strongly disagree, with the calculated index being according to Table 20 below.
TABLE 20: CALCULATED INDEX OF 5-POINT LIKERT SCALE

<table>
<thead>
<tr>
<th>5-point Likert scale range</th>
<th>Calculated index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
</tr>
<tr>
<td>Neither Disagree Nor Agree</td>
<td>3</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>5</td>
</tr>
</tbody>
</table>

The mean values of the Likert scale are presented in a numerical format to facilitate the interpretation of the results. The mean values were interpreted, according to Table 21 below.

TABLE 21: INTERPRETATION OF MEAN VALUES

<table>
<thead>
<tr>
<th>Mean value Interval</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 - 1.79</td>
<td>Very low importance</td>
</tr>
<tr>
<td>1.80 - 2.59</td>
<td>Low importance</td>
</tr>
<tr>
<td>2.60 - 3.40</td>
<td>Average importance</td>
</tr>
<tr>
<td>3.41 - 4.20</td>
<td>High importance</td>
</tr>
<tr>
<td>4.21 - 5.20</td>
<td>Very high importance</td>
</tr>
</tbody>
</table>

5.4.1 Customer Satisfaction (CUS)

Table 22 depicts the summarised mean value scores for each question measuring the influence of customer satisfaction in the determination of brand loyalty in the medical-device industry of South Africa. The table also represents the importance of each question in the determination of the brand loyalty, to establish the effect of customer satisfaction on brand loyalty across the private and public sector healthcare system.
### TABLE 22: MEAN SCORES OF CUSTOMER SATISFACTION

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUS01</td>
<td>I am very satisfied with the listed medical-device brands I purchase</td>
<td>2%</td>
<td>8%</td>
<td>90%</td>
<td>4.02</td>
</tr>
<tr>
<td>CUS02</td>
<td>Distinctive product attributes in medical devices keep me brand loyal</td>
<td>3%</td>
<td>7%</td>
<td>90%</td>
<td>4.03</td>
</tr>
<tr>
<td>CUS03</td>
<td>My loyalty towards a particular medical-device brand increases when I am satisfied with that brand</td>
<td>1%</td>
<td>3%</td>
<td>95%</td>
<td>4.27</td>
</tr>
<tr>
<td>CUS04</td>
<td>I do not repeat a purchase if I am dissatisfied with a particular medical-device brand</td>
<td>3%</td>
<td>1%</td>
<td>95%</td>
<td>4.60</td>
</tr>
<tr>
<td>CUS05</td>
<td>I obtain pleasure from the medical-device brands to which I am loyal</td>
<td>6%</td>
<td>11%</td>
<td>83%</td>
<td>4.28</td>
</tr>
</tbody>
</table>

**Mean score average**: 4.24

As many as 90% of the respondents in Table 22 indicated that they were highly satisfied with the brand of medical devices they procure. The distinctive product attributes of the medical devices have an effect on the customer satisfaction, thus keeping 90% of the respondents loyal to their chosen brand. For 95% of the respondents, brand loyalty increases, as a result of satisfaction with the brand; and if dissatisfied, the likelihood of a repeat purchase would be minimized. A total of 83% of the respondents obtain pleasure from the brands to which they are loyal.

The mean values of CUS03, CUS04 and CUS05 are above 4.21; and they range between 4.27 and 4.60, thereby indicating a very high importance in the influence of customer satisfaction towards brand loyalty. CUS01 and CUS02 at mean-value scores of 4.02 and 4.03 respectively, indicate a high level of importance of customer satisfaction factor to brand loyalty.

The mean average of customer satisfaction is 4.24, which is within the very high importance range of between 4.21 and 5.20. This result indicates that customer satisfaction has a significant influence on the development of brand loyalty in the medical-device industry.
5.4.2 Switching Costs/Risk Aversion (SCR)

The mean value scores for the influence of switching costs in the determination of brand loyalty in the medical-device industry of South Africa is depicted in Table 23 below. The table also represents the importance of each question in the determination of the brand loyalty to establish the effect of switching costs on brand loyalty across the private and public sector health-care system.

**TABLE 23: MEAN SCORES OF SWITCHING COSTS / RISK AVERSION**

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCR01</td>
<td>I do not switch medical-device brands because of the high cost implications</td>
<td>68%</td>
<td>14%</td>
<td>18%</td>
<td>2.44</td>
</tr>
<tr>
<td>SCR02</td>
<td>I do not switch medical devices brands because of the effort required to reach a level of comfort</td>
<td>67%</td>
<td>15%</td>
<td>18%</td>
<td>2.15</td>
</tr>
<tr>
<td>SCR05</td>
<td>I prefer not to switch medical-device brands, as I stand to lose out on the benefits from loyalty programmes</td>
<td>85%</td>
<td>9%</td>
<td>6%</td>
<td>1.64</td>
</tr>
</tbody>
</table>

Mean score average: 2.08

A majority of more than two-thirds of the respondents indicated that they would switch between medical-device brands, irrespective of the high cost implications associated with brand switching, and the required effort required to attain a level of comfort with another brand.

As many as 85% of the respondents indicated that the possible loss in loyalty programme benefits would not derail them from switching to another brand of medical devices.

The mean values of SCR01, SCR02 and SCR05 are all in the low importance range in the influence of switching costs on brand loyalty.
The mean average of switching cost is 2.08, which is within the low importance range of between 1.8 and 2.59. This result indicates that switching costs has a low influence on the development of brand loyalty in the medical-device industry.

5.4.3 Brand Trust (BTS)

Table 24 below highlights the mean value scores for the influence of brand trust in the determination of brand loyalty in the medical-device industry of South Africa. The table also represents the importance of each question in the determination of the brand loyalty – to establish the effect of brand trust on brand loyalty across the private and public sector health-care system.

| TABLE 24: MEAN SCORES OF BRAND TRUST |
|-------------------------------|----------------------------------|-------------------|-------------------|---------------------|
| CODE | QUESTION | % Disagree to Strongly Disagree | % Neither Disagree Nor Agree | % Agree to Strongly Agree | Mean value |
| BTS01 | I trust the medical-device brands I am loyal towards | 3% | 5% | 92% | 4.45 |
| BTS02 | I have confidence in the medical devices that I am loyal to | 1% | 8% | 91% | 4.47 |
| BTS03 | The medical-device brands I purchase have consistently high quality | 5% | 3% | 92% | 4.44 |
| BTS04 | The reputation of a Medical-Device brand is a key factor in my maintaining brand loyalty | 3% | 7% | 90% | 4.42 |

Mean score average | 4.45 |

As many as 92% of the respondents trust the medical-device brands to which they are loyal. Customer loyalty is also enhanced by the confidence the Medical Practitioner has developed in using the particular brand, as indicated by 91% of the respondents. A total of 92% of the respondents indicated that the brand trust, and the resultant loyalty, are both enhanced by the consistency of the high quality of the brand. Also important and playing a key factor in the maintenance of brand loyalty for 90% of the respondents is the reputation of a brand.
The mean values of BTS01, BTS02, BTS03 and BTS04 are above 4.21, and range between 4.27 and 4.60, thereby indicating a very high importance in the influence of brand trust towards customer-brand loyalty.

The mean average of brand trust is 4.45, which is within the very high importance range of between 4.21 and 5.20. This result indicates that brand trust has a significant influence on the development of brand loyalty in the medical-device industry.

5.4.4 Relationship Proneness (RPR)

The mean value scores for the influence of relationship proneness in the determination of brand loyalty in the medical-device industry of South Africa is depicted in Table 25 below. The table also represents the importance of each question in the determination of the brand loyalty – to establish the effect of relationship proneness on brand loyalty across the private and public sector healthcare system.

A total of 91% of the respondents in Table 25 indicated that they prefer to maintain long-term relationships with their chosen medical-device brand. A lower proportion at 69% of the respondents maintain the relationship with the medical brand in keeping with their personalities. For 84% of the respondents continuous communication and focus are important. As many as 64% of the respondents feel an emotional connection with the medical brand towards which they are loyal.

The mean values of RPR01 and RPS03 are above 4.21, and range between 4.27 and 4.60, thereby indicating a very high importance in the influence of relationship proneness towards customer-brand loyalty. RPR02 and RPR03 brand loyalty at mean value scores of 3.91 and 3.70, respectively, indicate the high importance of the relationship-proneness factor to brand loyalty.

The mean average of relationship proneness is 4.08, which is within the high importance range of between 3.41 and 4.20. This result indicates that relationship proneness has a significant influence on the development of brand loyalty in the medical-device industry.
TABLE 25: MEAN SCORES OF RELATIONSHIP PRONENESS

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPR01</td>
<td>I prefer to maintain a long-term relationship with a medical-device brand</td>
<td>2%</td>
<td>7%</td>
<td>91%</td>
<td>4.48</td>
</tr>
<tr>
<td>RPR02</td>
<td>I maintain a relationship with a medical-device brand in keeping with my personality</td>
<td>14%</td>
<td>17%</td>
<td>69%</td>
<td>3.91</td>
</tr>
<tr>
<td>RPR03</td>
<td>I maintain a relationship with a medical-device brand that focuses and communicates with me</td>
<td>5%</td>
<td>11%</td>
<td>84%</td>
<td>4.24</td>
</tr>
<tr>
<td>RPR04</td>
<td>I have a passionate and emotional relationship with the medical-device brands I am loyal to</td>
<td>23%</td>
<td>14%</td>
<td>64%</td>
<td>3.70</td>
</tr>
</tbody>
</table>

Mean score average 4.08

5.4.5 Involvement (INV)

Table 26 below highlights the mean value scores for the influence of involvement in the determination of brand loyalty in the medical-device industry of South Africa. The table also represents the importance of each question in the determination of the brand loyalty – to establish the effect of involvement on brand loyalty across the private and public sector health-care system.

Table 26 indicates that 85% of the respondents’ loyalty towards a medical-device brand increases as their involvement with the brand increases. For 70% of the respondents, their choice of medical-device brand is also influenced by the involvement of others with that medical brand. As the involvement with a medical-device brand diminishes, 81% of the respondents then consider alternative brands.

For 76% of the respondents, the involvement with a medical-device brand strengthens their excitement and interest in that particular brand.
TABLE 26: MEAN SCORES OF INVOLVEMENT

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INV01</td>
<td>Loyalty towards a medical-device brand increases the more I am involved with it</td>
<td>5%</td>
<td>10%</td>
<td>85%</td>
<td>4.18</td>
</tr>
<tr>
<td>INV02</td>
<td>Involvement with a medical-device brand intensifies my arousal and interest towards that brand</td>
<td>7%</td>
<td>17%</td>
<td>76%</td>
<td>3.75</td>
</tr>
<tr>
<td>INV03</td>
<td>I consider other medical-device brands when my involvement with my medical-device brand diminishes</td>
<td>8%</td>
<td>11%</td>
<td>81%</td>
<td>3.77</td>
</tr>
<tr>
<td>INV04</td>
<td>My choice of a medical-device brand is influenced by the involvement others have with their medical-device brand</td>
<td>16%</td>
<td>14%</td>
<td>70%</td>
<td>3.61</td>
</tr>
</tbody>
</table>

Mean score average: 3.83

The mean values of INV01, INV02, INV03 and INV04 are above 3.41, and range between 3.41 and 4.20, thereby indicating a high importance of the involvement factor to brand loyalty.

The mean average of involvement is 3.83 is within the high-importance range of between 3.41 and 4.20. This result indicates that involvement has a significant influence in the development of brand loyalty in the medical-device industry.

5.4.6 Perceived Value (PVL)

The mean value scores for the influence of perceived value in the determination of brand loyalty in the medical-device industry of South Africa is depicted in Table 27 below. The table also represents the importance of each question in the determination of the brand loyalty – to establish the effect of perceived value on brand loyalty across the private and public sector health-care system.

As many as 89% of the respondents in Table 27 indicated that their brand loyalty is influenced by the brand quality and its expected performance. An equal representation at 33% of the respondents indicated that they were emotionally attached to the brand they are loyal towards; whilst 34% felt indifferent; and the remaining 33% felt no emotional attachment to the brand to which they are loyal.
Value-for-money is a key influence of brand loyalty for 86% of the respondents. Only 56% of the respondents consider social self-concept as an influence on brand loyalty.

**TABLE 27: MEAN SCORES OF PERCEIVED VALUE**

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVL01</td>
<td>My medical-device brand loyalty is based on product quality and expected performance</td>
<td>6%</td>
<td>6%</td>
<td>89%</td>
<td>4.43</td>
</tr>
<tr>
<td>PVL02</td>
<td>I have an emotional attachment with the medical-device brands I am loyal towards</td>
<td>33%</td>
<td>34%</td>
<td>33%</td>
<td>2.93</td>
</tr>
<tr>
<td>PVL03</td>
<td>Price-worthiness is a key influence in my loyalty towards medical-device brands</td>
<td>2%</td>
<td>11%</td>
<td>86%</td>
<td>3.94</td>
</tr>
<tr>
<td>PVL04</td>
<td>The medical-device brands that I am loyal to enhance my social self-concept</td>
<td>22%</td>
<td>23%</td>
<td>56%</td>
<td>3.26</td>
</tr>
</tbody>
</table>

The mean average of perceived value is 3.64 is within the high importance range of between 3.41 and 4.20. This result indicates that perceived value has a significant influence on the development of brand loyalty in the medical-device industry.
5.4.7 Commitment (COM)

Table 28 below highlights the mean value scores for the influence of commitment in the determination of brand loyalty in the medical-device industry of South Africa. The table also represents the importance of each question in the determination of the brand loyalty – to establish the effect of commitment to brand loyalty across the private and public sector health-care system.

**TABLE 28: MEAN SCORES OF COMMITMENT**

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM01</td>
<td>I have pledged my loyalty to particular medical-device brands</td>
<td>45%</td>
<td>31%</td>
<td>24%</td>
<td>2.57</td>
</tr>
<tr>
<td>COM02</td>
<td>I do not purchase/sample other medical-device brands if my medical-device brand is unavailable</td>
<td>80%</td>
<td>9%</td>
<td>11%</td>
<td>1.85</td>
</tr>
<tr>
<td>COM03</td>
<td>I identify with the medical-device brands that I consume and feel this as being part of the brand community</td>
<td>20%</td>
<td>18%</td>
<td>61%</td>
<td>3.33</td>
</tr>
<tr>
<td>COM04</td>
<td>The more I become committed to a medical-device brand, the more loyal I become</td>
<td>14%</td>
<td>7%</td>
<td>80%</td>
<td>3.60</td>
</tr>
<tr>
<td>COM05</td>
<td>I remain committed to medical-device brands even through price increases and declining popularity</td>
<td>32%</td>
<td>10%</td>
<td>58%</td>
<td>3.22</td>
</tr>
</tbody>
</table>

**Mean score average** 2.91

The mean value of COM04 is above 3.41, and ranges between 3.41 and 4.20, thereby indicating a high importance in the influence of commitment factors towards customer-brand loyalty. COM03 and COM05 are at mean value scores of 3.33 and 3.22, respectively, thereby indicating an average importance of the commitment factors to brand loyalty. COM01 and COM02 are at mean value scores of 2.57 and 1.85, respectively, indicating a low importance of these commitment factors to brand loyalty.
The mean average of perceived value is 2.91, which is within the average importance range of between 2.60 and 3.40. This result indicates that commitment is a neutral influence on the development of brand loyalty in the medical-device industry.

5.4.8 Repeat Purchase (RPS)

The mean value scores for the influence of repeat purchase in the determination of brand loyalty in the medical-device industry of South Africa is depicted in Table 29 below. The table also represents the importance of each question in the determination of the brand loyalty to establish the effect of repeat purchasing on brand loyalty across the private and public sector health-care system.

**TABLE 29: MEAN SCORES OF REPEAT PURCHASE**

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPS01</td>
<td>My loyalty towards the medical-device brands is purely habitual</td>
<td>64%</td>
<td>11%</td>
<td>25%</td>
<td>2.24</td>
</tr>
<tr>
<td>RPS02</td>
<td>I do not necessarily purchase the same medical-device brands all the time</td>
<td>22%</td>
<td>8%</td>
<td>70%</td>
<td>3.49</td>
</tr>
<tr>
<td>RPS03</td>
<td>I always sample new medical-device brands – as soon as they are available</td>
<td>70%</td>
<td>17%</td>
<td>13%</td>
<td>2.33</td>
</tr>
<tr>
<td>RPS04</td>
<td>I establish a medical-device brand purchasing pattern and seldom deviate from it</td>
<td>60%</td>
<td>13%</td>
<td>27%</td>
<td>2.60</td>
</tr>
</tbody>
</table>

Mean score average 2.67

As many as 64% of the respondents in Table 29 indicated that their brand loyalty towards a particular medical-device brand is not driven by habit. A total of 70% of the respondents in their purchases of medical-device brands switch between the brands; while 60% of the respondents establish a buying pattern and rarely procure an alternative medical-device brand.
With innovation driving new product introductions in the medical-device arena, 70% of the respondents do not sample all new medical-device brands immediately after them becoming available in the market.

The mean value of RPS02 is above 3.41, and falls in the range between 3.41 and 4.20, thereby indicating a high importance in the influence of repeat purchase towards customer-brand loyalty. RPS04 is a mean value score of 2.60, thereby indicating an average importance of repeat-purchase factor to brand loyalty. RPS01 and RPS03 are at mean value scores of 2.24 and 2.33, respectively, indicating a low importance of repeat-purchase factor to brand loyalty.

The mean average of perceived value is 2.67, which is within the average importance range of between 2.60 and 3.40. This result indicates that repeat purchases have a neutral influence on the development of brand loyalty in the medical-device industry.

5.4.9 Brand Affect (BAF)

Table 30 below highlights the mean value scores for the influence of brand affect in the determination of brand loyalty in the medical-device industry of South Africa. The table also represents the importance of each question in the determination of the brand loyalty – to establish the effect of brand affect on brand loyalty across the private and public sector health-care system.

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAF01</td>
<td>I get a positive emotional response through the usage of a medical-device brand</td>
<td>25%</td>
<td>19%</td>
<td>56%</td>
<td>3.22</td>
</tr>
<tr>
<td>BAF02</td>
<td>The medical-device brands that I am loyal towards makes a difference in my life</td>
<td>18%</td>
<td>9%</td>
<td>73%</td>
<td>3.60</td>
</tr>
<tr>
<td>BAF03</td>
<td>I am distressed when I am unable to use/purchase a particular medical-device brand</td>
<td>19%</td>
<td>8%</td>
<td>73%</td>
<td>3.91</td>
</tr>
</tbody>
</table>

Mean score average 3.58
Table 30 above indicates that 56% of the respondents emotionally react positively when using a medical-device brand to which they are loyal. As many as 73% of the respondents feel that their chosen medical device brand has an impact on their lives. Thus, 73% of the respondents are anxious when unable to use or procure their preferred medical-device brand.

The mean values of BAF02 and BAF03 are above 3.41, and ranges between 3.41 and 4.20, indicating a high importance in the influence of brand-affect factors towards customer-brand loyalty. BAF01 has a mean value score of 3.22, indicating an average importance of the brand-affect factor on brand loyalty.

The mean average of brand affect is 3.58, which is within the high importance range of between 3.41 and 4.20. This result indicates that brand affect has a significant influence on the development of brand loyalty in the medical-device industry.

5.4.10 Brand Relevance (BRV)

The mean value scores for the influence of brand relevance in the determination of brand loyalty in the medical-device industry of South Africa is depicted in Table 31 below. The table also represents the importance of each question in the determination of the brand loyalty – to establish the effect of brand relevance on brand loyalty across the private and public sector health-care system.

**TABLE 31: MEAN SCORES OF BRAND RELEVANCE**

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRV01</td>
<td>The medical-device brands that I am loyal towards stand for issues that actually matter</td>
<td>9%</td>
<td>14%</td>
<td>77%</td>
<td>4.07</td>
</tr>
<tr>
<td>BRV02</td>
<td>The medical-device brands that I am loyal towards have a freshness about them and portray positive significance</td>
<td>9%</td>
<td>22%</td>
<td>69%</td>
<td>3.70</td>
</tr>
<tr>
<td>BRV03</td>
<td>I know that a medical-device brand is relevant through the brand messages communicated.</td>
<td>16%</td>
<td>41%</td>
<td>43%</td>
<td>3.35</td>
</tr>
<tr>
<td>BRV04</td>
<td>The medical-device brands that I am loyal towards are constantly updating and improving, so as to stay relevant</td>
<td>5%</td>
<td>11%</td>
<td>84%</td>
<td>4.18</td>
</tr>
</tbody>
</table>

**Mean score average** 3.83
As many as 77% of the respondents in Table 31 feel that their chosen brands have a purpose and stand for issues that matter. A total of 69% of the respondents perceive the brands to which they are loyal have freshness and portray positive significance. Only 43% of the respondents measure the relevance of the medical-device brand through communicated brand messaging; whilst 41% of the respondents felt indifferent towards measuring the relevance of the brand through brand communications. A high of 84% of the participants view their chosen brands as innovative and continuously improving and progressing – to ensure that they remain relevant to their consumers.

The mean values of BRV01, BRV02 and BRV04 are above 3.41, and range between 3.70 and 4.18, thereby indicating a high importance in the influence of brand relevance towards customer-brand loyalty. BRV03 has a mean value score of 3.35 – indicating an average importance of brand relevance factor to brand loyalty.

The mean average of perceived value is 3.83, which is within the high importance range of between 3.41 and 4.20. This result indicates that brand relevance has a significant influence on the development of brand loyalty in the medical-device industry.

### 5.4.11 Brand Performance (BPF)

Table 32 below highlights the mean value scores for the influence of brand performance in the determination of brand loyalty in the medical-device industry of South Africa. The table also represents the importance of each question in the determination of the brand loyalty to establish the effect of brand performance on brand loyalty across the private and public sector health-care system.

As many as 86% of the respondents in Table 32 above indicated that the medical-device brand is evaluated on the basis of its perceived performance. A total of 76% of the respondents are loyal towards the top-performing medical-device brand.

The mean values of BPF01 is 4.30, which is above 4.21, thereby indicating a very high importance in the influence of brand performance towards customer-brand loyalty. BPF03 has a mean value score of 4.15, thereby indicating a high importance of brand performance factor to brand loyalty.
TABLE 32: MEAN SCORES OF BRAND PERFORMANCE

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPF01</td>
<td>I evaluate a medical-device brand based on perceived performance</td>
<td>5%</td>
<td>9%</td>
<td>86%</td>
<td>4.30</td>
</tr>
<tr>
<td>BPF03</td>
<td>I am loyal only towards the top-performing medical-device brand</td>
<td>7%</td>
<td>17%</td>
<td>76%</td>
<td>4.15</td>
</tr>
</tbody>
</table>

The mean score average is 4.23.

The mean average of brand performance is 4.23, which is within the very high importance range of between 4.21 and 5.20. This result indicates that brand performance has a significant influence on the development of brand loyalty in the medical-device industry.

5.4.12 Culture (CUL)

The mean value scores for the influence of culture in the determination of brand loyalty in the medical-device industry of South Africa is depicted in Table 33 below. The table also represents the importance of each question in the determination of the brand loyalty to establish the effect of culture on brand loyalty across the private and public sector health-care system.

A high of 86% of the respondents in Table 33 above indicated that their choice of medical-device brand is not influenced by their race-group choices or family. A total of 83% of the respondents do not base their assurance of brand security and trust on family experiences. For 95% of the respondents, religion is not a factor in their purchase decision or brand loyalty.

The mean values of CUL01, CUL02, CUL03 are above 1.00 and range between 1.49 and 1.69, thereby indicating a very low importance in the influence of culture towards customer-brand loyalty. CUL04 has a mean value score of 1.80, indicating a LOW importance of culture factor to brand loyalty.
TABLE 33: MEAN SCORES OF CULTURE

<table>
<thead>
<tr>
<th>CODE</th>
<th>QUESTION</th>
<th>% Disagree to Strongly Disagree</th>
<th>% Neither Disagree Nor Agree</th>
<th>% Agree to Strongly Agree</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUL01</td>
<td>My choice of medical-device brands is in keeping with the choice made by other members in my race group</td>
<td>86%</td>
<td>9%</td>
<td>5%</td>
<td>1.69</td>
</tr>
<tr>
<td>CUL02</td>
<td>My loyalty towards a medical-device brand is based on the choice of the medical-device brand used by my family</td>
<td>86%</td>
<td>9%</td>
<td>5%</td>
<td>1.66</td>
</tr>
<tr>
<td>CUL03</td>
<td>Religion plays a role in my choice and loyalty of a medical-device brand</td>
<td>95%</td>
<td>3%</td>
<td>1%</td>
<td>1.49</td>
</tr>
<tr>
<td>CUL04</td>
<td>Family-used medical-device brands indirectly assure brand security and trust.</td>
<td>83%</td>
<td>10%</td>
<td>7%</td>
<td>1.80</td>
</tr>
</tbody>
</table>

Mean score average: 1.66

The mean average of culture is 1.66, which is within the very low importance range of between 1.00 and 1.79. This result indicates that culture is not a significant influence in the development of brand loyalty in the medical-device industry.

5.5 SUMMARY OF MEAN VALUES

The summary of the mean values of the brand loyalty factors in Table 34 below indicates the following:

- Customer satisfaction, brand trust and brand performance, relationship proneness, involvement, perceived value, brand affect and brand relevance have mean values of greater than 3.41. These influences are indicative of the high importance; and they can, therefore, be seen as significant influences in the development and measurement of brand loyalty in the medical-device industry of South Africa.

- Commitment, repeat purchases, switching costs and culture have mean values of less than 3.41. These influences are indicative of the low to average importance; and they can, therefore, be seen as less significant factors in the development and measurement of brand loyalty in the medical-device industry of South Africa.
### TABLE 34: SUMMARY OF MEAN VALUE OF BRAND-LOYALTY INFLUENCES

<table>
<thead>
<tr>
<th>CODE</th>
<th>Factor Description</th>
<th>QUESTIONS</th>
<th>Initial Mean score</th>
<th>Items deleted</th>
<th>Final Mean score</th>
<th>Number of items in analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUS</td>
<td>Customer Satisfaction</td>
<td>ALL</td>
<td>4.24</td>
<td>None</td>
<td>4.24</td>
<td>5</td>
</tr>
<tr>
<td>SCR</td>
<td>Switching Costs / Risk Aversion</td>
<td>ALL</td>
<td>2.45</td>
<td>SCR03, SCR04</td>
<td>2.08</td>
<td>3</td>
</tr>
<tr>
<td>BTS</td>
<td>Brand Trust</td>
<td>ALL</td>
<td>4.45</td>
<td>None</td>
<td>4.45</td>
<td>4</td>
</tr>
<tr>
<td>RPR</td>
<td>Relationship proneness</td>
<td>ALL</td>
<td>4.08</td>
<td>None</td>
<td>4.08</td>
<td>4</td>
</tr>
<tr>
<td>INV</td>
<td>Involvement</td>
<td>ALL</td>
<td>3.83</td>
<td>None</td>
<td>3.83</td>
<td>4</td>
</tr>
<tr>
<td>PVL</td>
<td>Perceived Value</td>
<td>ALL</td>
<td>3.64</td>
<td>None</td>
<td>3.64</td>
<td>4</td>
</tr>
<tr>
<td>COM</td>
<td>Commitment</td>
<td>ALL</td>
<td>2.91</td>
<td>None</td>
<td>2.91</td>
<td>5</td>
</tr>
<tr>
<td>RPS</td>
<td>Repeat Purchase</td>
<td>ALL</td>
<td>2.64</td>
<td>RPS05</td>
<td>2.67</td>
<td>4</td>
</tr>
<tr>
<td>BAF</td>
<td>Brand Affect</td>
<td>ALL</td>
<td>3.58</td>
<td>None</td>
<td>3.58</td>
<td>3</td>
</tr>
<tr>
<td>BRV</td>
<td>Brand Relevance</td>
<td>ALL</td>
<td>3.83</td>
<td>None</td>
<td>3.83</td>
<td>4</td>
</tr>
<tr>
<td>BPF</td>
<td>Brand Performance</td>
<td>ALL</td>
<td>4.24</td>
<td>BPF02</td>
<td>4.23</td>
<td>2</td>
</tr>
<tr>
<td>CUL</td>
<td>Culture</td>
<td>ALL</td>
<td>1.66</td>
<td>None</td>
<td>1.66</td>
<td>4</td>
</tr>
</tbody>
</table>
5.6 RELATIONSHIP AMONG BRAND LOYALTY FACTORS

The influences are not isolated from one another – thereby indicating that the different influences have inter-correlations with one another. The results of the correlations are shown in Table 35 below; and correlation coefficients with $|r| < 0.30$ have a weak correlation; those between $|r|$ 0.30 to 0.49 have a moderate correlation; and coefficients with $|r|$ 0.50 or larger have a strong correlation. The red indicates that the correlations are statistically significant.

TABLE 35: RELATIONSHIP AMONG BRAND LOYALTY FACTORS

<table>
<thead>
<tr>
<th></th>
<th>CUS</th>
<th>SCR</th>
<th>BTS</th>
<th>RPR</th>
<th>INV</th>
<th>PVL</th>
<th>COM</th>
<th>RPS</th>
<th>BAF</th>
<th>BRV</th>
<th>BPF</th>
<th>CUL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUS</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCR</td>
<td>-0.28</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTS</td>
<td>0.60</td>
<td>-0.28</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPR</td>
<td>0.50</td>
<td>-0.47</td>
<td>0.82</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INV</td>
<td>0.46</td>
<td>-0.36</td>
<td>0.71</td>
<td>0.82</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVL</td>
<td>0.24</td>
<td>-0.28</td>
<td>0.59</td>
<td>0.63</td>
<td>0.65</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM</td>
<td>0.33</td>
<td>-0.32</td>
<td>0.61</td>
<td>0.75</td>
<td>0.68</td>
<td>0.64</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPS</td>
<td>-0.13</td>
<td>0.37</td>
<td>-0.14</td>
<td>-0.16</td>
<td>0.02</td>
<td>0.11</td>
<td>-0.25</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAF</td>
<td>0.35</td>
<td>-0.38</td>
<td>0.55</td>
<td>0.70</td>
<td>0.74</td>
<td>0.56</td>
<td>0.63</td>
<td>-0.11</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRV</td>
<td>0.49</td>
<td>-0.34</td>
<td>0.70</td>
<td>0.74</td>
<td>0.79</td>
<td>0.67</td>
<td>0.62</td>
<td>0.01</td>
<td>0.79</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPF</td>
<td>0.47</td>
<td>-0.47</td>
<td>0.70</td>
<td>0.71</td>
<td>0.67</td>
<td>0.61</td>
<td>0.61</td>
<td>-0.18</td>
<td>0.70</td>
<td>0.70</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>CUL</td>
<td>-0.29</td>
<td>0.29</td>
<td>-0.26</td>
<td>-0.24</td>
<td>-0.08</td>
<td>-0.04</td>
<td>-0.10</td>
<td>0.33</td>
<td>-0.10</td>
<td>-0.12</td>
<td>-0.21</td>
<td>1.00</td>
</tr>
</tbody>
</table>

5.7 INFERENTIAL STATISTICS

An analysis of the results was conducted to determine if there are statistically significant differences in the measurement of the brand-loyalty factors, based on age groups, gender profile, health-care sector and medical specialisation.

The analysis was conducted using ANOVA for the comparison of the age group profile and health-care sectors; whilst the t-tests were performed in the analysis between the gender groups and the medical specialisation arena.
5.7.1 Analysis of variance (ANOVA)

The analysis of variance (ANOVA) is an inferential statistic technique used to test the hypotheses on multiple-population means (Wegner, 2007). This technique is an extension of the z-test or t-test, which tests equality between only two population means (Wegner, 2007). The null hypothesis in the t-test is that there is no difference between the samples or groups (Collis and Hussey, 2009). The analysis between the age groups and health-care sector was conducted using the t-test method, and the results are shown in Table 36 and Table 37, respectively.

### TABLE 36: ANOVA TO COMPARE AGE GROUPS IN TERMS OF THE FACTORS

<table>
<thead>
<tr>
<th>CODE</th>
<th>Factor Description</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUS</td>
<td>Customer Satisfaction</td>
<td>0.45</td>
<td>0.6364</td>
</tr>
<tr>
<td>SCR</td>
<td>Switching Costs / Risk Aversion</td>
<td>0.34</td>
<td>0.7096</td>
</tr>
<tr>
<td>BTS</td>
<td>Brand Trust</td>
<td>0.94</td>
<td>0.3963</td>
</tr>
<tr>
<td>RPR</td>
<td>Relationship proneness</td>
<td>1.07</td>
<td>0.3475</td>
</tr>
<tr>
<td>INV</td>
<td>Involvement</td>
<td>0.62</td>
<td>0.5384</td>
</tr>
<tr>
<td>PVL</td>
<td>Perceived Value</td>
<td>0.03</td>
<td>0.9731</td>
</tr>
<tr>
<td>COM</td>
<td>Commitment</td>
<td>0.19</td>
<td>0.8271</td>
</tr>
<tr>
<td>RPS</td>
<td>Repeat Purchase</td>
<td>0.81</td>
<td>0.4468</td>
</tr>
<tr>
<td>BAF</td>
<td>Brand Affect</td>
<td>0.88</td>
<td>0.4190</td>
</tr>
<tr>
<td>BRV</td>
<td>Brand Relevance</td>
<td>0.68</td>
<td>0.5091</td>
</tr>
<tr>
<td>BPF</td>
<td>Brand Performance</td>
<td>1.18</td>
<td>0.3137</td>
</tr>
<tr>
<td>CUL</td>
<td>Culture</td>
<td>0.06</td>
<td>0.9425</td>
</tr>
</tbody>
</table>

For analytical purposes, the first two and last two age groups were combined. Thus, the age group categories were 20 – 40 years; 41 – 50 years; and over 50 years’ old. The p-value for all the factors is greater than 0.05; therefore, we fail to reject the null hypothesis. The age groups do not differ with regard to the brand-loyalty factors.
### TABLE 37: ANOVA TO COMPARE HEALTH-CARE SECTOR IN TERMS OF THE FACTORS

<table>
<thead>
<tr>
<th>CODE</th>
<th>Factor Description</th>
<th>F</th>
<th>p</th>
<th>Cohen's d</th>
<th>Practical signif.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUS</td>
<td>Customer Satisfaction</td>
<td>0.82</td>
<td>0.4456</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCR</td>
<td>Switching Costs / Risk Aversion</td>
<td>4.75</td>
<td>0.0111</td>
<td>0.80</td>
<td>Large</td>
</tr>
<tr>
<td>BTS</td>
<td>Brand Trust</td>
<td>1.78</td>
<td>0.1747</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPR</td>
<td>Relationship proneness</td>
<td>2.54</td>
<td>0.0851</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INV</td>
<td>Involvement</td>
<td>2.41</td>
<td>0.0956</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVL</td>
<td>Perceived Value</td>
<td>1.35</td>
<td>0.2644</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM</td>
<td>Commitment</td>
<td>2.62</td>
<td>0.0786</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPS</td>
<td>Repeat Purchase</td>
<td>1.68</td>
<td>0.1934</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAF</td>
<td>Brand Affect</td>
<td>6.23</td>
<td>0.0030</td>
<td>0.89</td>
<td>Large</td>
</tr>
<tr>
<td>BRV</td>
<td>Brand Relevance</td>
<td>3.61</td>
<td>0.0313</td>
<td>0.67</td>
<td>Medium</td>
</tr>
<tr>
<td>BPF</td>
<td>Brand Performance</td>
<td>3.43</td>
<td>0.0369</td>
<td>0.68</td>
<td>Medium</td>
</tr>
<tr>
<td>CUL</td>
<td>Culture</td>
<td>0.99</td>
<td>0.3764</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The p-value for customer satisfaction, brand trust, relationship proneness, involvement, perceived value, commitment, repeat purchase and culture factors are greater than 0.05; therefore, the results fail to reject the null hypothesis. For these factors, the health-care sectors do not differ with regard to their brand-loyalty factors.

However, for switching costs, brand affect, brand relevance and brand performance, the p-value is less than 0.05; therefore, the results reject the null hypothesis. For these factors, the health-care sectors differ with regard to the brand-loyalty factors. Based on the Cohen’s d values, the practical significance is medium for brand relevance and brand performance, and large for switching costs and brand affect. In each case, the factors differed significantly for the Private and Public sector in the health-care system.
5.7.2 Comparison between two populations (t-test)

A t-test is conducted to establish whether there is any difference between the two groups or samples (Collis and Hussey, 2009). The null hypothesis in the t-test is that there is no difference between the two samples or groups (Collis and Hussey, 2009). The analysis between the gender groups and the arena of medical specialization was conducted using the t-test method. The results are shown in Table 38 and table 39, respectively.

**TABLE 38: T-TESTS TO COMPARE GENDER GROUPS**

<table>
<thead>
<tr>
<th>CODE</th>
<th>Factor Description</th>
<th>Mean Female</th>
<th>Mean Male</th>
<th>t-value</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUS</td>
<td>Customer Satisfaction</td>
<td>4.28</td>
<td>4.22</td>
<td>0.57</td>
<td>86</td>
<td>0.5707</td>
</tr>
<tr>
<td>SCR</td>
<td>Switching Costs / Risk Aversion</td>
<td>2.01</td>
<td>2.12</td>
<td>-0.66</td>
<td>86</td>
<td>0.5100</td>
</tr>
<tr>
<td>BTS</td>
<td>Brand Trust</td>
<td>4.47</td>
<td>4.43</td>
<td>0.29</td>
<td>86</td>
<td>0.7704</td>
</tr>
<tr>
<td>RPR</td>
<td>Relationship proneness</td>
<td>4.20</td>
<td>4.00</td>
<td>0.97</td>
<td>86</td>
<td>0.3336</td>
</tr>
<tr>
<td>INV</td>
<td>Involvement</td>
<td>3.85</td>
<td>3.81</td>
<td>0.23</td>
<td>86</td>
<td>0.8162</td>
</tr>
<tr>
<td>PVL</td>
<td>Perceived Value</td>
<td>3.66</td>
<td>3.63</td>
<td>0.30</td>
<td>86</td>
<td>0.7620</td>
</tr>
<tr>
<td>COM</td>
<td>Commitment</td>
<td>3.39</td>
<td>3.36</td>
<td>0.17</td>
<td>86</td>
<td>0.8639</td>
</tr>
<tr>
<td>RPS</td>
<td>Repeat Purchase</td>
<td>2.50</td>
<td>2.36</td>
<td>0.89</td>
<td>86</td>
<td>0.3749</td>
</tr>
<tr>
<td>BAF</td>
<td>Brand Affect</td>
<td>3.60</td>
<td>3.56</td>
<td>0.21</td>
<td>86</td>
<td>0.8334</td>
</tr>
<tr>
<td>BRV</td>
<td>Brand Relevance</td>
<td>3.80</td>
<td>3.85</td>
<td>-0.32</td>
<td>86</td>
<td>0.7510</td>
</tr>
<tr>
<td>BPF</td>
<td>Brand Performance</td>
<td>4.30</td>
<td>4.17</td>
<td>0.68</td>
<td>86</td>
<td>0.5015</td>
</tr>
<tr>
<td>CUL</td>
<td>Culture</td>
<td>1.67</td>
<td>1.65</td>
<td>0.12</td>
<td>86</td>
<td>0.9055</td>
</tr>
</tbody>
</table>

The p-value for all the factors is greater than 0.05; therefore, we fail to reject the null hypothesis. The male and female respondents do not differ with regard to the brand loyalty factors. However, females with a mean value of greater than 4.20 for brand performance have higher influence on brand loyalty than males with a mean value of 4.17, where it has only high influence. All other factor mean values for the two gender groups fell into the same interpretation interval.
The p-value for customer satisfaction, switching costs, perceived value, commitment, repeat purchase and culture factors is greater than 0.05; and therefore, the results fail to reject the null hypothesis. For these factors, the General Practitioners and Specialists do not differ with regard to the brand-loyalty factors. However, for specialists with a mean value of greater than 3.41, commitment has a higher influence on brand loyalty than that for General Practitioners with a mean value of 3.27 – where it has an average influence. For all other factors mean values for the factors with p-value greater than 0.05, the two medical specialisation groups fell into the same interpretation interval.

However, for brand trust, relationship proneness, involvement, brand effect, brand relevance and brand performance, the p-value is less than 0.05; therefore, the results reject the null hypothesis. For these factors, the General Practitioners and Specialists differ with regard to the brand-loyalty factors. Based on Cohen’s d values, the practical significance is small for brand trust and brand relevance, and medium for relationship proneness, involvement, brand affect and brand-performance factors.
5.8 CONCEPTUAL FRAMEWORK FOR BRAND LOYALTY IN MEDICAL DEVICES

Figure 16 below presents the conceptual framework to measure brand loyalty in the medical-device industry, as adapted from Moolla and Bisschoff (2012). The significance of the brand-loyalty factor is indicated by the mean values, and interpreted, according to Table 21.

FIGURE 16: FRAMEWORK FOR BRAND LOYALTY IN MEDICAL DEVICES

Source: Adapted - Moolla and Bisschoff (2012)
5.9 CONCLUSION

This chapter has presented the results of the empirical study, focusing on the results of the validity and reliability of the research instrument. The empirical results of the data collected from the sample were presented and analysed. The chapter reported on the demographic analysis; the statistical analysis to validate the questionnaire, which includes factor analysis and Cronbach Alpha coefficients; the empirical measurement of brand loyalty factors was performed by means of descriptive statistics and inferential analysis of the results.

A summary table presented the combined correlation results, which indicated that some of the brand-loyalty influences are significantly correlated.

This chapter analysed and reported on the results of the empirical study regarding the following research objectives:

- Whether Moolla’s brand loyalty model can be applied to measure brand loyalty for the medical-device industry of South Africa;
- The key influential factors of brand loyalty in the consumer’s choice of medical devices;
- The influence of price on brand loyalty;
- Whether a significant relationship exists between brand loyalty and repurchasing for consumers of medical devices;
- Whether there are significant differences in the brand-loyalty factors between age groups, health-care sectors, gender profile, and medical specialisation.

The empirical results analysed were used to build a conceptual framework for the measurement of brand loyalty in the medical-device industry in South Africa.

Chapter 6 concludes the study; and it will provide the conclusion and recommendations relating to methods for the management of brand loyalty in the medical-device industry in South Africa, and how organisations can gain competitive advantage through strategic focus on the factors that drive and enhance consumer-brand loyalty. The brand-loyalty framework for the medical-device industry will also be presented; and future research areas will also be identified.
CHAPTER 6

6. EVALUATION, CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

Chapter 5 presented the empirical results of the study on the measurement of brand loyalty in the medical-device industry in South Africa. The results explored and confirmed the results of the validity and reliability of the research instrument, the correlation of the brand-loyalty factors, and the important factors significant to brand loyalty in the medical-device industry. An analysis was conducted through inferential statistics to determine whether there were differences in the measurement of brand loyalty influences due to age differences, gender profile, health-care sector through which the medical professionals provide their service, and the fact that the medical professional was a General Practitioner or a Specialist in the field of medicine.

The chapter concluded with a conceptual framework for brand loyalty in the medical-device industry of South Africa.

This chapter forms the conclusion of this study on brand loyalty in the medical-device industry of South Africa. The focus of the chapter will be on providing the conclusion, as well as some recommendations – in accordance with the literature review conducted – and the empirical results of the research study. The results of this study will be compared with those of other similar studies. The limitation of this study will be explored, followed by some recommendations for future research. The chapter will conclude by an examination and exploration of the managerial implications forthcoming from this study.

6.2 OBJECTIVES OF THE STUDY

With the fierce rivalry amongst the competitors, and the quest for companies to achieve the competitive advantage, the primary objective of this study was to measure brand loyalty in the South African medical-device industry by applying the model developed by Moolla.
The secondary objectives of the study were to determine the following:

- The key influential factors of brand loyalty in the medical-device industry;
- The influence of price on brand loyalty;
- Whether a significant relationship exists between brand loyalty and repurchasing;
- To determine whether the brand loyalty factors differ between the private and public sector in the South African health-care system.

6.3 CONCLUSION, RECOMMENDATIONS AND MANAGERIAL IMPLICATIONS

The literature review in this study highlighted key influential factors of brand loyalty. To measure and determine the key influential factors of brand loyalty in the medical-device industry of South Africa, a survey was conducted across the public and private sector health-care system. The results of the survey were statistically tested and analysed.

A number of conclusions can be drawn from this study based on the literature review and the empirical results obtained. These conclusions will be based on the statistical techniques and measurements used in this study, as well as the results of brand loyalty in the medical-device industry of South Africa. The results were compared with the studies conducted by Moolla (2010) and Du Plooy (2012), measuring brand loyalty in the FMCG and pharmaceutical industries of South Africa. The findings will also be compared with those in the literature review conducted in the study.

6.3.1 Customer satisfaction

6.3.1.1 Research instrument

The instrument to measure customer satisfaction indicated a good reliability at a Cronbach Alpha coefficient of 0.77. All the factors, except CUS04, had a factor loading of above the recommended 0.4; however, the factor was not excluded from the research instrument.

6.3.1.2 Empirical results

Customer satisfaction has a significant influence on brand loyalty – with a mean value of 4.24. Customer satisfaction was also found to be a significant influence in the study by Moolla (2010), as well as in that of Du Plooy (2012).
Customers loyalty increases when customers are satisfied; and it relates to the findings in line with those of Lee and Lee (2013). These authors found that satisfied customers are likely to show brand loyalty. However, if dissatisfied, the customer does not make a subsequent purchase of the product.

And this concurs with the findings of Osarenkhoe and Kamunda (2013), who found that if customers are dissatisfied they would then discontinue their patronage towards the brand.

The unique attributes of products play a major role in customer-brand loyalty.

6.3.1.3 Managerial implications

In a competitive environment, such as the medical-device industry, product attributes and differentiation play a major role in gaining the competitive advantage. Organisations in the medical-device industry should develop and launch into the marketplace – with innovative and differentiated products from those of the competitors.

The customers buy products and satisfaction; therefore, the marketing strategy of the organisation should focus on the quality of its products. Quality refers to the ability of the product to satisfy the needs of the customer. Satisfaction and quality are components of the total product offering (Perreault and McCarthy, 2010). Organisations must improve the quality of their product and services, in order to drive and increase their customer loyalty.

6.3.2 Switching costs / risk aversion

6.3.2.1 Research instrument

The instrument to measure switching costs or risk aversion indicated an initial Cronbach Alpha coefficient of 0.37. The validity of the instrument was improved by omitting the SCR03 factor – thereby resulting in a Cronbach Alpha coefficient of 0.54, which still indicates poor reliability. The Cronbach Alpha coefficient ultimately reported a fair reliability at a Cronbach Alpha coefficient of 0.6. Factor loadings for three of the factors were below the recommended 0.4; however, only two of the factors were omitted from the analytical procedure.
6.3.2.2 Empirical results

The mean value for the switching of costs or risk aversion factor is 2.08, indicating that switching costs is not a significant factor in brand loyalty. This is similar to the findings of Du Plooy (2012) and Moolla (2010), where switching costs was found to have little influence on brand loyalty in the pharmaceutical industry and FMCG industry, respectively.

Customers are willing to switch brands, despite the high cost implications and the required effort associated with switching to an alternate brand. This finding is contrary to that of Matzler et al. (2008). These authors found that customers tend to stay with well-established brands, in order to avoid the cost implications of trying any alternative brands.

6.3.2.3 Managerial implications

The risk associated with brand switching is not a factor for customers in the medical-device industry, as the customers are willing to switch to alternate brands, regardless of the high costs implications. Organisations should focus on the other key influencers of brand loyalty, such as brand trust, customer satisfaction and brand performance, as ways of creating a barrier for customer to switch brands. Since cost is not a deterrent for customers to switch brands, the quality of the product and service would result in a strategic advantage over the competitors.

6.3.3 Brand trust

6.3.3.1 Research instrument

The brand trust-measuring instrument’s Cronbach Alpha coefficient of 0.93 indicates good reliability. All the factor loadings for brand trust were above the required minimum of 0.4; and, it was therefore considered adequate for measuring brand trust.

6.3.3.2 Empirical results

Brand trust has a significant influence on brand loyalty, with a mean value of 4.45. This is contrary to the findings of Moolla (2010), where brand trust has a low influence on brand loyalty; but it is similar to the findings of Du Plooy (2012).
The similarity is probably driven by the connections in the nature of the medical-device industry to those of the pharmaceutical industry – rather than the FMCG industry.

Customers generally trust and have confidence in the brands to which they are loyal. Developing a trustworthy brand is considered to be a key strategic differentiator in the market (Hur, 2014). The development of brand trust is highly influenced by the consistency in high brand quality, and the brand reputation over a long-term relationship therewith. Phan and Ghantous (2013) also established that brand trust plays a critical role in the building of long-term relationships between consumers and suppliers.

6.3.3.3 Managerial implications

Brand trust induces brand loyalty and brand commitment, just as trust creates highly valued exchanges in relationships. Brand commitment, which is gaining increasingly in weight in consumer behaviour, is related to the loyalty of consumers towards a particular brand in a product class (Ha, 2004).

6.3.4 Relationship proneness

6.3.4.1 Research instrument

The measuring instrument for relationship proneness had a Cronbach Alpha coefficient of 0.88, indicating good reliability. All the factor loadings for relationship proneness were above the required minimum of 0.4; and therefore, it could be considered adequate to measure brand trust.

6.3.4.2 Empirical results

Relationship proneness has a significant influence on brand loyalty, with a mean value of 4.08. This finding is similar to the results found in the study by Moolla (2010); however, it varies from the findings of Du Plooy (2012).

Customers generally prefer to maintain a long-term relationship with the medical-device brand – especially, if the brand focuses and communicates with them. According to Kim et al. (2012), relationship proneness exerts a significant influence on the resistance to change; and it enhances customer-brand loyalty.
A high number of customers eventually develop an emotional and passionate relationship with the brands to which they are loyal.

6.3.4.3 Managerial implications

The emphasis should be placed on building and maintaining quality relationships with the customers – to drive customer satisfaction and to ultimately win customer confidence. Organisations must invest in sustaining key strategic relationships with their customers. A customer-centric organisation would undoubtedly gain a competitive advantage, and ultimately influence the customers’ loyalty to their particular brand.

A relationship is highly influenced by customer experience and trust – made possible through the comparison of the realities of the organisation and customers’ expectations.

6.3.5 Involvement

6.3.5.1 Research instrument

The measuring instrument for involvement had a Cronbach Alpha coefficient of 0.84, indicating good reliability. All factor loadings for relationship proneness were above the required minimum of 0.4, and could therefore be considered adequate to measure the involvement variable.

6.3.5.2 Empirical results

Involvement has a significant influence on brand loyalty, with a mean value of 3.83. This finding is contrary to the results found in the study by Moolla (2010); but it concurs with those from the findings of Du Plooy (2012).

Customer loyalty is inclined to increase – as the customer becomes more involved with the brand. High levels of product involvement pave the way for the development of loyalty to a particular brand (Sritharan et al., 2008). The more involved the customer is with the brand, so the interest and arousal towards the brand intensifies accordingly. Brand loyalty and involvement play major roles in the consumer-purchase decision (Sritharan et al., 2008).
Similarly, with customer satisfaction, if the customers’ involvement with the brand diminishes, then these customers would tend to consider alternative brands.

The results also indicate the importance of word-of-mouth and positive customer experiences across the board; as customers are influenced by the involvement others have with their preferred medical brand. Svari et al. (2010) also found that dissatisfied customers do not only discontinue their patronage; but they have the inclination to spread a negative message, which could jeopardize the brand image.

6.3.5.3 Managerial implications

The literature review examining the relationship between product involvement and brand loyalty indicate that brand involvement drives commitment and loyalty to the brand (Quester and Lim, 2003).

Consumers with high levels of brand involvement would be interested in gathering all the relevant information relating to the product prior to the purchasing decision. Organisations need to ensure that customers are kept up-to-date with all the relevant product information and attributes – in order for them to continuously maintain product-brand loyalty.

6.3.6 Perceived value

6.3.6.1 Research instrument

The factor analysis for perceived value resulted in a Cronbach Alpha coefficient of 0.38, indicating poor reliability. Factor loadings for PVL01, PVL02 and PVL03 were below the required minimum of 0.4; and they were, therefore, considered inadequate to measure the perceived value variable. The research instrument has not been omitted from the results, as the instrument in both the study from Moolla (2010) and that of Du Plooy (2012) indicated Cronbach Alpha coefficients of greater than 0.6.

6.3.6.2 Empirical results

Perceived value has a significant influence on brand loyalty, with a mean value of 3.64. This finding concurs to the results found in the study by Moolla (2010) and those from the findings of Du Plooy (2012).
Brand loyalty for the customers is grounded on the product quality and on the expected performance. As established by Beneke et al. (2013), perceived product quality and relative price have a significant positive relationship with the perception of product value. The price worthiness of the brand is a key influence in customer loyalty to medical devices, in line with the findings of Fiol et al. (2009) who perceived that value is a key variable in the establishment of customer loyalty. Customers generally were spread equally with regard to their emotional attachment to the medical brand; and this further enforces the need for organisations to drive other influences, such as customer satisfaction; since the perceived value has an indirect relationship with the loyalty of the customers brand via their satisfaction (Roig et al., 2009).

6.3.6.3 Managerial implications

This study resulted in poor reliability for the measuring instrument of the perceived value factor, thus making it impossible to provide recommendations on perceived value.

A study would be needed to explore and conduct research on a bigger sample, in order to determine whether the reliability factor was impacted by the size of the sample of the study.

6.3.7 Commitment

6.3.7.1 Research instrument

The measuring instrument for commitment had a Cronbach Alpha coefficient of 0.73, indicating good reliability. All the factor loadings, except COM02, were above the required minimum of 0.4; and therefore, they were considered adequate to measure the commitment variable.

6.3.7.2 Empirical results

Commitment has a less significant influence on brand loyalty – with a mean value of 2.91. This finding concurs with the results found in the study of Du Plooy (2012); however, it differs from the findings of Moolla (2010), who found that commitment in FMCG has the most significant influence on brand loyalty.
The findings of the results indicated that customers have not necessarily pledged commitment to a particular brand, supporting the fact that the customers are willing to change brands if they are dissatisfied, when they become less involved with the brand, or if the brand does not meet their requirements of quality and expected performance. Customers are willing to purchase other medical-device brands – if their preferred brand is not available. However, as loyalty increases towards the brand, the more committed the customer becomes; and some customers remain committed to the brand – regardless of price and popularity. When committed, the customer is highly likely to remain brand loyal, and would less easily be attracted to the products of the competitors (Hur et al., 2011).

6.3.7.3 Managerial implications

The study indicates that in the medical-device industry, commitment has a low influence on brand loyalty. Marketers should thus invest their resource in those areas that drive brand loyalty, such as customer satisfaction, brand trust and brand performance.

6.3.8 Repeat purchase

6.3.8.1 Research instrument

The instrument to measure brand affect indicated an initial Cronbach Alpha coefficient of 0.47. The validity of the instrument was improved by omitting the RPS05 factor, resulting then in a Cronbach Alpha coefficient of 0.57, which indicated a fair level of reliability. Factor loadings for four of the five factors were below the recommended 0.4, and are therefore not adequate to measure the repeat purchase variable.

6.3.8.2 Empirical results

Repeat purchase has a less significant influence on brand loyalty, with a mean value of 2.67. The finding differs from the results found in the studies of Du Plooy (2012) and Moolla (2010), who both found that repeat purchase has a significant influence on brand loyalty.

The findings of the results indicated that the loyalty of customers towards the brand is not purely habitual; as the customers do not necessarily purchase the same brand time after time.
The purchase pattern is not established for those brands that deviate from time to time. Customers have a greater intent to re-patronize those brands with which they are most satisfied (Kuo et al., 2013).

6.3.8.3 Managerial implications

This study resulted in poor reliability for the measuring instrument of the repeat purchasing factor, thus making it impossible to provide recommendations on repeat purchasing.

A study is needed to explore and conduct research on a bigger sample, in order to determine whether the reliability factor is impacted by the size of the sample in the study.

6.3.9 Brand affect

6.3.9.1 Research instrument

The measuring instrument for commitment had a Cronbach Alpha coefficient of 0.85, indicating good reliability. All the factor loadings were above the required minimum of 0.4; and they were, therefore, considered adequate to measure the brand-affect variable.

6.3.9.2 Empirical results

Brand affect has a significant influence on brand loyalty with a mean value of 3.58. The finding differs from the results found in the study Du Plooy (2012), who found that brand affect does not have any significant influence on brand loyalty; but this is in agreement with the findings of Moolla (2010).

The findings of the results indicate that customers feel that the brands to which they are loyal have a positive impact in their lives. Sung et al. (2010) emphasise that brands that are perceived to possess sincere or competent personality characteristics are more likely to influence brand trust and brand affect. If their preferred brand is unavailable for use or purchase, the customers are distressed; however, as indicated in the other brand influences, customers are willing to procure other brands – if their preferred brand is not available.
The distressed customer could be caused by the notion that brand affect captures a share of the heart (Ong et al., 2012).

6.3.9.3 Managerial implications

Product experience and impact are key factors for customers; as they are inclined to remember the last purchase experience. Positive experiences are sufficient to alter the perceptions of preceding negative experiences. Organisations should develop strategies and inventory-management processes which ensure that the fast-moving brands are available for use and purchase by the customers. It is also important that there is a purpose behind the organisational brand. Brands should be developed and maintained to always present credibility, quality and the brand experience promise to the customers.

6.3.10 Brand relevance

6.3.10.1 Research instrument

The instrument to measure brand affect had a Cronbach Alpha coefficient of 0.67, indicating fair reliability of the instrument. Factor loadings for all the factors, except BRV03, were above the recommended level of 0.4; and they are, therefore, adequate to measure the brand-relevance variable. BRV03 was subsequently omitted from the analysis of the results, thereby improving the Cronbach Alpha coefficient to that of good reliability at 0.72.

6.3.10.2 Empirical results

Brand relevance has a significant influence on brand loyalty – with a mean value of 3.83. The finding is similar to the results found in the studies of Du Plooy (2012) and those of Moolla (2010). They both found that brand relevance had a major influence on brand loyalty in the pharmaceutical and FMCG industries, respectively.

Customers feel that the brands to which they are loyal have a purpose, and stand for issues that actually matter, and thus portray positive significance. The customers had a split view on measuring brand relevance through brand communications, with 41% neither agreeing nor disagreeing, and only 43% agreeing with the statement.
The results showed that customers are loyal towards those brands that are continuously updating and improving, with the objective of remaining relevant in the market. Sritharan et al. (2008) found that consumers can be persuaded to buy a product brand that is consistently enhancing new features that offer a unique benefit.

6.3.10.3 Managerial implications

Brand relevance should be managed, in order to cultivate the loyalty of consumers to medical-device products. Organisations must develop and execute on the basis of a marketing strategy that communicates value propositions to their customers. There should be continuous improvement and innovation relating to the products that render the brand and organisation relevant to their customers. With the change in the market landscape and the economic pressures experienced by organisations, they have to have flexibility – in order to be able to adapt, and to respond timeously to the market pressures and demands.

6.3.11 Brand performance

6.3.11.1 Research instrument

The instrument to measure brand performance indicated an initial Cronbach Alpha coefficient of 0.55. The validity of the instrument was improved by omitting the BPF02 factor, resulting in a Cronbach Alpha coefficient of 0.72, which indicated a good level of reliability. Factor loadings for the remaining factors were above the recommended 0.4, and are therefore adequate to measure the brand-performance variable.

6.3.11.2 Empirical results

Brand performance has a significant influence on brand loyalty – with a mean value of 4.23. The finding is similar to the results found in the study of Du Plooy (2012), but contradicts those of Moolla (2010), who found that brand performance had no significant influence on brand loyalty in the FMCG industry.

Customers confirmed that brand evaluation was based on the perceived brand performance, resulting in customer loyalty to the top-performing brands. This confirms the finding that customers are increasingly procuring brands for experimental benefits, as opposed to the functional benefits (Ismail et al., 2011).
6.3.11.3 Managerial implications

To grow and retain the loyalty of consumers to medical devices, brand relevance should be managed. Organisational success in a competitive environment is influenced by brand awareness and performance. Organisations have quality control procedures that guarantee the quality of the brand and the brand performance. Continuous communication relating to the quality and differentiation attributes of the brand must be given to the consumers, in order to cultivate a positive perception of the brand.

6.3.12 Culture

6.3.12.1 Research instrument

The measuring instrument for culture had a Cronbach Alpha coefficient of 0.79, indicating good reliability. All the factor loadings were above the required minimum of 0.4, and were, therefore, considered adequate to measure the culture variable.

6.3.12.2 Empirical results

Culture has no significant influence on brand loyalty – with a mean value of 1.66. The finding is similar to the results found in both the study by Du Plooy (2012) and that of Moolla (2010), who both found that culture had no significant influence on brand loyalty in the pharmaceutical and FMCG industries.

Customers confirmed that brand evaluation was based on the perceived brand performance, resulting in customer loyalty to the top-performing brands. The various racial groups and family choice towards a brand do not influence the customer brand loyalty. Religious factors also have no role in the choice of the medical brands to which they are loyal. This contradicts the findings of Seock and Lin (2011), who found that culture impacts on customer-loyalty tendencies.

6.3.12.3 Managerial implications

Culture forms a boundary within which an individual acts and thinks (Babu, 2001). Marketers need to be multicultural in their marketing activities, so that they are able to appeal to a variety of cultures at the same time.
6.4 LIMITATIONS OF THE STUDY

This study should be interpreted with these limitations in mind:

- The research was conducted on only one of the groups of decision-makers, focusing more from the clinical stakeholder perspective than that of the non-clinical stakeholder.
- The study was conducted within the South African culture – and not from a global perspective.
- The other key influencers on brand loyalty, such as the decision powers of the non-clinical stakeholders within the private sector, and the tendering system within the public sector, have not been taken into account.
- The response rate for the survey was low at 35.2% which could have influenced the outcome of the results and study.

6.5 AREAS OF FUTURE RESEARCH

This study provided a perspective on the factors influencing brand loyalty in the medical-device industry of South Africa. The results of the study provided insight into the significant factors that influence brand loyalty; however, it also presents some opportunities for future research.

The following areas have been identified for future research relating to the measurement of brand loyalty:

- One of the main limitations of the study related to the scale and response rate of the research survey. Further research to determine the brand loyalty in the medical industry of South Africa should be conducted on a larger scale to refine or confirm the results of this study.
- The present study can be replicated in a global context, in order to assess the differences between brand loyalty influences in different countries. The study would be beneficial in assessing whether brand loyalty influences are unique to different cultures – or if they are universal in nature.
- Further research is recommended to determine the influence of the factors that influence brand loyalty, such as the role of the funders, non-clinical stakeholders, and the tendering process.
• With the upcoming NHI programme spearheaded by the South African government, research is recommended to determine whether price would play a significant role in the determination of brand loyalty in the medical-device industry of South Africa.

• With the impending and proposed medical-device regulation in South Africa, which could result in single-exit pricing for medical devices, research is recommended to establish whether the consumers would prefer the premium medical-device brands or low-cost medical-device alternatives.

6.6 SUMMARY OF THE RESEARCH STUDY

The main objective of this study was to measure brand loyalty, and to establish the main factors of brand loyalty in the medical-device industry of South Africa. The measurement of the brand loyalty in the medical-device industry was based on the conceptual brand loyalty framework developed by Moolla for the FMCG industry. The study also aimed at determining whether a significant relationship exists between brand loyalty and repurchasing, the influence of price on brand loyalty, and to determine whether the brand loyalty factors differ between the private and public sector in the South African health-care system.

The introductory chapter highlighted the relevance and significance of the study of brand loyalty in the medical-device industry in South Africa. The research problem to be investigated was stated, as well as the primary and secondary research objectives. The chapter further outlined the research methodology to be used in the study, and defined the major concepts in the study. It also highlighted the limitations within which this particular study was conducted.

Chapter 2 focused on the overview of the South African health-care industry and the medical-device industry of South Africa. The chapter highlighted and outlined the two health-care systems which are currently prevalent in South Africa, namely, the Private and Public sectors. Facts and figures relating to the medical-device industry in general, and in South Africa, were presented and analysed.

Chapter 3 focused on the literature review relevant to brand loyalty, and the key variables that drive and impact the loyalty of consumers to a particular brand.
The chapter also highlighted brand loyalty frameworks developed over the last decade, as well as the brand-loyalty framework developed by Moolla to develop the research instrument for this study.

Chapter 4 provided justification for the use of the quantitative-research methodology for the study, and the appropriate use of a proven research instrument to measure brand loyalty. The chapter further constructed the questionnaire that was used as the research instrument for the study; and it evaluated the objectives and results obtained from the pilot study.

It elaborated on the methodology used to conduct this study, which included the sampling procedure, the data collection, the data analysis, and the statistical techniques utilised.

Chapter 5 focused on the analysis of the research findings of the study undertaken. The empirical results focused on the demographic profile of the respondents, the validity of the questionnaire, the reliability of the results, as well as the importance of the research variables. The analysis enabled certain conclusions to be drawn relating to the significant factor of brand loyalty in the medical-device industry in South Africa. A comparison was conducted relating to age group, gender profile, health-care sector and medical specialization to determine whether there were any significant differences in the brand-loyalty factors identified. The chapter concluded with a conceptual framework for the medical-device industry adapted from Moolla’s framework.

Chapter 6, the final chapter, consolidated the literature review and the analysis of the previous chapters. The results were reviewed in terms of their relevance to the research problems, and hypothesis tested in the study for the determination of the validity. It also provided conclusions and recommendations with regard to the statistical procedures used and the results obtained in this study. Recommendations for management were also discussed, based on the conclusion reached from the study results.

To conclude this chapter, the limitations encountered during the study and future research opportunities were additionally identified.
REFERENCES


Brikkels, C.P. 2010. The critical success factors needed to successfully implement a stores communication portal in a nationally represented retailer. Master's Dissertation. Cape Peninsula University of Technology.


Cook, G.T. 2009. Key factors required to be classified as a world class supplier from a South African automotive industry perspective. Nelson Mandela Metropolitan University, Port Elizabeth.


Rhodes, A. 2012. Re-examining the Effects of Switching Costs. [Web]:


REQUEST TO PARTICIPATE IN A SURVEY – BRAND LOYALTY IN MEDICAL-DEVICE INDUSTRY OF SOUTH AFRICA

Dear

REQUEST TO PARTICIPATE IN A SURVEY

I am a final year MBA student at the Nelson Mandela Bay University Business School. As part of my research treatise I am conducting a study to measure brand loyalty in the Medical-device industry of South Africa. The study will also assist in understanding the key attitudinal and behavioural factors that drive brand loyalty in the Medical-device industry.

I would appreciate your completing the questionnaire attached. The validity of the results depends a lot on obtaining a high response rate; your participation is crucial to the success of this study, and is once again greatly appreciated. The questionnaire will focus on brand loyalty, and will take approximately five minutes to complete.

Your completion of the questionnaire indicates your agreement to participate in this study. I can confirm that the responses will be held in the strictest confidence.

If you have any questions about this study, you can contact the person below:

Veliswa Celestine Rozani

MBA Student - NMMU Business School – Port Elizabeth

(011) 265 1105

vrozani@live.co.za

I hope that you will be able to participate in this study.

Survey close date:

Yours sincerely,

Veliswa Rozani
# ANNEXURE 2: MEASURING INSTRUMENTS

Research Questionnaire to determine brand loyalty in Medical Devices Industry of South Africa

This survey is xxx pages long and should take only 5 - 10 minutes to complete

Please place a cross in the appropriate column

## Section 1 - Demographics

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Province of Residence</th>
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<tbody>
<tr>
<td>20 - 30</td>
<td>Gauteng</td>
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<td>31 - 40</td>
<td>KwaZulu-Natal</td>
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<td>41 - 50</td>
<td>Eastern Cape</td>
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<td>51 - 60</td>
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<td>North West</td>
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<th>Sex</th>
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<td>Female</td>
<td>Mpumalanga</td>
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<td>Free State</td>
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<th>Healthcare Sector</th>
<th>Ethnicity</th>
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<td>Private Sector</td>
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<td>Public Sector</td>
<td>White</td>
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<tr>
<td>Private &amp; Public Sector</td>
<td>Coloured</td>
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<td>Asian</td>
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<tr>
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<th>Code</th>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Agree sometime</th>
<th>Undecided</th>
<th>Disagree sometime</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CUS01</td>
<td>I am very satisfied with the listed Medical Devices brands I purchase</td>
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<tr>
<td>2</td>
<td>CUS02</td>
<td>Distinctive product attributes in Medical Devices keep me brand loyal</td>
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<tr>
<td>3</td>
<td>CUS03</td>
<td>My loyalty towards a particular Medical Devices brand increases when I am satisfied about that brand</td>
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<tr>
<td>4</td>
<td>CUS04</td>
<td>I do not repeat a purchase if I am dissatisfied about a particular Medical Devices brand</td>
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<tr>
<td>5</td>
<td>CUS05</td>
<td>I attain pleasure from the Medical Devices brands I am loyal towards</td>
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<tr>
<td>6</td>
<td>SCR01</td>
<td>I do not switch Medical Devices brands because of the high cost implications</td>
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<tr>
<td>7</td>
<td>SCR02</td>
<td>I do not switch Medical Devices brands because of the effort required to reach a level of comfort</td>
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<tr>
<td>8</td>
<td>SCR03</td>
<td>I avoid switching Medical Devices brands due to the risks involved</td>
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<tr>
<td>9</td>
<td>SCR04</td>
<td>I switch Medical Devices brands according to the prevailing economic conditions</td>
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<td>10</td>
<td>SCR05</td>
<td>I prefer not to switch Medical Devices brands as I stand to lose out on the benefits from loyalty programmes</td>
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<tr>
<td>11</td>
<td>BTS01</td>
<td>I trust the Medical Devices brands I am loyal towards</td>
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<tr>
<td>12</td>
<td>BTS02</td>
<td>I have confidence in the Medical Devices that I am loyal to</td>
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<td>13</td>
<td>BTS03</td>
<td>The Medical Devices brands I purchase has consistently high quality</td>
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<tr>
<td>14</td>
<td>BTS04</td>
<td>The reputation of a Medical Devices brand is a key factor in me maintaining brand loyalty</td>
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<td>15</td>
<td>RPR01</td>
<td>I prefer to maintain a long term relationship with a Medical Devices brand</td>
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<td>16</td>
<td>RPR02</td>
<td>I maintain a relationship with a Medical Devices brand in keeping with my personality</td>
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<td>17</td>
<td>RPR03</td>
<td>I maintain a relationship with an Medical Devices brand that focuses and communicates with me</td>
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<td>18</td>
<td>RPR04</td>
<td>I have a passionate and emotional relationship with the Medical Devices brands I am loyal to</td>
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<td>Agree somewhat</td>
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<td>Strongly Disagree</td>
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<tr>
<td>19</td>
<td>INV01</td>
<td>Loyalty towards a Medical Devices brand increases the more I am involved with it</td>
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<tr>
<td>20</td>
<td>INV02</td>
<td>Involvement with a Medical Devices brand intensifies my arousal and interest towards that brand</td>
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<td>21</td>
<td>INV03</td>
<td>I consider other Medical Devices brands when my involvement with my Medical Devices brand diminishes</td>
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<tr>
<td>22</td>
<td>INV04</td>
<td>My choice of a Medical Devices brand is influenced by the involvement others have with their Medical Devices brand</td>
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<tr>
<td>23</td>
<td>PVLO1</td>
<td>My Medical Devices brand loyalty is based on product quality and expected performance</td>
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<tr>
<td>24</td>
<td>PVLO2</td>
<td>I have an emotional attachment with the Medical Devices brands I am loyal towards</td>
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<tr>
<td>25</td>
<td>PVLO3</td>
<td>Price worthiness is a key influence in my loyalty towards Medical Devices brands</td>
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<td>26</td>
<td>PVLO4</td>
<td>The Medical Devices brands that I am loyal to enhances my social self concept</td>
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<tr>
<td>27</td>
<td>COM01</td>
<td>I have pledged my loyalty to particular Medical Devices brands</td>
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<td>28</td>
<td>COM02</td>
<td>I do not purchase/sample other Medical Devices brands if my Medical Devices brand is unavailable</td>
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<td>29</td>
<td>COM03</td>
<td>I identify with the Medical Devices brands that I consume and feel as part of the brand community</td>
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<td>30</td>
<td>COM04</td>
<td>The more I become committed to a Medical Devices brand, the more loyal I become</td>
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<tr>
<td>31</td>
<td>COM05</td>
<td>I remain committed to Medical Devices brands even through price increases and declining popularity</td>
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<tr>
<td>32</td>
<td>RPS01</td>
<td>My loyalty towards Medical Devices brands is purely habitual</td>
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<tr>
<td>33</td>
<td>RPS02</td>
<td>I do not necessarily purchase the same Medical Devices brands all the time</td>
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<tr>
<td>34</td>
<td>RPS03</td>
<td>I always sample new Medical Devices brands as soon as they are available</td>
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<tr>
<td>35</td>
<td>RPS04</td>
<td>I establish a Medical Devices brand purchasing pattern and seldom deviate from it</td>
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<tr>
<td>36</td>
<td>RPS05</td>
<td>Loyalty programmes are reason I repeat Medical Devices brand purchases</td>
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<tr>
<td>37</td>
<td>BAF01</td>
<td>I attain a positive emotional response through the usage of a Medical Devices brand</td>
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<tr>
<td>38</td>
<td>BAF02</td>
<td>The Medical Devices brands that I am loyal towards makes a difference in my life</td>
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<tr>
<td>39</td>
<td>BAF03</td>
<td>I am distressed when I am unable to use/purchase a particular Medical Devices brand</td>
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<tr>
<td>40</td>
<td>BRV01</td>
<td>The Medical Devices brands that I am loyal towards stands for issues that actually matters</td>
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<tr>
<td>41</td>
<td>BRV02</td>
<td>The Medical Devices brands that I am loyal towards has freshness about them and portray positive significance</td>
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<tr>
<td>42</td>
<td>BRV03</td>
<td>I know that an Medical Devices brand is relevant through the brand messages communicated</td>
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<tr>
<td>43</td>
<td>BRV04</td>
<td>The Medical Devices brands that I am loyal towards are constantly updating and improving so as to stay relevant</td>
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<tr>
<td>44</td>
<td>BPF01</td>
<td>I evaluate a Medical Devices brand based on perceived performance</td>
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<tr>
<td>45</td>
<td>BPF02</td>
<td>I will switch Medical Devices brand loyalty should a better performing Medical Devices brand be available</td>
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<tr>
<td>46</td>
<td>BPF03</td>
<td>I am loyal only towards the top performing Medical Devices brand</td>
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<tr>
<td>47</td>
<td>CUL01</td>
<td>My choice of Medical Devices brands is in keeping with the choice made by other members in my race group</td>
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<tr>
<td>48</td>
<td>CUL02</td>
<td>My loyalty towards an Medical Devices brand is based on the choice of Medical Devices brand used by my family</td>
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<tr>
<td>49</td>
<td>CUL03</td>
<td>Religion plays a role in my choice and loyalty of Medical Devices brands</td>
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<tr>
<td>50</td>
<td>CUL04</td>
<td>Family used Medical Devices brands indirectly assure brand security and trust</td>
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ANNEXURE 3: ETHICAL CLEARANCE FORM E

ETHICS CLEARANCE FOR TREATISES/DISSERTATIONS/THESSES

Please type or complete in black ink

FACULTY: ____________________________________________________________

SCHOOL/DEPARTMENT: _______________________________________________

1. (surname and initials of supervisor) Petro Boonman.

the supervisor for (surname and initials of candidate) ROZANI, V.C.

__________________________________________________ (student number) 198041220

a candidate for the degree of MASTERS IN BUSINESS ADMINISTRATION


MEASURING BRAND LOYALTY IN THE MEDICAL DEVICES INDUSTRY OF SOUTH AFRICA

considered the following ethics criteria (please tick the appropriate block):

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
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</thead>
<tbody>
<tr>
<td>1. Is there any risk of harm, embarrassment of offence, however slight or temporary, to the participant, third parties or to the communities at large?</td>
<td>X</td>
</tr>
<tr>
<td>2. Is the study based on a research population defined as 'vulnerable' in terms of age, physical characteristics and/or disease status?</td>
<td>X</td>
</tr>
<tr>
<td>2.1 Are subjects/participants/respondents of your study: (a) Children under the age of 18?</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>(b) NMMU staff?</td>
</tr>
<tr>
<td></td>
<td>(c) NMMU students?</td>
</tr>
<tr>
<td></td>
<td>(d) The elderly/persons over the age of 60?</td>
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<tr>
<td></td>
<td>(e) A sample from an institution (e.g. hospital/school)?</td>
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<td>(f) Handicapped (e.g. mentally or physically)?</td>
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</table>
3. Does the data that will be collected require consent of an institutional authority for this study? (An institutional authority refers to an organisation that is established by government to protect vulnerable people)

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3.1 Are you intending to access participant data from an existing, stored repository (e.g. school, institutional or university records)?

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4. Will the participant’s privacy, anonymity or confidentiality be compromised?

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</tbody>
</table>

4.1 Are you administering a questionnaire/survey that:

(a) Collects sensitive/identifiable data from participants?

(b) Does not guarantee the anonymity of the participant?

(c) Does not guarantee the confidentiality of the participant and the data?

(d) Will offer an incentive to respondents to participate, i.e. a lucky draw or any other prize?

(e) Will create doubt whether sample control measures are in place?

(f) Will be distributed electronically via email (and requesting an email response)?

Note:

- If your questionnaire **DOES NOT** request respondents’ identification, is distributed electronically and you request respondents to return it **manually** (print out and deliver/mall); **AND** respondent anonymity can be guaranteed, your answer will be NO.

- If your questionnaire **DOES NOT** request respondents’ identification, is **distributed via an email link and works through a web response system (e.g. the university survey system)**; **AND** respondent anonymity can be guaranteed, your answer will be NO.

and hereby certify that the student has given his/her research ethical consideration and full ethics approval is not required.

SUPERVISOR(S)

HEAD OF DEPARTMENT

STUDENT(S)

Please ensure that the research methodology section from the proposal is attached to this form.