The interplay of visual and auditory cues, telepresence, customisation and product information on South African millennials' online sensory experiences and clothing purchase intentions

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Ethics statement

The author, whose name appears on the title page of this thesis, has obtained, for the research described in this work, the applicable research ethics approval. The author declares that he/she has observed the ethical standards required in terms of the University of Pretoria's Code of Ethics for researchers and the Policy guidelines for responsible research.

The ethics approval letter is presented in Appendix E.

Abstract

While consumers are shifting towards online clothing purchases globally, South Africa, a developing economy with well-developed infrastructure, is lagging in this regard. This research highlights significant drawbacks that may jeopardise the growth of online shopping despite the multiple advantages that consumers and retailers could benefit from. The key to the issue is that a consumer is not physically present in the store, and that online consumers' experiences are limited to the technological capabilities of existing digital platforms. Inevitably, consumers' online experiences would be framed in terms of what they are accustomed to in physical stores, therefore, sensory-rich, captivating environments. Creating well-designed mobile phone applications, which incorporate multiple sensory cues, is consequently crucial to capture online shoppers' attention, and to ensure online retailers' success. Millennials, the largest generational consumer group presently worldwide, is particularly important to online clothing retailers due to their potential buying power, interest in clothing as a product category, as well as their extensive use of mobile technologies.

This study was conducted in the context of an emerging economy and aimed to examine the real-time influence of visual and auditory cues - that could viably be incorporated with available technology into a custom-designed mobile phone application for a fictitious clothing retailer - on millennials' sensory experience and purchase intentions when purchasing clothing online. Clothing is a rather complex product category where sensory cues in combination with a range of extrinsic and intrinsic product characteristics are highly relevant during product evaluation. To accommodate the realities of physical store experience, three moderating influences were examined within the chosen stimulus-organism-response (S-O-R) theoretical framework, namely, the effects of telepresence, customisation, and available clothing product information.

A positivistic, quantitative, descripto-explanatory, cross-sectional study was designed, presenting a two-phase electronic survey. It presented a vignette design that exposed respondents to the capabilities of the custom-designed mobile phone application before completing a questionnaire. Convenient, online snowball sampling through social media produced a sample size of 842 millennial respondents, from the Gauteng province in South Africa. Statistical analyses included descriptive statistics, covariance-based structural equation modelling, moderation analyses, and multivariate analyses of variance.

The findings confirmed the significant influence of visual and auditory cues on millennials' online sensory experience, as well as the significant positive moderating role of telepresence and customisation respectively, in facilitating millennials' purchase intentions when shopping

online. Failure to affirm the moderating influence of product information on consumers' purchase intentions, may be ascribed to the absence of intrinsic product characteristics such as fit, feel, and comfort, which are highly relevant but can not yet be incorporated into an online platform. This elevates the importance of how existing sensory cues are presented, and how they could counteract shortcomings of online shopping encounters. Considering what has been achieved by the gaming industry, in terms of visuals and sound when playing online, retail store mobile phone applications have not yet optimised their potential. Gender differences in online shoppers' sensory experience, purchase intention and use of product information suggest that millennial men's purchase decisions may be more rational inclined compared to their female counterparts. The study indicates how millennials' online clothing purchase endeavours could be enhanced in developing countries like South Africa, where online shopping has not yet reached first-world levels. Empirical evidence is also provided on how online sensory experiences and effective mobile phone app designs could enhance clothing retailers' online apps to boost online sales.

Keywords: visual and auditory cues, millennials' online sensory experiences, telepresence, customisation, product information, clothing purchase intentions, developing market, South Africa, S-O-R framework

Declaration

I, Douwes Sorgdrager, declare that this thesis, which I hereby submit for the degree of Doctor of Philosophy at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

Signature: Douwes Sorgdrager

Date: 12 August 2021

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Table of contents

Appendices

List of figures

List of tables

List of abbreviations

AIDI   Africa infrastructure development index

ANOVA   Analysis of variance

AVE   Average variance extracted

BRICS   Brazil, Russia, India, China, and South Africa

CAGR   Compound annual growth rate

CB-SEM   Covariance-based structural equation modelling

CFI   Comparative fit index

CMV   Common method variance

CR   Composite reliability

GOF   Goodness of fit

HSD   Honest significant difference (Tukey's HSD)

ICT   Information and communication technologies

MANOVA   Multivariate analyses of variance

MB   Megabytes

ML   Maximum likelihood

RMSEA   Root mean square error of approximation

SEM   Structural equation modelling

S-O-R   Stimulus organism response

SRMR   Standardised root mean residual

TPB   Theory of planned behaviour

TRA   Theory of reasoned action

TLI   Tucker-Lewis index

Chapter one: Introduction to this study

1.1. Introduction

A global increase in the use of the internet to conduct product searches and purchases, as well as the advancements in mobile technologies, have transformed, and continue to transform the online shopping landscape (Bilgihan, Kandampully, & Zhang, 2016; Grewal, Levy, & Kumar, 2009; Micu, Bouzaabia, Bouzaabia, Micu, & Capatina, 2019; Souiden, Ladhari, & Chiadmi, 2019). It is also evolving consumer experiences, driving profitability (Lee, Ha, & Johnson, 2019) and changing the retailing marketplace (Bethan & Cano, 2019; Grewal, Roggeveen, & Nordfält, 2017; Hagberg, Jonsson, & Egels-Zandén, 2017; Lee et al., 2019; Lemon & Verhoef, 2016). The attraction of online shopping and the associated transformative changes are related to progress that has been made in sensory-enabling technologies in recent years, such as mobile devices and the proliferation of online touchpoints (Bethan & Cano, 2019; Kim, 2019). Modern technological devices have the potential to stimulate consumers' interest and curiosity, with consumers' "addiction" to their cellular phones and other technological devices, giving testimony to this (Berthon, Pitt, & Campbell, 2019).

Online purchases in South Africa have slowly increased over recent years (Statista, 2020d). This increase has been driven largely by the shutdown of retailers during the global COVID-19 pandemic lockdowns (Eger, Komárková, Egerová, & Mičík, 2021; Pantano, Pizzi, Scarpi, & Dennis, 2020). When access to physical stores became a concern due to the pandemic, the relevance of online shopping was accelerated on many levels (De', Pandey, & Pal, 2020; Koch, Frommeyer, & Schewe, 2020; Roggeveen & Sethuraman, 2020). Evidence of the increases in online purchases is also a testimony that consumers' shopping behaviour should be viewed differently in terms of the possibilities for the future; and that their needs and preferences — specifically concerning online purchases — deserve more attention. Through increased experience and exposure to online shopping, consumers' expectations of the availability of sensory cues — the information captured by consumer's sensory organs, such as eyes and ears (Gibson, 2014; Helmefalk, 2017; Macpherson, 2011) — in the online mobile environment have inevitably increased (Flavián, Ibáñez-Sánchez, & Orús, 2021; Petit, Velasco, & Spence, 2019). The same applies to clothing purchases, which are generally complex regarding how the products are evaluated and deemed suitable for the different end-uses and individual consumers' very diverse needs and preferences.

Clothing represents a relatively complex product category due to the multitude of dimensions of clothing that may influence a consumer's purchase decisions (Erasmus, Donoghue, &

Dobbelstein, 2014; Faulds, Mangold, Raju, & Valsalan, 2018). The complexity of an online purchase decision is further intensified when consumers are less technologically savvy, for example consumers with lower technology-competency levels, in comparison to more educated consumers, or relative to consumers in more developed countries who have become accustomed to the idea of online shopping (Alam, Babu, Noor, Rahman, & Alam, 2020; Soares, Zhang, Proença, & Kandampully, 2017). Therefore, the purchase behaviour of South African millennials, which is of interest to this study, not only differs from that of previous generations in the country but may also differ vastly from their counterparts in more developed countries (Diedericks, 2019; Duh & Struwig, 2015; Lappeman, Egan, & Coppin, 2020).

Millennials constitute more than 1.8 billion people, or 23% of the global population (United Nations, 2019). This cohort is a highly attractive target group for consumer industries (Moreno, Lafuente, Carreón, & Moreno, 2017), as their purchasing power constitutes over 50% of global consumption (Eastman, Iyer, Liao-Troth, Williams, & Griffin, 2014; Moreno et al., 2017). Furthermore, the majority of this age cohort, who are currently between 20 and 40 years of age, has only recently entered adulthood and still have a long future of consumer decisions ahead (Bolton et al., 2013; Chang & Watchravesringkan, 2018; Lappeman at al., 2020; Su, Watchravesringkan, Zhou, & Gil, 2019). This age group also comprises the parents of the forthcoming consumer generation, and through consumer socialisation, they will have considerable influence on the consumers of the future. Compared to previous generations, millennials have grown up in an era of technological advancement, and many possess a high technological fluency (Lappeman et al., 2020; Schiffman, Kanuk, & Brewer, 2014) and are fairly confident in the virtual retail space, including purchasing online (Dharmesti, Dharmesti, Kuhne, & Thaichon, 2019; Pandey & Chawla, 2018). Their purchase decisions may, however, differ in perceived complexity in relation to their gender, income level, and the type of product being considered (Erasmus et al., 2014; Faulds et al., 2018).

Millennials, who are typically highly interested in clothing as a tool to express themselves and convey whom they strive to be (Kim, Ha, & Park, 2019; Ladhari, Gonthier, & Lajante, 2019; Valaei & Nikhashemi, 2017), may find themselves frustrated when, due to their interest in technology, they venture into online clothing purchases. The problem until now has been that the online environment has lacked the sensory experience that consumers, in general, have become accustomed to in physical stores (Flavián et al., 2021; Petit et al., 2019), such as background music; and this has hampered their ability to properly evaluate clothing using an array of senses.

Previous research on consumers' online sensory experiences predominantly focused on a single cue (Helmefalk & Berndt, 2018), which was visual in nature owing to prevailing technological limitations. Auditory cues have also been considered, but only sporadically applied (Biswas, 2019; Krishna, 2012), resulting in research into consumers' perceptions of their exposures to various sensory stimuli being relatively limited or restricted to just a handful.

Traditionally, consumers develop their own rituals and routines when shopping in physical, 'brick-and-mortar' retail stores (Rose, Clark, Samouel, & Hair, 2012). Compared to physical store settings, online or mobile shopping applications (apps) have two significant drawbacks: the consumer is not physically in the store to observe the offerings or the atmosphere; and their sensory experiences, while shopping, are limited to what they can see and hear (provided auditory cues are present) (Mpinganjira, 2016). This is not an insurmountable problem, however, and can be bridged in several ways.

Firstly, in the absence of a physical presence, consumers can rely on sensory cues to create a form of telepresence, thereby influencing the extent to which the consumers feel present in the online environment so that it is more comparable to being in the actual physical space (Baker, Hubona, & Srite, 2019). This, in turn, can shape their sensory experiences and purchase intention in the online environment (Ye, Lei, Shen, & Xiao, 2020). Additionally, as products cannot be physically examined when shopping online, consumers can rely on the product information displayed to influence their purchase intention (Bleier, Harmeling, & Palmatier, 2019; Chen, Wang, & Gao, 2020; Filieri, Lin, Pino, Alguezaui, & Inversini, 2021; Petit et al., 2019). Furthermore, through mobile devices, which have become much more sophisticated in recent years, retailers are now able to customise, and thus enhance their consumers online shopping experiences by adding additional functionality or features to elevate consumers' sense of personal control while also imitating and creating an approximation of their in-store rituals and familiarities (Chopdar & Balakrishnan, 2020; Rose et al., 2012; Ziaie, ShamiZanjani, & Manian, 2021).

Secondly, the latest mobile technology advancements have unlocked even more new options for the presentation of sensory cues. For instance, retailers are now able to make use of technology that was previously unavailable, specifically using 360-degree rotatable product images as visual cues to allow consumers to view products from many more angles as opposed to being restricted to viewing static images. This is particularly important when presenting clothing images and can therefore assist to improve consumers' experiences and facilitate more desirable purchase outcomes (Kim, Baek, & Yoon, 2020). The role of auditory cues in physical stores has been researched extensively (Biswas, Lund, & Szocs, 2019;

3

Imschloss & Kuehnl, 2019). However, instances of using background and interactive music in online stores are uncommon (Hwang, Oh, & Scheinbaum, 2020; Imschloss & Kuehnl, 2019). This indicates that there is an opportunity for its inclusion in newly developed online shopping software applications. Additionally, mobile phone apps that entice consumers' senses so that they become more stimulated and involved might be beneficial to heightening consumers' curiosities and boosting their actual purchases.

This research has therefore acknowledged existing shortcomings when deciding to focus on how well-designed mobile phone apps that incorporate visual and auditory cues, can be used to boost the success of online retailers. In doing so, this research could contribute to overcome the hardship created by the recent COVID-19 pandemic, and to secure a growing online customer base to enhance retailers' future prosperity. Previous work on consumers' use of online apps and websites has predominantly addressed the use of a single cue (Biswas, 2019; Helmefalk & Berndt, 2018; Flavián et al., 2021; Petit et al., 2019) without accounting for the combined influence of additional senses. For the most part, former research reports are based on post-purchase surveys, which can now be overcome by means of mobile phone applications that place consumers directly into a simulated purchase setting to make evaluations "on-site", which will be more truthful in terms of their experiences (Baker, Parasuraman, Grewal, & Voss, 2002; Jüttner, Schaffner, Windler, & Maklan, 2013; Kelleher et al., 2015; Rose et al., 2012). Previous research had also focused mainly on developed market settings such as the USA (Bleier et al., 2019; Dharmesti et al., 2019; Hwang et al., 2020; Kim et al., 2020; Rose et al., 2012). Therefore, it is unclear how a combination of visual and auditory cues will influence consumers' sensory experiences and their purchase intentions during an online purchase encounter using mobile phone apps in developing countries, where consumers are less experienced in online purchasing compared to their first-world counterparts. This study responds to the recent calls for further research into consumers' online sensory experiences in a developing country context (Biswas, 2019; Chopdar & Balakrishnan, 2020; Flavián et al., 2021; Izogo & Jayawardhena, 2018; Kumar, Nim, & Sharma, 2019; Petit et al., 2019).

Consumers' perceptions of online mobile phone applications and their subsequent behavioural responses can be explained in terms of the Stimulus Organism Response (S-O-R) framework that was introduced by Woodworth (1929) for application in marketing (Howard & Sheth, 1969) and which was later expanded by Mehrabian & Russell (1974). Within this framework, cues from the external environment serve as stimuli (S), and when observed and noted by an individual through his or her senses, will trigger cognitive and/or affective (emotional) activity within the consumer's or organism's (O) mind, changing the individual's internal state, thus

4

creating interest, curiosity, excitement, and so forth, which prompts a related behavioural response (R) (Mehrabian & Russell, 1974). In terms of online shopping using a mobile phone application, then, a consumer perceives the cues provided by the mobile shopping app through his or her senses and integrates the stimuli internally, which then instigates behaviour such as to purchase, or not; to browse further or not, or to revisit the site or not. This sequential theoretical S-O-R framework has been applied successfully in online consumer behavioural contexts before (Bleier et al., 2019; Matos & Krielow, 2019; Micu et al., 2019; Rose et al., 2012), as well as in contexts involving mobile technologies (Chen, Chung, & Tsai, 2019; Chopdar & Balakrishnan, 2020; Rodríguez-Torrico, San-Martín, & San José-Cabezudo, 2019).

Expanding on existing online sensory experience research, this study aims to propose a model within the context of a developing country that is framed in accordance with the S-O-R framework. This is done to indicate the relevance of visual and auditory cues as part of consumers' sensory experiences, and their subsequent purchase intention when conducting clothing purchases that involve the consideration of multiple criteria, using a mobile phone app. It also intends to explain the relationships among visual and auditory cues, sensory experience, and purchase intention within such a scenario, while explaining the respective roles of telepresence and customisation (between the stimuli and the organism in the framework) and product information (between the organism and the response in the framework). In so doing, online clothing retailers in developing countries will benefit from a model that provides empirical evidence and guidance; whereby, such retailers could use to improve the design and performance of their mobile phone apps to encourage online shopping and improve the millennial online experiences.

1.2. Operating in a changing retail environment

Numerous real-life complexities are associated with the era of the Fourth Industrial Revolution that, for example, encompass changes in the way people live, how consumers behave in the marketplace, and how retailers and businesses respond and conduct their business. Existing evidence suggests that the world of retail is changing forever (Grewal et al., 2017; Inman & Nikolova, 2017). Retailer competitiveness and rivalry have intensified over recent years due to globalisation and increased product availability, often leading to reduced selling prices and operating profit (Hult, Sharma, Morgeson, & Zhang, 2019; Kumar, Anand, & Song, 2017). Retailers have subsequently had to implement multiple strategies, including cost reduction strategies, to remain relevant (Barari, Ross, & Surachartkumtonkun, 2020; Grewal et al., 2017; Inman & Nikolova, 2017; Pantano et al., 2020; Rose et al., 2012). They have also had to reconsider selected aspects of their businesses, for example, supply chain management,

operating efficiency, and costing, even offloading costs downstream onto suppliers where possible to remain competitive (Bekker, 2018).

To further reduce rental and facility costs in brick-and-mortar stores and to supplement their sales and increase profits, retailers have introduced opportunities for online purchases, while encouraging consumers to explore the use of mobile shopping applications (Grewal et al., 2017; Inman & Nikolova, 2017). The introduction of omni-channel retail is a multichannel approach intended to provide an uncomplicated customer experience for customers who generally patronise physical stores to encourage them to also shop online. An online app allows online shopping to be performed using any electronic device, such as a desktop computer or a mobile device such as laptops, tablets, or mobile phones. Some retailers have since moved entirely to the online context (Barari et al., 2020; Martin, Mortimer, & Andrews, 2015).

Inevitably, the customer experience, when shopping either in a physical store or online, is not the same; and despite indisputable advantages when shopping online, the online offering of certain product categories is more challenging. At the same time, the specifications for certain products are clear and easy to present, as in the case of grocery products or household appliances, clothing merchandise is a far more intricate category to present online (Retief & De Klerk, 2010). When purchasing clothing, consumers' choices include a combination of extrinsic and intrinsic characteristics and extend beyond the price of an item and mere functionality, to also include performance characteristics such as comfort, aesthetics, status elements, and fit (Hines & Swinker, 2001; Littrell, Jin Ma, & Halepete, 2005; Osmud & Małgorzata, 2020; Rahman & Kharb, 2018; Retief & De Klerk, 2010). Clothing purchase decisions can therefore become quite complicated and involving.

The digitalisation of purchases has profoundly influenced retail clothing businesses, altering consumers' shopping expectations and driving the need for uncomplicated, effective online platform designs (Cao, Ajjan, & Hong, 2018; Hasan, 2016; Kaushik, Khare, Boardman, & Cano, 2020). To ensure that consumers derive positive experiences while shopping online (Biswas, 2019; Kaushik et al., 2020), retailers are obliged to understand and acknowledge consumers' needs, including the type of experiences that consumers desire (Roggeveen & Sethuraman, 2020). This applies particularly to situations where consumers have no other option but to order the products online, as has occurred during the extreme conditions of COVID-19 lockdowns (De' et al., 2020; Koch et al., 2020; Roggeveen & Sethuraman, 2020).

These types of encounters influence consumers' behavioural intentions and the probability that their online shopping habits will continue in the future. Therefore, a positive consumer experience is crucial to retaining consumers' interests and gaining a competitive advantage (Jain, Aagja, & Bagdare, 2017). Today's consumers are accustomed to the sensory cues generally present in physical stores, and when online platforms do not provide similar experiences or at least engage more of their senses (apart from visual cues), the customers are inclined to be disappointed (Flavián et al., 2021; Petit et al., 2019). Therefore, as consumers become more connected online and more empowered in online retailing, online platforms need to attend to and respond with online sensory experiences that will encourage consumers to prolong their browsing on their websites. Ideally, online shopping experiences should encourage consumers to adopt online shopping as a shopping format of choice, as opposed to perceiving it as an alternative to what they have been accustomed to (Bethan & Cano, 2019; Grewal et al., 2017; Lemon & Verhoef, 2016; Souiden et al., 2019).

Sensory experience is a crucial dimension of customer experience, which refers to stimulation that affects one's senses (Gentile, Spiller, & Noci, 2007; Mehraliyev, Kirilenko, & Choi, 2020; Rajaobelina, 2018; Schmitt, 1999; Spence, Puccinelli, Grewal, & Roggeveen, 2014). Sensory stimuli are cues that relate to visual (seeing), auditory (hearing), haptic (touching), olfactory (smelling) and gustation (tasting) sensory systems (Biswas, Szocs, & Abell, 2019; Krishna, 2013). At any moment, when shopping either offline or online, multiple stimuli simultaneously influence consumers' shopping experiences. Subsequently, positive experiences are generally derived from a combination of stimuli that involves different senses (Biswas, 2019; Spence et al., 2014).

When not physically present in a store, consumers have to rely on sensory cues to simulate a condition of telepresence (Ye et al., 2020). Telepresence refers to a feeling of being present in a specific location, in real-time, despite accessing that location from somewhere other than a person's current location (Grewal, Noble, Roggeveen, & Nordfalt, 2020). A so-called telepresence shapes consumers' sensory experiences and their intention to purchase via online platforms (Ye et al., 2020). Significant interest in the use of telepresence as a moderator in mobile phone commerce is evident from the study of Liu, Jiang, and Chan (2019), who considered the effect of gesture-based interaction modes such as touchscreen and mid-air gestures on consumers' virtual product experiences, during a between-subjects factorial experiment. Similarly, Hwang and Oh (2020) investigated the application of interactive music in e-commerce website designs. However, their study excluded the complexity of multi-factorial interactions with other sensory cues, which is a gap that this research seeks to address.

Customisation is among the most essential utilitarian factors that enhance consumers' experiences when using mobile phone apps (Ho & Chung, 2020). Customisation is achieved by mobile phone app developers through a unique grouping of elements, by matching services according to geographic location, through the customisation of consumer interfaces, and by personalising services and information in accordance with shoppers' attributes (Dastane, Goi, & Rabbanee, 2020). One of the pertinent limitations of mobile shopping remains the extent to which customisation is possible, particularly when considered in relation to an augmented reality (Smink, van Reijmersdal, van Noort, & Neijens, 2020). Any effort to convert online shopping to resemble reality more closely would therefore be invaluable in terms of consumers' perceptions and the future growth of this shopping mode.

A major challenge with online shopping, is that products cannot be examined physically. Consumers generally rely on sensory cues and the available product information that is displayed to guide their purchase decisions and influence their purchase intentions (Ahn, Bae, Ju, & Oh, 2018; Retief & De Klerk, 2010; Souiden, Amara, & Chaouali, 2020). Product information is regarded as an important moderator of consumers' attention to particular products and their eventual purchase behaviour (Ahn et al., 2018; Retief & De Klerk, 2010; Souiden et al., 2020).

Nowadays, consumers can use various avenues to acquire product information to facilitate their product choices and purchase decisions, consumers can use various avenues (Shakir Goraya et al., 2020). Mobile phones, which are more readily available than other electronic devices such as tablets and computers, serve as an important tool for conducting product searches fairly rapidly, and tend to increase consumers' feelings of competence. Because technological devices allow access to vast amounts of information, consumers can swiftly compare the information of alternative websites, enabling them to critically evaluate and even "challenge" retailers' sales pitches (Fuentes & Svingstedt, 2017). Technological devices, therefore, hold much potential in terms of the interaction between consumers and retailers.

1.3.   The theoretical framework for this study

The stimulus-response theory, generally referred to as S-O-R theory (Howard & Sheth, 1969; Mehrabian & Russell, 1974; Woodworth, 1929), posits that the external environment, as a stimulus (S), triggers cognitive or affective responses from an organism's (O) internal state, which in turn prompts the behavioural response (R) of the organism. Thus, the framework affirms that observed stimuli generate activity within consumers' minds that instigate related behavioural responses (Rodríguez-Torrico et al., 2019). The sequential S-O-R framework has

been used extensively in consumer behaviour studies across the world (Bleier et al., 2019; Matos & Krielow, 2019; Micu et al., 2019; Rose et al., 2012) to comprehend consumers' psychological and behavioural reactions towards contextual stimuli, such as in the commerce-based environment (Chopdar & Balakrishnan, 2020). Studies have also considered the retail industry by identifying the shopping environment as a stimulus that presents an array of contextual factors that influence consumers' behaviour in the physical shopping environment (Baker, 1986; Bitner, 1992; Donovan & Rossiter, 1982). Subsequent research has also applied the S-O-R framework in the online retail environment (Eroglu, Machleit, & Davis, 2001) in the online consumer behaviour context (Bleier et al., 2019; Matos & Krielow, 2019; Micu et al., 2019; Rose et al., 2012), and in the mobile technology context (Chopdar & Balakrishnan, 2020; Rodríguez-Torrico et al., 2019).

Over the decades, the S-O-R framework has framed several studies on in-store ambiences (Baker, 1986; Bitner, 1992; Donovan, Rossiter, Rarcoolyn, & Nesdale, 1994; Wirtz, Mattila, & Tan, 2000). Notwithstanding evidence of various S-O-R framework studies in the mobile and online spheres, its application in mobile shopping applications is still scarce. It is important to note, at this point that mobile phone apps function differently compared to mobile or online websites in terms of convenience, personalised offers, or speed of shopping experiences (Chopdar & Balakrishnan, 2020; Forbes, 2017).

The study of Akram, Ansari, Fu, and Junaid (2020), which applied the S-O-R framework to ascertain the links between the usefulness of the fast-food related applications on a mobile phone and their perceived ease of use, for instance, focused mainly on the moderating influence of digital coupon use. Their research inspired this study, which investigates the influence of visual and auditory cues on consumers' online sensory experiences, framed in terms of the S-O-R framework as the theoretical underpinning.

In this study, two sensory cues (visual and auditory) have been applied as the stimuli, with sensory experience being the organism and purchase intention the response. The sensory cues were expected to trigger an affective response (a sensory experience), which elicits a purchase intention's behavioural response. These relationships were expected to be moderated by telepresence and customisation (between the stimuli and the organism in the framework), and product information (between the organism and the response in the framework). This framework was considered relevant and appropriate to frame this study and is visually presented in Figure 1. It is also discussed in more detail later in Section 4.1.
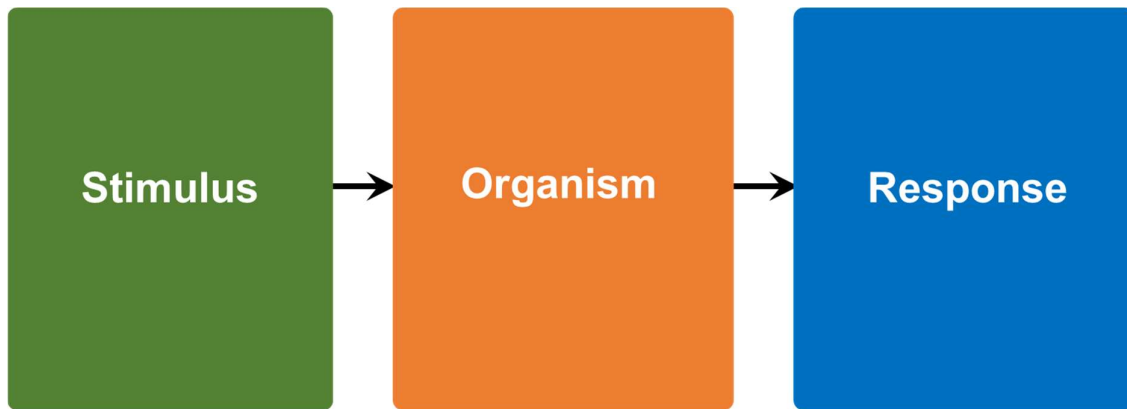
Figure 1: S-O-R framework

Source: Mehrabian and Russell (1974).

1.4. Research problem

In a highly competitive global environment, retailers have already considered many cost-reduction strategies to curb the immense costs related to maintaining and managing physical stores and retaining their presence in the marketplace (Bekker, 2018). One such initiative has been to encourage online shopping. As part of this initiative, online shopping using mobile shopping apps has been introduced in recent years (Grewal et al., 2017; Inman & Nikolova, 2017). As businesses are already competing in terms of price and product decisions in an attempt to distinguish themselves, they are devoting increased attention to consumer experience as a way to differentiate consumers' buying experiences (Gao, Melero-Polo, & Sese, 2019; Lemke, Clark, & Wilson, 2011; Lemon & Verhoef, 2016; Ostrom, Parasuraman, Bowen, Patrício, & Voss, 2015). This is done in an ongoing strive to offer positively differentiated shopping experiences (Hult et al., 2019; Retief, Erasmus, & Petzer, 2018).

The perception of business leaders that customer experience is fundamental to enhance and achieve increased competitiveness in the market has subsequently led to customer experience receiving considerable attention in recent years — both in practice and in academia. Academics have even described customer experience as the central premise of marketing management (Gao et al., 2019; McColl-Kennedy, Zaki, Lemon, Urmetzer, & Neely, 2019; Roggeveen, Grewal, & Schweiger, 2020). Essentially, consumers' experience has become "the key battleground for today's global competition" (Kawaf & Tagg, 2017; Weinman, 2015). Several studies have concluded that positive consumer experiences are indeed a vital prerequisite for business success (Kumar & Pansari, 2016; Kumar, Rajan, Gupta, & Pozza, 2019).

Some have argued that failure on the part of retailers to provide high-quality customer experiences will have detrimental consequences for their organisations (Kawaf & Tagg, 2017). This failure often explains why consumers opt to switch to competitors or express their negative experiences by using alternative online channels, something which retailers should avoid at all costs (Singh & Crisafulli, 2016). Consequently, a positive customer experience is vital for achieving the competitive advantage that would encourage positive purchase intentions among consumers (Jain et al., 2017). Therefore, customer experience has emerged as a pertinent differentiating factor in retail, which is even more important when targeting the very important millennial consumer category, as millennial shoppers are known to be hedonic shoppers who expect pleasurable customer experiences (Chang & Watchravesringkan, 2018; Su et al., 2019). This has also been confirmed in recent studies conducted in South Africa among millennial clothing shoppers (Diedericks, 2019; Pentz, du Preez, & Swiegers, 2020; Retief et al., 2018).

A problem that retailers have recently been grappling with, is that, despite the growing popularity of online shopping, over 85% of consumer purchases globally still occur in physical retail stores (Souiden et al., 2019; Statista, 2020b). Concerning online purchases specifically, statistics indicate that since 2017, over 50% of global web traffic has taken place through mobile devices (excluding tablets) (Statista, 2020e), which indicates that consumers have an affinity for using their mobile devices for online purchases. Generally, technology, including mobile devices, is used to conduct product searches, to compare prices and to look for service providers (Fiestas & Tuzovic, 2021; Flavián, Gurrea, & Orús, 2020; Holmes, Byrne, & Rowley, 2013; Qin, Peak, & Prybutok, 2021; Thakur, 2016).

Across industries, the most significant global online retail sales revenue stream is clothing, leading the way with a 24% online retail contribution (detail is presented in Section 2.3.3). However, in South Africa, the clothing industry has only recently achieved a 6% online retail sales revenue in the clothing segment (Statista, 2020c). Compared to global markets, South Africa, as a developing country, therefore still lags behind with the uptake of online apparel sales (Statista, 2020c, 2020d). Despite recent rapid increases in the infiltration of mobile phones across the population, almost one-third of South Africans have access to a smartphone (Mpinganjira & Maduku, 2019; Statista, 2020b). Consequently, smartphones are the device of choice for e-commerce in South Africa (Pentz et al., 2020). In addition, and despite smartphone applications having been available for many years globally, their adoption for online purchases, in general, has been slower than retailers had anticipated (Kim et al., 2020). Low online purchase rates, particularly in the clothing category, indicate that something may still be lacking with online shopping platforms.

An issue that is worth exploring is the apparent shortcoming of online shopping applications, particularly the lack of attention, recently, concerning the inclusion of relevant sensory cues, and the nature of the products' information, and its effects on consumers' purchase intentions (Bleier et al., 2019; Filieri et al., 2021; Petit et al., 2019; Retief & De Klerk, 2010). It should be kept in mind that consumers develop their own rituals, routines, and expectations over time, based on what they have experienced and how they have operated in the past, particularly in brick-and-mortar stores (Rose et al., 2012. Experiential retailing with associated elements of fun and excitement has become more prominent in recent years (Retief et al., 2018). Retailers are therefore obliged to respond by improving consumers' online sensory experiences accordingly, so that consumers do not feel that they are missing out when shopping online (Bethan & Cano, 2019; Grewal et al., 2017; Lemon & Verhoef, 2016; Souiden et al., 2019).

While various stimuli may enhance consumers' shopping experiences, visual sensory stimuli appear to be particularly influential in consumers' behaviour, including their purchase intentions (Biswas, 2019; Petit et al., 2019; Spence et al., 2014). Therefore, it is particularly important to attend to how stimuli are presented on mobile platforms and understand how they are interpreted — particularly if they are intended to incite consumers' interest, spark purchase behaviour, and positively influence consumers' purchase intentions or boost purchase decision behaviour. Consumers have become accustomed to the presence of sensory cues in physical stores, which have become highly sophisticated in recent years (Retief et al., 2018). They are likely to expect online environments to stimulate more of their senses (Flavián et al., 2021; Petit et al., 2019), particularly through visual and auditory cues (Mpinganjira, 2016). This has, however, largely been neglected in previous research (Chopdar & Balakrishnan, 2020; McLean, Al-Nabhani, & Wilson, 2018). While visual and auditory cues are effective in their own right, they can, in combination, through the intelligent design of technological applications in the online context, produce synergistic and multisensory effects (Mehraliyev et al., 2020; Yoganathan, Osburg, & Akhtar, 2019). The presence of sensory cues enriches consumers' online experiences and facilitates telepresence in the virtual environment (Baker et al., 2019), which shapes consumers' purchase intentions (Ye et al., 2020). Essentially, mobile phone apps designed to entice consumers' senses are highly beneficial in improving consumers' shopping experiences and heightening their purchase intentions.

The value of sensory cues in enhancing consumers' online shopping experiences is still under-researched within the domain of the use of mobile phone applications for online shopping. Previous online sensory experience research had predominantly focused on a single cue (Helmefalk & Berndt, 2018), which was the visual cue, due to technical limitations, although some have also acknowledged the relevance of auditory cues (Biswas, 2019; Krishna, 2012).

12

The role of auditory cues in physical stores has explicitly been studied extensively (Biswas, Lund, et al., 2019; Imschloss & Kuehnl, 2019), although the inclusion of interactive- and background music in online stores is uncommon (Hwang et al., 2020; Imschloss & Kuehnl, 2019). Despite continual calls for further research concerning consumers' online sensory experiences in recent years (Becker & Jaakkola, 2020; Biswas, 2019; Grewal & Roggeveen, 2020; Heller, Chylinski, de Ruyter, Mahr, & Keeling, 2019; Moreau, 2020; Reynolds-McIlnay & Morrin, 2019), the topic is still underdeveloped. It is this gap that inspired this research endeavour.

Technological advancement and progress concerning the application of technology in retail, to date, has unlocked considerable potential in terms of how shopping platforms can be designed and improved for everyday use by the average person. For example, apart from accommodating sensory cues, 360-degree rotatable product images, rather than merely showing static images, would allow consumers to inspect products from many angles (Kim et al., 2020). Progress in sensory-enabling technologies, such as touchscreens and smartphone technology, also allow for improved functionality and the inclusion of music that engages more of the consumers' senses, increasing the likelihood that they will become more immersed in their online shopping experiences (Petit et al., 2019; van Heerde, Dinner, & Neslin, 2019).

When shopping online, a consumer's perception of online shopping is evaluated against what they would have been experienced in a physical store. With the rise in modern technology, retailers can customise and thus enhance consumers' shopping experiences. This is thereby elevating their sense of personal control and creating an approximation of their in-store rituals and familiarities (Chopdar & Balakrishnan, 2020; Rose et al., 2012). Online shopping has become an important topic of interest for practitioners and researchers alike (Homburg, Jozić, & Kuehnl, 2017; Lemon & Verhoef, 2016), and it deserves more attention in terms of what the future might hold for both retailers and consumers.

In summary, the research problem for this study reflects the real-life complexities of the era of the Fourth Industrial Revolution, which is characterised by changes in the way that people live, how consumers behave in the marketplace, and how retailers and businesses respond and conduct their business (Grewal et al., 2017; Inman & Nikolova, 2017). A worldwide increase in online transactions is indisputable, and this became abundantly apparent during the COVID-19 pandemic when physical stores were forced to close their doors and explore alternative avenues to survive (De' et al., 2020; Koch et al., 2020; Roggeveen & Sethuraman, 2020). During this health-related crisis, online shopping has become a welcome solution for many, and retailers have consciously invested more efforts in creating an online presence.

Although the extreme conditions that rocked the world in 2020 have fast-forwarded many retailers' online presence and consumers' willingness to pursue online shopping in more product categories than food, movie and theatre tickets, significant changes in retail were already predicted in 2018. At the time it was claimed that consumers' conduct in the marketplace would change rather drastically (Bizcommunity, 2018). This prediction was inevitably facilitated by the increased popularity of technology (Mpinganjira & Maduku, 2019; Statista, 2020b), as well as by consumers' increased familiarity with and possession of sophisticated technologies, whilst becoming more accustomed to online transactions (Bento, Martinez, & Martinez, 2018; Ladhari et al., 2019). Particularly important in this scenario, is the conduct of the millennial age cohort, which currently comprises the largest age cohort globally (Eastman et al., 2014; Moreno et al., 2017).

Millennials are far more familiar with technology than their older counterparts and display pertinent behavioural characteristics that retailers have to consider (Dharmesti et al., 2019; Lissitsa & Kol, 2016; Valentine & Powers, 2013a). For example, millennials are inclined to be status-conscious, which explains their interest in clothing, brand consciousness, and a strong need for recreation, pleasure and excitement (Chang & Watchravesringkan, 2018; Diedericks, 2019; Moreno et al., 2017; Su et al., 2019). They have also grown up in a technological era and are more willing to explore new devices, new programs, and novel applications than older generations (Parment, 2013). Any attempt to encourage online shopping, as retailers might aim to do, therefore requires a recognition of the needs, preferences, and potential contribution of this age cohort.

Millennials represent a viable market segment responsible for raising the future generation, including their consumer socialisation (Lissitsa & Kol, 2016; Valentine & Powers, 2013b). Therefore, their conduct in the marketplace will set the scene for what their children might prefer in the future. In order to capture their attention and insatiable need for excitement and novelty, retailers that aim to encourage millennials to adopt online shopping more-seriously as their preferred shopping mode, have to offer well-designed websites, preferably on online mobile phone applications that can be accessed in the palm of their hands, wherever they are, and whenever they wish. Instead of being merely functional, mobile phone applications that represent sensory experiences — by involving more of consumers' senses than merely presenting primary visual stimuli, specifically through the skilful integration of visual and auditory cues — have a better chance of succeeding, and serving the intended purpose of boosting online sales, than applications that do not (Yoganathan et al., 2019).

1.5. Purpose and research questions of this study

This study was conducted in the context of an emerging economy, South Africa, in order to examine the influence of visual and auditory cues on millennials' sensory experience and purchase intentions when purchasing clothing online. Previous research has primarily relied on consumers' post-experience feedback (Baker et al., 2002; Jüttner et al., 2013; Kelleher et al., 2015; Kumar, Umashankar, Kim, & Bhagwat, 2014; Lemke et al., 2011; Rose et al., 2012), which may be less accurate than real-time strategies in determining how consumers truly felt at the time of their shopping experience. For instance, it is possible that consumers' recollections of shopping encounters may have faded over time or may be prejudiced according to whether a transaction indeed took place (Stein & Ramaseshan, 2019). This motivated this researcher to employ an alternative approach to gathering more reliable information and expand the investigation to examine the interplay of all the factors mentioned earlier when consumers use mobile phone apps to make online clothing purchases in South Africa. Existing evidence on the subject of mobile phone applications has, to date, primarily focused on scenarios in the context of developed countries, which are not necessarily relevant locally.

Evidence of the relevance of telepresence, customisation and product information in the mobile phone application context is also sparse. This study considered the moderating effects of telepresence and customisation on the associations between visual and auditory cues and consumers' sensory experiences and the moderating effect of product information on the relationship between consumers' sensory experience and their purchase intentions.

Furthermore, consumer behaviour (see Section 3.2.1) and consumers' purchase decisions (see Section 3.2.2) are highly complex and involve several influences, including personal properties or demographic properties such as gender and age, together with situational factors that are external in nature and not always controllable (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019). Several studies that have been conducted in physical shopping malls have reported significant gender differences in consumers' shopping behaviours (Ameen, Tarhini, Shah, & Nusair, 2021; Haj-Salem, Chebat, Michon, & Oliveira, 2016; Katrodia, Naude, & Soni, 2018; Lucia-Palacios, Pérez-López, & Polo-Redondo, 2018). In addition, because clothing is gender specific, it made sense to also examine the likelihood of gender differences in the online shopping space (see Section 2.2.3).

This study did not discriminate demographic characteristics other than age, that was important for sample selection. It was argued that every millennial, irrespective of income or education

level who wanted to purchase clothing online, would experience/encounter the same challenges with a mobile phone app. Therefore, income level and education level were not considered relevant in this study. Gender, however, drew the attention, because literature states that men are inclined to be more task oriented when purchasing goods and services, while females are more emotionally inclined, desiring more hedonic experiences (Ameen et al., 2021; Chang & Watchravesringkan, 2018; Dabbous & Barakat, 2020; Pandey & Chawla, 2018). The study therefore took interest in the behaviour of millennial males versus females as this is a unique age cohort that does not necessarily behave in the way that their older counterparts (that gender research refers to) do (see Section 2.2.3 and 4.2).

Accordingly, the following research questions (see Section 5.1) were formulated to guide this research undertaking:

Research question 1 (RQ1): How do visual and auditory cues influence consumers' sensory experience when using a particular mobile phone app to purchase clothing online?

Research question 2 (RQ2): How does the sensory experience derived from an online shopping encounter, when using a particular mobile phone app to conduct a clothing purchase, influence consumers' purchase intention?

Research question 3 (RQ3): What is the moderating influence of telepresence in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online?

Research question 4 (RQ4): What is the moderating influence of customisation in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online?

Research question 5 (RQ5): What is the moderating influence of clothing product information between consumers' sensory experiences and their purchase intention when using a particular mobile phone app to purchase clothing online?

Research question 6 (RQ6): How does gender influence the relationships in the conceptual model for this study, which specifies specific interactions during an online shopping encounter when using a particular mobile phone app to conduct a clothing purchase?

1.6. Research approach

This research was framed within the S-O-R theoretical framework (Mehrabian & Russell, 1974). The study specifically focused on observed or perceived sensory cues (S) that are external in nature, generating sensory experiences when interpreted in consumers' minds (O). This subsequent internal activity in consumers' minds influences consumers' purchase intentions and related behavioural responses (R). Accordingly, the framework affirms that observed stimuli are interpreted by consumers, thereby generating activity in consumers' minds, which then culminates in certain behavioural responses (Rodríguez-Torrico et al., 2019).

Scrutiny of prior research indicated that various mobile and online studies had been framed within the S-O-R framework. However, its application in mobile shopping has not attracted much attention to date (Chopdar & Balakrishnan, 2020). Subsequently, gaps exist in the literature with regard to the design characteristics of online apps (stimuli) and their related prerequisites to ensuring a cognitive interpretation (O) that would encourage various desirable responses (R). These desirable responses include boosting consumers' usage of mobile phone apps and utilising online shopping as a convenient and alternative mode of shopping in the complex shopping category of clothing purchases. Previous studies have not yet attended to the relevance of online visual and auditory cues as part of consumers' sensory experiences, nor their effect on consumers' purchase intentions when using mobile phone applications. Furthermore, existing evidence from developed countries is not likely to be applicable to consumers' behaviour in developing markets, where online shopping has not yet advanced to the reported levels in developed countries (Izogo & Jayawardhena, 2018; Mukherjee, 2014).

A comprehensive literature review was conducted to set the background for the study, highlight and define relevant constructs for investigation, and derive hypotheses that could be tested in the context of the study, which are outlined in Chapter Three. A positivist paradigm with a quantitative methodology that is cross-sectional in nature was selected to secure quantifiable data that aptly reflects the situation of the market at a specific point in time and which could be analysed statistically (Hair, Ortinau, & Harrison, 2021; Saunders, Lewis, & Thornhill, 2016; Walsh et al., 2015). The questionnaire was developed in accordance with the envisaged conceptual model for this study (Lee & Park, 2019).

A purposive, non-probability sampling technique was employed, which incorporated snowball sampling using on specific inclusion criteria as a pre-requisite for participation in the study, while social media was used to distribute invitations for participation (Zafar, Qiu, Li, Wang, &

Shahzad, 2021). Specific eligibility questions ensured that willing respondents were suitable to be included as part of the target population. Millennials who are generally competent in using mobile technology, were targeted (Babin & Zikmund, 2016). The online survey commenced with a specific fictitious online shopping task that every respondent had to complete before immediately progressing to the online structured questionnaire. This online shopping task involved the download and use of a specially designed app, whereby participants had to follow the instructions for use and to customise certain parts of the shopping experience, for example selecting the background music. Upon completion of the shopping task, the app was deactivated and could not be accessed for a second attempt.

Data was statistically assessed for normality, reliability, and validity, guided by the relevant parameters (Babbie, 2016; Hair et al., 2021). Data analyses included descriptive and inferential statistics, in accordance with the hypotheses that were formulated for the study, which contributed to the envisaged model that was meant to depict the online shopping encounter (Cooper & Schindler, 2002). Specifically, covariance-based structural equation modelling (CB-SEM) was performed (Babin & Svensson, 2012; Breitsohl, 2019), using EQS software to test the structural relationships (Bentler, 1995), was followed by moderation analysis using the PROCESS macro plug-in (Hayes, 2017) and multivariate analysis of variance (MANOVA) is (Cooper & Schindler, 2002).

1.7. Scope and limitations of this study

This study was conducted within a developing country setting (as explicated in Section 2.3.4) and focused on the clothing segment of the fashion retail industry (as explicated in Section 2.3.3.2). This is a complex product category (Erasmus et al., 2014), and poses pertinent challenges in terms of online shopping due to the relevance of both extrinsic and intrinsic product characteristics that are more complex to convey compared to, for example, groceries and appliances, which can be described in terms of precise product specifications. The study focused on millennial consumers owing to their current prominence in the market and their potential influence on the consumer markets of the future. Online shopping was selected due to its future growth potential (as detailed in Section 2.3.3). The investigation was limited to the influence of two senses, as stimulated by means of visual and auditory cues. The other senses could not yet be considered for this research because of existing technological limitations in the design of mobile phone applications.

No research focusing on the influence of visual and auditory cues has been performed to date on online sensory experience or purchase intention pertaining to mobile phone applications

within the South African market (see Section 2.3.4). Currently, no reputable study (in a highly ABS-ranked publication) has attempted to prospectively identify the combined effects of the aforementioned sensory cues in a realistic online developing country retail setting. Furthermore, no known research could be found that explored the constructs of telepresence, customisation, or product information as moderators in the S-O-R framework within a developing country context. Previous studies have predominantly reflected on developed countries (see Section 1.8.1), thus leaving a gap in terms of what is known about consumers' behaviour in developing countries, like South Africa. Former online studies have also relied primarily on post-experience recall data (Kumar et al., 2014; Lemke et al., 2011), while mobile phone applications allow for real-time online data collection, which this study pursued.

In order to address the research problem (see Section 1.4), this study made use of the S-O-R framework to measure the influence of visual and auditory cues on consumers' online sensory experience and purchase intention after having used a mobile phone application to purchase clothing online in South Africa (see Section 2.3.4). In addition, telepresence, customisation, and product information were considered possible moderators, while the S-O-R framework served as the theoretical underpinning of the study (see Section 1.3).

Millennials were recruited in terms of their year of birth, ranging between 1980 and 2000 (Diedericks, 2019; Ryke, 2019; Weber, 2017). For inclusion in the study, they should have purchased clothing in the past twelve months (this time limitation was fairly long, as the study had to acknowledge COVID-19 restrictions that prevented consumers from going to physical stores for several months), and they should have purchased any product online in the preceding twelve months. Furthermore, respondents were limited to those who had access to an Android software-based mobile device and resided in South Africa's Gauteng province, the country's economic hub. In addition, respondents could not be visually impaired or auditorily challenged (see Section 5.9.1).

1.8. Relevance of the study

Previous research primarily reflects on developed market settings (Izogo & Jayawardhena, 2018; Mukherjee, 2014) instead of retailers in developing markets where online shopping is still in its infancy (particularly in the clothing product category). Guidelines in terms of how retailers can attract their target markets' attention and how to incite curiosity that would encourage online purchases are not yet clear. Noting the recommendations of scholars who have previously conducted research in developed market contexts, it is not clear how a proposed integration of visual and auditory cues would influence consumers' sensory experiences during online clothing shopping encounters. It is also uncertain how this might

influence consumers' purchase intentions to the benefit of much needed increased sales from the perspective of retailers who might wish to invest in more sophisticated mobile phone applications.

While an online environment requires favourable telepresence to capture consumers' interest, it also needs to be customised to reflect the image of the retailer and has to present detailed product information that will as close as possible match a target market's physical store shopping routines. This study provides theoretical, methodological, and practical contributions relevant to both researchers and retailers in South Africa and other developing countries. It aims to expand role players' understanding of consumers' purchase intentions, using a mobile phone app that was intentionally modified to enhance consumers' sensory experiences when conducting online shopping in a specific product category. These theoretical, methodological, and practical contributions are discussed below.

1.8.1. The theoretical contribution of this study

From a theoretical perspective, this study extends knowledge on the relevance of visual and auditory cues when designing mobile phone apps to enhance millennials' sensory experiences and purchase intentions when conducting clothing purchases online. The study was framed within the S-O-R framework and was conducted in real-time in a developing country, where online purchasing is growing, although its adoption is not yet comparable to the sales figures in more developed countries (Chopdar & Balakrishnan, 2020; Cunningham & De Meyer-Heydenrych, 2021). This was achieved by infusing the relevant constructs into the three components of the S-O-R framework to propose a conceptual model to summarise the outcomes of the research. The relevant constructs include visual and auditory cues (as the stimuli), sensory experience (as the change occurring within the organism due to exposure to the stimuli), and purchase intentions (as the outcome or response component). Telepresence, customisation, and clothing product information are integrated into the S-O-R framework as moderators. Telepresence and customisation were expected to elicit stronger sensory experiences (Bilgihan et al., 2016; Novak, Hoffman, & Yung, 2000), while relevant product information that is conveyed as part of the stimuli was expected to increase consumers' purchase intentions (Fuentes & Svingstedt, 2017; Weisstein, Kukar-Kinney, & Monroe, 2016).

Since visual and auditory cues can be manipulated through effective mobile phone app design (Bleier et al., 2019), their influence on consumers' sensory experience was investigated based on their expected positive associations with online purchases (Biswas, 2019; Petit et al., 2019). The dependent variables (sensory experience and purchase intention) of the conceptual model

(see Section 4.4) were also tested to indicate possible gender differences (see Sections 2.2.3 and 4.3.7).

This study responds to the recent calls for further research in the context of developing countries, as theories are mostly generated in developed countries where conditions differ vastly from those in developing countries (Izogo & Jayawardhena, 2018; Kumar, Nim, et al., 2019). The research also responds to calls for further research to explain consumers' behaviour concerning mobile shopping applications, as such research is sparse (Chopdar & Balakrishnan, 2020; Ziaie et al., 2021). The study contributes to an understanding of millennials' online clothes shopping experiences and purchase intentions, which is an important topic for a retail segment that contributed significantly to the South African economy (Statista, 2020d), retailers with regard to this cohort's contribution to the economy in the future, considering their market size (Lappeman, Egan, Rightford, & Ramogase, 2021) and interest in clothing (Valaei & Nikhashemi, 2017).

1.8.2. The methodological contribution of this study

Methodologically, this study tested visual and auditory cues by means of a fictitious online shopping task, using a specifically designed mobile phone application, to comprehend the effect that auditory and visual cues have on consumers' sensory experiences and purchase intentions framed within the S-O-R framework. The visual cues employed the use of 360-degree rotatable images rather than the static images that are commonly used. The auditory cues involved interactive music that online consumers could control to their liking. Research has mainly explored consumers' online sensory experiences using a single cue (Helmefalk & Berndt, 2018), while visual and auditory cues are known to be effective, together, in producing a synergistic, multisensory effect (Yoganathan et al., 2019).

In addition, former studies have primarily relied on post-purchase data (Kumar et al., 2014; Lemke et al., 2011), while this study relied on real-time data that captured more accurate and reliable accounts of consumers' sensory experiences at the time of the online purchase encounter.

1.8.3. The practical contribution of this study

This study has targeted millennials due to their current and future market potential. From a practical perspective, this study indicates to retailers how consumers' sensory experience of a mobile phone application can boost their purchase intentions. It provides an evidence-based proposal on how sensory cues; specifically, visual, and auditory cues, can be managed on a

mobile phone application to benefit online retailers and consumers alike. This study provides online clothing retailers in developing countries with a model that will enable them to improve their online performance by means of well-designed applications.

Because the development of mobile phone applications is generally rather expensive (Hoehle & Venkatesh, 2015), this study is particularly valuable in a resource-constrained setting. This has been evident globally during the economic downturn that has prevailed as a result of the COVID-19 pandemic, where many clothing retailers have had to downsize their operations or close down altogether (Bowker, Kew, & Prinsloo, 2020). Retailers will benefit from mobile phone apps that are more effective in terms of increased transactions, as this would assist in recovering the notable development costs (Boyd, Kannan, & Slotegraaf, 2019).

1.8.4. Summary of the research contributions

Table 1 presents a summary of the study's research contributions, indicating gaps in research, based on the discussions presented in Sections 1.4, 1.8.1, 1.8.2 and 1.8.3.

Table 1: Summary of the research contributions

	Identified research gap	Research contribution
Theoretical	Scarcity of evidence of the use of both visual and auditory cues in online settings.	This study made make use of both visual and auditory cues in a fictitious online shopping task (Biswas, 2019; Flavián et al., 2021; Petit et al., 2019; Souiden et al., 2019; Yoganathan et al., 2019).
	Lack of attention in research to the presence of physical store attributes as part of consumers' online shopping experiences.	Integration of the role of telepresence, customisation, and product information within an S-O-R framework to resemble the conditions of physical stores (Bilgihan et al., 2016; Bleier et al., 2019; Chen et al., 2019; Dastane et al., 2020; Grewal et al., 2020; Hadi & Valenzuela, 2020; Kim, Wang, & Malthouse, 2015; Novak et al., 2000; Petit et al., 2019).
	The S-O-R framework has not yet been optimised for online research in developing contexts.	The suitability of the S-O-R framework was challenged in this study, which was conducted within the context of a developing market (Chopdar & Balakrishnan, 2020; Cunningham & De Meyer-Heydenrych, 2021).
	Theories originating from developed markets are not generalisable in a developing country.	This study answers calls for further research in a developing country setting (Izogo & Jayawardhena, 2018; Mukherjee, 2014).

	Identified research gap	Research contribution
	Millennials' online clothing shopping purchase decision is not fully understood.	Calls have been made recently for further research concerning millennials' online shopping purchase behaviour (Diedericks, 2019; Ladhari et al., 2019; Lappeman et al., 2020).
	The dependent variables in the conceptual model were expected to yield different results across the male and female gender categories in this research setting.	The dependent variables in the conceptual model (sensory experience and purchase intention) are tested to distinguish significant differences across the selected gender categories that might affect online decision-making (see Sections 2.2.3 and 4.3.7).
	Calls for further research to explore consumers' online shopping behaviour and related sensory experiences.	This study responds to calls for further research to explain consumers' behaviour and sensory experiences associated with mobile shopping applications (Becker & Jaakkola, 2020; Biswas, 2019; Grewal & Roggeveen, 2020; Heller et al., 2019; Moreau, 2020; Reynolds-McIlnay & Morrin, 2019).

	Identified research gap	Research contribution
Methodological	Scant assessments of consumers' sensory experiences in real-time.	A quantitative real-time assessment of consumers' sensory experiences was conducted (Collins, Kashdan, & Gollnisch, 2003; Kubiak & Krog, 2012; Kumar et al., 2014; Lemke et al., 2011).
	Scant assessments of consumers' sensory experience when using mobile phone applications.	Conducted an assessment of consumers' sensory experience using a mobile phone application (Becker & Jaakkola, 2020; Biswas, 2019; Grewal & Roggeveen, 2020; Heller et al., 2019; Moreau, 2020; Reynolds-McIlnay & Morrin, 2019).
	Limited evidence of the use of online sensory cues; specifically, visual, and auditory cues.	Used a vignette design on a mobile phone application designed with both cues (Biswas, 2019; Flavián et al., 2021; Hwang et al., 2020; Kim & Forsythe, 2009; Petit et al., 2019; Souiden et al., 2019; Yoganathan et al., 2019).

	Identified research gap	Research contribution
Practical	Developing countries are lagging behind in online sales revenue compared to trends in first world countries.	Clothing retailers in developing markets will be provided with a model enabling them to improve their online performance by means of a specially designed mobile phone application, targeting a viable market segment (Statista, 2020b, 2020c, 2020d).
	Mobile phone applications are expensive to develop.	In a resource-constrained environment, the design costs of mobile phone apps can be recovered through increased sales (Boyd et al., 2019; Hoehle & Venkatesh, 2015).

1.9. Measures to eliminate error

In order to eliminate errors that might infringe the reliability and validity of the findings of the study, measures were taken throughout, including a thorough scrutiny of recent literature, published in renowned journals, the choice of a suitable theoretical framework that has been proven to be suitable in previous research, the intricate design of the mobile phone app, the thoughtful design of the survey that had to be thorough although not too time consuming and complicated, as well as suitable data analytical procedures that were considered under guidance of a professional statistician. Details in this regard are provided in Chapter Five (see Section 5.11.4). The professional statistical services confirmation letter is presented in Appendix F.

1.10. Ethical considerations

The study was submitted for ethics approval at GIBS, University of Pretoria, before the data collection commenced. The approval related to issues including intellectual property, recognition of the contribution of previous research through the proper referencing of literature sources, caution about the way in which respondents were to be recruited and communicated with during the data collection, anonymity and confidentiality issues, and acknowledgement of any assistance provided during the completion of the research and thesis. The ethics approval letter, dated 9 February 2021 is presented in Appendix E.

1.11. Definition of key terms

Auditory cue: Sound-based outputs, such as those emanating from a mobile shopping application, which consist of music clips or sounds that are familiar to the user in their everyday life (Batra & Ghoshal, 2017).

Customisation: Personal tailoring of a mobile phone application's appearance and functionality (Rose et al., 2012).

Interactive music: A category of an auditory cue in which the consumer's actions cause changes in the tempo, mode, texture, or volume of the music (Hwang et al., 2020).

Mobile phone application: An application (or software) that performs specified operations or functions for the user on a variety of mobile devices, such as electronic devices, phones, and smartphones (Logan, 2016).

Product information: The information about a product, its attributes or how the product will perform (Retief & De Klerk, 2010). In this study, clothing product information referred to a combination of extrinsic and intrinsic product attributes.

Purchase intention: The likelihood of a consumer to display a particular purchase behaviour online (Gao & Bai, 2014).

Sensory experience: A dimension of customer experience, appealing to the senses, and aimed at creating experiences through the stimulation of sight and sounds (Hsu & Tsou, 2011).

Telepresence: The degree to which one feels present in an online environment relative to an actual real-world setting (Baker et al., 2019).

Visual cue: Visual stimuli that are presented to be perceived by a recipient, such as the user of a mobile shopping application, to generate a response, which can include the visual aspects of a product (such as its visual orientation) (Lowe & Haws, 2017).

1.12. Structure of the thesis

This thesis is structured into eight chapters.

Chapter one: Introduction to the study

This chapter has introduced the need for the study, indicating the gaps that exist in the literature concerning consumers' online decision-making and challenges faced by retailers. More specifically, a gap exists concerning an understanding of how visual and auditory cues may influence consumers' online sensory experiences and purchase intentions when purchasing clothing merchandise with a mobile phone app. Reasons for acknowledging the possible moderating influence that telepresence, customisation, and product information may have on consumers' purchase intentions have been indicated. The selection of the S-O-R framework was motivated and explained in this context, followed by a statement of the research problem, research questions and purpose statement of the study. The chapter is concluded with an outline of the approach that was adopted for the research and an explication of the study's relevance.

Chapter two: The rationale for the research context: Focusing on a selected generational cohort in an emerging economy

This chapter discusses the research setting, firstly attending to South Africa as a developing country. It highlights the differences between developed and developing countries and South Africa's role in the BRICS affiliation and described the characteristics of the Gauteng province as its economic hub, its socio-cultural diversity, and well-developed infrastructure. As the target population, Millennials are discussed in terms of their typical characteristics that served as the motivation for focusing on this generational cohort, and attending to gender differences in their purchase behaviour, millennials' interest in clothing, and the adaptation of online shopping. The industry setting is discussed, commencing with the importance of the retail industry, digital sales channels, the importance of online retail sales, reasons for the focus on the clothing category, and the importance of South Africa's online fashion industry.

Chapter three: Literature review

Having explained the research setting, this chapter begins by providing a deliberation on the relevance of creatively designed shopping contexts, elaborating on customer experiences and the relevance of in-store atmospherics. It continues with a discussion of the skilful integration of sensory cues in physical retail environments, which should be imitated to establish telepresence when designing apps to promote online shopping. The importance of customisation to boost consumers' online retail experiences is explicated. Thereafter, a discussion of the intricacy of consumer decision-making follows, providing a summary of consumers' decision-making processes, consumers' attention to product information and environmental cues (stimuli), as well as the product-evaluation process whereby information is transformed internally (O) to achieve certain decision outcomes (R).

Chapter four: Theoretical framework and conceptual model

The S-O-R framework is presented as the chosen theoretical framework that underpins the design and interpretation of this study. Replications and hypotheses derived from the existing literature are presented before concluding with a conceptual model that integrates the study's main constructs.

26

Chapter five: Research design and methodology

This chapter details the chosen research design and methodology, which is positivistic and quantitative in nature, following a survey design and reflecting the characteristics of a cross-sectional study. The chapter introduces the research questions and explicates the research setting, research paradigm, research design, and research strategy. Attention is devoted to the design of the vignette that the respondents were required to complete, commencing with an explanation of the design of the mobile phone app. The measuring instruments are also described, as is the pilot test. This is followed by a presentation of the sampling procedure, data collection and analysis processes. Measures to eliminate error throughout the research are discussed, and ethical considerations are attended to.

Chapter six: Empirical results

This chapter presents the study's empirical results, starting by outlining the demographic properties of the data sample. This is followed by an explanation of the relevant descriptive statistics that were performed, including tests for normality and the reliability and validity outcomes. The replications and hypotheses are attended to, in the order of introduction in Chapter Four. The CB-SEM is reported to indicate the structural paths in the proposed conceptual model, as explained in Chapter Four. This is followed by the results of the tests that examined the moderating effects of the selected variables in the model and statistical outcomes relating to the investigation of possible gender differences. The chapter concludes with a summary of the results.

Chapter seven: Discussion of results

The study's empirical results are discussed in terms of the replications and hypotheses that were formed, in line with the existing literature. The chapter concludes with a final conceptual model that integrates the final results.

Chapter eight: Conclusions and contributions

In the final chapter, the study's key findings are outlined to specify the research's practical, methodological, and theoretical contributions. The discussions are organised in terms of the S-O-R framework; while the limitations of the research are also noted and explained, concluding with some proposed ideas for future research.

Chapter two: The rationale for the research context: Focusing on a selected generational cohort in a developing economy

Following the introduction to the study and the research problem outlined in the preceding chapter, this chapter explicates the research setting with supporting literature to rationalise the context of the study. Characteristics of South Africa as a developing country are highlighted, and pertinent differences between developed and developing countries are indicated. Reasons are provided for the focus on the Gauteng province in terms of the selected population and sampling process. Typical characteristics of the millennial generational cohort are highlighted to explain this cohort's suitability as the study's target population. The clothing and fashion retail industry is described to acknowledge the importance of this industry, both offline and online, for the South African economy.

2.1. South Africa's developing economy as a research setting

The importance of the clothing retail industry in developing countries such as South Africa extends the brief introduction in Chapter One, to contextualise the research setting. Differences between developed and developing economies are explained, followed by South Africa's part in the Brazil, Russia, India, China and South Africa (BRICS) affiliation of emerging economies, with focus on the Gauteng province, as it forms the economic hub of the country. It also attends to its socio-cultural diversity, as well as its well-developed infrastructure.

2.1.1. Differences between developed- and developing economies

Developed economies include countries such as the United States of America (USA) and the United Kingdom (UK), while developing economies refer to countries such as Brazil, Russia, India, and South Africa (Hofbauer, Huber, Leenders, & Mangold, 2020; Lappeman et al., 2020; Preogreso, 2019; United Nations, 2014). Six criteria are used to distinguish a country's level of economic development (Hofbauer et al., 2020; Preogreso, 2019; United Nations, 2014). In developed countries, for example, the income per capita grows annually, increasing the countries' economic value, resulting in lower levels of poverty. In contrast, developing countries battle with high unemployment rates. In South Africa, specifically, more than a quarter of the population is unemployed (Hofbauer et al., 2020). Developed countries furthermore enjoy higher levels of security as a result of access to more sophisticated technologies and improved weapons technology. In developing countries, however, owing to limited or minimal security, the crime rate is much higher. In South Africa, specifically, 34 people per 100 000 of the population are murdered annually, ranking South Africa in the sixth position in terms of the most murders globally (Hofbauer et al., 2020).

Thirdly, access to reliable healthcare facilities and trained medical staff in developed countries has resulted in decreased mortality and increased life expectancy rates, while the opposite is often true in developing countries (Hofbauer et al., 2020; Lappeman et al., 2020; United Nations, 2014). However, the life expectancy of South African men increased from 52 in 2006, to 61 in 2018, while the life expectancy of South African women increased from 62 to 67, during the same period (StatsSA, 2019). This resulted from improved healthcare facilities in the country, which have reduced both HIV/AIDS- and infant-related mortalities. Fourth, developed countries have a lower unemployment rate, whereas the uncontrolled population growth in developing countries contributes to a lack of available education and healthcare facilities (Hofbauer et al., 2020; Lappeman et al., 2020; United Nations, 2014). Fifth, developed countries tend to import fewer products than what they export to developing countries, while lastly, developed countries' populations have access to sophisticated technology and modern tools, which rely on sophisticated infrastructure, including electricity (Hofbauer et al., 2020; Lappeman et al., 2020; United Nations, 2014). Although South Africa is probably more advanced in terms of infrastructure and its economy than other developing countries, it is nevertheless classified as a developing country because it does not fit other inclusion criteria (Hofbauer et al., 2020; Lappeman et al., 2020; United Nations, 2014).

Inherent economic, cultural, and structural differences also exist between developed- and developing countries, and the related exposures and experiences of consumers in these diverse contexts differ vastly (Mukherjee, 2014). Developing markets are, for example, challenged by inadequate infrastructures, a persistent lack of resources, socio-political influences from the governance, and heterogeneity that complicates any prediction about the nature of the markets (Sheth, 2011; Wang, He, & Barnes, 2017). In combination with the social complexities that prevail in developing markets, multiple external factors influence the mental processes that consumers are engaged in when making purchasing decisions in these markets (Sheth, 2011; Thongpapanl, Ashraf, Lapa, & Venkatesh, 2018). Therefore, it is not possible to simply replicate established theories about consumer experiences from developed markets seamlessly in developing markets (Izogo & Jayawardhena, 2018). For example, consumers in developing markets are apparently significantly more price-sensitive than those in developed markets (Izogo & Jayawardhena, 2018; Narang & Trivedi, 2016), which influences how they perceive and evaluate products. The practical implication of this is that organisations that wish to operate in emerging markets need to adapt their business models accordingly (Izogo & Jayawardhena, 2018). In Africa, specifically, infrastructural inadequacies that do not exist in more industrialised countries present additional challenges concerning the marketing of products (Molino, Exarchos, & Ize, 2015).

Admittedly, many initiatives have led to new opportunities in developing countries in recent times, such as the successful introduction of electrification programmes. As a result, more people now own sophisticated, modern technological devices, and can communicate online (Department of Mineral Resources and Energy, 2020; South African Goverment, 2018). Younger generations' increased competence and adoption of modern technology, in general, have undoubtedly paved the way for alternative ways of communication, purchasing, and consumption practices in recent years (Goga, Paelo, & Nyamwena, 2019; Pentz et al., 2020; Statisa, 2020e). Notwithstanding, e-commerce has not yet attracted considerable attention in developing countries (Agarwal, 2019; Kituyi, 2020; Reardon et al., 2021).

Even millennials, who are generally more competent with technology compared to previous generations, may be negatively influenced by external factors such as lack of infrastructure and lack of access to the latest technological devices. External hindrances are often the cause of limited experience and doubt, for example uncertainty on how to conduct online transactions (Marceux, 2015). In developed markets, consumers are generally more experienced with technology, and are therefore more experienced with online purchasing compared to their counterparts in developing markets (Izogo & Jayawardhena, 2018). Therefore, disparities in consumers' experiences with online purchases in developed and developing markets still exist. Within this complex, continually changing environment, ongoing research is needed to comprehend the factors that drive consumers' decision-making processes in the marketplace (Ashraf, Thongpapanl, & Auh, 2014). This is especially true for developing markets that differ distinctly from developed and well-established markets (Ashraf, Thongpapanl, Menguc, & Northey, 2017; Wang et al., 2017).

2.1.2. South Africa as a developing economy

2.1.2.1. South Africa as part of the BRICS economies

South Africa forms part of the BRICS economies, an acronym used for the five major developing economies, namely Brazil, Russia, India, China, and South Africa. Figure 2 indicates the BRICS countries as positioned on the world map.
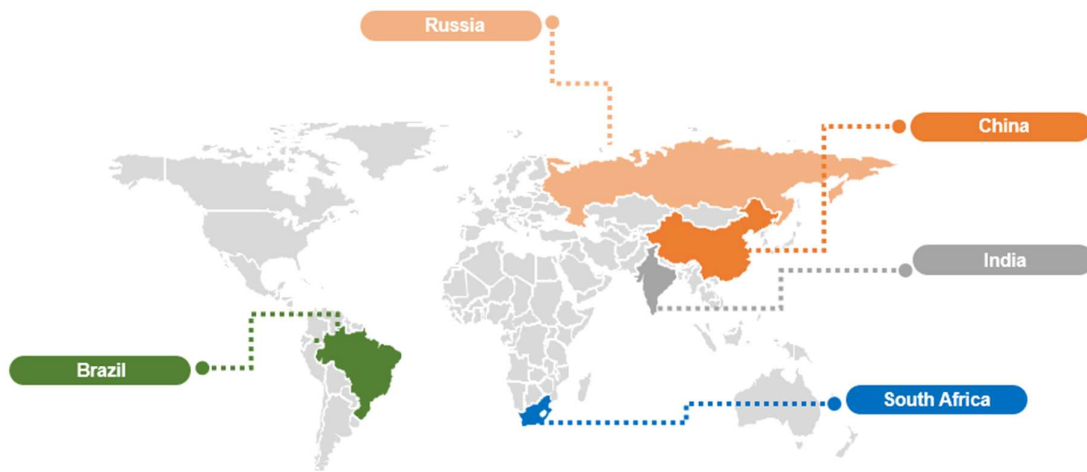
Figure 2: BRICS countries on the world map
Source: Researcher's own.

In comparison to the other four developing economies in the BRICS affiliation, South Africa has the smallest gross domestic product (GDP) and population, although representing the African continent, which elevate its importance in its affiliation (Bartenstein & Oyamada, 2017). South Africa's GDP is forecast to grow by 2.14%, reaching USD 351.90 billion in 2024 (Statista, 2020a). South Africa boasts the most developed retail sector in sub-Saharan Africa, that is growing at a steady rate of 5% per year (Pentz et al., 2020). Therefore, the South African retail industry is an important indicator of consumer spending and a driver of the country's economic growth (Menon, 2018).

South Africa is also among the top ten largest countries in the Middle East and Africa region, and the 23rd largest country in the world (Euromonitor, 2020c), being home to 59 million people (StatsSA, 2020), which is projected to grow to 71 million residents by 2040 (Euromonitor, 2020c). Despite this, South Africa's economy is only the second largest on the African continent, after Nigeria (Lappeman et al., 2020).

2.1.2.2. Gauteng, the economic hub of South Africa

South Africa is divided into nine provinces, of which the Gauteng province is acknowledged as the country's economic hub, having the highest income, as well as the highest disposable income per capita (GEDA, 2016). Furthermore, Gauteng is the seventh-largest economy on the continent (Africa Check, 2018; Cunningham & De Meyer-Heydenrych, 2021), and with over 26% of the South African population residing in Gauteng, it is the most densely populated province, followed by KwaZulu-Natal (KZN), with 19% of the country's population (Lappeman et al., 2021). As many as 44% of South Africa's middle class resides in Gauteng, which is more

31

than double that of any other province in the country (Marsland, 2019). South Africa's urban expansion is also expected to continue at a brisk pace, and by 2040, a significant 76.2% of the population will be living in an urban area (Euromonitor, 2020c). Johannesburg, the capital city of Gauteng, is the second-largest city in Africa, and experiences the fastest population growth rate, forecast at 11.5% by 2040 (Euromonitor, 2020c). Gauteng province also boasts the largest clothing sales, and most mobile subscribers in the country (Euromonitor, 2020a). Figure 3 indicates the location of the nine provinces of South Africa.
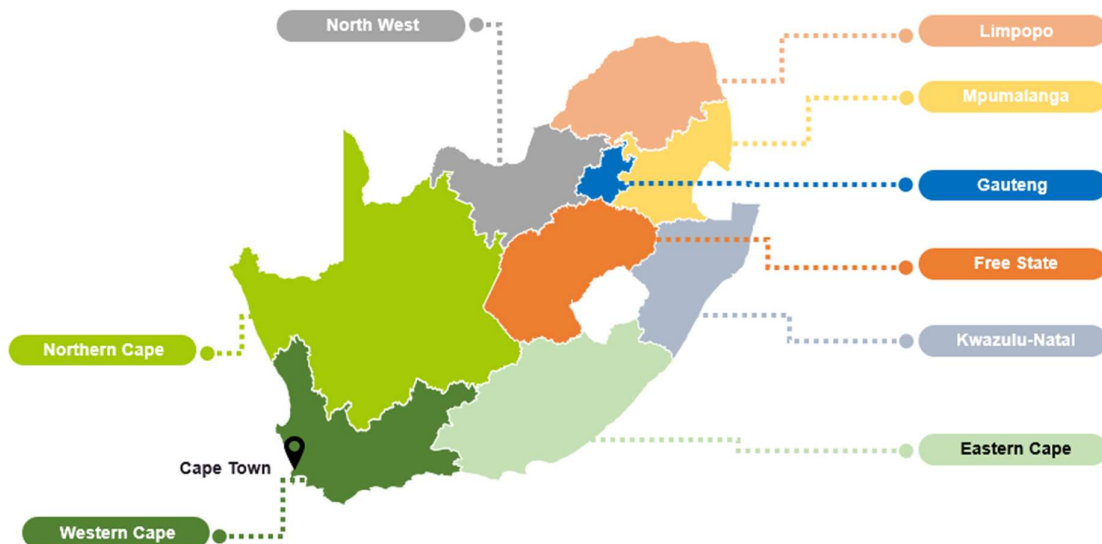
Figure 3: Provinces of South Africa
Source: Researcher's own.

2.1.2.3. South Africa's socio-cultural diversity

In order to understand South African consumers' behaviour in the market, one should understand the socio-cultural complexity in the country. Socio-culture is a phrase used to define an environment according to the values within the population and the behaviours they engage in based on their social circumstances and cultural beliefs (Lappeman et al., 2021). Therefore, socio-culture describes the population as a whole by looking at the people's cultural and social norms in a specific context, highlighting similar traditions, habits, behavioural patterns, and beliefs. The list of socio-cultural factors that affect consumer behaviour is extensive and covers factors such as consumers' education level, family size, social class, culture, and lifestyle (Lappeman et al., 2021). In a marketing context, the term socio-culture describes the key drivers of consumers' decision-making behaviour within a society (Lappeman et al., 2021).

When an organisation decides to target a certain consumer group, knowledge of their willingness to accept the product will facilitate efforts to sell or promote the products. In addition, how well consumers react to new products and their development is determined largely according to the prevailing social norms by which the person abides (Lappeman et al., 2021). It is not enough for marketers to only consider socio-economic status when they formulate their marketing strategies, they should also be acutely aware of cultural differences within a society. In South Africa, specifically, cultural diversity makes it rather difficult for marketing teams to formulate relevant marketing strategies (Petzer & De Meyer, 2013; Vorster, Kipnis, Bebek, & Demangeot, 2020). Nevertheless, it remains a very appealing market (Lappeman et al., 2021; Petzer & De Meyer, 2013; Vorster et al., 2020).

The centrality of family is one of the most prominent value systems in South African cultures. South Africa is characterised by large households comprising of family members that live together in a single place with extended families, due to the importance of family within cultures (Petzer & De Meyer, 2013; Vorster et al., 2020). Marketers should be aware of this because the majority of these families survive on low incomes, which affect the types of products or services they purchase (Petzer & De Meyer, 2013; Vorster et al., 2020). For example, 46% of the population earns less than ZAR 1000 per month (approximately USD 63), and 31% of the population lives on less than ZAR 3500 per month (approximately USD 219) per household (Lappeman et al., 2021). In contrast, the top one percent of the population earns more than ZAR 75000 per month (approximately USD 4690) (Lappeman et al., 2021). The South African middle class represents nearly 36% of the population but contributes 62% to the country's annual consumer spend of around ZAR 700 billion (approximately USD 43 billion) (Lappeman et al., 2021). Therefore, the middle class is strong and creates a solid, constant demand for products and services, which underpins the country's economic growth. However, the large lower-income segment explains why South Africa's uptake of modern technology, relative to its population size, is still low and slow.

2.1.2.4. South Africa's well-developed infrastructure

Across the world, infrastructure development is crucial to promote economic growth and to raise societies' living standards. Infrastructure makes a substantial contribution to human development and poverty reduction (African Development Bank, 2020; Calderón, Cantú, & Chuhan-Pole, 2018). In Africa, infrastructure investment has accounted for more than half of Africa's economic development over the previous decade, and it has the capacity to contribute even more if prevailing conditions permit it (African Development Bank, 2020; Azolibe &

Okonkwo, 2020). Undoubtedly then, physical infrastructure is a prerequisite for industrialisation and economic development (Azolibe & Okonkwo, 2020; Calderón et al., 2018).

In essence, physical infrastructure is comprised of two parts: social infrastructure that includes school facilities, hospitals, sewage systems and water supplies; and economic infrastructure that includes electricity, irrigation, roads, and telecommunications facilities (Azolibe & Okonkwo, 2020). The African Development Bank uses an index to compare various counties' infrastructure — the Africa Infrastructure Development Index (AIDI) — which attends to four infrastructure components, namely: (i) transport; (ii) power; (iii) information and communication technologies (ICT); and (iv) water and sanitation. Figure 4 illustrates the top-ten performers for the composite AIDI on the African continent, in order of magnitude: 1) Seychelles, 2) Egypt, 3) Libya, 4) South Africa, 5) Mauritius, 6) Tunisia, 7) Morocco, 8) Algeria, 9) Cabo Verde and 10) Botswana. Both the Seychelles and Mauritius are part of the African continent for political and geographical location reasons. Theoretically, therefore, South Africa's infrastructure is relatively well developed.
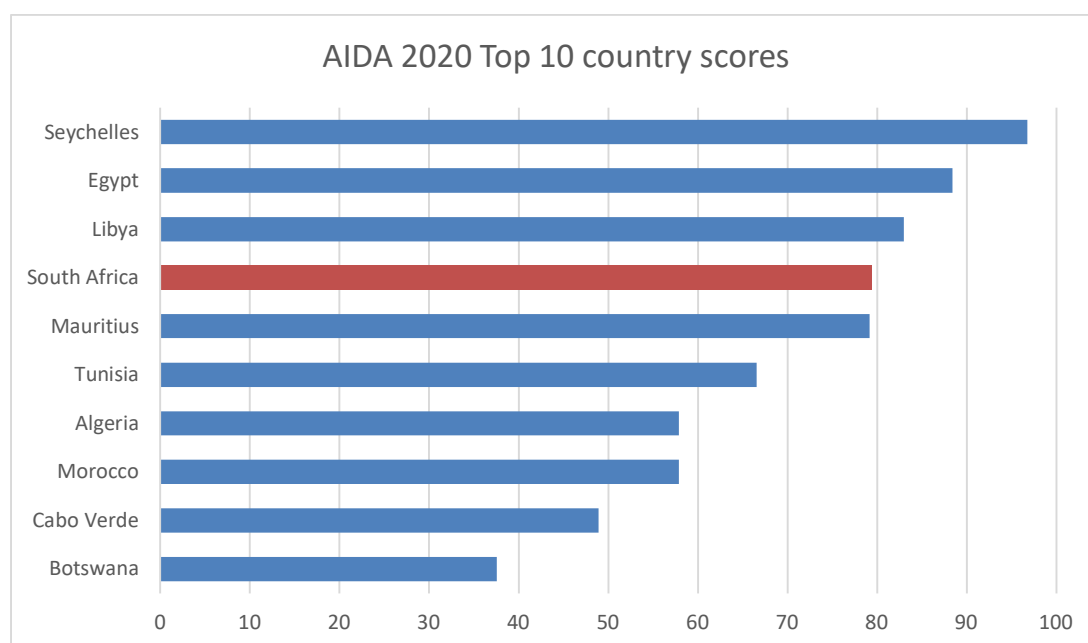
Figure 4: Top 10 African country scores based on AIDI index
Source: Adapted from African Development Bank (2020).

A breakdown of each of the four individual components of the AIDI, is presented in Table 2, comparing the top five African countries that are mentioned in Figure 4.

Table 2: The top five developing countries' overall index scores, specifying individual components of infrastructure

Country	Electricity	Transportation	ICT*	Water
Seychelles	2nd	2nd	3rd	5th
Egypt	5th	1st	7th	2nd
Libya	1st	3rd	13th	3rd
South Africa	3rd	7th	1st	7th
Mauritius	4th	4th	2nd	1st

* ICT: information and communication technologies

Source: Adapted from African Development Bank (2020).

In line with the aim of this study, which focused on online purchases, both ICT and electricity are essential aspects to be considered to enable online shopping. South Africa's internet penetration is facilitated by the increased availability of electricity throughout the country, and its subsequent internet access, which is forecasted to reach 61.4% by 2024. Mobile phone subscriptions per 100 inhabitants are forecasted to reach 173 by 2024 (Statista, 2020a). Indications are that smartphones are the device of choice for e-commerce in South Africa (Pentz et al., 2020). This means that market conditions, such as access to the internet and smartphones, are indeed enabling tech-savvy South African millennials to explore m-commerce. An important characteristic of the millennial generation is that they have been exposed to and are more experienced with technology than previous generations (Brosdahl & Carpenter, 2011; Lappeman et al., 2020; Twenge, Campbell, & Freeman, 2012). Because a large percentage of millennials have only entered adulthood fairly recently, they have considerable potential concerning their contribution to, and influence on the marketplace in the future – specifically concerning the use of technology and online shopping (Bolton et al., 2013; Chang & Watchravesringkan, 2018; Lappeman et al., 2020; Su et al., 2019).

South Africa's infrastructure is well-developed compared to other African counties, and the country has state-of-the-art shopping centres (Euromonitor, 2020a; RMB, 2020). Many shopping centres and physical stores have only been erected recently, such as the Fourways Mall expansion project in Johannesburg with an envisaged 175 000 square metres, together with Ballito Junction and The Pavilion in KwaZulu-Natal (SACSC, 2019). According to the SA Council of Shopping Centres, the number of shopping malls in South Africa exceeds 2000 (BusinessTech, 2018), affording it the sixth position on the list of countries with the most shopping centres in the world (Fin24, 2017). It is the most saturated retail market in sub-Saharan Africa. In 2017, 88% of the accessible retail space in South Africa, was occupied

(Fin24, 2017). South Africans are therefore accustomed to large shopping malls and shopping in physical stores.

In summary, South Africa, a developing economy, is positioned as a key market within both Africa and the BRICS affiliation. South Africa has well developed infrastructure. The country's economic hub, the Gauteng province, boasts with the highest clothing retail sales, and is home to the highest middle class population. The researcher would therefore introduce eligibility questions as to limit the respondents to this population segment, which is a viable target market segment for retailers to focus on, to remain relevant. Furthermore, examining the clothing sales of this population segment will provide insights to clothing retailers which might lead to leapfrogging developed economy retailers.

2.2. Millennials as the target population

After describing the characteristics of South Africa as a developing economy in the preceding section, the characteristics of a particular market segment, namely the millennial generational cohort, are described next in order to explain the study's focus on this cohort as a viable market segment.

2.2.1. Defining the millennial age cohort

Generational cohort theory, which is based on people's birth year, is often considered a better way to segment populations for research purposes, rather than to rely on selected demographic characteristics, such as gender (Ladhari et al., 2019; Parment, 2013; Parry & Urwin, 2011). Cohorts are groups of people that were born around the same time and have shared comparable life experiences (Dharmesti et al., 2019). External events extremely influence members of cohorts during their "coming of age", between the ages of 17 and 23 years (Lappeman et al., 2020; Lazarevic, 2012), for example economic changes in the country, global turmoil, and advancements in technology (Dharmesti et al., 2019). Specifically, there are numerous so-called "defining moment" events during a person's early-adulthood or late-adolescence periods that are the most likely to instil particular values within the cohort that then remain relatively consistent throughout the rest of members' lives (Parment, 2013).

Millennials, also referred to as Generation Y, comprise the cohort of individuals born in the period from the early 1980s to the 2000s. Authors differ, however, in terms of the exact birth dates of this cohort. As illustrated in Figure 5, which was adapted from Lappeman et al. (2020), Ordun (2015) indicates different birth timeframes for developed and developing countries, specifically the five major developing BRICS economies.

		1940	1950	1960	1970	1980	1990	2000	2010
Developing economies	South Africa	Apartheid Generation 1933-1960		Struggle Generation 1961-1979		Transition Generation 1980-1999		Generation Second Wave 2000-2020	
	China				Cultural Revolution 1966-1976	Economic Reform 1980-1991	Globalisation of China 1992 +		
	India		Traditional 1946-1968		Non-Traditional 1969-1980	Generation Y 1981-2002			
	Russia	The Thaw 1937-1952	Stagnation 1953-1968		Peres-troika 1969-1974	Post - Soviet 1975 +			
	Brazil	Optimism 1938-1950	Iron Years 1951-1962	Lost Decade 1963-1974		Be on your own 1975 +			
Developed economies	UK		Churchill 1945-1958	Thatcher 1959-1976		Blair 1977-1990			
	USA		Baby Boomers 1943-1964	Generation X 1965-1980		Generation Y 1981-2001		Generation Z 2001 +	

Figure 5: Generational overview

Source: Lappeman et al. (2020); Ordun (2015).

Similar to the studies of Diedericks (2019), Ryke (2019) and Weber (2017), this study used the interval between 1980 and 2000 to recruit millennials for participation in this research. This South African generation was born during the era when a new democracy was established in the country, witnessing the transition from the apartheid regime to the postcolonial period (Lappeman et al., 2020). Currently, the millennial generation, which also represents an active working population, comprises over 35% of the South African population (StatsSA, 2020), making it a worthwhile target for consumer research.

2.2.2. Motivation to focus on millennials as a viable market segment

2.2.2.1. Millennials' market share

Globally, millennials constitute over 1.8 billion people, thus approximately 23% of the global population (United Nations, 2019). Their purchasing power represents over 50% of global consumption (Eastman et al., 2014; Moreno et al., 2017). Accordingly, they constitute a very lucrative target group for consumer industries (Moreno et al., 2017). In South Africa, millennials make up over 35% of the population, thus, representing the largest population cohort in the country, contributing just over 38% of all consumer spend (Lappeman et al., 2021). Considering their spending power, population size and online presence, this generation is important for the development of online commerce (Ladhari et al., 2019), which explains the

significant market interest in the millennial generation. Millennials are also perceived to be influential indicators of consumers' future behaviour, as they hold much of the future potential, considering their market size, and remaining working years (Bolton et al., 2013; Chang & Watchravesringkan, 2018; Lappeman et al., 2020; Su et al., 2019). Due to their high spending power, they are also more independent, self-sufficient, and sophisticated shoppers compared to previous generations and are highly consumption-oriented (Eastman & Liu, 2012; Ladhari et al., 2019; Lissitsa & Kol, 2016; Parment, 2013). Several studies have found that millennials have a particular interest in clothing as a visual symbol of success (Cham, Ng, Lim, & Cheng, 2018; Diedericks, 2019; Verdugo & Ponce, 2020). Therefore, it is envisaged that they will have a significant impact on the future performance of retailers' online clothing sales (Lissitsa & Kol, 2016; Valentine & Powers, 2013b). More than 45% of millennials in developed countries have apparently admitted to making purchases using mobile retail apps (Qin et al., 2021), which is comforting in the context of this study, as it appears that millennials have considerable influence on their families' purchase decisions, including clothing and food purchases (Hwang & Chung, 2019).

2.2.2.2. Typical characteristics of millennials

Three different lifestyle segments are distinguished among millennials based on their predominant characteristics, such as gender, typical behaviours, beliefs and attitudes towards marketing, and media usage (Rese, Schlee, & Baier, 2019). The so-called "achievers" are wealthy consumers who highly value status and image, while the "strives" are particularly image-conscious, and the so-called "experiencers" are action-oriented individuals (Ladhari et al., 2019). Millennials often adhere to recurring belief systems, which may vary from conservation beliefs of security, conformity, and tradition, to the self-transcendence beliefs of conservation and benevolence; the self-enhancement goals that pertain to power and achievement; or the change-related ideologies of self-direction, stimulation, and hedonism (Chang & Watchravesringkan, 2018; Su et al., 2019), making them an interesting market segment to focus on.

Characteristics associated with consumers who are part of the millennial cohort include the fact that they are more technologically competent compared to previous generations (Lappeman et al., 2020; Schiffman et al., 2014), having grown up in a hyper-connected and multicultural society in which many technological innovations were introduced. They use communication technology extensively and are constantly connected to the rest of the world (Bento et al., 2018; Ladhari et al., 2019), making them better informed than previous generational cohorts (Valentine & Powers, 2013a). It is even said that they use technology as

a means to escape ordinary activities (Dharmesti et al., 2019; Hill, Beatty, & Walsh, 2013), thus willingly venturing into online shopping. They have been found to demonstrate strong product and brand preferences, tend to avoid mass-produced products, seem more sceptical than older generations, and can often be extremely challenging for retailers due to distrusting online retailers concerning issues such as privacy and exclusivity (Ladhari et al., 2019).

Eastman and Liu (2012) found that millennials are more status-conscious than previous generations, while Parment (2013) reported that they are concerned with brands, brand image, social profiling, and quality. Various studies have also indicated that the millennial generation, internationally, is probably the most sustainability-conscious generation to date, with many seeking products that are repairable, eco-friendly, artisanal, ethical, long-lasting, and sustainable, even encouraging many to adopt new consumer habits that align with their values (Chang & Watchravesringkan, 2018; Su et al., 2019). Together with Generation Z consumers, Millennials are even willing to pay more for products or services with links to social and environmental causes (Vadakkepatt et al., 2021). The millennial generation has also been shown to use brands to extend their self-image, selecting brands that align with the image they wish to portray to their social networks (Coelho, Rita, & Santos, 2018). Therefore, they may buy brands associated with environmental causes and wear those articles conspicuously for others to notice.

Interestingly, millennials seem more inclined towards emotional decision processing compared to their older counterparts, whose behaviour is more rational. It is probably not surprising that Giovannini, Xu, and Thomas (2015) found millennials to be more inclined to complain about poor service. They are also more inclined to express their brand affiliation motivation through social media than previous generations (Bento et al., 2018).

What makes millennials particularly attractive for retailers, is that this cohort is seen as early adopters who are not afraid to try new products and services (Parment, 2013). They are also inclined to seek immediate gratification, often spending their income faster than other cohorts, especially through technology platforms where purchases are instant (Moreno et al., 2017). This generation consumes more social media content than previous generations (Bento et al., 2018; Bolton et al., 2013), is more inclined to source information digitally, and is more inclined to interact with retailers and brands on social media (Bolton et al., 2013). Apparently, millennials conclude decisions faster and with less deliberation than other generations (Lissitsa & Kol, 2016).

Retailers need to note that millennials tend to seek their peers' approval through social media (Ladhari et al., 2019), unfortunately often placing more trust in strangers than the producers or retailers (Ordun, 2015). Particularly worrying for retailers, is that millennials' experience with technology makes them more aware of marketing tactics, and they are more suspicious of marketing than their predecessors (Lissitsa & Kol, 2016). They also seem less brand loyal than other generations, which means that they are more inclined to switch retailers and brands when they are unhappy (Moreno et al., 2017).

2.2.2.3. A word of caution

Of particular importance in this study are scholars' cautions that millennials' attitudes and behaviours should not be stereotyped across the world (Debevec, Schewe, Madden, & Diamond, 2013; Dharmesti et al., 2019), owing to contextual differences (Su et al., 2019), and differences in demographic, socio-cultural, and psychological characteristics (Dharmesti et al., 2019; Kaur & Anand, 2018; Tan & Leby Lau, 2016). While admitting that numerous similarities exist, differences among millennials across geopolitical divides have been reported by Su et al. (2019) following a comparison of millennials of developed countries such as the USA and developing countries such as China. Younger Australian millennials' purchases have also been strongly hedonistic related, such as dining, movies, music, and clothes (Pentecost, Donoghue, & Thaichon, 2019). Conversely, older millennials' purchasing patterns seem to be more aligned with the so-called adult, mature lifestyles, incorporating commodities that would improve their living standards, such as high-value household appliances (Pentecost et al., 2019).

Differences in values and attitudes among generations can also be shaped by a country's history and important events (Dou, Wang, & Zhou, 2006; Lappeman et al., 2020). In the South African context, this was the first generation raised in the "new" post-apartheid South African era (Duh & Struwig, 2015; Lappeman et al., 2020). As a result of the political changes that have taken place since 1994, many millennials are now better educated, have better job opportunities, and benefit from better lifestyles than their parents (Bevan-Dye, Garnett, & De Klerk, 2012; Dash, Kiefer, & Paul, 2021; Duh & Struwig, 2015; Lappeman et al., 2020; Ryke, 2019). These changes have also influenced their clothing expenditure, as many millennials support clothing retailers (and probably international retailers) to showcase their newly acquired wealth (Bevan-Dye et al., 2012; Diedericks, 2019). Therefore, the choices of South African millennial consumers may differ from those of the same cohort elsewhere in the world (Diedericks, 2019; Duh & Struwig, 2015).

2.2.3. Gender differences in millennials' purchase behaviour

Gender is considered an important influencing factor in the marketing field, with regard to consumers' shopping intentions, with ample evidence of gender differences in consumers' intentions when exposed to similar contexts and scenarios (Ameen et al., 2021; Walsh, Schaarschmidt, & Ivens, 2017). Several studies conducted in shopping malls reported considerable variations between men and women concerning their experiences and purchase behaviour (Ameen et al., 2021; Haj-Salem et al., 2016; Katrodia et al., 2018; Lucia-Palacios et al., 2018). Significant gender differences in product purchases have also been reported, indicating that females are more likely to purchase items such as clothing and groceries, while their male counterparts are more attracted to specialised items like technology and cars (Chebat, Michon, Haj-Salem, & Oliveira, 2014; Sohail, 2015). Another study explained that these differences are now changing, as females' roles in society are changing, affecting their shopping behaviour and preferences in general (Sohail, 2015).

While studies have repeatedly found that women are more involved in clothing shopping than men, the contrary is true for millennials. Evidence exists that millennial men increasingly enjoy clothing shopping (Schreiner, Rese, & Baier, 2019). Kim et al., (2019) reported that millennial men prefer speciality stores, unlike baby boomers and Gen X men, who prefer discount stores and department stores, respectively. It is reasonable to anticipate that differences related to product purchases in physical stores may manifest in the online shopping store as well.

Gender is therefore an important factor that influences e-commerce adoption and online design assessments (Kühn & Petzer, 2018; Pascual-Miguel, Agudo-Peregrina, & Chaparro-Peláez, 2015; Yoon & Occeña, 2015). Online retailers should be cognisant that the gender gap is closing, although the factors affecting men and women while shopping are still broad (Pascual-Miguel et al., 2015). These differences in online shopping behaviour between men and women are asserted to be due to differences in interface-related attitudes, how millennials process information, and differences in their interactions (Melović, Šehović, Karadžić, Dabić, & Ćirović, 2021; Pandey & Chawla, 2018).

Men are apparently affected by instrumental factors such as a technology's perceived usefulness, hence preferring online channels, while women prefer the ease of use, such as touch panels, and are influenced by social factors (Pandey & Chawla, 2018). Women have also been found to perceive higher levels of distrust in electronic channels than men due to higher computer-related anxiety (Faqih, 2016; Pandey & Chawla, 2018). Also, owing to preferences for touch-related opportunities for clothing purchases and lower self-efficacy (Cho

& Workman, 2011), women are less inclined to conduct online clothing purchases (Chou, Chen, & Lin, 2015; Meyers-Levy & Loken, 2015; Pandey & Chawla, 2018). Interestingly, in terms of retailers' online strategies, women appear to show stronger will power in delaying gratification and resisting temptations, thus delaying the actual purchase, while men are more inclined to act impulsively (Meyers-Levy & Loken, 2015). Another challenge for clothing retailers, is that women generally require different sizes that may differ from the standard sizes that are available online, causing increased return rates (Chou et al., 2015; Pandey & Chawla, 2018).

The South African retail clothing industry had a compound annual growth rate (CAGR) of 8.7% between 2013 and 2017 (MarketLine, 2018). In the South African retail clothing industry, menswear currently has the majority of market share (42%) compared to womenswear (33.1%), which had dominated the market for decades (MarketLine, 2018). In 2017, this lucrative menswear market category had a total revenue of USD 3.9 billion (MarketLine, 2018), and is not only expanding remarkably in terms of revenue but is also experiencing transformation with regards to consumer behaviour (Diedericks, 2019; Ryke, 2019). Therefore, the stronger shift towards menswear is not surprising.

2.2.4. Millennials' specific interest in clothing as a product category

Millennials are apparently obsessed with fashion: indications are that some of them spend up to 70% of their salaries on fashion and apparel (Bakewell & Mitchell, 2003; Valaei & Nikhashemi, 2017). Their strong interest in fashion explains their significance for clothing retailers (Valaei & Nikhashemi, 2017). It should be noted that fashion, especially clothing trends, changes rapidly, and styles are seldom current for more than six months (Valaei & Nikhashemi, 2017), explaining why millennials who are interested in fashion spend so much money on clothing.

Millennials have also been categorised in terms of different shopper types in brick-and-mortar store settings, namely hedonistic, brand-conscious, quality-conscious, brand-loyal, habitual, fashion-conscious, novelty-seeking and confused-by-choice shoppers (Ladhari et al., 2019). Earlier research also reported that millennials, who generally prefer activities that are hedonic in kind, mostly apply a more hedonistic shopping style (Mandhlazi, Dhurup, & Mafini, 2013). Conversely, a study involving 538 female millennials, to explore their online fashion shopping practices in Canada and the US, distinguished four types of online fashion shopping trends, namely brand orientation, price, pleasure, and trend shopping (Ladhari et al., 2019).

With so many different retailers to choose from, the complexity of consumers' choices is amplified (Diedericks, 2019). Millennials generally pay attention to store appearance, in-store experience, the newness of fabrics and styles, and fashion trends (Kim et al., 2019), confirming the relevance of sensory cues in terms of their in-store experiences (see Section 3.1.2).

2.2.5. Millennials' adoption of online shopping

Generally, consumers' online retail shopping behaviour is driven by both utilitarian and hedonic motivations (Childers, Carr, Peck, & Carson, 2001; Parker & Wang, 2016). In essence, utilitarian motivations refer to functional or goal-oriented consumer needs (Childers et al., 2001), while hedonic motivations are viewed as personal, experiential, and subjective, as they involve emotional stimulation, pleasure, and potential excitement (Holbrook & Hirschman, 1982). Drawing on the idea of hedonic value shopping motivations, the enjoyment of online shopping entails the amount of intrinsic enjoyment that a person derives from an online shopping experience, where enjoyment may occur irrespective of whether or not a purchase has been made. Generally, tech-savvy millennials are the most likely to attempt online shopping, and their online shopping encounters are highly likely to be less stressful (Dash et al., 2021; Lissitsa & Kol, 2016). Several studies on online shopping with mobile phones have concluded that such purchases can even be regarded as pleasant, due to the high-convenience factors (Agrebi & Jallais, 2015; Olivier & Terblanche, 2018). Indications are that any positive developments in online shopping, such as apps that would increase interactivity, pleasure, and entertainment, would encourage millennials to shop online (Hur, Lee, & Choo, 2017).

The enjoyment associated with online purchases lies in the opportunity for personalisation or customisation (Moreno et al., 2017), which can be fascinating (Alam et al., 2020) owing to an increased sense of freedom and control (Wolfinbarger & Gilly, 2001). Having grown up during the era of the internet, millennials have also developed a greater understanding of the benefits and risks associated with online shopping, compared to the previous generations (Obal & Kunz, 2013). They can avoid risks, which enhances a positive attitude towards online shopping (Sorce, Perotti, & Widrick, 2005). Previous research on online shopping behaviour has suggested a positive association between consumers' online shopping attitudes and their purchase intentions (Dharmesti et al., 2019; Sorce et al., 2005). In a recent study, researchers confirmed that high internet penetration and tech-savviness have enabled millennials to appreciate the advantaged associated with online shopping (Melović et al., 2021). Accordingly, millennials are generally more positive towards online shopping and are likely to develop favourable purchase intentions when the conditions of the online encounter are favourable.

43

In summary, millennials are known to be more tech-savvy than previous generations, also being rather obsessed with clothing, with pertinent gender differences concerning their decision-making behaviour. These characteristics provided the researcher with three opportunities. Firstly, the opportunity to examine their online clothing purchases, which are lagging in South Africa compared to developed economies. Secondly, using their tech-savvy mobile phone fluency, to design a a mobile phone application in an online vignette design, similar to what clothing retailers could use, and to collect data in real-time. Lasty, gender preferences could be explored. The insights leading from the research will enable retailers to not only 'fish where the fish are' but to also 'lure the fish with the right bait'.

2.3.   Contextualising the retail landscape

The previous sections discussed the importance of millennials as a cohort, and market segment, to retailers, particularly in the fashion and clothing industry, emphasising the typical characteristics that indicate their competence with modern technology, their pleasure-seeking behaviour, and their interest in fashion and clothing. The following section devotes attention to the importance of the retail clothing industry, digital sales channels, online retail, and clothing as an important product category in terms of the economy of South Africa.

2.3.1. The importance of the retail industry

The retail industry is one of the world's largest and most important industries (Hult et al., 2019; Kumar et al., 2017). In 2020, the retail industry generated sales exceeding USD 15.5 trillion, of which the USA contributed over 21%, while the combined African continent contributed 6% of the generated sales revenue (Euromonitor, 2021). This industry has also forecasted a 7% year-on-year growth in global sales (Euromonitor, 2021). New technologies, and the presence of an ever-changing and competitive market, which has become more global in its operations, are forcing the retail industry to continuously adapt to accommodate new challenges (Kumar et al., 2017; Souiden et al., 2019). Consequently, it is critical to understand how technologies are changing today's retail landscape (Grewal et al., 2017), including the adoption of online shopping.

2.3.2. Digital sales channels in the retail industry

Traditional brick-and-mortar fashion retailers are faced with various strategic opportunities and challenges, such as increasing high overhead costs (Blázquez, 2014). They have therefore had to reconsider selected aspects of their businesses, for example, supply chain management, operating efficiency, and costing, even offloading costs downstream onto

suppliers, where possible, to remain competitive and to survive (Bekker, 2018). To further reduce rental and facility costs related to physical stores to supplement their sales and to increase their profits, retailers have introduced opportunities for online purchases, encouraging consumers to explore the use of online ordering platforms, such as mobile shopping applications (Grewal et al., 2017; Inman & Nikolova, 2017).

Until recently, physical stores were presumed to have had a competitive advantage over e-commerce platforms due to a tangible interactive customer experience that involves both the environment and the product, where consumers are allowed to consult staff, and can touch and try on products. Consumers' experiences are hence enhanced in these stores by providing both utilitarian and hedonic value (Teller, Reutterer, & Schnedlitz, 2008). Many consumer segments, therefore, still prefer physical stores (Maggioni, Sands, Kachouie, & Tsarenko, 2019; Sands, Ferraro, Campbell, & Pallant, 2016). More recent studies concur that improving consumers' experiences should include attention to online shopping environments and alternative modes of interaction (Kokho Sit, Hoang, & Inversini, 2018; Stein & Ramaseshan, 2016).

In essence, consumer experience encompasses the interactions between the retailer and the customer, which creates value and affects the customers' satisfaction and intention to purchase (Alnawas & Aburub, 2016; Molinillo, Navarro-García, Anaya-Sánchez, & Japutra, 2020). In a world of accelerated technological advancement, in the midst of the so-called fourth industrial revolution (Schwab, 2017), new challenges and opportunities for digital commerce are expected to accelerate. Therefore, it has become increasingly common for retailers to complement their offline activities with online activities through the so-called option of omni-channels (Parise, Guinan, & Kafka, 2016).

The lucrative millennial cohort that is present in the challenging retail space, are known to possess higher levels of technological fluency than its predecessors (Lappeman et al., 2020; Schiffman et al., 2014), explaining why they are generally more comfortable purchasing online (Dharmesti et al., 2019; Pandey & Chawla, 2018). In recent years, retailers are increasingly exploring online sales channels, aiming to create memorable experiences, and distinguishing themselves in a highly competitive market (Hilken et al., 2018; Meyer & Schwager, 2007). Introducing new terminologies in marketing, such as "augmented reality" (AR), which indicate that retailers are consciously attempting to elevate consumers' omni-channel experiences to retain customers' interest (Hilken et al., 2018).

2.3.2.1. The introduction of e-commerce as a sales channel

E-commerce refers to all electronic- or virtual-information exchanges that occur within and between organisations, such as retailers, their stakeholders, and their consumers (Chaffey, Edmundson-Bird, Hemphill, & Pearson, 2019; Kaushik et al., 2020). E-commerce has radically altered the dynamics of the business environment in recent years and how consumers and retailers are operating in terms of access to products, services, and prices (Chaffey et al., 2019; Kaushik et al., 2020), drastically increasing the competitiveness among retailers. E-commerce websites has also challenged the survival of many physical retailers, resulting in an evolution of the retail landscape, and causing many established brands to exit the market. Those who have continued to compete, have capitalised on the opportunities offered by the channel (Klaus & Nguyen, 2013), including around-the-clock availability, reduced geographical barriers, lower costs, and extended reach to customers (Christodoulides, Michaelidou, & Argyriou, 2012; McLean et al., 2018). Retailers are therefore obligated to adapt their strategies to incorporate an online presence – termed omni-channel – realising that the internet (e-commerce) will continue to dictate the evolution of the retail landscape (Martin et al., 2015).

2.3.3. Progressing to m-commerce as a sales channel

Although e-commerce has made a revolutionary shift in how companies conduct their processes and operations, the advent of m-commerce has further widened the scope of the virtual trade revolution (Al-Adwan, Alrousan, Al-Soud, & Al-Yaseen, 2019; Omonedo & Bocij, 2014). This is because the global trend, now, is to focus on the use of wireless technologies, such as mobile devices (Wong, Tan, Ooi, & Lin, 2015). Other drivers of increased mobility are the increasing penetration of mobile phones into people's everyday lives, and the universal trend towards economic globalisation (Afshar Jahanshahi, 2012). For this study, the definition of m-commerce was adapted from the business to customer (B2C) relationship, referring to consumers' online browsing, comparison, search and acquisition of products and services, via wireless hand-held or mobile devices, such as smartphones (Groß, 2015; Marriott, Williams, & Dwivedi, 2017).

Mobile retailing, or m-commerce, describes the use of mobile devices, including smartphones and tablets, as platforms for the sale of products or services (Souiden et al., 2019). Hence, the contemporary retail environment now also includes the use of mobile devices to conduct fast transactions through accessible technologies, such as hand-held mobile devices. This has forced retailers to adapt further to offer consumers access to multiple commercial alternatives in ways they can shop (Pantano & Priporas, 2016; Rose et al., 2012; Souiden et al., 2019).

M-commerce can also form a part of the overall purchasing cycle. Certain shopper groups do, for example, use mobile phone apps to buy products, but prefer to collect the products from the store, in person. Others use digital channels to research product information and then go into the physical stores to make their actual purchases (Nakano & Kondo, 2018; Souiden et al., 2019). A significant challenge for retailers, is to decide how mobile and digital technology or services can be incorporated or merged into their existing operations (Chou, Chuang, & Shao, 2016). Most retailers have therefore now extended their websites to accommodate customers who own a computer, with access to the internet, commonly known as the "desktop website" (Nel & Boshoff, 2020), as well as mobile phone users, by developing mobile versions of their websites, or "mobile websites" (Wang, Malthouse, & Krishnamurthi, 2015). This allows consumers to conveniently browse for products, conduct product information searches, perform price comparisons, as well as purchase the products or services, similar to what can be done in-store (Groß, 2015).

M-commerce has changed consumers' shopping behaviour considerably (Shankar et al., 2016), in that they can purchase anytime and anywhere, not necessarily having to travel to physical stores to acquire products and services, without even having to sit in front of a computer (Lee, Kim, & Kim, 2005; Verhoef, Kannan, & Inman, 2015). Consumers can also easily and simultaneously use mobile devices with other channels, for instance, to conduct information searches, checking stock, or comparing prices on their mobile phones while in an offline store (Melero, Javier Sese, & Verhoef, 2016). While they are busy with an online transaction, using their mobile phones, consumers can also engage in real-time interactions with friends, retailers, and other consumers to discuss their envisaged purchases (Shankar et al., 2016; Verhoef et al., 2015), providing them with the feeling that they are in control.

Owing to developments in mobile devices, consumers now have many different interfaces and screen sizes, with touchscreens that are easy to operate (Brasel & Gips, 2014). These characteristics may influence the response and subsequent experiences of consumers while using and viewing content. Because of the increased rate of purchases made via applications (apps) on mobile phones, retailers have become increasingly attentive to this technology (Molinillo et al., 2020). Figure 6 illustrates how the retail environment is aligned, integrating physical stores, e-commerce (online shopping) and m-commerce (mobile shopping).

47
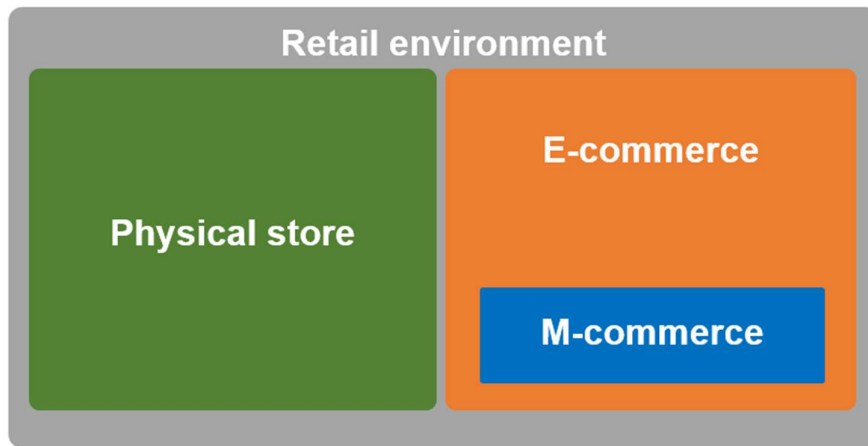
Figure 6: The retail environment

Source: Researcher's own.

However, while mobile phone apps are an important element of m-commerce, not much research has been conducted, to date, concerning customers' experiences while using m-commerce applications (McLean et al., 2018). Furthermore, because online shopping on mobile devices is growing steadily (Statista, 2020d), industries or retailers that do not adapt accordingly will most likely lose their relevance in the foreseeable future.

2.3.3.1. Comparison between e-commerce and m-commerce

M-commerce and e-commerce are similar, in that both provide instant access to roughly the same internet sources (Raphaeli, Goldstein, & Fink, 2017). The difference is that m-commerce is performed on mobile devices, such as smartphones (Liu, Li, Edu, Jozsa, & Negricea, 2019) using wireless, mobile electronic infrastructure (Dan, 2014), while e-commerce simply requires a fixed location with internet access (Al-Adwan et al., 2019; Tiwari, Buse, & Herstatt, 2006). A consumer's browsing experience differs for the two modes of commerce for three main reasons. Firstly, m-commerce facilitates anytime, anywhere transactions, allowing mobile users access to timely information (Sumita & Yoshii, 2010). Mobile devices may even be used while shopping in-store, to perform product searches, and to compare products and prices, which creates new challenges for retailers (Piotrowicz & Cuthbertson, 2014). Secondly, compared to e-commerce, m-commerce might raise more privacy and security concerns among users, as this platform allows more information to be collected on customers (such as time- and location-related information), and because data is transferred wirelessly, interception by third parties is easier (Chong, 2013). Thirdly, the smaller screens of mobile devices, compared to computer screens, may hamper the long and complex use of the m-commerce channel (Raphaeli et al., 2017). Other differences include page layout variations (Chung, Chun, & Choi, 2016), differences in interaction convenience (Chung et al., 2016), and

48

differences in the types of entertainment (Agrebi & Jallais, 2015; Liu, Li et al., 2019). The design of the mobile app is therefore crucial.

Consequently, since m-commerce is still developing and expanding, a broader understanding of m-commerce is required, which can be used to enhance customer experiences.

2.3.3.2. The value of mobile phone applications

Mobile phone applications (apps) are mobile operating systems that perform specified operations or functions for the user on various mobile devices, such as electronic devices, phones, and smartphones (Logan, 2016). Mobile phone apps are based on small software programs that are designed to run on mobile devices, performing various functions, including but not limited to a calendar, email, social networking, web browsing and online gaming (Hsiao & Chen, 2016). The apps are downloaded onto a smartphone from an online application platform, such as Google Play or App Stores (Garg & Telang, 2011). Not only have mobile phone apps changed consumer behaviour by providing platforms for entertainment, sharing opinions, obtaining information, and making purchasing decisions, they have also changed business, marketing, and promotion strategies by allowing companies to build networks with existing customers and to attract new customers (Cheung & To, 2017). Mobile phone apps function differently from mobile or online websites in terms of aspects such as convenience, personalised offers, and the speed of the shopping experiences (Chopdar & Balakrishnan, 2020; Forbes, 2017), and these advantaged are not yet fully explored.

Admittedly, consumers have their own routines with shopping (Rose et al., 2012), and mobile phone apps can help to customise their experiences (Parise et al., 2016). Unlike websites, mobile phone apps can make use of the hardware on the mobile phone, as well as the features of the devices to provide customised user experiences, such as offering location-specific content via the GPS capabilities or incorporating the built-in camera function to scan bar codes (Levi-Bliech, Pliskin, & Fink, 2020; McLean et al., 2018). Furthermore, mobile phone apps provide the benefit of consistent access to the online environment, which allows retailers to be in contact with consumers at any time (Grewal et al., 2017). This function has the ability to improve the retailer–consumer relationship considerably (Inman & Nikolova, 2017; Iyer, Davari, & Mukherjee, 2018; Molinillo et al., 2020).

Therefore, while both apps and mobile websites can be accessed through mobile devices and have a similar layout, they are accessed through different devices with distinctly different characteristics (such as differences in screen size) (Liu, Lobschat, Verhoef, & Zhao, 2019).

49

They are also used in different contexts (such as on-the-go, instead of at home), while the usage contexts of apps and mobile websites are more similar (Liu, Lobschat et al., 2019). Therefore, for clothing retailers to venture into m-commerce is rather challenging because the small screen of a mobile phone significantly reduces the impact of the message unless the app is sophisticated enough to overcome pertinent limitations (Choi, Ko, Medlin, & Chen, 2018).

2.3.3.3. The dilemma

Whether done online or in a physical (brick-and-mortar) store, retail environments have become increasingly sophisticated, with shopping frequently blurring transactional, social and leisure boundaries (Bell, Gallino, & Moreno, 2014; Hult et al., 2019). Even though retail stores provide consumers with a unique opportunity that most of their online competitors cannot leverage concerning unique in-store experiences, consumers are becoming more aware that shopping in physical stores is not the only way to shop (Siqueira, García Peña, ter Horst, & Molina, 2020).

Many consumers are now switching across channels and devices, such as desktop, laptop, and mobile devices, as part of the consumers' omni-channel experience, requiring of retailers to provide seamless functionalities to facilitate consumer's retail experiences (Verhoef et al., 2015). Retailers are also obliged to acknowledge the benefits of physical stores (in terms of sensory experience), as well as online platforms (in terms of convenience), and the merit of omni-channel strategies (Bell et al., 2014; Hult et al., 2019).

In line with the differences in offline and online channels, consumer conceptions and behaviours are likely to differ considerably when they procure products offline versus online, which has implications, and poses pertinent challenges for retailers (Hult et al., 2019; Rajamma, Paswan, & Ganesh, 2007). Intense competition among retailers requires online fashion retailers to offer more attractive propositions than their competitors and improved experiences while shopping online, such as developing mobile phone applications that remind consumers of their in-store experiences (Kaushik et al., 2020). However, a key challenge in relation to physical stores, is that online shopping environments are restricted in their presentation of cues (Spence & Gallace, 2011; Yoganathan et al., 2019). In this regard, scholars have already noted online sites' inability to aptly incorporate sensory experiences (Flavián et al., 2021; Petit et al., 2019; Velasco et al., 2021). Fortunately, recent technological advancements have unlocked new options for presenting sensory cues (Kim et al., 2020), for instance, including background music (Hwang et al., 2020; Imschloss & Kuehnl, 2019).

2.3.4. The importance of the online retail sales channel

Increased use of the internet and e-commerce, as well as progress and advancements in sensory-enabled technologies, have boosted interest in online shopping (Souiden et al., 2019). In 2018, statistics showed that e-commerce retail sales worldwide amounted to USD 3.53 trillion and were projected to grow to USD 6.54 trillion in 2020, with an increase of 12.2% compared to the previous year (Clement, 2020). This growth is attributed to emerging countries such as India, Spain and China which have in the past experienced poor fixed broadband connections but now have access to cheap mobile connections (Clement, 2020). Online retail sales vary from region to region. In Africa, Nigeria, Kenya, and South Africa specifically are at the forefront of retail commerce (CNBC Africa, 2017). In South Africa, e-commerce saw growth of 56%, reaching ZAR 27.3 billion (approximately USD 1.7 billion) in sales revenue during 2020.

Online shopping was further accelerated by the recent impact of the global COVID-19 pandemic (Koch et al., 2020; Roggeveen & Sethuraman, 2020). This pandemic brought about a shift in physical store purchases, resulting in a worldwide 22% growth in online purchases from 2019 to 2020 (Euromonitor, 2021). In 2020, online sales contributed 19% of all retail sales in the retail industry, with a forecast of 10% year-on-year growth in online global sales (Statista, 2020b). This suggests that consumers' behaviour is changing and embracing the advantages of new technologies.

Because online shopping on mobile devices is growing steadily (Statista, 2020d), retailer competition has intensified, and retailers that wish to remain relevant in a very challenging global pandemic now have no option other than to join the new trend (Roggeveen & Sethuraman, 2020). An advantage of online shopping is that it reduces retailers' need for physical store infrastructure and related expenses, significantly reducing their operating costs (Grewal et al., 2017; Inman & Nikolova, 2017). In response to the worldwide lockdowns, for instance, retailers have had to drastically improve their online presence to survive (Park & Yoo, 2020; Roggeveen & Sethuraman, 2020; Verhoef et al., 2015), a reality that supports the relevance of this research.

Of the global online retail revenue streams, fashion retailing is the largest (Statista, 2020d). Clothing, which is just one of the fashion retail categories, and includes products such as pants, shirts and dresses, contributes over 68% to this industry category, having generated global sales of USD 360 billion in 2020. These figures are expected to increase to around USD 514 billion by 2025, with 24% being generated through online revenues (Statista, 2020d). Figure 7

illustrates how the various product categories contributed to the world's total online retail revenue in 2020.
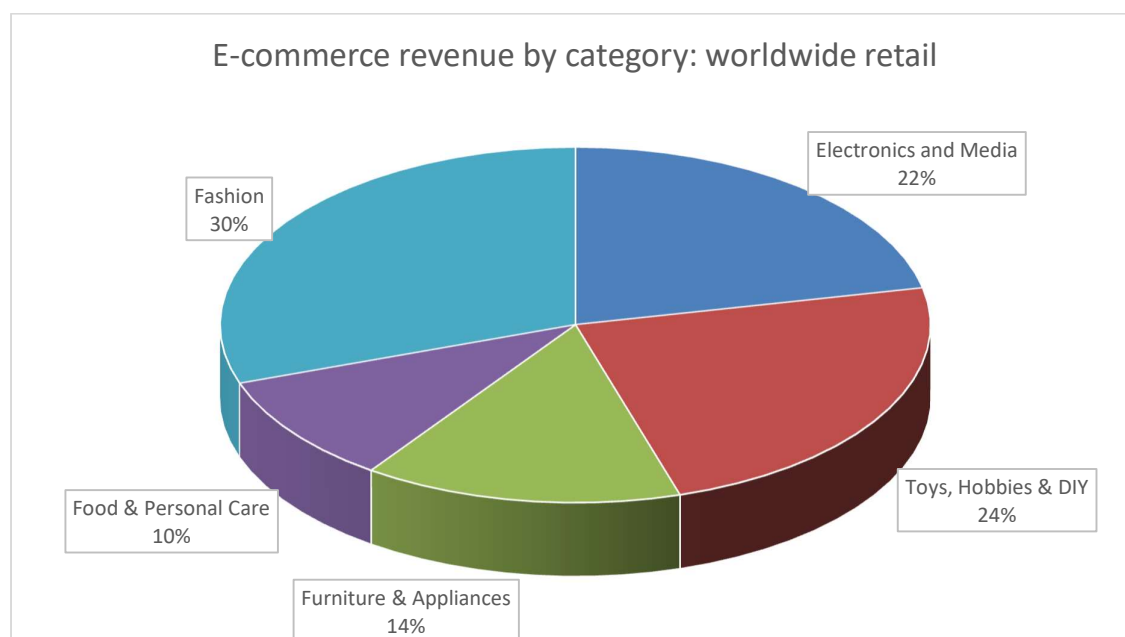
Figure 7: Worldwide e-commerce revenue by category
Source: Statista (2020d).

2.3.4.1. The importance of the online fashion industry

The global fashion industry declined by 18% at current prices in 2020, in contrast to the initial 2% increase forecasted prior to the pandemic (Cazin, 2021; Euromonitor, 2020d). Fashion is forecasted to constitute almost 10% of the absolute increase in retail e-commerce, for the period 2020-2025 (Euromonitor, 2020d).

The year 2020, amid the COVID-19 crisis, has introduced considerable global retail challenges and has also inspired progress, such as unprecedented growth in the digital and e-commerce space. There is no question that 2020 has radically changed the face of fashion and consumer shopping habits (Cazin, 2021), such as moving from in-store to online purchasing. A total of 16% of all consumer goods in 2020 were purchased online, constituting over double the sales volume figures from 2015 (Cazin, 2021; Euromonitor, 2020d). This surge in online spending on fashion is not surprising, as non-essential stores were subject to severe restrictions and had to close to the public for long periods of lockdown. In 2020, Zalando — Europe's largest online-only fashion retailer — saw a 23% increase in annual sales, reaching a record-high amount of EUR 8 billion (Cazin, 2021; Euromonitor, 2020d). Research has also demonstrated that irrespective of the COVID-19 pandemic, there is a consistent uptake of electronic

purchases of apparel and footwear, with the emerging markets in Eastern Europe, Africa, the Middle East, and Latin America witnessing the most significant uptake of e-shopping (Euromonitor, 2020d). The Middle East and Africa showed a phenomenal increase of 60% in e-commerce sales, compared to the period 2018 to 2020 (Cazin, 2021; Euromonitor, 2020d). Furthermore, it has been projected that more than 50% of the overall increase in worldwide retail between 2020 and 2025, will come from e-commerce sales (Euromonitor, 2020d), of which approximately 10% will be generated through the fashion industry (Euromonitor, 2020d).

2.3.4.2. Clothing as a key category of the fashion retail industry

The worldwide apparel market is expected to grow in the value from USD 1.5 trillion in 2020 to approximately USD 2.25 trillion by 2025, indicating that there will be a global rise in the demand for clothing, including shoes (Shahbandeh, 2021). This considerable change will introduce new opportunities and new challenges for fashion brands and retailers, as they will be required to make advances in their online stores to be aligned with consumers' expectations, and to provide them with comparable consumer experiences to physical stores.

Apparel consists of a number of sub-categories, namely clothing, footwear, bags, and accessories (Krüger & Rootman, 2017; Statista, 2020d; Tustin, van Aardt, Jordaan, van Tonder, & Meiring, 2014). These are distinguished in terms of four main product categories, namely: childrenswear, sportswear, menswear, and womenswear, which has been the best-selling category, globally, for a long time. The three largest clothing markets globally, are Japan, China and the United States, in ascending order (Shahbandeh, 2021). The USA alone, generated USD 187 billion from the sale of womenswear and about USD 86 billion from menswear sales (Shahbandeh, 2021).

However, sales figures differ from one context to the next. In South Africa, for example, menswear currently occupies the majority of the market share (42%) as opposed to womenswear (33.1%) which had dominated the market for decades (Diedericks, 2019; MarketLine, 2018). In 2017, this lucrative menswear category produced a total revenue of USD 3.9 billion (Diedericks, 2019; MarketLine, 2018). The sports clothing category has also shown considerable growth recently, which was valued at about USD 185 billion in 2020 (Shahbandeh, 2021), while denim, a classic staple fabric used in the worldwide casual wardrobe, has grown in popularity across almost every clothing category (Degenhard, 2021; Shahbandeh, 2021).

While countless clothing retailers exist across the globe of various sizes, the largest of these organisations govern most of the market. In 2020, the largest three retailers of footwear and clothing, in terms of sales, were H&M, Inditex, and TJX Companies (Shahbandeh, 2021). Conversely, the top-selling retailer based on sales value within the casual clothing category, is The Gap, Inc, although the enormous French luxury goods conglomerate, LVMH Moet Hennessy Louis Vuitton S.E, is leading sales of the luxury clothing category (Shahbandeh, 2021). Yet, some of the world's most valuable brands, in terms of specific brands, are Adidas, GUCCI and Nike (Shahbandeh, 2021).

Clothing purchases have undergone noteworthy changes in recent years, indicating a shift towards online shopping during the COVID-19 pandemic and showing a shift in the type of clothing purchases. Loungewear sales, for example, have increased considerably as a consequence of an increase in remote working (Cazin, 2021). Leading brands, such as Nike, the Gap's active brand for women Athleta, and Lululemon, have also noted higher sales figures during the pandemic than most of the other clothing retailers (Cazin, 2021): Gap's Athleta 2020 sales surpassed USD 1 billion, with a 16% annual growth in sales (Cazin, 2021; Euromonitor, 2020d). It is important that clothing retailers, in order to remain competitive, take note of, and understand changes in consumers' purchase behaviour, and adapt their strategies accordingly.

Compared to other retail sectors, online fashion retailing is an even more unique and complex industry, because consumers cannot physically try on and examine products, which is a noteworthy issue in that it prevents consumers from making informed purchase decisions (Ha, Kwon, & Lennon, 2007). Retailers, therefore, have no alternative but to reinvent their current practices so that consumers could enjoy enhanced shopping experiences (Pantano & Priporas, 2016; Rose et al., 2012). For online clothing retailers to be more successful, they need to create a similar setting, or at least a setting reminiscent of brick-and-mortar apparel shops (Lindström, Berg, Nordfält, Roggeveen, & Grewal, 2016; Park, Jeon, & Sullivan, 2015).

Unfortunately, not all sensory stimuli can be produced in the online environment, for example, the involvement of tactile sense is not possible yet. Nonetheless, research suggests that elaborating on product details can enhance the levels of product information presented, such as the washing instructions, style information, fabric (textile) properties and type, the manufacturing processes used, and finishes applied (Blanco, Sarasa, & Sanclemente, 2010; Karimov, Brengman, & Van Hove, 2011; Kaushik et al., 2020; Kim & Lennon, 2008; Zhou, Cao, Tang, & Zhou, 2017).

2.3.5. The importance of South Africa's online fashion industry

The South African retail sector has a significant impact on the South African economy (Cant & Van Heerden, 2021), having contributed ZAR 890 billion (approximately USD 55 billion) in retail trade sales during 2020 (StatsSA, 2021). This is witnessed through the rand value spent in the sector, the provision of jobs, both direct and indirect, and the increase in the number of retail stores (Cant & Van Heerden, 2021). As stores increase, accessibility to stores also increases, enhancing shopping convenience, and attracting even more interest (Cant & Van Heerden, 2021).

2.3.5.1. General overview of South Africa's clothing industry

Like global trends, South Africa's fashion category is very important in terms of the local economy, representing 30% of the country's online revenue: the clothing subcategory represented 52% of the total fashion category in 2019 (Statista, 2020d). Despite large figures internationally, the clothing segment generated a far lower revenue of USD 785 million in South Africa in 2020. While the South African clothing retail industry has an expected CAGR of 10.28% for the period between 2021 and 2025, which is projected to reach US 785 million in 2021 (Statista, 2020d), the South African economy is currently in a significant slowdown. This is negatively influencing South African clothing retailers in particular. An example of this major downturn is evident from an iconic South African apparel store, Edgars, which had to close its doors after 91 years of operation in 2020 (Bowker et al., 2020), as was the case for the retailer Stuttafords, which shut its doors at the end of July 2017 after 159 years of operation (Omarjee, 2017). In both cases, the closures led to forced retrenchments of employees and vacant stores that produced no income.

The challenging economic conditions in South Africa, including low and fluctuating exchange rates, existing government fiscal policies and inflation, an increase in competitors, especially international competitors, further spur competition in this highly competitive environment (Diedericks, 2019; Makholwa, 2015; Reitumetse, 2016). In developed markets, it is very hard for retailers to achieve revenue growth, due to strong competition and fewer market opportunities due to market saturation (Burt & Carralero-Encinas, 2000; Diedericks, 2019). This explains why developed market players are venturing into developing markets, such as South Africa (Burt & Carralero-Encinas, 2000; Cunningham & De Meyer-Heydenrych, 2021; Diedericks, 2019). The presence of international apparel retailers such as Zara and H&M in South Africa offers more competitive and affordable clothing options to local consumers, which is highly appreciated locally (Cunningham & De Meyer-Heydenrych, 2021). The entrance of prestigious international retailers into South Africa is also fairly easy, due to limited trade

restrictions, and they are generally well-received by consumers (Eckman, Sakarya, Hyllegard, Borja, & Descals, 2015; Sakarya, Eckman, & Hyllegard, 2007). However, the problem is that the diverse South African market differs in taste and preferences from markets elsewhere in the world (Diedericks, 2019). Furthermore, consumers who might want to purchase clothing from these retailers, which they admire, often simply cannot afford it. Therefore, not all international retailers have successfully expanded their operations in South Africa. For example, Tom Tailor, Topshop, and River Island failed to survive (Brand-Jonker, 2017). Therefore, retailers, whether local or from elsewhere in the world, have to understand consumers' tastes and preferences the local target market, as well as what is considered affordable to successfully operate locally.

While the world has been severely affected by the COVID-19 pandemic, and its long-term effects are still unknown, its immediate impact on the retail industry has been significant. Non-essential goods, such as apparel, have especially faced significant drops in sales (Roggeveen & Sethuraman, 2020). Yet, even before the COVID-19 crisis, retailers were perusing the viability of online sales to curb the costs of maintaining physical, brick-and-mortar (offline) stores (Grewal et al., 2017; Inman & Nikolova, 2017). This is because, in 2019, South Africa's online fashion purchases represented only 6% of the total sales, compared to the worldwide online clothing sales revenue which had reached 34% (Statista, 2020c). Yet, analysts predict that global online fashion retail sales will reach USD 765 billion by 2022, approximately 36% of the total global fashion sales (Meena, 2018), further widening South Africa's e-commerce gap compared to global trends.

The lag in the rate of online purchases in South Africa therefore prevails, despite the rapid penetration of mobile phones into the market (Mpinganjira & Maduku, 2019), together with the arrival of 5G, which boosted consumers' interest in mobile phone apps (Euromonitor, 2020b). In 2020, there were 33.42 million internet users in South Africa, which is expected to grow to 39.13 million (62.3% of the population) by 2025 (Johnson, 2021). During March 2019, there were 4.73 million unique internet browsers daily (referring to the daily number of devices that request content from the internet, as opposed to the actual number of requests from individual people), and an average of 1.29 billion page views by South Africans (Pentz et al., 2020). Furthermore, devices used by South Africans to conduct online transactions and purchases have undergone a transformation, indicating a strong move from the traditional laptop or personal computer (PC), to smartphones, therefore m-commerce (Pentz et al., 2020).

In September 2018, there were 46 904 835 smartphone subscriptions in South Africa, suggesting a smartphone penetration rate of 81.72% in the country, which is almost double

the rate of 2016 (Pentz et al., 2020). Almost one-third of South Africa's population is therefore now using a mobile or smartphone device (Statista, 2020b). In 2019 mobile services accounted for over 50% of telecommunications revenue, growing at over 9.7% year-on-year since 2018, signifying an increased use of mobile phones (Bekker, 2019). These figures are promising evidence of the expanded mobile phone use, and increased technological know-how in South Africa — both of which are regarded as drivers of online retailing. This also indicates that there is now greater access to online sales using mobile devices in the South African market than ever before, increasing the possibility of making online purchases. An apparent lag in the uptake of online clothing purchases, specifically, in South Africa, using mobile phones indicates hesitance among clothing shoppers to do so (Pandey & Chawla, 2018).

Historically, online retailing was limited due to factors such as the high cost of data to use the internet, problems with interne accesst, unreliable delivery services, and consumers' lack of trust in payment systems. Although most of these issues have been addressed or resolved, over time, two issues remain (Goga et al., 2019). Firstly, for retailers, the high platform development costs require of them make informed decisions about their online presence and to cautiously spend funds that they have devoted for their application development endeavours (Goga et al., 2019). They more specifically need to attend to features that would entice consumers to explore the use of the apps, and continue using them (Hoehle & Venkatesh, 2015). Secondly, an over-shopped physical infrastructure ("mall culture") still prevails in South Africa, which had over 23 million square meters of physical retail store floor space in 2019 (Thompson, 2019). South African consumers are therefore used to physical stores, and what they offer. For example, the combination of sensory cues in in-store environments contribute to inviting, positive in-store experiences. It is, therefore, not surprising that consumers' online shopping experiences would be framed in terms of what they are accustomed to in physical stores, including the sensory experiences that form part of stores' ambience (Petit et al., 2019; Velasco et al., 2021).

2.3.5.2. E-commerce

E-commerce growth in emerging markets has exceeded that in developed markets for several reasons, including the level of development and adoption of sophisticated technologies, how internet-savvy consumers are in general, and prevailing consumer lifestyles (Kühn & Petzer, 2018; Narang & Trivedi, 2016). The retail industry is known for low profits. The additional value added tax (VAT) price hike recently, coupled with continued fuel price increases, further erode profit margins, and increase competition in the markets (Bekker, 2018). In order to survive, retail organisations, in desperate attempts for differentiation, have already elevated the

importance of supply chain management, operating efficiency, cost-cutting, and have offloaded whatever costs could be downstreamed onto suppliers (Bekker, 2018). One of the developments that would reduce retailers' expenses, is increased online sales, rather than to cling to brick-and-mortar stores.

2.3.5.3. M-commerce as a shopping channel in South Africa

In a South African context, the online apparel retailer Spree (rebranded to Superbalist in 2018) stated that in mid-2017, their total sales increased by 88% on a year-on-year basis (Fastmoving, 2018). The South African online retailer, Zando, claimed to have sold 80 items per minute on Black Friday in 2017 (Esterhuizen, 2018). In January 2019, the Mr Price Group announced that sales on their online channel, focusing on apparel, increased by 35.4% for the nine months ending on 29 December 2018. Similarly, the Foschini Group reported an increase of more than 35% in the last four months of 2018 for their online fashion channel, Foschini Online (Gilbert, 2019). Evidently, therefore, online sales in South Africa are attracting increased interest.

A particularly convenient way to conduct online shopping, is to use cellular phone technology. In South Africa smartphones are the devices of choice among e-commerce consumers (Pentz et al., 2020). During 2020, m-commerce sales revenue increased, with retailers responding with updated mobile services and apps (Chokossa, 2021). M-commerce thereby saw a growth of 59% in 2020, reaching ZAR 3.5 billion in sales revenue, which is projected to increase to 26% of the current value CAGR (20% of the 2020 constant value CAGR), over the forecasted period to reach ZAR 11.3 billion in 2025 (Chokossa, 2021). Figure 8 illustrates the historical and forecasted m-commerce sales revenue expressed in ZAR millions, as well as the past and projected year-on-year growth.
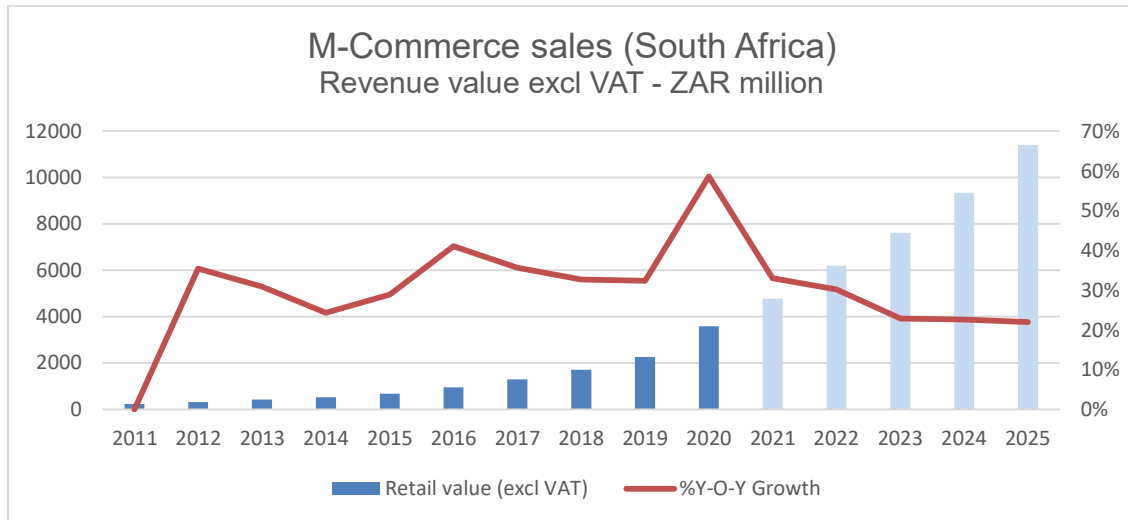
Figure 8: M-commerce sales (South Africa)

Source: Chokossa (2021).

Recent research has demonstrated that consumer's emotions, satisfaction, and behavioural intentions are positively influenced by mobile phone app usage (Iyer, Davari, & Mukherjee, 2018; McLean et al., 2018). By simply using their smartphones or smart pads, customers can access retailers' service offerings anywhere and at any time (Chou et al., 2016). However, a broader understanding of m-commerce is required, which can be used to enhance customers' purchase experiences, while providing differentiation. Therefore, retailers are encouraging South African consumers to convert to online shopping rather than brick-and-mortar shopping (Kühn & Petzer, 2018).

In summary, online clothing retail differs from physical retailing in brick-and-mortar stores, which are appreciated for engaging multiple consumer senses, and creating memorable purchase experiences. Advances in mobile phone technologies now provide exciting opportunities for clothing retailers, and opportunity to seriously contemplate the design of their online platforms to capture and retain the attention of the very lucrative tech-savvy millennial market segment, which is also known to be rather obsessed with clothing. Probably due to high development costs of mobile phone apps, retailers have not yet devoted enough attention to upgrade their online platforms to ensure memorable online sensory experiences that would encourage them to shop online. The insights leading from this research will enable retailers to focus on app development for m-commerce, that is bound to increase in the future, understanding it would be a worthwhile expense that would contribute to satisfying consumers' expectations in a highly competitive retail environment.

2.4. Conclusion

This chapter presented an overview of the research setting, describing the South African context, and highlighting it as being a developing economy. Reasons are provided for limiting the population to residents in Gauteng and targeting the millennial segment. Their importance for the retail clothing industry, which has been severely affected by the COVID-19 pandemic is described, particularly concerning possible avenues to grow clothing retailers' sales to prevent further store closures. The importance of the retail clothing sector in terms of the country's economy, which has been under severe pressure due to prevailing economic circumstances, is accentuated to provide an understanding of the importance of this research. Online shopping, especially M-commerce, as an emerging shopping trend is discussed in relation to what consumers have become accustomed to in brick-and-mortar stores, which are still highly popular in South Africa. The need is expressed for clothing retailers to attend to the sophistication of online shopping apps that offer the convenience that consumers appreciate, on the one hand, while reminding of highly valued in-store experiences that consumers have become accustomed to. The following chapter provides an overview of supporting literature, highlighting constructs that were relevant in this research.

Chapter three: Literature review

The previous chapter described the research setting. This chapter presents an overview of literature in support of the research, defining important constructs in terms of their relevance in this research, for example, the creative design of physical store environments, consumers' in-store experiences, the importance of in-store atmospherics in terms of the skilful integration of sensory cues to engage consumers' senses and to encourage them to linger longer when entering a store. Concerning online shopping, the importance of a telepresence is discussed, as well as how customisation can fascinate online shoppers and provide them with a sense of control. The chapter concludes with a discussion of consumers' decision-making processes to explain the intricacy of the transformation of cues in terms of consumers' intentions, the importance of product information, and purchase decisions. The replications and hypotheses of the study are specified to indicate how existing theory guided the research process (see Section 4.3).

3.1. The relevance of creatively designed shopping environments

When explaining the relevance of creatively designed in-store environments in this chapter, attention is firstly devoted to consumers' experiences when entering physical stores and the contribution of sensory experiences towards consumers' perceptions of in-store atmospherics. The related shortcomings when designing online shopping applications are indicated, highlighting avenues that could be pursued to enhance consumers' online shopping experiences. This includes the skilful integration and optimisation of sensory cues, which could be manipulated when designing online shopping apps, as well as how telepresence and customisation could contribute to a pleasurable online purchase experience. Discussions are framed in terms of what would be required to boost online clothing purchases.

3.1.1. Customer experience

Customer experience is a multidimensional construct that refers to an essential concept in marketing, encompassing all the efforts to create unique pleasurable, and memorable experiences (Fernandes & Pinto, 2019; Lemon & Verhoef, 2016; McColl-Kennedy et al., 2019). Scholars and practitioners agree that a focus on the product alone, is no longer sufficient (Gentile et al., 2007; Rajaobelina, 2018), and that organisations/retailers are increasingly supporting an experience-based economy (Palmer, 2010; Pine & Gilmore, 1998, 1999, 2011; Retief et al., 2018; Schmitt, 1999). Subsequently, customer experience is considered a strategic requisite for retailers to generate a sustainable competitive advantage, achieve differentiation, and develop an all-inclusive perception of value among consumers (Gentile et

al., 2007; Pine & Gilmore, 1999; Verhoef et al., 2009). Several scholars have made calls for further research into customer experience as a phenomenon, explaining its key role in influencing retailers' success (Becker & Jaakkola, 2020; Kumar, Rajan, et al., 2019; Ostrom et al., 2015). The following section defines customer experience and then explains online consumer experience.

3.1.1.1. Customer experience defined

The definition of customer experience has evolved considerably over time, and many attempts have been made to conceptualise the construct and its related elements (Becker & Jaakkola, 2020; Bhattacharya, Srivastava, & Verma, 2019; Bilgihan et al., 2016). Holbrook and Hirschman (1982) initially defined customer experience as integrating numerous emotional responses, aesthetic enjoyments, daydreams, sensory pleasures and/or playful leisure activities. They asserted that consumption, when considered in terms of consumers' experiences, should be seen as involving a steady flow of fun, feelings, and fantasies. These authors argued that it is not correct to view consumers as solely rational decision-makers who merely focus on benefits and functional features, suggesting that conventional marketing research failed to present a true, comprehensive understanding of consumers' behaviour. In subsequent research, Pine and Gilmore (1999, p. 12) described customer experience as the "events that engage individuals in a personal way" while also stating that each consumer's spiritual, intellectual, physical, or emotional engagements have direct outcomes on his or her experiences, thus emphasising that consumer experience is a subjective process. Another early definition of customer experience is that it entails the "set of interactions between a consumer and a product, a company, or part of its organisation", which stimulates a consumer's response (Gentile et al., 2007, p. 395). Such experiences are argued to be purely personal, implying that consumer involvement culminates on different levels, for instance, spiritual, physical, sensorial, emotional, and on a rational level (Gentile et al., 2007). Grønholdt, Martensen, Jørgensen, and Jensen's (2015) definition of customer experience introduced the timeline concept of experience, products, and services, from inception to the "grave", linking an emotional element to the phenomenon. Supporting the notion that customer experience comprises several dimensions, Du Plessis and de Vries (2016), as well as Homburg et al. (2017), assert that customer experience represents an evolution in a consumer's behavioural, relational, cognitive, affective, and sensorial responses to a brand or firm, through a dynamic journey along the organisation's/retailer's so-called touchpoints. These touchpoints, or points of interaction, present both challenges and opportunities to incorporate unique dimensions that might elevate consumers' experiences (Hoyer, Kroschke, Schmitt, Kraume, & Shankar, 2020; Kaushik et al., 2020; Petit et al., 2019). Verhoef et al. (2009), as well as Lemon and Verhoef

62

(2016) accentuate that customer experience is critical in driving an organisation's competitive advantage.

In order to demonstrate the complexity of customer experiences, Schmitt (1999) distinguished five dimensions related to the construct, namely sensory, affective, cognitive, physical and lifestyle, as well as social identity. In further studies, Gentile et al. (2007) added the pragmatic dimension of customer experience, as the sixth dimension. A short description of each dimension follows in Table 3.

Table 3: Customer experience dimensions

Dimension	Description	Authors
Sensory (sense)	Stimulation of one or more of the senses: sight, hearing, smell, taste, and touch, however not all the senses are stimulated at the same time and is dependent on the touchpoint used. For example, in an online or digital context, the sense of taste would necessarily be less relevant.	Gentile et al., 2007; Holbrook & Hirschman, 1982; Pine & Gilmore, 1998; Schmitt, 1999.
Cognitive (think)	Customer thinking and conscious mental processes, giving the impression that they are learning something. By piquing both their curiosity and creativity, they are drawn to engage in reflection.	Gentile et al., 2007; Holbrook & Hirschman, 1982; Pine & Gilmore, 1998; Schmitt, 1999.
Affective (feel)	Internal feelings and emotions of customers, which may me favourable or non-favourable.	Gentile et al., 2007; Holbrook & Hirschman, 1982; Pine & Gilmore, 1998; Schmitt, 1999.
Physical (act)	Encompasses all the behavioural aspects of consumption as a result of an interaction.	Gentile et al., 2007; Holbrook & Hirschman, 1982; Pine & Gilmore, 1998; Schmitt, 1999.
Social (relate)	Individual's social identity and link to a reference group, and includes relationships that are social in nature.	Gentile et al., 2007; Schmitt, 1999; Tynan et al., 2009.

The various definitions of customer experience indicate that there are some discrepancies, for instance, there is some confusion concerning whether customer experience is an outcome of a response to the offering itself (Meyer & Schwager, 2007) or a representation of the quality of an offering (Kumar et al., 2014). Some studies have even labelled the construct as an antecedent that leads to consumer satisfaction (Becker & Jaakkola, 2020). This study accepted the more recent definition that customer experience represents "non-deliberate, spontaneous responses and reactions [of customers] to particular stimuli" (Becker & Jaakkola, 2020, p. 8), as this definition distinguishes stimuli from the outcomes, presenting stimuli as

inputs. Consequently, customer experiences represent consumers' spontaneous responses and reactions to perceived stimuli (Becker & Jaakkola, 2020), admitting that there are possible social, sensorial, physical, affective, and cognitive influences (Lemon & Verhoef, 2016; Schmitt, 1999; Verhoef et al., 2009).

This study specifically focused on the sensory dimension of customer experience in an online shopping environment. Physical customer experience differs from online experiences, and therefore a greater understanding of online customer experience is required (Hagberg et al., 2017). Figure 9 is only meant to display the link between consumer experience and relevant dimensions of this study, highlighting the sensory attended to.
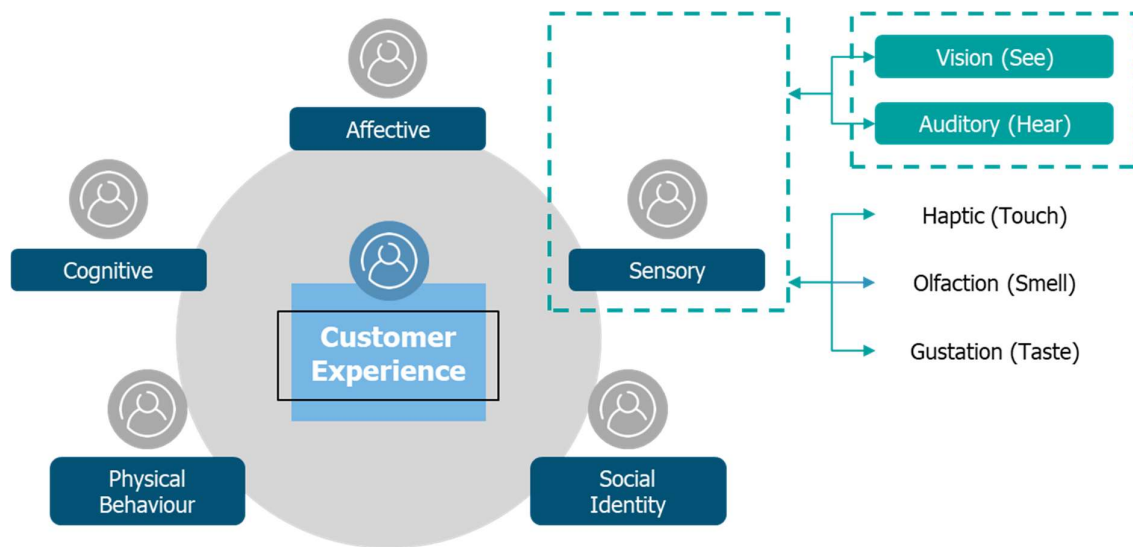
Figure 9: Consumer experience dimensions and this studies sensory cues
Source: Researcher's own.

3.1.1.2. The relevance of sensory experiences in general

The term "sensory experience" is not new and has often been used in the neurosciences, health- and social sciences (Kang et al., 2013; Mehraliyev et al., 2020). In the marketing field, sensory experience is a crucial dimension of customer experience (Gentile et al., 2007; Mehraliyev et al., 2020; Rajaobelina, 2018; Schmitt, 1999), as a consumer interacts with the environment using various sensory cues that refer to visual (seeing), auditory (hearing), haptic (touching), olfactory (smelling) and gustatory (tasting) sensory systems (Biswas, Szocs, et al., 2019; Krishna, 2012). Sensory cues are particularly influential to create positive experiences (Biswas, 2019; Spence et al., 2014), although not all senses are equally relevant when creating sensory experiences (Mehraliyev et al., 2020). For example, a consumer typically prefers

visual cues when interacting with a brand (Lindstrom, 2005). In the tourism field, destinations typically rely on visual cues to create appropriate sensory experiences (Xiong, Hashim, & Murphy, 2015). However, in rural tourism, tourists prefer auditory cues, such as birdsong, followed by visual cues, such as interesting landscape images. Therefore, a person's sensory experience depends on the presence of cues within a specific context.

Apart from sensory cues, situational contexts may also have an impact on the way in which people's experiences are shaped, for example the cultural context, location, season, economic climate, competitive intensity, retail channel, and type of store (Verhoef et al., 2009). The relevance of store atmospherics in shaping consumers' experiences is discussed next.

3.1.2. Store atmospherics

3.1.2.1. Store atmospherics in general

Store atmospherics are vital in enhancing store image, consumers' store patronage intentions, and consumers' overall shopping experiences (Baker et al., 2002; Kumar et al., 2017). Retailers create shopping environments by incorporating a multitude of atmospheric elements and sensory cues to create in-store experiences that will, hopefully, have a favourable impact on consumers' purchase decisions (Krasonikolakis, Vrechopoulos, Pouloudi, & Dimitriadis, 2018; Roggeveen et al., 2020; Spence et al., 2014). Atmospheric elements that are commonly found in physical stores, include visual elements such as product displays and ambient elements such as background music that are perceived through consumers' visual and auditory senses to culminate as a complete sensory experience. These senses seldom interact in isolation, but rather interplay with each other (Helmefalk, 2017; Wagner, Schramm-Klein, & Steinmann, 2020; Yoganathan et al., 2019).

In the early 1970s, Kotler (1974) coined the term "atmospherics" to describe the integration of all the elements within a shopping environment that influence consumers' in-store experience and behaviour. Atmospherics, therefore, refers to elements of the environment that evoke emotional, perceptual, and behavioural consumer responses (Kotler, 1974). Consumers' responses may, however, differ depending on consumer demographics and culture (Helmefalk & Hultén, 2017; Kumar et al., 2017; Wakefield & Baker, 1998), suggesting that millennials, as a specific generational cohort, may react differently to in-store stimuli than previous generations.

Several typologies are used to describe the elements that coherently contribute to an in-store atmosphere. Baker (1986) proposed that it occurs through the integration of ambient factors

65

(non-visual cues including sounds and smells), design factors (visual cues including colour, cleanliness, clutter, and layout), and social factors (the employees, customers, and people in the store). Due to this study's focus on the contexts of retail services industry, the definition of Bitner (1992) was considered more relevant. He also incorporated artefacts (such as signals that convey information to the consumer), symbols, signs, functionality (the capacity to satisfy consumers goals according to the arrangement of the store), layout and ambient cues (that stimulate the five senses) (Eroglu, Machleit, & Davis, 2003).

In an earlier South African study, it was found that atmospheric elements influence the time and money that consumers spend in a store (Nell & Cant, 2015), which also influence their purchase intentions, resulting in approach-or-avoidance behaviour (Nell & Cant, 2015). A subsequent South African clothing study emphasised the importance of product merchandising as part of store design (Cant & Wiild, 2020). Therefore, atmospheric elements, such as visual and auditory cues, are important to boost consumers' purchase intentions. Similar studies on online environments are lacking.

Retailers should keep in mind that in-store atmospherics and related cues that consumers have become accustomed to in brick-and-mortar stores, may have a significant effect on how shoppers perceive online shopping environments. Undoubtedly, consumers' shopping expectations are framed according to what they are used to, in physical stores (Hagberg et al., 2017; Petit et al., 2019; Velasco et al., 2021). Some years ago, researchers speculated about the relevance of online atmospherics concerning consumers' online shopping behaviour (Eroglu et al., 2003), arguing that the physical environment in a traditional retail store influences numerous psychological and behavioural shopping outcome. Subsequently consumer's perception of the atmospheric properties in an online shopping are likely to influence online shoppers' purchase intentions, use of the online platform, as well as the purchase outcomes (such as time spent in the online store, amount purchased, re-patronage and satisfaction) (Bitner, 1992; Donovan & Rossiter, 1982; Sherman, Mathur, & Smith, 1997). Similar to conventional in-store stimuli, online atmospheric cues (such as colours, design, layout and graphics) can supply information about to the retailer (such as the retailer's target audience or the type of retailer), and influence consumers' responses during the online interaction (Eroglu et al., 2003).

A pertinent limitation in the design of online purchase apps is that the entire store environment is reduced to whatever can be incorporated on the device's screen, which is even smaller when using mobile devices. Subsequently, the capacity of traditional store designers to appeal to shoppers' senses through complex variations of aesthetic, social, structural, and ambient

factors, has for years, been restricted to a predominant focus on visual stimuli (Eroglu et al., 2001).

Retailers are fully aware of the effect and importance of atmospheric cues on shoppers' behaviours (Helmefalk & Hultén, 2017; Spence et al., 2014; Turley & Milliman, 2000), in terms of behavioural outcomes such as consumers' purchase intentions (Ballantine, Parsons, & Comeskey, 2015), encouragement to linger longer in the store (or website), and their decision to conclude a purchase (Donovan et al., 1994; Morrison, Gan, Dubelaar, & Oppewal, 2011; Spangenberg, Crowley, & Henderson, 1996). Congruence between sensory cues, the nature of the retail setting and store image is equally important to consumers (Helmefalk, 2017), and similar to the importance of sensory experiences in physical retail settings (Knasko, 1995; Mattila & Wirtz, 2001; Morrin & Ratneshwar, 2000), sensory experiences in online settings are important for stimulating shoppers' interest and encouraging purchase intention, although overstimulation is likely to cause irritation and avoidance.

3.1.2.2. Online consumer experiences

The retail environment has changed substantially in recent years, with retailers increasing their implementation of online channels alongside their offline channels (Verhoef et al., 2015). While consumers are increasingly exposed to new ways of shopping, retailers are obliged to acknowledge the types of shopping experiences that customers require (Roggeveen & Sethuraman, 2020). In reality, online consumers are online shoppers and technology users at the same time, and therefore, which complicates the conceptualisation of an online consumption experience (Klaus, 2013). The shift to online shopping has significantly increased the need for academics to attend to the phenomenon, but even more so for retailers, who are constantly striving to remain relevant (Barari et al., 2020; Grewal et al., 2017; Inman & Nikolova, 2017; Kawaf & Tagg, 2017; Rose et al., 2012). With a dearth of literature on the topic (Bilgihan et al., 2016; Kuppelwieser & Klaus, 2021), existing literature focuses primarily on the outcomes of consumer experience, such as consumers' purchase intentions (Kawaf & Tagg, 2017; Rose et al., 2012), seldom attending to consumers' sensory experiences and the importance of sensory cues. According to the work of Schmitt (1999), who conducted an experimental study whereby cues within the environment were altered, as well as Pine and Gilmore (1999), who positioned experience as a form of the theatrical state that results from a consumer's interaction with the retail environment, it can be postulated that mobile phone app stimuli would trigger and enhance consumers' online shopping experiences (Kawaf & Tagg, 2017).

The majority of online consumer experience research studies have been formulated in technologically advanced contexts, and primarily in developed markets, such as the USA and the UK (Izogo & Jayawardhena, 2018; Klaus, 2013; Lemke et al., 2011; Martin et al., 2015; Pandey & Chawla, 2018). These studies have not fully taken into account the economic situation, social-cultural realities or differences in technology that impact online shopping in developing countries (Mpinganjira & Maduku, 2019; Mukherjee, 2014; Pandey & Chawla, 2018), such as the lag in mobile phone penetration in these countries (Mpinganjira & Maduku, 2019), and subsequent limited experience of different populations with online shopping (Pandey & Chawla, 2018).

Many researchers argue that online experience studies should be content-specific, limiting the focus to a single product category (Klaus, 2013; Verhoef et al., 2009), thus creating further gaps in the literature concerning online shopping across different product categories. It is argued that consumer experience dimensions may also vary across different product categories, influencing shopping outcomes differently (Pandey & Chawla, 2018; Workman & Cho, 2013). Most of existing studies have been conducted in developed markets and either focus on certain product categories like electronics (Constantinides, Lorenzo-Romero, & Gómez, 2010), or books (Klaus, 2013), or are not product-specific (Rose et al., 2012).

Online consumer experiences involve a number of functionalities related to the technology or even the websites used (Klaus, 2013), which inevitably also applies to mobile phone applications as they are based on similarities in the online environment, which affect their usability, product presence, communication, and interactivity. However, lack of direct consumer contact and lack of interaction with sales personnel or other consumers may reduce online shoppers' shopping enjoyment. It is therefore important to enhance consumers' online sensory experiences in other ways (Gauri et al., 2020).

It is argued that the impact that online shopping atmospherics have on consumers, can be measured by the degree of sensory stimulation that they have received (Menon & Kahn, 2002). The initial experience of an online shopping atmosphere significantly increases the levels of arousal and pleasure that consumers experience (Menon & Kahn, 2002), which elevates the person's experience during the shopping encounter. Therefore, the higher the sensory experience, the more positive consumers' experiences, and subsequent behaviours, including their purchase intentions. Key motivations to engage in online retail shopping, hence include hedonic aspects and the retailers' potential to create (mimic) a pleasurable online environment similar to that of a physical store (Childers et al., 2001; Menon & Kahn, 2002).

Online shopping has received considerable attention marketing literature. However, results pertaining to e-commerce contexts cannot be generalised upon m-commerce, for example, due to pertinent situational, technical, and motivational differences (Bilgihan et al., 2016; Bleier et al., 2019; Lemon & Verhoef, 2016; Novak et al., 2000; Rose et al., 2012). Some researchers have proposed, for instance, that customers using m-commerce platforms particularly value the convenience of mobile shopping and are more time-conscious, as they utilise the platforms while "on the go" (McLean et al., 2018; Wang et al., 2015). Furthermore, mobile devices facilitate personalised or customised functionalities, which is important in terms of creating shopping routines (Verhoef et al., 2015; von Briel, 2018).

In the online context, sensory experience cues are still limited to the incorporation of visual and auditory cues, meaning that any measurement of sensory experience should determine how visual and auditory cues such as product presentation and music are used to enhance aesthetic features (Briand Decré & Cloonan, 2019; Petit et al., 2019), keeping in mind that consumers are likely to frame their sensory experience of online shopping channels in terms of what they are accustomed to in physical stores (Ringler, Sirianni, Gustafsson, & Peck, 2019). Until recently, sensory technology was limited (Petit et al., 2019; Velasco et al., 2021).

In retail settings, visual cues define consumers' aesthetically related responses (Mathwick, Malhotra, & Rigdon, 2001), thus their reaction to design features and physical attractiveness. Online features that are visual in type stimulate a consumer's senses as part of an aesthetic appeal and are therefore part of consumers' sensory experiences (Mathwick et al., 2001) that may include, for example, the clever use of colour (Wu, Cheng, & Yen, 2008), images, videos (Hsu & Tsou, 2011) and music (Hwang et al., 2020; Wu et al., 2008).

Generally, the clothing industry is associated with devoting considerable attention to in-store atmospherics, including visual and auditory stimuli. Amid all the benefits of technological advancements, this has yet to be fully acknowledged by online clothing retailers when promoting clothing online (Petit et al., 2019). Scholars concur that consumers' sensory experiences are highly influential in ensuring that consumers enjoy similar sensory experiences to what they are accustomed to in physical stores, and in influencing their behavioural outcomes, for example, their purchase intentions (Biswas, 2019; Mehraliyev et al., 2020; Petit et al., 2019), which can be either positive, negative, or mixed (Mehraliyev et al., 2020).

3.1.3. The skilful integration of sensory cues or stimuli

3.1.3.1. Introduction

It is well understood and accepted that consumers perceive surrounding environments through five senses, namely sight, smell, sound, taste, and touch (Buzova, Cervera-Taulet, & Sanz-Blas, 2020; Krishna, 2012) and that these are important elements for enhancing consumer experiences (Helmefalk & Hultén, 2017). Essentially, a composite package of cues culminates as a sensory experience. Sensory cues can be described as information that is transferred through a medium, for example, through the air, whereafter the information is captured by the people's sensory organs (Gibson, 2014; Helmefalk, 2017; Macpherson, 2011), including their eyes and ears (Macpherson, 2011). Information such as light, sound, heat or other cues lacks meaning until processed by the relevant sensory organs (Vannini, 2013). For example, the retina in the eye senses visual cues, such as light, which is then categorised into associations that can be simple (e.g., colour), or complex (e.g., written signs) (Macpherson, 2011). Conversely, auditory cues, such as music, are the vibrating and broadcasting waves that are transmitted through the air, which are likewise sensed, categorised, and comprehended in the brain (Spence & Shankar, 2010). Figure 10 presents, within the S-O-R framework, the link between stimuli from the environment (sound and visual cues), and the interpretation of the perceived stimuli (music and visual clothing images) within an individual's brain, culminating as the sensory experience (O), that then influences a consumer's responses, namely purchase intentions and purchase decision (R) (see Section 4.1).
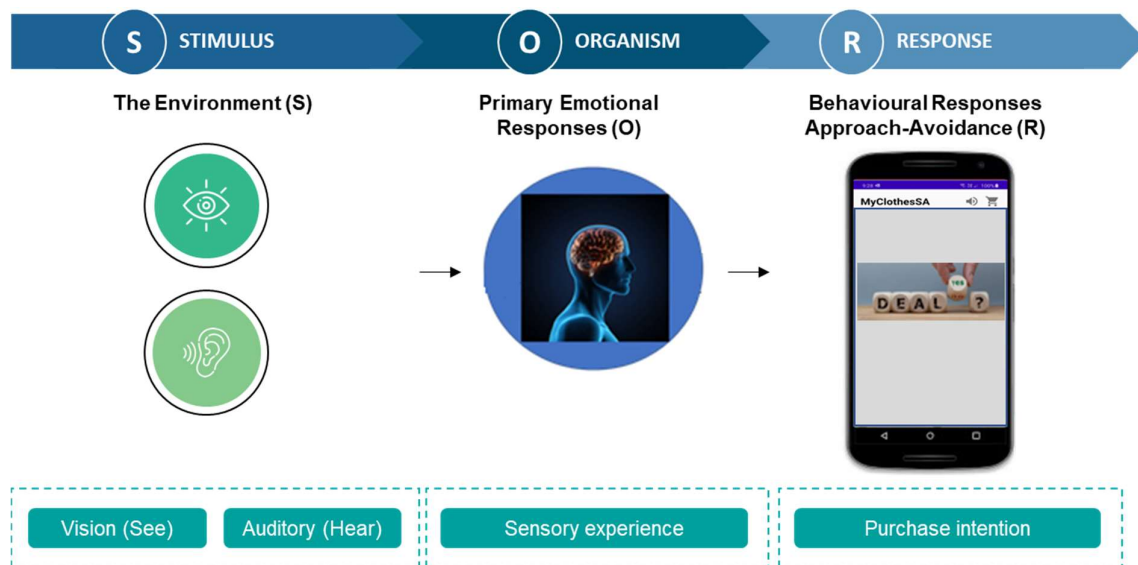
Figure 10: Consumer's experience of sensory cues within the S-O-R framework
Source: Researcher's own.

In reality, people's most enjoyable experiences are inherently multisensory (Spence et al., 2014). Thus, the concept of multisensory interplay describes the association between two or more human senses when perceiving sensory cues (Helmefalk, 2017). Multisensory interplay describes all the possible interactions across the spectrum of sensory cues (Marks, Carterette, & Friedman, 2014), which provide people with a more acute sense of the environment around them (Macpherson, 2011). Accordingly, while sensory cues impact consumers, these cues seldom affect them in isolation, but rather through an interplay with the other senses, the surrounding settings, products, people, and other latent variables (Helmefalk, 2017).

3.1.3.2. Optimising sensory cues in marketing and retail

In the marketing realm, sensory cues perform a critical role in influencing consumers' behaviour and perceptions (Krishna, 2012), but scholars caution that whatever retailers have in mind, customer experiences should always be developed from the consumers' perspective (Lemke et al., 2011).

When developing sensory experiences, such as in-store atmospherics, companies generally manipulate various "stimuli", also referred to as "cues" (Pine & Gilmore, 1999) or "clues" (Berry, Carbone, & Haeckel, 2002) to certain their environments and promote the companies' products, and services (Carbone & Haeckel, 1994). Theoretically, the cues are categorised as functional, mechanical and humanic in nature (Berry et al., 2002). Functional cues pertain to the physical functioning of the product or service, such as the technical quality of the service offering, and are based on facts and reason. Mechanical and humanic cues are concerned with people's emotions and senses, and typically present the physical properties of the product or service, such as the presence of music. Humanic cues emanate from people's behaviour and appearance, for example, the behaviour and presence of sales staff (Berry et al., 2002).

For retailers, the use of sensory cues, as part of in-store atmospherics, is useful in influencing shoppers' emotions and purchase behaviours (Hultén, 2012; Krishna, 2012), by realising that a person's experience changes when removing or adding sensory cues (Krishna, 2013). This is believed to be true for online environments as well (Petit et al., 2019). Previous research on online sensory experience predominantly focused on a single cue (Helmefalk & Berndt, 2018), which was often visual in nature due to the prevailing technological limitations. Sporadically, auditory cues were also considered (Biswas, 2019; Krishna, 2012). More recent advancement of mobile device technologies now enables the inclusion of more sophisticated visual (sight) and auditory (sound) as well, to enrich consumers' online shopping experiences (Petit et al.,

2019) when using retailers' apps on a mobile device (Chopdar & Balakrishnan, 2020). Consequently, while visual and auditory cues are known to be effective, they also have a synergistic, multisensory effect when applied in combination (Yoganathan et al., 2019). For instance, a multisensory experience can be generated with interactive music when designing a platform to observe visual material (Hwang et al., 2020; Wagner et al., 2020). Admittedly, not all senses are equally relevant when creating sensory experiences (Mehraliyev et al., 2020).

Evidence that sensory cues influence consumers' online sensory experiences, has attracted the attention of many academic and managerial practitioners in recent years (Becker & Jaakkola, 2020; Biswas, 2019; Grewal & Roggeveen, 2020; Heller et al., 2019; Moreau, 2020; Reynolds-McIlnay & Morrin, 2019).

3.1.3.3. The value of selected cues in marketing and retail

This study focused on selected sensory cues, specifically visual and auditory cues, to shape consumers' online sensory experiences. Due to technological limitations, however, cues or stimuli associated with the other three senses, namely taste, touch and smell, could not be incorporated in this research endeavour which focused on the creative design of mobile phone applications for online clothing purchases.

3.1.3.4. Visual cues

The sense of sight is regarded as the most dominant of all the human senses, as it is generally encountered more frequently by healthy people than any of the other senses. Visual cues are therefore generally the first sensory cues noticed by consumers (Akarsu, Melewar, & Foroudi, 2019; Biswas, Labrecque, Lehmann, & Markos, 2014; Helmefalk & Hultén, 2017; Hultén, 2013). Subsequently visually attractive product presentations and displays can positively facilitate consumers' decision-making process by reducing uncertainty or the risk associated with a purchase, thereby increasing consumer's purchase intent in a particular shopping context (Park & Stoel, 2005).

Visual cues have been investigated from different perspectives, arranging them in terms of coherent typologies (Kotler, 1974), such as to describe the optimum use of colour and lighting. Other scholars have differentiated external and internal variables, such as layout and design variables (Turley & Milliman, 2000), to emphasise the importance of design factors (Baker, 1986). Over time, colour, logos, lighting, cleanliness, fixtures, graphics, signage and even mannequins have been used to demonstrate how visual cues can be manipulated by retail companies to influence consumers' behaviour and to boost purchases (Akarsu et al., 2019;

Deng & Kahn, 2009; Hong & Sun, 2012; Hultén, 2013; Krishna, 2008; Spence et al., 2014). Generally, consumer's senses are stimulated through interaction with a visual cue, and are then more strongly stimulated (Krishna, 2012; Spence & Gallace, 2011), therefore, consumers who find the visual appearance of an item attractive, are more inclined to be favourably influenced by their overall sensory experiences.

The visual display of products is subsequently even more important for certain categories of products such as clothing, where the end-use goes beyond the mere functional properties and where aesthetic properties are very important (Kim & Lennon, 2008; Yoo & Kim, 2014). The fashion industry relies heavily on imagery to promote merchandise (Menon, Sigurdsson, Larsen, Fagerstrøm, & Foxall, 2016). In the contexts of brick-and-mortar stores, interior quality and store image greatly impact consumers' decisions to purchase apparel, which explains the challenge that online clothing retailers face concerning product presentations (Chi, 2018; Park et al., 2015).

Because online clothing shoppers cannot touch products, the visual presentation of clothing merchandise becomes critical to evoke positive experiences and to increase consumers' purchase intentions (Kim & Forsythe, 2009). In terms of online settings, existing research primarily explains the importance of the characteristics of visual cues and consumers' interactivity with images (Beuckels & Hudders, 2016), elaborating on the dimensions of images (Kim & Lennon, 2008), modes of product display (Kim, Kim, & Lennon, 2009), background effects (Maier & Dost, 2018), and the value of three dimensional (3D) views of the images (Kim, 2019; Kim et al., 2020; Visinescu, Sidorova, Jones, & Prybutok, 2015). This type of research has provided considerable insights for practitioners and has enhanced the degree of researchers' understanding of the phenomenon, which has led to the conclusion that consumer's information processing and decision-making are undoubtedly contoured by the visual format of virtual presentations (Choi, Yoon, Kim, & Kim, 2019).

Visual cues have lately been transformed on mobile devices to introduce 360-degree rotatable images so that items can be viewed from various angles. Conventional 3D displays traditionally require a pair of 3D-enabled glasses to convey the sensation of depth, while mobile devices now provide functionalities whereby users are able to rotate items manually to view product displays different angles without special glasses (Kim et al., 2020). In the past, images were static, and viewers could only see products from certain angles. The possibility to view product images in three dimensions has favourably enhanced online product assessments (Algharabat, Alalwan, Rana, & Dwivedi, 2017; Kim et al., 2020). For instance, consumers presented with 3D product images were found to feel more stimulated (Choi & Taylor, 2014),

and showed increased interest in products, because they could process available product information more accurately (Yim, Cicchirillo, & Drumwright, 2012).

Therefore, online retailers such as Amazon are urging retailers to use 360-degree rotatable images based on its potential to increase sales by up to 8% (Masters, 2018). When clothing is presented on human models or mannequins, these quasi 3D displays provide a more realistic presentation of the clothing as if on the human body, compared to lying the items down on a flat surface, or displaying them on hangers (Choi & Taylor, 2014; Kim et al., 2009). Indications are that higher levels of pleasure are also produced by 3D environments relative to physical or two-dimensional (2D) environments (Petit et al., 2019), as consumers are able to assess the functionalities of products more easily with 3D product presentations and can access product details more accurately (Ozok & Komlodi, 2009). Evidence shows that three-dimensional product displays, are more effective to enhance consumer satisfaction, to shape brand attitudes, and increase consumers' purchase intentions (Algharabat et al., 2017; Kim et al., 2020). This explains why online shoppers are often more inclined to favour websites that apply both virtual and video demonstrations of products (Jiang & Benbasat, 2007).

3.1.3.5. Auditory cues

Auditory cues have been found to have an irrefutable effect on consumers' value perceptions (Yalch & Spangenberg, 2000), as well as their choice of shopping destination, time spent shopping (North & Hargreaves, 2007; Turley & Milliman, 2000) and their mood (Park & Young, 1986; Rahman & Kharb, 2018).

In retail settings, the sense of hearing or listening inherently relates to the use of music (Helmefalk & Hultén, 2017). Bruner (1990) specified three main dimensions of music that should be considered in retail store design, namely, texture (the volume, orchestration, and timbre), pitch (the harmony, mode, keys, and melody), and time (the phrasing, tempo, and rhythm), explaining that each of these dimensions convey affective meaning. For example, animation and happiness can be expressed and perceived through faster tempos (Wu et al., 2008).

Over time, the retail literature has also explained the contribution of different aspects of auditory cues such as the type of music being played (Charles & Kim, 1993), the volume of the music (Winkler, 2001), as well as the tempo (Knoferle, Spangenberg, Herrmann, & Landwehr, 2012; Wu et al., 2008), which coherently influence consumers' emotions (Helmefalk & Hultén, 2017). A particular study explained the functional value of musical stimuli, indicating their effect

on consumers' perceptions and behaviours, such as the relationship between acoustic tone and product selection (Lowe & Haws, 2017), while Stewart and Koh (2017) reported the mediating effect of the tempo of music on consumers' emotional reactions to brands.

Consumers' evaluative judgements of products can apparently also be enhanced by the wave frequencies of resonating background sounds/music and can aid consumers' generation of a mental representation of products (Lowe & Haws, 2017; Sunaga, Park, & Spence, 2016). Generally, therefore, retailers make use of background music to influence the unconscious behaviour of shoppers, such as to create a positive mood state which would increase consumers' willingness to buy (Allan, 2008). Accordingly, Kim and Lennon (2012) distinguish music as an influential atmospheric element in terms of consumers' online shopping experiences. Earlier studies cautioned that music with a fast tempo should be avoided (Eroglu, Machleit, & Chebat, 2005), while a slow tempo positively influences consumers' purchase intentions (Oakes, 2003).

More recent studies have reported that consumers' purchase intentions and behaviours could be influenced by changing some of the aforementioned dimensions of the music to produce distinctive ambient effects (Biswas, Lund, et al., 2019), thus influencing consumers' emotions while shopping (Floh & Madlberger, 2013). As music is more of an affective dimension than a cognitive one, consumers who "feel good" are arguably more inclined to employ simple disjunctive and elimination principles during their decision-making process than to conduct more meticulous product assessments, which makes shopping tasks easier and more pleasurable (Kim & Lennon, 2012; Swinyard, 1993).

The difference between online and offline retail settings is that in the offline setting, thus in a physical store, a consumer cannot turn off the music, while in an online setting, it is possible for an individual to manipulate the music in accordance with personal preferences. Online shoppers apparently also devote more attention when hearing music that they like when shopping (Kim & Lennon, 2012). By adjusting the timbre and mode of background music, consumers' execution of tasks can be interceded, changing consumers' submissions of enquiries, their scroll path, and even the time spent online, ultimately to positively influence their purchase decisions (Rodríguez et al., 2019). Researchers hence agree about the effect of music on consumers' affective states in online retail platforms (Cuny, Fornerino, & Helme-Guizon, 2015; Hwang & Oh, 2020), particularly when integrating appealing background music as part of the field of experiential marketing on online platforms (Hwang & Oh, 2020). Despite the advancement of sensory-enabled technology, such as mobile devices, and the interactive techniques used in the design of user interfaces, interactive music and its applications have

not yet been extensively explored in relation to online shopping platforms. This knowledge gap inspired this research.

Interactive music describes the formats of audio media in which users can manipulate the physical properties of the sound, together with the volume, texture, mode, tempo, and audio track selection (Winkler, 2001). Attention to audio media formats is important for two reasons. Firstly, while earlier research into interactive music in the video game and music therapy industries reported the positive influence of music on user engagement, little dialogue has occurred since then on the effects of interactive music on consumers within the context of online commerce and retail (Hwang et al., 2020). Secondly, since the earlier research has established positive or augmenting effects on consumers' sensory experiences when using either interactive or musical stimuli, more evidence is needed concerning the potential of their combined presence in terms of consumers' behavioural intentions (Ding & Lin, 2012).

3.1.3.6. Tactile cues

In addition to vision, touch is one of the most active senses (Helmefalk & Hultén, 2017; Hultén, 2015; Spence & Gallace, 2011), which is necessary for people's physical and mental interaction with one another and with products. Touch aids visual perception by providing information to the brain about the firmness, shape and texture of the goods being handled (Helmefalk & Hultén, 2017; Hultén, 2015; Spence & Gallace, 2011). The feel of a product and it's packaging significantly influence a consumer's product evaluation (Spence & Gallace, 2011).

The rapid growth in internet purchasing is one of today's most pressing issues (Chaffey et al., 2019; Clement, 2020; Kaushik et al., 2020). Virtual shopping isolates all other senses except for visual clues at first (Helmefalk & Hultén, 2017; Hultén, 2015; Spence & Gallace, 2011). The lack of touch has a substantial impact on consumers when purchasing things that require handling while in use (Krishna, 2012; Rodrigues, Silva, & Duarte, 2017). For example, when buying a lightbulb, one probably does not need to feel it, but this is not necessarily the case when buying a jacket (Velasco et al., 2021) or examining the fabric used to produce underwear (Spence & Gallace, 2011).

When shopping online, the touch-based elements associated with the mobile shopping experience are limited to zooming in and out to manage the size of the image of the product, or when it is possible for a consumer to squeeze and scrunch part of a garment 's fabric with one's fingers on a touch screen, or tablet (Cano, Perry, Ashman, & Waite, 2017; Peukert,

Pfeiffer, Meißner, Pfeiffer, & Weinhardt, 2019; Velasco et al., 2021; Zhu & Meyer, 2017). However, it is still not possible to hold or touch the product, and therefore the haptic sense was not be included in this research.

3.1.4. Establishing telepresence

Based on the formats of physical stores to which consumers have become acquainted and which they are still used to, it is not surprising that consumers have certain expectations about the store atmospherics of physical stores when entering stores (Bitner, 1992). Understandably, online consumers would frame their perceptions of online "store environments" in terms of what they are accustomed to in physical store environments. However, when shopping online, consumers' sensory experiences are limited to what they can see and hear (Mpinganjira, 2016). In an online shopping environment, available sensory cues are integrated to create a telepresence, to shape online consumers' sensory experiences, and purchase intentions (Ye et al., 2020).

Telepresence refers to the set of technologies that facilitates a feeling of real-time presence at a place other than a person's current location. This requires that a person's senses are stimulated in the same or similar manner as they would be if present at a physical location (Grewal et al., 2020). Telepresence differs from the virtual presence, such as immersive virtual reality (VR), where a user's senses are stimulated to function within a simulated, computer-generated environment (Pfeiffer, Pfeiffer, Meißner, & Weiß, 2020). The relevance of telepresence in online and mobile commerce applications to enhance user involvement and influence consumers' behaviour has attracted considerable attention in recent years (Hadi & Valenzuela, 2020), as is the case in this study.

In order to create a desirable telepresence in online and mobile phone applications, technologies need to mimic the sensory aspects of vision, sound, and touch optimally (Ye et al., 2020). Sound is usually the easiest cue to provide, as stereophonic sound production equipment is quite advanced (Hwang & Oh, 2020). Visual cues have also received considerable attention, with recent advancements incorporating entire fields-of-view capabilities of remote locations through 360-degree images and displays that allow users to experience an immersive and convincing 3D experience (Pfeiffer et al., 2020). Touch, which is moderated through haptic cues, is the most recent and expensive to implement, and suggestions have been made to include tactile force feedback mechanisms to provide users with a sense of texture, size, firmness and/or weight of the remote objects, even though this is still very difficult and costly to implement (Serrano & Karahanna, 2016).

The function of telepresence as a moderator in mobile phone commerce (m-commerce) has received considerable attention in recent years. In a creative study on the role of telepresence in mobile and online applications, Liu, Jiang et al. (2019) considered the effect of gesture-based interaction modes, such as touchscreen and mid-air gestures, on consumers' virtual product experiences (VPE). While the researchers did not specifically refer to the concept of telepresence, their research considered the use of hand gestures relative to mouse-based interactions, and the ability to elicit spatial and mental imagery. The research concluded that, as a form of visual product presentation, touchscreen gestures outperformed both mouse-based and mid-air gesture interactions in eliciting spatial and haptic imagery (Liu, Jiang et al., 2019). The study of Ahn et al. (2018) focused on the online sale of clothing, linking visual senses to consumer attention, and found that the attention span of consumers decreased exponentially as they searched downwards to the bottom of web pages. This indicated that the interaction of an individual's visual sense – even eye positioning – is crucial when interacting with digital devices while shopping. This is a valuable finding when designing visual cues for online use, where it is vital to keep the consumer engaged.

Hwang and Oh (2020) investigated the application of interactive music in e-commerce website designs, where a single factor experiment with three conditions illustrated that the heightened novelty of interactive music resulted in increased consumer engagement in shopping tasks. They did not, however, consider the complexity of multifactorial interactions with other sensory cues. As intended in this study, Akram et al. (2020) applied the S-O-R framework to ascertain the relationship between usefulness and perceived ease of use of m-commerce in the fast-food industry. Unlike this research, however, the researchers considered mobile quality and brand image (the stimuli), and perceived ease of use and usefulness (the organism), concerning the use of mobile phone apps for fast food shopping (the response). The study failed to answer important questions concerning visual and auditory cues and their relation to telepresence, which this research intended to achieve. More on the S-O-R framework is outlined in Chapter Four.

Javornik (2016) determined that visual-enabling technologies, such as mobile devices, create a sensation of telepresence. In a more recent study by Cowan and Ketron (2019), a real-world experience was facilitated by blocking out the reality to make the user more present in the virtual realm. Interactive features were used to activate telepresence (Novak et al., 2000), and these features were found to be generally entertaining (Bilgihan et al., 2016). In the case of millennials, whose consumption behaviour is reported to be driven by hedonic motives, purchase intentions are likely to increase if they enjoy the experience (Babin, Darden, & Griffin,

1994; Dabbous & Barakat, 2020). Noteworthy, however, is that telepresence always depends on the quality and the interaction of sensory information (Cowan & Ketron, 2019).

3.1.5. The customisation of consumers' retail experiences

Customisation refers to the personalisation or generation of unique experiences or facilities for consumers and creates a sense of personal control that enhances their shopping experiences (Rose et al., 2012). The control and manipulation of elements, such as visual and auditory cues, can be an attempt to match consumers' preferences and to provide some sense of uniqueness for the consumer (Nyadzayo, Casidy, & Thaichon, 2019). In a physical store, consumers accomplish customisation by means of their own rituals or routes travelled between products in the store (Rose et al., 2012).

The issue is that consumers have become accustomed to physical in-store atmospherics with a multitude of stimuli that are designed to capture and involve their senses and shape their perceptions of the store environments (Bitner, 1992). It is therefore understandable that they might expect similar experiences when shopping online, although, in an online shopping environment, consumers' sensory experiences are still limited to cues that they can see (visual) and hear (auditory) (Mpinganjira, 2016). A progressive trend among consumers in recent years to demand uniquely tailored, personalised shopping experiences (Pentz et al., 2020), exerting pressure on retailers to optimise any opportunity to customise consumers' online shopping experiences so that they are encouraged to revisit a particular site. This could be achieved by adding functionality or additional features to an online site, to elevate consumers' sense of personal control and to create an approximation of their in-store rituals and familiarities (Chopdar & Balakrishnan, 2020; Nyadzayo et al., 2019; Rose et al., 2012).

Customisation should, however, be selective, cautiously contemplating when and how multisensory experiences should be employed (Petit et al., 2019), for example, acknowledging that senses related to taste are more applicable for food items, which is still technologically impossible in the online environment (Petit et al., 2019). Currently, the interaction of visual and auditory cues in real-time can offer some degree of customisation to enhance consumers' experiences (Hwang et al., 2020). Ho and Chung (2020) assert that, within the context of m-commerce, numerous utilitarian factors can enhance the consumers' online experiences, highlighting issues such as ease of use, enjoyment, convenience, and timeliness, in addition to customisation. They particularly note scholars' increased interest in the mediating roles of personalisation and personal control of mobile phone apps in driving consumer engagement and loyalty.

Accordingly, the research of Dastane et al. (2020) accentuates the value of mobile phone applications unique capabilities in capturing consumers' habits, such as matching services by location and according to shoppers' characteristics. Adapa, Fazal-e-Hasan, Makam, Azeem and Mortimer (2020) assessed perceived shopping value derived from smart retail technologies (SRT) such as smart mobile phones and the internet, focusing on customisation. They concluded that SRT that offers personalised services with increased control of the shopping process and increased convenience and enjoyment shapes a positive attitude towards SRT and increases consumer loyalty. The research of Baier and Rese (2020) found that multichannel shopping satisfaction and electronic payment using smartphones are positively associated with the users' capabilities of customisation on the mobile interfaces, further establishing the link between customisation and mobile shopping.

Smink et al. (2020) argue in favour of an augmented reality (AR) when shopping online, warning that to merely present a 2D image of a product does not allow users to see products in a personally relevant context, which could be very disappointing. In an attempt to refute similar problems, this study presents the potential of using 360-degree rotatable images as visual cues in an online shopping task (see Section 5.6), as a solution to the predicament.

Researchers concur that the customisation of mobile phone applications strengthens the retailer–consumer relationship (Aguirre, Mahr, Grewal, de Ruyter, & Wetzels, 2014; Koch & Benlian, 2015). Customisation by means of interactive features have been found to positively influence consumers' purchases (Kim et al., 2015). Consumers who perceive visual and auditory cues about products in a more expressive way that matches their needs or that they can control (Mosteller, Donthu, & Eroglu, 2014) enjoy shopping more, and develop increased purchase intentions (Pappas, Kourouthanassis, Giannakos, & Chrissikopoulos, 2014).

In summary, this research examines online sensory experience, identifying shortcomings when comparing online shopping to what is achieved in physical stores to stimulate consumers' shopping experiences. The value of customisation, that presents some form of freedom to explore a store environment independently, should not be underestimated. Lack of evidence concerning online shoppers' behaviour in emerging economies where online shopping is not yet well established, created opportunity for this research to explore ways in which this phenomenon could be made more appealing, and viable for retailers to invest in.

3.2. Understanding consumer decision-making

This next section discusses the complexities associated with consumer decision-making, providing an overview of the consumer decision-making process, consumers' attention to product information and the product evaluation process. This is important to understand the challenges that consumers might encounter when shopping online. The complexities that are particularly associated with clothing purchases and with online clothing purchases are also discussed.

3.2.1. Complexities associated with consumer decision-making

The process of consumer decision-making is multifaceted. The literature generally distinguishes between extensive (also called complex), limited (also called impulsive) and habitual (also called routine) decision-making (Erasmus & Mpinganjira, 2019; Erasmus et al., 2014; Hawkins & Mothersbaugh, 2010; Jobber & Ellis-Chadwick, 2012; Mandl, Felfernig, Teppan, & Schubert, 2011). Firstly, routine purchase decisions are those that are frequently repeated, where product alternatives are seldom considered, such as when purchasing bread or milk (Cant & Van Heerden, 2021; Erasmus et al., 2014; Olyott, 2018). These are generally low-risk, cheaper and frequently purchased products and services (Erasmus et al., 2014; Olyott, 2018). These purchase decisions are usually based on experience, require limited information search, and imply a less extensive evaluation of product alternatives. They often lead to brand loyalty due to repetitive purchasing (Erasmus et al., 2014; Olyott, 2018).

Impulsive purchase decisions are those that occur very swiftly, for example, when purchasing reputable products such as a chocolate bar at the checkout counter (Cant & Van Heerden, 2021; Erasmus et al., 2014; Olyott, 2018). Complex purchase decisions, on the other hand, mostly require a more extensive process of deliberation regarding aspects, such as the intricacy of the product's expected service life and performance, as well as price and affordability (Cant & Van Heerden, 2021; Erasmus et al., 2014; Olyott, 2018), and social visibility of the products (Erasmus, Donoghue, & Sonnenberg, 2011). Therefore, in order to limit the risk of a negative post-purchase outcome, the decision cannot be rushed or finalised without considering additional facts that would support a final decision. Consumers are highly involved in these decision-making processes, wanting to make the right decision (Erasmus et al., 2014). Figure 11 illustrates the relative complexity of different purchase decisions.
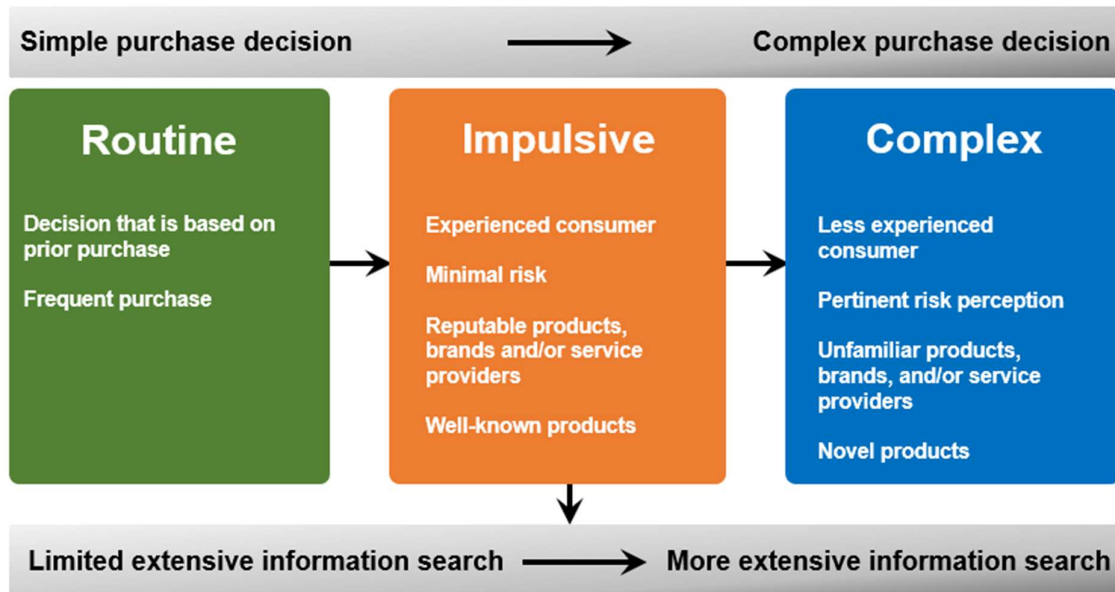
Figure 11: Simple versus complex purchase decisions
Source: Adapted from Erasmus and Mpinganjira (2019).

The following section outlines the factors that may affect consumers' behaviour in the marketplace.

3.2.1.1. Factors influencing consumer behaviour

Purchase decisions can be complex, as consumers are emotional beings who are influenced by a multitude of factors, some of which are external while others are internal (Cant & Van Heerden, 2021; Erasmus et al., 2014; Olyott, 2018). External factors that influence consumer decisions relate to situational influences, marketing-related factors, and influences in the socio-cultural environment (Cant & Van Heerden, 2021; Erasmus et al., 2014; Olyott, 2018). Internal factors include consumers' values, attitudes, emotions, knowledge, demographic characteristics such as gender, age, and past experience, which eventually form part of a frame of reference during the product evaluation process (Cant & Van Heerden, 2021; Lappeman et al., 2021; Schiffman et al., 2014; Sinha & Lu, 2019).

Consumer behaviour tends to be complicated, and the factors affecting consumers' behaviour within a marketplace setting are broadly segmented into five categories, namely: (i) personal; (ii) physiological; (iii) sociocultural; (iv) situational, and (v) marketing mix factors (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019). These factors will be discussed briefly in the following section to indicate their relevance in terms of online shopping.

82

Personal factors that influence consumer decisions include those factors that distinguish the unique personal/internal characteristics of a specific individual or a group as a whole, such as their demographic characteristics, lifestyle, and stage of life (Cant & Van Heerden, 2021). Demographic characteristics include aspects such as gender, race or ethnic affiliation, education level and age. These characteristics are relevant during consumers' online shopping, in that older consumers, less affluent consumers, and lower educated consumers might not possess the relevant technology and/or related experience owing to limited access and exposure to conclude a decision confidently (Zhou, Dai, & Zhang, 2007). For example, younger consumers are generally more experienced with technology and with online shopping, while gender differences in consumers' online buying patterns are undeniable (Olyott, 2018; Zhou et al., 2007). However, consumers with similar demographic characteristics may not necessarily reach the same purchase outcomes, owing to differences in their lifestyles (Cant & Van Heerden, 2021).

As explained in Section 2.2.3, the competency of the millennial age cohort in more detail and highlights the gender differences within this group that may influence their purchase decisions. A recent study that involved millennial men concluded that "hedonism" is the primary underlying value that influences millennial men's store image perceptions and store choices. This was true across all demographic categories and across all types of clothing retailers (Diedericks, 2019). In another study, participants preferred conducting their online shopping through popular and well-known websites (Melović et al., 2021). However, the concept of pleasure differs within the millennial cohort: for high-income millennial men, "pleasure" is derived from durable, quality merchandise, with price being less significant (Diedericks, 2019). Lower-income and less educated millennial men often patronise discount and so-called "value" retailers, considering "convenience" and "time-saving" as very important, which has implications for the location of retail stores and how the services are presented (Diedericks, 2019).

Psychological factors are internal and develop continuously over time to cause a major effect on a customer's behaviour, irrespective of the external circumstances. The fundamental spectrum of psychological factors includes dimensions such as attitudes and personality, learning (knowledge and ability), perception, and motivation (Cant & Van Heerden, 2021; Schiffman et al., 2014). Motivation, the internal driver, aimed at satisfying a product's need, may be positive such as encouraging a purchase, or it may be negative such as avoiding the purchase situation (Cant & Van Heerden, 2021). Consumer perceptions refer to how consumers view objects/surroundings and may be positive or negative, influencing the amount of attention devoted to products or services (Cant & Van Heerden, 2021).

In the context of consumer behaviour, learning is the process whereby consumers expand what they know and understand about products and services (cognition) to the extent that increased knowledge generally changes the consumers' behaviour permanently. In order to modify consumers' attitudes towards a product/service, a consumer's knowledge concerning a product or service, for example, when shopping online, needs to be expanded through accessible information about it. Learned behaviour refers to the behaviour that develops over time as a result of repeated experiences and thoughts about something (Cant & Van Heerden, 2021). With online shopping, learned behaviour about the phenomenon has probably not reached optimal levels for many consumers yet. Personality is an internal trait that is associated with a set of consistent behaviours or responses that can influence consumers' buying decisions and affect how consumers behave, for example, their willingness to experiment with online purchasing versus being dogmatic and not attempting anything that is not familiar (Cant & Van Heerden, 2021).

Social influences during consumers' decision-making processes refer to all the people- and society-related influences that a consumer experiences within his or her environment, such as friends and family, or groups of people to which they relate, without necessarily having any knowledge or familiarity with the individual people (Cant & Van Heerden, 2021). Millennials would therefore be influenced when associating with their peers. Family and friends are generally trusted, easily accessible sources of learning, and children often follow the purchasing behaviour of their parents. For this reason, millennials represent a very important target market for retailers. They have furthermore only recently entered adulthood and potentially have a long future of consumer decisions ahead of them that retailers can benefit by (Bolton et al., 2013; Chang & Watchravesringkan, 2018; Lappeman et al., 2020; Su et al., 2019).

Every generational cohort is also affiliated with a particular social class that shares similar lifestyles, values, and behaviours. A social class generally captures characteristics related to people's occupation, education level, as well as source and level of income (Cant & Van Heerden, 2021). People or consumers with a higher social standing, who generally possess higher levels of education, often earn more money, and have access to more resources. As a result, online shopping might be a lucrative option for them to pursue because they can afford the relevant technology and have had exposure to more options in the marketplace (Diedericks, 2019). Cultural affiliation is an influence that can be both external and internal in nature in terms of the consumers' behaviour. It involves the set of attitudes, ideas, and values that a group of people accepts and/or adheres to. The literature indicates that cultural affiliation

influences what consumers consider to be acceptable, due to the norms that guide people within such an affiliation. This includes, for example, guidance in terms of what is considered appropriate product advertising (Cant & Van Heerden, 2021).

Situational factors are external influences that are generally short-lived and temporary, such as the in-store atmospherics experienced when entering a store (Cant & Van Heerden, 2021). Situational factors could be physical in nature, such as the displays in a store or the area where the store is located (Cant & Van Heerden, 2021). With online shopping, the accessibility of the "online store" is a typical physical, situational factor. Other situational factors that may influence consumers' mood state are the weather, distance from the parking area, or how crowded a store is (Cant & Van Heerden, 2021). With online shopping, it would refer to the accessibility of the website and the means to access the site, such as during a power failure. Similarly, the influence of time factors differs over days and the time of the year, such as during a holiday period, a working day, and Black Friday, as well as the way time pressure (or not) influences the consumers' behaviour (Cant & Van Heerden, 2021).

Lastly, the **marketing mix factors**, which are all external in nature, refer to the influence of the product itself (e.g., clothing as a product category), price, place (that could be offline or online) and promotion, which all exert both a singular and an integrated influence on the consumers' purchase decisions. The product refers to the physical product, and the complexity of a purchase decision is determined by the product type (Erasmus, et al., 2014), and it is therefore evaluated differently, depending on its importance to the consumer (Cant & Van Heerden, 2021).

Similar products might be evaluated differently based on available intrinsic and extrinsic cues (see Section 3.2.3.2). Price determines affordability and also indicates certain properties of a product, such as its quality and prestige. Price is often used as an influential tool in promotional strategies to encourage sales (Cant & Van Heerden, 2021). The place generally describes the location where the purchase occurs (online, offline, or in physical stores), and this can also significantly influence the consumers' choices through impressions that are created by the store's design, the location of the physical store (or the accessibility of the website when shopping online), and so forth (Cant & Van Heerden, 2021) (see Section 3.1.2).

In the online shopping environment, atmospherics and sensory experiences are as important as in physical stores (Petit et al., 2019; Velasco et al., 2021) (see Section 3.1.2) in terms of the presence and influence of sensory cues for consumers' overall shopping experiences (Becker & Jaakkola, 2020; Biswas, 2019; Grewal & Roggeveen, 2020; Heller et al., 2019; Moreau,

2020; Reynolds-McIlnay & Morrin, 2019) and the eventual decision to purchase (approach behaviour) or not (avoidance). Promotions, which are another element of the marketing mix, refer to initiatives that are used to communicate and attract the attention of a target market (Cant & Van Heerden, 2021). Promotions are used to inform, remind, or persuade consumers and can take the shape of a benefit, an offer, or a simple statement that increases the consumers' knowledge about a product. Promotions pertain to any aspect such as sales promotions, public relations, social media, advertising, packaging, and/or the design of the logos (Cant & Van Heerden, 2021). The goal of promotion is usually to modify the consumers' behaviour, such as to encourage purchases, encourage repeated purchases, and increase purchasing frequency (Cant & Van Heerden, 2021).

Online promotions would therefore be ideal for encouraging online shopping. Consumers' purchase behaviour is therefore influenced by several factors, of which some are external in nature and not always controllable by consumers, as well as internal factors that form part of the unique characteristics of each individual.

3.2.1.2. Consumers' decision-making in the clothing product category

In a study that explored the relative complexity of various consumer products, clothing purchases were found to be rather complex and more time-consuming than other products due to all the factors that have to be considered when evaluating product alternatives (Erasmus et al., 2014). Millennials, the target population of this research, are apparently rather obsessed with clothing (Bakewell & Mitchell, 2003; Valaei & Nikhashemi, 2017), and therefore highly involved when conducting clothing purchases (Olyott, 2018). Understandably, they would be very important to clothing retailers, even more so in trying economic times (Valaei & Nikhashemi, 2017) (see Section 2.2.4).

From consumers' point of view, clothing is important as it captivates a person's affiliation, fantasies, aspirations, social standing in life, and even their identities, based on the symbolic meaning that clothing conveys (Cham et al., 2018; Krüger & Rootman, 2017; Olyott, 2018; Pandey & Chawla, 2018). Even within the clothing product category, certain product categories are more intricate than others, for example, everyday clothing is less complex than purchasing clothing for a special occasion (Erasmus et al., 2014; Olyott, 2018). From a price and quality point of view, day-to-day clothing is also generally mass-produced and is cheaper than clothing for special occasions, as the latter serves to make an impression and to reflect the person's (desired) social status and lifestyle (Johnson, Lennon, & Rudd, 2014; Millan & Mittal, 2017; Olyott, 2018). Everyday clothing is also generally more aligned with a consumer's financial

reality and is more practical and durable as it is worn more frequently (Johnson et al., 2014; Millan & Mittal, 2017; Olyott, 2018). Demographic factors such as gender further influence consumers' clothing purchase decisions (see Section 2.2.3).

3.2.2. General overview of the consumer decision-making process

Admittedly, consumers have choices, and these choices are affected by many factors, some of which are external while others are internal in kind (see Section 3.2.1.1). An understanding of consumers' purchase decisions makes it easier for retailers to anticipate consumers' in-store (online) and purchase behaviour. A purchase decision generally consists of five stages which are not equally important in every purchase situation. These decision-making stages are: recognising a product need, searching for information, product evaluation, the conclusion of the sale, and the post-purchase evaluation (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019; Lappeman et al., 2021; Retief & De Klerk, 2010). The process is sequential in nature, but the same purchase decision might have different outcomes for different consumers whose needs and capabilities differ. The following section briefly discusses every stage of the consumer decision-making process.

During the **problem or need recognition stage**, a consumer notices the need for a product, which prompts them to find a means to solve that need, thus changing an actual state (not having something to wear to a special function) to an ideal state (having purchased a suitable outfit) (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019; Lappeman et al., 2021).

Information search typically follow the need identification stage. This is when a consumer does an internal search by recalling information from their memory, hence relying on prior experience. After that, an external product information search may begin by consulting external sources, such as salespeople, printed or promotional material including advertising and social media, or consulting personal sources such as friends and family. The urgency of the information or the consumer's ability to make the purchase is determined by the perceived complexity of the transaction (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019; Lappeman et al., 2021) and the relevant prior experience (see Section 3.2.1).

The **evaluation of alternatives** is done after a consumer has shortlisted a number of products or service offerings (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019; Lappeman et al., 2021). Various factors may influence this shortlist, for example, price, brand name, style and fit, in the case of purchasing clothing (see Section 3.2.3). Depending on the consumer's own experience with purchasing within a given product category, the product evaluation stage

may be difficult, time-consuming, or even intimidating. The more precise and intricate the search parameters are, the more expensive and complicated the item often is, and when a consumer has little experience, the more complicated and challenging the evaluation process becomes (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019; Lappeman et al., 2021).

The **purchase decision** refers to the selection of the most preferred product from the evoked set of shortlisted products (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019; Lappeman et al., 2021); however, the "best" option will differ from one person to the next (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019; Lappeman et al., 2021).

The post-purchase evaluation describes the final stage of the decision-making process, whereby the consumer evaluates the eventual performance of their purchase in relation to their expectations (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019; Lappeman et al., 2021). When a product's performance exceeds the consumer's expectations, it results in positive disconfirmation of expectations and, subsequently, customer satisfaction. Dissatisfaction occurs when a product's performance falls short of the consumer's expectations, thus resulting in negative disconfirmation of expectations. Satisfied customers tend to repeat purchases more often, engage in the spread of positive word-of-mouth, or remain loyal to the brand. Conversely, dissatisfied consumers tend to participate in negative behaviour more often, such as spreading negative forms of word-of-mouth communication or switching brands (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019; Lappeman et al., 2021). Figure 12 visually depicts the various phases of a typical consumer purchase decision-making process.
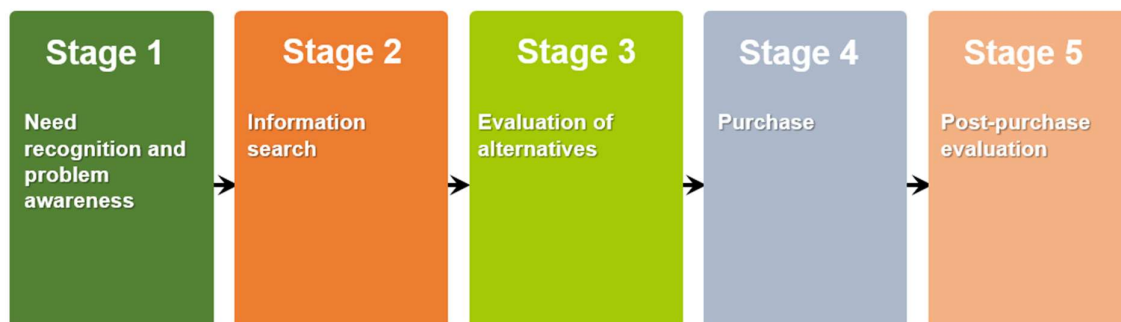
Figure 12: The five-stage purchase decision-making process
Source: Adapted from Cant and Van Heerden (2021); Erasmus and Mpinganjira (2019); Lappeman et al., (2021); Retief and De Klerk (2010).

3.2.3. Consumers' attention to product information

This study was especially concerned with the relevance and influence of product information, as well as external stimuli that exist in the store or website environment (S), which are interpreted internally in consumers' minds (O), considering previous, personal buying and consumption experiences. All these influences are generally internalised and may be considered rationally or emotionally, eventually influencing consumers' responses (R) – either positively (to linger longer on or browse the website and to purchase), or negatively (to leave the store or website, and terminate buying). While product information is an important external influence in terms of concluding informed, responsible buying decisions (Erasmus et al., 2014), a well-designed shopping context can provide a key competitive advantage by creating unique, pleasurable, and memorable in-store or online shopping experiences that would enhance consumers' return- and purchase intentions (Faqih, 2016; Pandey & Chawla, 2018). Product information can provide consumers with the cues they need to approve or reject a product. The amount and quality of product information that consumers have about a product affect their product evaluation.

The following section presents information concerning the relevance of product information in general, followed by a more focused discussion of clothing product information.

3.2.3.1. The relevance of product information in general

In emerging economies, such as South Africa, where many consumers possess lower levels of education and where product exposure and experience across the population are not as sophisticated as in developed economies such as the USA and the UK, consumers often possess lower levels of product knowledge. This jeopardises their ability to conclude informed purchases (Labuschagne, van Zyl, van der Merwe, & Kruger, 2012; Patrinos & Psacharopoulos, 2020). Even within South Africa, education levels of consumers in urban and rural areas differ. Generally, education levels in urban areas are higher due to increased exposure and better opportunities (De Clercq, 2020; Lembani, Gunter, Breines, & Dalu, 2020). Product information is also often used to distinguish acceptable product alternatives and reassure consumers that products will meet their expectations (see Section 3.2.2).

A product decision process entails a pre-purchase stage when information is accumulated, both internally and externally, hence the stage when a consumer (prospective buyer) attends to available product information. At this stage, a consumer may rely on previous experiences with similar products, such as post-purchase information from previous encounters, together with after-sales service, which represents a form of internal information (Labuschagne et al.,

2012). External product information or cues, in the form of labels and marketing information, are generally the first points of communication between the retailer (or manufacturer) and consumer (van der Merwe, Bosman, Ellis, van der Colff, & Warnock, 2014). This information is convenient to a consumer if the product information is complete, easy to distinguish, and understandable (van der Merwe et al., 2014).

Consumers generally depend on available product information, and failure to source relevant information (information search failure) could result in frustration and disappointment (Labuschagne et al., 2012). Too little information could cause uncertainty, while an information overload could be overwhelming, causing confusion, which is equally problematic (Labuschagne et al., 2012). In physical stores, sales staff are also usually available to assist consumers with relevant product information that might be lacking, which is not the case when purchasing online. The product information presented online should therefore be cautiously contemplated and clearly presented.

3.2.3.2. The relevance of clothing product information

Clothing product labels typically include sizing details, textile and fabric information, construction details, country of origin information, the brand name and product care instructions (Labuschagne et al., 2012; Prinsloo, van der Merwe, Bosman, & Erasmus, 2012; Retief & De Klerk, 2010). The South African clothing industry requires the country of origin to be displayed, in line with Regulation Notice 1831 of 2006, while fibre content, size and care labelling are regulated by the South African national standards (van der Merwe et al., 2014). Global guidelines require aspects such as the manufacturer's name, country of origin, fibre content, size, and care instructions to also be shown on clothing labels (van der Merwe et al., 2014).

To overcome language barriers, care instructions are portrayed using easy to understand symbols (van der Merwe et al., 2014). The visual appearance of labels is also important, as the colour may attract attention and positively influence a consumer to pay attention to the label content (Labuschagne et al., 2012; Prinsloo et al., 2012). Labels should furthermore be placed conspicuously so that they can be accessed easily (Labuschagne et al., 2012). While labels are required to be permanently fixed or secured onto clothing items (Labuschagne et al., 2012), this would not be visible to an online shopper, and therefore retailers have to provide the information separately and clearly.

With clothing choices, the cues that consumers generally consider as part of the product evaluation process are distinguished as **intrinsic** and **extrinsic cues.** Intrinsic cues are those that refer to characteristics that are inherent to the product: when these properties are changed, the characteristics of the product will change, for example, the style. In contrast, extrinsic cues are those with characteristics that are not inherent to the product, for example, the price (Hines & Swinker, 2001; Rahman & Kharb, 2018; Retief & De Klerk, 2010). Inexperienced or less experienced consumers are more likely to use extrinsic cues when evaluating products as they are easier to distinguish (Brucks, 1985; Hines & Swinker, 2001). For clothing quality, this would mean that less knowledgeable consumers would rely on extrinsic cues such as price or brand name to evaluate clothing, while those who are more knowledgeable would use intrinsic attributes such as construction quality and fabric type (Hines & Swinker, 2001). Therefore, extrinsic cues are highly significant in online shopping and should be presented clearly and in as much detail as possible.

Intrinsic cues are subdivided into three sections (Brown & Rice, 2013). Firstly, physical features include the design, such as colour and style; its construction, such as the seams and stitches used; all the components and other materials used in the garment's production; and any final processing that is used to complete the garment. Secondly, performance features determine the product's standards and how this may benefit the consumer, such as the attractiveness or the aesthetic properties that usually satisfy the consumer's emotional needs, together with the design elements and prevailing fashion trends (Langan, Besharat, & Varki, 2017). Lastly, functional performance entails the utilitarian properties, which refer to how well the product adheres to the standards of end-use, as well as the product's ultimate usefulness (Choi et al., 2018). These would include the fit of the garment, whether its functioning is suitable for the intended purpose, and its ease of maintenance. The durability of a garment is regarded as its ability to maintain its appearance and structure during wear, as well as its serviceability and ease of care. The durability of a garment describes its dimensional stability (resistance to shrinkage), seam strength, colourfastness, and resistance to tearing or abrasion (Brown & Rice, 2013). Not all of these properties are easy to assess.

Extrinsic cues include aspects such as a product's country of origin, brand name, and price information. Price-conscious consumers would, for example, highly value the price of items relative to similar merchandise and consider aspects relating to their affordability, often attending to low or discounted prices (Mafini, Dhurup, & Mandhlazi, 2014). Research clearly indicates that price significantly influences consumers' clothing purchase decisions (Rajagopal, 2006). Research conducted in the USA indicated that price is important to millennials, as a large proportion of this generational cohort comprises younger people and

students, who tend to be price conscious (Diedericks, 2019; Kumar, Lee, & Kim, 2009). Other studies have refuted this claim, stating that millennials have more modern parents, with well-established careers, and fewer siblings, so millennials from these households can often afford to spend more on themselves (Grant & Stephen, 2005; Valaei & Nikhashemi, 2017). A more recent South African study that involved millennial men concluded that as income increases, price sensitivity among millennials decreases (Diedericks, 2019). Furthermore, it was suggested that value retailers that target millennial men should be cognisant that price is relevant but that the durability of merchandise signals "value for money" in the consumers' mind (Diedericks, 2019).

Brands have a significant impact on how consumers create and maintain a feeling of identity and accomplishment. Various studies have argued that certain clothing items are purchased and used by consumers to enhance their sense of self and to exhibit themselves to others, creating an image that corresponds with their image of themselves and concurs with how they perceive themselves (Eastman, Goldsmith, & Flynn, 1999; Jacobs & de Klerk, 2010; Lappeman et al., 2021). Hsieh, Pan, and Setiono (2004) accentuate the importance of brand image in differentiating among brands and increasing repurchase intentions. Then again, Kwan and Yeung (2004) found that brand-conscious consumers are more inclined to choose expensive, imported and globally known clothing labels. Similarly, Mafini et al. (2014) argued that brand-conscious consumers often purchase products from well-known brands that are widely advertised and expensive. The online survey conducted by Giovannini et al. (2015) among millennial luxury consumers confirmed a positive correlation between consumers' purchase intentions and brand self-congruency. Brand consciousness is also a differentiated consumer decision-making style, accentuating the importance of brand information when designing online sites (Olyott, 2018; Valaei & Nikhashemi, 2017). However, because of the strong influence of brand name and the potential bias that it might create within and among respondents when completing the survey, brand information was deliberately excluded when designing this research.

Country of origin information indicates where the brand originates from (Mohd Yasin, Nasser Noor, & Mohamad, 2007), which could differ from the "country of manufacture". Country of origin stereotypes do, however, exist. Usually, brands are stereotyped in terms of a particular country's people and brand reputation (Lin & Chen, 2006). The literature indicates that considerable numbers of consumers rely on stereotypes surrounding countries of origin to judge the level of quality of a product (Mohd Yasin et al., 2007). It has been found, for example, that consumers avoid garments that are produced in countries such as China that are known to use sweatshop labour (Shaw, Hogg, Wilson, Shiu, & Hassan, 2006). On the other hand,

consumers' purchase intentions would increase when products originate from countries with a well-established fashion reputation, such as Italy (Valaei & Nikhashemi, 2017). For this study, the country of origin was kept identical for each clothing item and the same as the research setting (South Africa) to avoid any country bias.

Figure 13, which was adapted from the work of Brown and Rice (2013), and Retief and De Klerk (2010), illustrates the relevance of both intrinsic- and extrinsic clothing product attributes (Abraham-Murali & Littrell, 1995; Eckman, Damhorst, & Kadolph, 1990; Retief & De Klerk, 2010) during consumers' evaluation of clothing merchandise at the point of sale.
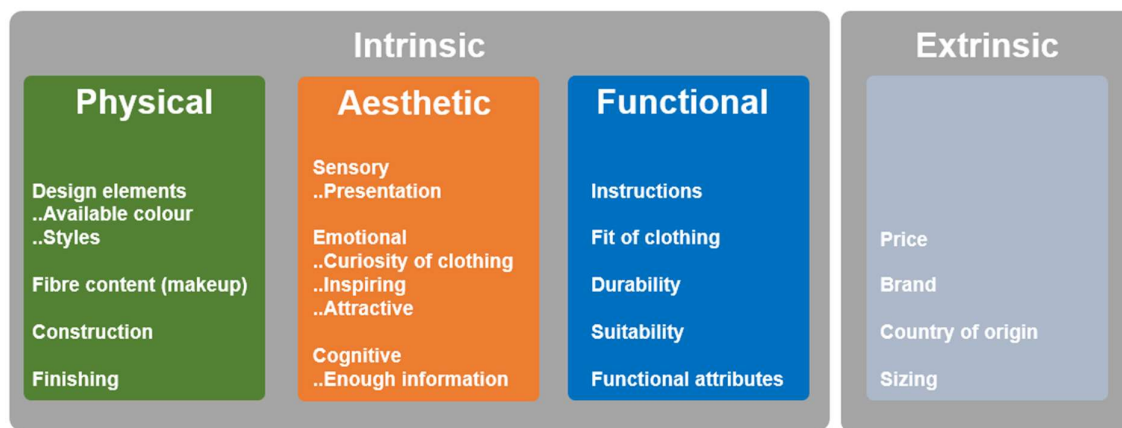
Figure 13: Product information used to evaluate clothing at the point of sale
Adapted from Brown and Rice (2013) and Retief and De Klerk (2010).

3.2.3.3. The presentation of clothing product information

The internet and fashion industries are primarily visual environments, where items are shown, promoted, and explained using visible information and visual imagery (Kaushik et al., 2020; Wong, Bartels, & Chrobot, 2014). Owing to an inability to interact with and feel a product before acquiring it online, the available information and how the information is presented is crucial to assist consumers to visualise products and to enhancing their sensory experiences (Kaushik et al., 2020; Liu, Batra, & Wang, 2017; Morton, 2018).

Because tactile sensing is not possible in the online environment, research advocates that by being able to expand the details on the products, such as details concerning the washing instructions, user precautions, style, fabric, manufacturing processes and other attributes that might be of interest, much of the products' tactile information can be assumed (Blanco et al.,

93

2010; Karimov et al., 2011; Kaushik et al., 2020; Kim & Lennon, 2008; Zhou et al., 2017), while evoking positive responses (Blanco et al., 2010).

Consumers are typically accustomed to physical store atmospherics, which involves their senses to judge products in particular settings (Bitner, 1992; Gao & Bai, 2014; Lee & Kim, 2019; Nell & Cant, 2015; Roggeveen et al., 2020). With online shopping, the situation is different, in that consumers are not physically present in the stores, cannot physically examine the products, and their sensory experiences are limited to what they can see and hear (Mpinganjira, 2016). Because products cannot be physically examined, consumers also rely on selected sensory cues and available product information to guide their purchase intentions (Bleier et al., 2019; Chen et al., 2020; Filieri et al., 2021; Petit et al., 2019). Particularly with clothing purchases where the visual aspects of clothing are very important during decision-making, it is crucial to provide information clearly, and as detailed as possible.

3.2.4. The product evaluation process

3.2.4.1. Considering external information within an internal frame of reference

The process of product evaluation occurs when consumers integrate the available information, thus all the available external product information or cues (Baek, Huang, & Lee, 2021; Chandrasekaran, 2012; Ghalachyan & Karpova, 2021; Lee & Lou, 2011), and frame it in their minds within existing internal information frameworks. Consumers, therefore, rely on existing knowledge concerning a product and prior experience (Baek et al., 2021; Chandrasekaran, 2012; Ghalachyan & Karpova, 2021; Lee & Lou, 2011). A consumer with no or limited experience might therefore find a purchase decision more complicated or challenging. In this study, external cues refer to cues from the environment or store atmospherics, as well as the available product information. Internal information refers to consumers' previous experiences as the frames of reference. This study specifically focused on available product information as presented on the mobile phone application, as well as atmospheric information that was sensory in nature.

Available product information is considered to be an important moderator of consumers' purchase behaviour because an understanding of products and their characteristics affects the attention that a consumer devotes to the product during the purchase process (Ahn et al., 2018; Retief & De Klerk, 2010). Therefore, product information should ideally strengthen the relationship between consumers' sensory experience and the consumers' purchase intentions.

94

3.2.4.2. Consumers' purchase intentions

Purchase intentions, which is the outcome of consumers' product evaluations, include the consequences of their sensory experiences, and describe the chances that the consumers will purchase a product, would patronise a retailer, or would otherwise conclude a purchase (Mehraliyev et al., 2020; Riedel & Mulcahy, 2019). Consumers' sensory experience can be particularly influential in terms of related behavioural and consumer's purchase intentions (Biswas, 2019; Mehraliyev et al., 2020; Petit et al., 2019). Purchase intention is a predictor of a consumer's purchase behaviour, in that strong, positive purchase intentions are likely to lead to a product purchase (Huang, Lurie, & Mitra, 2009 (see Section 3.2.2).

In summary, the complexity of consumer decision making is associated with the product category. This research focused on clothing specifically, which is a rather complex product due to the relevance of extrinsic and extrinsic product attributes during product evaluation. In a physical store environment, additional support is provided through in-store displays and customer support that are not present when shopping online. The way in which clothing merchandise is presented on an online platform, is therefore crucial to retain consumers' interest, and to boost purchase intentions. This may be a very daunting task for online clothing retailers unless the clothing decision process is fully understood and acknowledged.

3.3.   Conclusion

This chapter presented and discussed the constructs that are relevant in this research as derived from existing literature that also guided the formulation of the replications and the hypotheses that will be tested in this research. Attention was devoted to the relevance of creatively designed shopping contexts, specifically attending to in-store atmospherics, and the role of sensory cues in terms of consumers' shopping experiences, whether shopping in brick-and-mortar stores, or shopping online. The importance of a telepresence and customisation when shopping online, was explained. Furthermore, customisation was explained and how it can fascinate online shoppers and provide them with a sense of control. In order to understand the complexity of consumer decision-making that is equally relevant in online shopping, and the stages of consumer decision-making were explained, particularly attending to influences on consumer decision-making, and including external cues that are converted in memory within consumers' existing memory frameworks to influence consumers' purchase intentions as well as their eventual purchase decisions. Attention was given to product information. Throughout, discussions were directed to clothing purchases, the product category of interest in this research. The relevance of the S-O-R theoretical framework, that guided this research endeavour, is presented in the following chapter.

Chapter four: Theoretical framework and conceptual model

Following the literature review presented in the previous two chapters, this chapter devotes attention to the established S-O-R (stimulus-response) framework as the chosen theoretical framework that was used to frame and organise this study. It was particularly relevant to structure the methodology, and the discussion of the research findings. This chapter also presents the replications and hypotheses of the research, that guided the data gathering process and statistical analyses. The chapter concludes with the proposed conceptual model.

4.1. The S-O-R theoretical framework

This study sought to understand changes in consumers' behaviour, specifically focusing on consumers' purchase intentions, resulting from consumers' sensory experiences after following an online purchase encounter. Various attitudinal and behavioural models exist that could have been used to depict consumers' online shopping (Cheng & Huang, 2013; Hsu, Yen, Chiu, & Chang, 2006). This includes, for example, the theory of planned behaviour (TPB) and the theory of reasoned action (TRA). The latter posits that consumers' behaviour is forecasted by their intentions, which are a function of their attitudinal and individual norms (Ajzen & Fishbein, 1975). TPB extends the TRA by including behavioural control as a predictor of consumers' behavioural intention and behaviour (Ajzen & Fishbein, 1980).

One of the assumptions of TRA and TPB is that consumers are sensible beings in the way in which they conduct their decisions and their actions. Therefore, a cognitive approach to consumer decision-making is suitable to forecast consumers' behaviour (Ajzen & Fishbein, 1975, 1980; Cheng & Huang, 2013; Hsu et al., 2006; Moon et al., 2017). However, this assumption has received extensive criticism for excluding the affective dimension of consumers' decision behaviour. Hence, the inclusion of affective variables is recommended as a useful addition to these established theories (Conner & Armitage, 1998). For this reason, the S-O-R framework was proposed, as it enables researchers to examine the effect of both cognitive and affective influences on the behavioural outcomes of consumers' decision processes (Mehrabian & Russell, 1974), therefore potentially being a more comprehensive framework.

Originally proposed by environmental psychologists Mehrabian and Russell (1974), based on the S-O-R behaviour formula of Woodworth (1929), the S-O-R theory posits that stimuli in the external environment (S) trigger related cognitive or affective responses within the mind of an individual (the so-called organism) (O). This instigates mental activity that spurs an individual,

or consumer, or organism's behavioural response (R). Hence, this framework suggests that observed stimuli generate certain thought processes that lead to actions or related responses (Rodríguez-Torrico et al., 2019). In terms of consumer decision-making contexts, external stimuli, when observed, are integrated within consumers' minds, and in existing mental frameworks derived from previous experiences, which influence consumers' subsequent reactions. This study attended to consumers' reaction to two particular sensory cues (visual and auditory) when shopping online, as cues that could be manipulated with available technology in m-commerce, and that would be viable for retailers to pursue when designing their online applications. These sensory cues were applied as stimuli (S) when using a specific custom designed mobile phone application to purchase clothing online, culminating as the consumer's/organism's online experience (O).

During this experience, the consumer evaluated the product-related information or stimuli, which resembled the product information that the consumer would find in a physical store, influencing the individual's purchase intention (positively or negatively), and subsequent response to buy (or not). The sensory cues were expected to trigger an affective response (based on a positive or negative sensory experience), which in turn elicited a favourable or negative purchase intention with its associated behavioural response. Therefore, this study proposed that a favourable online experience would positively enhance consumers' purchase intentions and subsequently produce favourable responses or purchase outcomes. The study assumed that the relationships between the sensory stimuli (S) and sensory experience (O), as presented in the conceptual framework, are moderated by telepresence (explained in Section 3.1.4) and customisation as enabled in the app (explained in Section 3.1.5), and that the relationship between consumers' sensory experiences and their purchase intentions are moderated by product information, which was presented when using the app (explained in Section 3.2.3).

The sequential S-O-R framework has been used extensively in consumer behaviour studies to comprehend consumers' psychological and behavioural reactions after exposure to and experience of contextual stimuli that are present in commerce- or retail-based environments (Chopdar & Balakrishnan, 2020; Rapp & Beeler, 2021; Waqas, Hamzah, & Salleh, 2021; Ziaie et al., 2021). Using the S-O-R framework in retail-related studies, the shopping environment has been used as a stimulus to confirm the influence of selected contextual factors on consumers' behaviour in the physical shopping environment (Baker, 1986; Bitner, 1992; Donovan et al., 1994; Wirtz et al., 2000). More recent research has also applied the S-O-R framework in terms of online retail (Eroglu et al., 2001), specifically concerning online shopping behaviour (Bleier et al., 2019; Matos & Krielow, 2019; Micu et al., 2019; Rose et al., 2012), as

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well as in the context of mobile telecommunications (Chopdar & Balakrishnan, 2020; Rodríguez-Torrico et al., 2019).

The S-O-R framework has, therefore, already been used successfully to explore consumers' reactions and behaviours in online purchase settings, as it permits the incorporation of numerous antecedents to predict consumers' behavioural intentions. Subsequently, specific knowledge gaps have emerged that have inspired this research endeavour. For example, despite studies that have used the S-O-R framework in the research domains of mobile and online shopping, its application in mobile shopping applications is particularly limited. This has attracted the attention of this research that accepted that mobile phone apps function differently from online websites and that the outcomes of previous studies cannot simply be applied interchangeably (Chopdar & Balakrishnan, 2020).

In this study, two sensory cues (visual and auditory) were applied as the external stimuli (S), while the sensory experience of the organism (O) drove the subsequent purchase intention, as a positive or negative response (R). The sensory cues were expected to trigger an affective response (a sensory experience), which in turn elicited a related behavioural response, namely a consumer's purchase intention. These relationships were expected to be moderated by telepresence and customisation (between the stimuli and the organism, on the framework), and product information (between the organism and the response, on the framework).

In view of the previous successful applications of the S-O-R theoretical framework, in research conducted on in-store ambience (Aboubaker Ettis, 2017; Donovan et al., 1994; Gao & Bai, 2014; Liu, Li et al., 2019), the elements of the S-O-R framework were adopted for this research, and are discussed in the subsequent sections:

4.1.1. Stimulus

In brick-and-mortar stores, the stimulus element of S-O-R focuses on the different physical cues that are present within the in-store environment. The in-store environment, which has been described by means of Bitner's (1992) servicescape framework, is also frequently described as the online servicescape, e-servicescape, or cyberscape in the context of virtual stores (Harris & Goode, 2010; Hopkins, Grove, Raymond, & LaForge, 2009). This terminology has been helpful for describing retail store settings as well, even where the platform used for e-commerce is now replacing the physical stores in which the interaction between consumers and retailers traditionally occurred. The term "online servicescape" describes the culmination of online environmental stimuli, or cues, that pertain to the features and designs of the online

platforms and which exist even before a consumer's engagement and experience with the online shop or platform begins (Harris & Goode, 2010; Hopkins et al., 2009).

The clothing industry is known for implementing considerable in-store atmospherics to promote and enhance the display of clothing merchandise, including visual and auditory cues. Owing to technological advancements, this is now also possible to apply and explore using mobile devices. In physical stores, consumers are accustomed to the idea that their senses are stimulated when entering a store, and also while inspecting various products that are visually or cleverly displayed along with relevant product information. Therefore, made sense to ascertain the outcomes when consumers' senses are stimulated in a similar way in the online mobile shopping environment (Petit et al., 2019; Velasco et al., 2021).

While several dimensions and subdimensions of the online servicescape have been distinguished (Harris & Goode, 2010), this research only focused on the value of the presence visual and auditory cues for specific reasons. Firstly, visual, and auditory cues perform a central function in both consumers' online assessments of mobile phone applications and in their ensuing decision-making processes (Choi et al., 2019; Hwang et al., 2020; Kim & Lennon, 2008; Visinescu et al., 2015). Visual cues also play an important role when consumers develop their first impressions of retailers. When consumers find the visual appearance of something attractive, it positively influences their sensory experiences (Kim et al., 2020). Similarly, auditory cues, such as music are regarded as significant and distinctive in creating more hedonic consumer experiences in online retail settings (Cuny et al., 2015; Hwang & Oh, 2020). The second reason for focusing on visual and auditory cues, was that the progress in sensory-enabling technologies such as mobile devices (Bethan & Cano, 2019; Kim, 2019) have now enabled visual (sight) and auditory (hearing) cues to simultaneously be more ubiquitously provided and manipulated in the design of applications (Petit et al., 2019). This is appreciated due to consumers' increased expectations concerning the cues that they expect to be present when shopping online (Petit et al., 2019; Velasco et al., 2021).

In the absence of a physical in-store presence, online shoppers rely on external sensory cues to create a telepresence that will shape their sensory experiences and purchase intentions while shopping (Ye et al., 2020). This study, therefore, examined the moderating roles of telepresence, as well as the customisation of a specifically designed application (thus a personal manipulation of the stimuli), on online shoppers' (as the organism) perception of selected stimuli (that were technologically possible to manipulate, as indicated in the conceptual framework), and their subsequent responses (R). In order to effectively experience

the telepresence created for online and mobile phone applications, technologies are required to mimic the sensory features of visual and auditory cues (Ye et al., 2020).

In the same way that consumers develop their own routines and rituals when shopping in physical stores (Rose et al., 2012), it is now possible, through mobile devices, to add functionality or features that elevate consumers' sense of personal control, as a form of customisation. Consumers are thereby able to customise their online user experiences and to enhance their shopping encounters by creating an approximation of their in-store practices (Chopdar & Balakrishnan, 2020; Rose et al., 2012).

4.1.2. Organism

The organism element of the S-O-R theoretical perspective considers the transformation of environmental stimuli that are perceived by the consumer, into meaningful information that can produce an altered emotional state or cognitive status (Mehrabian & Russell, 1974). The term "affective state" describes the positive and negative emotions that consumers may develop throughout their interactions with the environmental stimuli, amid the cognitive state that represents the conscious mental processes that the consumer employs to acquire, process and retrieve information about a specific task (Eroglu et al., 2001).

In this research, the internal sensory experience represented the so-called organism, and this experience encompassed all the related dimensions of the experience that would have appealed to the individual's senses through the stimulation of sight (visual) and hearing or sound (auditory) (Hsu & Tsou, 2011). Sensory experience can be particularly influential in behavioural outcomes, such as influencing consumers' intention to make a purchase or not (Biswas, 2019; Mehraliyev et al., 2020; Petit et al., 2019). Therefore, the simulated projection of visual and auditory cues provides an enhanced sensory experience that changes the affective state within the consumer's mind, consequently influencing or altering behavioural outcomes, including influencing consumers' purchase intentions.

When considering the moderating role that product information has (between the organism and the response, in the framework), it is important to reiterate that products cannot be physically examined when using mobile devices to shop, and therefore consumers have to rely on available sensory cues, as well as the product information that are displayed alongside the items, as additional external cues, to direct shoppers' purchase intentions (Bleier et al., 2019; Chen et al., 2020; Petit et al., 2019). Inevitably, the product information is usually displayed

100

alongside the visual images. This research focused on the addition of selected sensory cues as described before, and their potential influence on online consumers' purchase intentions.

4.1.3. Response

The organism element of the S-O-R theoretical perspective considers the transformation of environmental stimuli that are perceived by the consumer, into meaningful information that can produce an altered emotional state or cognitive status (Mehrabian & Russell, 1974). The term "affective state" describes the positive and negative emotions that consumers may develop throughout their interactions with the environmental stimuli, amid the cognitive state that represents the conscious mental processes that the consumer employs to acquire, process and retrieve information about a specific task (Eroglu et al., 2001).

In this research, the internal sensory experience represented the so-called organism, and this experience encompassed all the related dimensions of the experience that would have appealed to the individual's senses through the stimulation of sight (visual) and hearing or sound (auditory) (Hsu & Tsou, 2011). Sensory experience can be particularly influential in behavioural outcomes, such as influencing consumers' intention to make a purchase or not (Biswas, 2019; Mehraliyev et al., 2020; Petit et al., 2019). Therefore, the simulated projection of visual and auditory cues provides an enhanced sensory experience that changes the affective state within the consumer's mind, consequently influencing or altering behavioural outcomes, including influencing consumers' purchase intentions.

When considering the moderating role that product information has (between the organism and the response, in the framework), it is important to reiterate that products cannot be physically examined when using mobile devices to shop, and therefore consumers have to rely on available sensory cues, as well as the product information that are displayed alongside the items, as additional external cues, to direct shoppers' purchase intentions (Bleier et al., 2019; Chen et al., 2020; Petit et al., 2019). Inevitably, the product information is usually displayed alongside the visual images. This research focused on the addition of selected sensory cues as described before, and their potential influence on online consumers' purchase intentions.

4.2. Considering gender as a control variable

Control variables are sometimes referred to as controls, nuisance variables or covariates (Atinc, Simmering, & Kroll, 2012), and are key in many empirical studies (Nielsen & Raswant, 2018). It is important to determine whether the key hypothesised independent variables in a study covary, since this may hamper both the explanatory power of the formulated models and

101

the explication of any causal inferences (Nielsen & Raswant, 2018; Stone-Romero, 2009). Control variables should also be identified through the experimental design or statistical analysis of a study to avoid type I (false positive) errors. Failure to attend to controls could threaten the internal validity of the findings (Nielsen & Raswant, 2018).

Following the recommendations of Nielsen and Raswant (2018), the issue of including control variables in this research was resolved by consulting similar studies, their settings, and their relevance to this research. Based on the best-practice guidelines of Bernerth, Cole, Taylor, and Walker (2018), the inclusion of demographic control variables should be avoided unless there is a clear theoretical rationale for doing so, as was decided in this study. According to existing literature, gender differences exist in millennials' decision-making behaviour, and therefore, gender was attended to as a research question rather than a control variable and will also not be part of the hypothesised model for the study (see Section 4.3.7 and 5.1).

4.3.   Replications and hypotheses

The following section presents the study's replications and hypotheses. Replications are typically used in marketing-related studies and allow researchers to test and confirm any previously hypothesised relationships (Hunt, 1975). Therefore, the replications in a study have typically been tested in several contexts before, with ample evidence to verify their outcomes. This study included several replications in answer to calls for further research to confirm existing evidence. The replications in this study were however formulated in a developing market setting, while most established theories have been formulated in developed countries with vastly different circumstances (Izogo & Jayawardhena, 2018; Kumar, Nim, et al., 2019). The hypotheses that were formulated for this study and which were tested for statistical significance were specifically related to the moderators that are specified in the conceptual framework of this study and were derived from a thorough review of both established and recent literature (Babin & Zikmund, 2016). The theoretical motivation for the various selected replications and hypotheses for the research are presented next.

4.3.1. Visual cues as part of consumers' sensory experience

Various kinds of stimuli contribute to the generation of a productive and unforgettable consumer experience, of which sensory stimuli can be particularly influential (Biswas, 2019; Petit et al., 2019). Visual cues are often the first sensory cues that are noticed by consumers (Akarsu et al., 2019; Biswas et al., 2014; Helmefalk & Hultén, 2017; Hultén, 2013). Visual cues refer to colours, logos, lighting, cleanliness, fixtures, graphics, signage and even mannequins, which are intentionally and skilfully controlled by companies to influence consumers'

behaviours and their purchase decisions (Akarsu et al., 2019; Deng & Kahn, 2009; Hultén, 2013; Krishna, 2008).

With online settings, visual cues can be manipulated by adjusting various visual characteristics, such as the dimensions of images (Kim & Lennon, 2008), product display modes (Kim et al., 2009), the number of views that a consumer has of something (Song & Kim, 2012), the background of images (Maier & Dost, 2018), consumers' interactivity with the images (Beuckels & Hudders, 2016), and nature of the view of the images, for example, 2D or 3D (Kim, 2019; Kim et al., 2020; Visinescu et al., 2015). It has been established that every one of the available cues influence consumers' behaviour (Krishna, 2012; Spence & Gallace, 2011) and presumably, therefore, also their online purchase behaviour. The role of visual merchandise presentations has become more imperative for products such as clothing, when shopping online, and when products cannot physically be examined: the involvement of consumers' senses then becomes crucial to visualise the products, and to conclude purchase decisions (Kim & Lennon, 2008; Yoo & Kim, 2014). A positive sensory experience then derives from exposure to an object that is visually attractive. Hence, the following replication (R) was proposed:

R1: Visual cues have a significant influence on consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

4.3.2. Auditory cues as part of consumers' sensory experience

Similarly, to visual cues, auditory cues such as music create a key ambient condition that influences consumers' sensory experiences and their subsequent emotional and behavioural responses (Bartholmé & Melewar, 2014; Bitner, 1992; Helmefalk & Hultén, 2017; Hultén, 2013). In retail settings, music that inherently relates to the sense of hearing, sound, or listening (Helmefalk & Hultén, 2017) is regarded as a distinctive component that can create more pleasant consumer experiences in online retail settings (Cuny et al., 2015; Hwang & Oh, 2020). Research has established, for instance, that positive sensory experiences are derived from exposure to music, and that music may enhance consumers' behavioural intentions (Ding & Lin, 2012). Accordingly, the following replication was proposed:

R2: *Auditory cues have a significant influence on consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.*

103

4.3.3. The moderating role of telepresence

Telepresence describes the set of technologies that facilitate the real-time feeling that one is present elsewhere, therefor in a place other than one's current location. Ideally when designing mobile phone applications for online shopping, technologies should provide a telepresence that, as closely as possible, replicates the sensory aspects of vision and sound that consumers are familiar to in physical stores (Ye et al., 2020). A pleasant, inviting telepresence is likely to encourage online shoppers to linger longer, enhancing their purchase intentions (Ye et al., 2020).

Javornik (2016) determined that visually enhancing technologies, which can be accommodated in mobile devices, are able to present the sensation of a telepresence, facilitating a real-world experience. Consumers thereby experience a presence in a virtual realm rather than in the physical world where the real world is blocked out, and consumers become entirely dependent on the virtual environment to capture available sensory information (Cowan & Ketron, 2019).

Sound is probably the easiest cue to provide since equipment with advanced stereophonic sound production capabilities is widely, and cost-effectively available (Hwang & Oh, 2020). Visual cues that provide an enhanced telepresence have also received considerable attention in recent years, with advancements incorporating the capabilities of remote locations, presenting 360-degree rotatable images, and presenting displays that allow users to experience an immersive and convincing 3D experience (Pfeiffer et al., 2020). The interactive features of 360-degree rotatable images, together with interactive music, are recognised as fundamental in creating an effective telepresence (Novak et al., 2000). Because these features are generally entertaining (Bilgihan et al., 2016), they can enhance consumers' sensory experiences (Pine & Gilmore, 1999).

Because consumers are used to the presence of sensory cues in physical stores as part of part of their shopping experiences, a telepresence on a mobile phone application can have a significant moderating effect, and enhance consumers' sensory experiences (Pine & Gilmore, 1999). Therefore, the following hypotheses were formulated:

H1a: Telepresence significantly moderates the relationship between visual cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

H1b: Telepresence significantly moderates the relationship between auditory cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

4.3.4. The moderating role of customisation

Customisation refers to the generation of a personalised, or unique experience while facilitating the sense of personal control, and enhance consumers' experiences (Rose et al., 2012). In a physical store, consumers are able to exercise practices of customisation by means of their own, unique rituals, such as the routes they travel through the aisles in the store (Rose et al., 2012). Customisation requires some form of interaction of a consumer with a mobile phone app to personalise their experience. In this study, both 360-degree rotatable clothing images and interactive music were used to customise consumers' interaction within the mobile phone application. Customisation by means of 360-degree rotatable pictures (Kim et al., 2020) and interactive features (Kim et al., 2015) were expected to positively affect consumers' purchase intentions. Similarly integrating interactive background music as part of the online platform is expected to yield a positive consumer experience (Hwang & Oh, 2020). Consumers who perceive the visual and auditory cues about products in a more eloquent way, that is tailored to their needs or that they can control (Mosteller et al., 2014), experience increased enjoyment and a more positive experience (Pappas et al., 2014). Therefore, the following hypotheses were formulated:

H2a: Customisation significantly moderates the relationship between visual cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

H2b: Customisation significantly moderates the relationship between auditory cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

4.3.5. Sensory experience and purchase intention

The interaction between visual and auditory cues could enhance consumers' sensory experience and boost their purchase intention (Riedel & Mulcahy, 2019). Consumers' sensory experiences can be particularly influential in influencing behavioural outcomes and driving their purchase intentions (Biswas, 2019; Mehraliyev et al., 2020; Petit et al., 2019). Behavioural

outcomes could however be positive, negative, represent confusion (Mehraliyev et al., 2020). Purchase intentions, following consumers' sensory experiences, refer to the likelihood that consumers will purchase a product, or patronise a retailer in the future (Mehraliyev et al., 2020; Riedel & Mulcahy, 2019). As an important predictor of consumers' eventual purchase behaviour, consumers with stronger purchase intentions are more inclined to conclude purchases (Huang et al., 2009). Hence, the following replication was proposed:

R3: Consumers' sensory experience has a significant influence on their purchase intention when using a particular mobile phone application to conduct an online clothing purchase.

4.3.6. The moderating role of product information

An understanding of products' specifications, related characteristics and subsequent performance characteristics form part of consumers' rational product evaluations, and comparison of available alternatives, influencing consumers' willingness to purchase (Ahn et al., 2018; Souiden et al., 2020). Rational decision-making means that a consumer considers all the available product characteristics and then chooses the product that outweighs the others in terms of benefits (Ahn et al., 2018; Baek et al., 2021; Chandrasekaran, 2012; Ghalachyan & Karpova, 2021; Lee & Lou, 2011). Product information is hence an important moderator of consumers' purchase decision behaviour. By contrast, emotional product choices are made based on how a consumer feels about a product, not necessarily prioritising the true product characteristics, often assuming good performance (Cant & Van Heerden, 2021; Erasmus et al., 2014; Olyott, 2018).

A consumer who is equipped with sound product knowledge feels both more knowledgeable about the product and more adept at evaluating it (Liu, Li et al., 2019). Therefore, when consumers can clearly visualise the spatial properties of an item, such as its outline, shape, and components, as is possible in a physical store, the decision process is less challenging than when shopping online. Mobile phone applications should therefore be designed to provide a more realistic presentation of a "real" store environment and should increase a consumer's feeling of competence to make a purchase decision and to rationally "challenge" a retailer's sales pitch in terms of content (Fuentes & Svingstedt, 2017).

Weisstein et al. (2016) confirmed that the availability of product information positively influences consumers' online purchase intentions. Evidence also exists that a favourable

sensory experience enhances consumers' in-store experiences (Grewal et al., 2020; Hadi & Valenzuela, 2020; Ye et al., 2020). This can be particularly influential in terms of behavioural outcomes, and to increase consumers' purchase intentions (Biswas, 2019; Mehraliyev et al., 2020; Petit et al., 2019), while consumers' who are equipped with sound product knowledge would be more capable to finalise decisions (Liu, Li et al., 2019). The following hypothesis is therefore presented for this study:

H3: Product information significantly moderates the relationship between consumers' sensory experience and their purchase intention when using a particular mobile phone application to conduct an online clothing purchase.

4.3.7. Possible gender differences in millennials' purchase decisions

Gender differences in consumers' behaviour in the marketplace, particularly concerning consumers' decision behaviour in general, and their shopping intentions, are indisputable (Ameen et al., 2021; Walsh et al., 2017), for example concerning consumers' behaviour in brick-and-mortar shopping malls (Ameen et al., 2021; Haj-Salem et al., 2016; Katrodia et al., 2018; Lucia-Palacios et al., 2018), and consumers' experience of retail settings (Ameen et al., 2021; Haj-Salem et al., 2016; Katrodia et al., 2018; Lucia-Palacios et al., 2018). Gender is also noteworthy in influencing consumers' e-commerce adoption, and online design assessments (Kühn & Petzer, 2018; Pascual-Miguel et al., 2015; Yoon & Occeña, 2015). Gender differences in consumers' decision styles have also been reported (Olyott, 2018) and therefore not surprising in online shopping settings (see Section 2.2.3). Lastly, literature states that men are inclined to be more task oriented when purchasing goods and services, while females are more emotionally inclined, desiring more hedonic experiences (Ameen et al., 2021; Chang & Watchravesringkan, 2018; Dabbous & Barakat, 2020; Pandey & Chawla, 2018). The following hypotheses were therefore proposed:

H4a: *Significant gender differences exist in consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.*

H4b: *Significant gender differences exist in consumers' purchase intention when using a particular mobile phone application to conduct an online clothing purchase.*

4.4. Conceptual model

Based on the literature review, a conceptual model was designed for this study, as is presented in Figure 14. The model was formulated by incorporating visual and auditory cues as the external influences (S) that form part of the sensory experiences that culminate in consumers' minds after cognitively interpreting the stimuli (O). The subsequent purchase intention that directs consumers' willingness to conclude a purchase (R) represents the outcome of the sensory experience. These constructs are presented sequentially. Within this model, telepresence, customisation, and clothing product information are indicated as possible moderators during the purchase encounter.

The relationships between these constructs have not yet been empirically tested within the online shopping (clothing) context in a developing market setting (see Section 2.3.4). The conceptual model was proposed to indicate the relationships between the independent variables, namely visual and auditory cues, and the dependent variables, namely sensory experience, and purchase intention. The replicated and hypothesised relationships are illustrated in Figure 14.
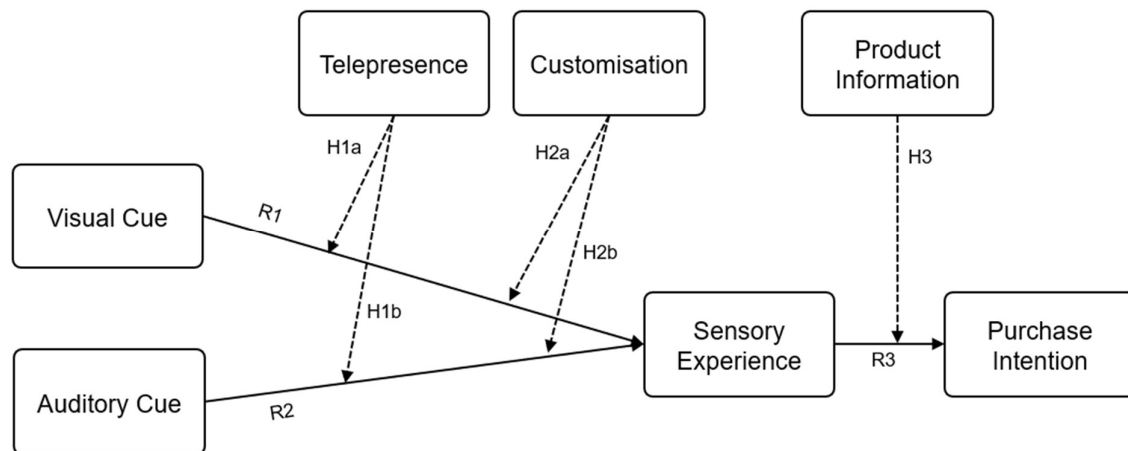
Figure 14: Conceptual framework

Note: The hypothesised relationships H4a and H4b are not indicated in the framework as they relate to the dependent variables in the conceptual framework.

4.5. Conclusion

This chapter discussed the relevance of the S-O-R theoretical framework in the context of this research, based on the successful application of this theoretical anchor in previous studies.

This study aimed to examine the interplay of visual and auditory cues in millennials' sensory experience and purchase intention within an online shopping context, in a selected product category (clothing), in a developing market This study examined the possible moderating effects of telepresence and customisation on the relationships between visual as well as auditory cues and millennials' sensory experiences. Furthermore, the study considered the moderating effect of product information on the relationship between consumers' sensory experience and their purchase intention (see Section 1.5).

The research **questions** that guided the research were:

RQ1: How do visual and auditory cues influence consumers' sensory experience when using a particular mobile phone app to purchase clothing online?

RQ2: How does the sensory experience derived from an online shopping encounter, when using a particular mobile phone app to conduct a clothing purchase, influence consumers' purchase intention?

RQ3: What is the moderating influence of telepresence in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online?

RQ4: What is the moderating influence of customisation in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online?

RQ5: What is the moderating influence of clothing product information between consumers' sensory experiences and their purchase intention when using a particular mobile phone app to purchase clothing online?

RQ6: How does gender influence the relationships in the conceptual model for this study, which specifies specific interactions during an online shopping encounter when using a particular mobile phone app to conduct a clothing purchase?

The **replications** that were examined in terms of their relevance within the context of this study were:

R1: Visual cues have a significant influence on consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

R2: Auditory cues have a significant influence on consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

R3: Consumers' sensory experience has a significant influence on their purchase intention when using a particular mobile phone application to conduct an online clothing purchase.

The **hypotheses** that were derived from the literature, which were tested in this research in terms of an app that was custom designed and modified for use in the online purchase of clothing, were:

H1a: Telepresence significantly moderates the relationship between auditory cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase

H1b: Telepresence significantly moderates the relationship between auditory cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

H2a: Customisation significantly moderates the relationship between visual cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

H2b: Customisation significantly moderates the relationship between auditory cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

H3: Product information significantly moderates the relationship between consumers' sensory experience and their purchase intention when using a particular mobile phone application to conduct an online clothing purchase.

H4a: Significant gender differences exist in consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.

H4b: Significant gender differences exist in consumers' purchase intention when using a particular mobile phone application to conduct an online clothing purchase.

Chapter five: Research design and methodology

The previous chapter confirmed the aim of the study and indicated the replications and hypotheses that were formulated to answer the research questions (see Section 4.3, summarised in 4.5), also introducing the conceptual model (Figure 14) of this study. This chapter presents the research design and research methodology, commencing with a deliberation of the research questions. Details are presented concerning the research setting, the research paradigm, and measuring instruments, which commenced with a vignette design that had to be completed before starting with the survey questionnaire. The pilot test is described, followed by an explanation of the sampling procedure, the data collection techniques, and methodsused to analyse the data. The measures that were taken to eliminate error throughout the research are discussed before concluding with the ethical considerations of the study.

5.1.   Research questions

Research questions that guide the research process, are generally supported by theory (Hair et al., 2021). This study examined the interplay of visual and auditory cues on millennials' sensory experience and purchase intention within an online shopping scenario, involving clothing purchases in the context of a developing market. This research also investigated the moderating effects of telepresence and customisation on consumers' experiences, particularly concerning the relationships between visual and auditory cues, and online shoppers' sensory experience. Furthermore, this study considered the effect of product information, as a moderator, in the relationship between sensory experience and purchase intention (see Section 1.5). Gender differences were examined. The following research questions guided the research:

Please note: In all the research questions, "consumer" refers to a particular age cohort, namely, millennials.

Research question 1 (RQ1): How do visual and auditory cues influence consumers' sensory experience when using a particular mobile phone app to purchase clothing online?

Unlike brick-and-mortar or physical stores, the mobile phone application environment is limited by what technology can offer. Currently, technology only allows for the inclusion of visual and auditory cues when designing mobile phone applications, as the other cues involve technology that is still too complicated and expensive, or not possible yet to include. Shopping in physical stores is generally associated with sensory experiences that are skilfully designed to excite

customers and to lure them into the stores. It is therefore not unrealistic to think that consumers would frame their expectations of online shopping accordingly. Previous research on consumers' online sensory experiences has predominantly focused on the manipulation of visual cues. Understanding both visual (see Section 3.1.3.4) and auditory cues (see Section 3.1.3.5), independently and in concert, in terms of their influence on consumers' sensory experiences, is expected to provide insights for both scholars and clothing retailers into how to optimise the potential for their mobile phone apps to retain consumers' attention and to enhance their purchase intentions. This first research question was investigated by subjecting respondents to an online shopping task that was presented as a vignette before gaining access to a questionnaire (see Section 5.6). This data was then used to test the conceptual framework (see Section 4.4).

Research question 2 (RQ2): How does the sensory experience derived from an online shopping encounter, when using a particular mobile phone app to conduct a clothing purchase, influence consumers' purchase intention?

Sensory experience can be particularly influential in terms of consumers' behavioural responses, such as to drive their purchase intentions (see Sections 3.1.1.2 and 3.2.4.2). However, concerning the use of a specially designed mobile phone application, within a clothing purchase context, the influence of sensory experiences on consumers' purchase intentions needed to be measured and understood to gain reliable empirical evidence concerning the predictability of consumers' online sensory experiences, on their purchase intentions.

Research question 3 (RQ3): What is the moderating influence of telepresence in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online?

In the absence of a physical in-store presence, online shoppers, rely on sensory cues to create a telepresence, which then in turn shapes their sensory experiences (see Section 3.1.4). Including visual and auditory cues as independent variables and using telepresence as a possible moderator of consumers' experiences within the S-O-R framework, provided the researcher with the opportunity to indicate the importance of the presence of sensory cues in terms of the predictability of consumers' purchase intentions (the dependent variable).

Research question 4 (RQ4): What is the moderating influence of customisation in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online?

Over time, consumers develop their own, often unique ways of shopping. By providing an opportunity for individual customisation of a mobile phone application, a sense of personal control is created that may enhance consumers' sensory experiences (see Section 3.1.5). Including visual and auditory cues as independent variables, with customisation as a moderator within the S-O-R framework, provided the researcher with the opportunity to investigate the moderating influence of customisation on consumers' sensory experiences.

Research question 5 (RQ5): What is the moderating influence of clothing product information between consumers' sensory experiences and their purchase intention when using a particular mobile phone app to purchase clothing online?

Because online shoppers cannot physically examine products they are interested in, they have to rely on available sensory cues and available product information to direct their purchase intentions (see Sections 3.2.3 and 3.2.4.2). Including sensory experience and purchase intention as variables and using clothing product information as a moderator within the S-O-R framework, provided the researcher with the opportunity to evaluate the moderating influence of product information on consumers' purchase intention, improving the predictability of consumers' purchase intentions in a specific scenario. In this study, a thorough investigation of clothing product information preceded to selection of product information included on the mobile app.

Research question 6 (RQ6): How does gender influence the relationships in the conceptual model for this study, which specifies specific interactions during an online shopping encounter when using a particular mobile phone app to conduct a clothing purchase?

The need to consider the influence of demographic characteristics when investigating tendencies in consumers' online shopping has been raised before (Zhou et al., 2007). Some scholars argue that consumers' purchase motivations are often dictated by demographic characteristics within generational cohorts (Dharmesti et al., 2019; Kaur & Anand, 2018; Tan & Leby Lau, 2016). Indisputably, consumers' behaviour (see Section 3.2.1), as well as their purchase decisions (see Section 3.2.2), are highly complex and subject to numerous factors that are linked to personal attributes such as gender and age, as well as external and situational attributes (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019). Gender,

specifically, is distinguished as a key demographic characteristic that affects consumers' evaluation of the design of online platforms and e-commerce adoption (Kühn & Petzer, 2018; Pascual-Miguel et al., 2015; Yoon & Occeña, 2015).

Several studies conducted in brick-and-mortar shopping malls have also confirmed significant gender significant gender differences in how consumers experience and behave when shopping (Ameen et al., 2021; Haj-Salem et al., 2016; Katrodia et al., 2018; Lucia-Palacios et al., 2018). More recent studies have also reported gender differences in consumers' purchase behaviour (Chou et al., 2015; Meyers-Levy & Loken, 2015; Pandey & Chawla, 2018). As an example, menswear currently occupies the majority of the market share (42%) in South Africa's retail clothing industry, as opposed to womenswear (33.1%), which had dominated the market for decades (MarketLine, 2018). Therefore, possible gender differences in millennials' purchase intentions, when exposed to selected sensory stimuli when using a particular mobile phone app to conduct clothing purchases, seemed to be a question to examine by means of appropriate statistical techniques (see Section 2.2.3). The research setting of the study is outlined next.

5.2. Research setting

The clothing industry within the Gauteng province of South Africa, a developing country, was selected as the research setting to conduct this study. Within this setting, millennials' reactions when exposed to a specially designed mobile phone app were observed to determine their purchase behaviour in a product category that they value greatly. The millennial consumer segment was targeted, focusing on their clothing purchases. Table 4 presents a summary of the selected research setting.

Table 4: Summary of the research setting

Context	Study section	Theoretical support
South Africa as a developing country	2.1.2	Cunningham & De Meyer-Heydenrych, 2021; Hofbauer et al., 2020; Lappeman et al., 2020; Pentz et al., 2020; Petzer & De Meyer, 2013; Vorster et al., 2020
Gauteng province	2.1.2.2	Africa Check, 2018; Cunningham & De Meyer-Heydenrych, 2021; Euromonitor, 2020c; GEDA, 2016; Lappeman et al., 2021; Marsland, 2019

Context	Study section	Theoretical support
South Africa's online clothing industry	2.3.4	Burt & Carralero-Encinas, 2000; Cant & Van Heerden, 2021; Cunningham & De Meyer-Heydenrych, 2021; Diedericks, 2019; Johnson, 2021; Statista, 2020c; StatsSA, 2021
Millennials, the target population	2.2	Diedericks, 2019; Ladhari et al., 2019; Lappeman et al., 2020; Ryke, 2019; Weber, 2017

Source: Researcher's own.

5.3. Research paradigm

This study was designed withing a positivist research paradigm, based on the certainty that conclusive, observable answers could be achieved to statistically explain the influence of multisensory experiences on millennial consumers' purchase intention during an online shopping encounter, using quantitatively measurable constructs and selected quantitative techniques (Hwang et al., 2020; Rose et al., 2012). Supported by authors such as Walsh et al. (2015), positivist research is well suited to conduct hypotheses testing, confirmation, and deduction, making it the most appropriate philosophical approach to test the research hypotheses of this study.

Therefore, single reality was assumed, that could be precisely defined and measured using selected quantitative, mathematically established techniques to solve a real-life problem (Quaglione, Muscio, & Vallanti, 2015; Sekaran & Bougie, 2016), as discussed in Section 1.4. A deductive approach was used for the theory development in this study, which was tested in the selected context through several hypotheses that were formulated in accordance with the existing literature, to direct the study (Bueno, Weber, Bomfim, & Kato, 2019; Mehraliyev et al., 2020; Saunders et al., 2016; Yeo, Goh, & Rezaei, 2017).

5.4. Research design

A research design describes a researcher's master plan, which is used to select specific research methods and techniques to accomplish the anticipated research objectives and solve the research problem (Hair, Bush, & Ortinau, 2006). This study followed a descripto-explanatory approach, allowing the researcher to gain knowledge about the selected phenomena and to build, expand, and test the proposed theories (Rahi, 2017). The study

specifically aimed to examine the relationships implied in the conceptual model; and, more, the links between visual and auditory cues and consumers' sensory experiences. It furthermore examined the possible moderating influence of telepresence and customisation on millennials' sensory experience, and the moderating influence of product information on millennials' purchase intentions during an online clothing purchase encounter.

5.5. Research strategy

Supported by the recommendations of Hair et al. (2021), a survey method using logically structured questions was chosen as the most appropriate research strategy for data collection. Quantitative surveys provide the opportunity to gather quantifiable information and to use the relevant, established, statistical techniques to mathematically compare selected subsets of the data, such as exploring moderating effects, statistical significance of relationships, and gender differences (Clow & James, 2014).

The structured questionnaire was developed, including the most suitable measurement scales, and attending to potential measurement issues (Hair, Sarstedt, Hopkins, and Kuppelwieser, 2014) (see Section 5.7). A vignette design was chosen, to be presented to willing respondents who indicated their willingness to participate in the survey, and who met the pre-requisites for participation in the survey. A fictitious online shopping task was presented after respondents had read the conditions for participation and gave consent to use their responses anonymously. This was followed by an online completion of the questionnaire (Brasel & Gips, 2014; Flavián et al., 2020; Hwang et al., 2020; Kim, 2019; Kühn & Petzer, 2018; Meents, Verhagen, Merikivi, & Weltevreden, 2020; Olivier & Terblanche, 2018).

It was considered important for the respondents to experience the stimuli in a similar way to how they would have encountered an in-store experience, and for them to capture their experiences of using the specifically designed app to conduct the fictitious shopping task, in real-time. This was achieved by completion of an online questionnaire immediately after completion of the shopping task (Collins et al., 2003; Kubiak & Krog, 2012; Kumar et al., 2014; Lemke et al., 2011). It was not possible for a respondent who had completed the survey to access the shopping task or survey again. A discussion on the vignette design follows next.

5.6. An explication of the screening questions and the vignette design

5.6.1. Screening questions

This study recruited respondents from a specific target population, the millennial generational cohort (see Section 5.9.1). To achieve this, a website was developed with screening questions to confirm the eligibility of individuals who indicated interest to participate in the study. The website link (https://tinyurl.com/MyClothesSA) was made available to potential respondents through a social medial platform (see Section 5.10). In order to control access to the study, the mobile phone application could only be downloaded through this website. The alternative would have been to publish the mobile phone application on a platform such as the Google Play store, which would have made the mobile phone app available to a larger population. However, this would have excluded the screening questions, and have jeopardised exclusive participation of the target population. Upon completion of the screening questions, only eligible respondents could gain further access to the link to download the mobile phone app that was required to conduct the online shopping task and the survey. Respondents who had completed the survey could not download the survey for a second time on the same device to repeat the exercise. The design of the app is explained in Section 5.6.3.

5.6.2. The compulsory online shopping task

The respondents (millennials) were asked to complete the screening questions, after which, the eligible individuals (in terms of birth date and province of residence) could then download the mobile phone application, as per the specified set of instructions for Android mobile phones. The shopping task required each respondent to interact with the mobile phone application, and to browse the available clothing options, and to then select and place a minimum of three clothing items into their online shopping cart. During this process, the respondent was subjected to the sensory stimuli/cues. During this process, for example, when considering the different clothing items, or when pressing the various mobile phone app buttons, the background music would change. Once the respondents had completed the product evaluation and had selected certain items to be loaded into the "shopping cart", the shopping task was terminated, and the respondent was then directed to the follow-up questionnaire. The mobile phone app was programmed to only allow one response per mobile device. The respondent was reminded that it was possible to terminate the task at any stage and to withdraw at any point during the process (see Section 5.11.8). The following section explains the design of the mobile phone application.

118

5.6.3. Introduction to the mobile phone application

A fictitious retailer's mobile phone app was created for this study, involving a programmer under the instruction and supervision of the researcher. The researcher familiarised the programmer with the purpose and aims of the study, after which the programmer presented various mock-ups and functionality options, such as buttons and layout options, both for the website for screening and downloading the mobile phone app. Once the researcher had selected the most apt mock-up choice, the programmer commenced developing and testing both the website and the mobile phone app.

Vigorous testing was done to ensure that all the screening questions produced the required access control to the app download; that the download link was operational; and that the mobile phone app functioned as intended. The control limitation of only allowing one completed online questionnaire submission was also thoroughly checked to ensure accuracy. Completed answers to the online questionnaire were matched to the central kept database, to confirm accuracy. The implementation of rotatable product images required around 10,000 images to be created for each product display. The mobile phone application consisted of over 500,000 lines of coding. However, the mobile phone app was relatively small in size, being 46 megabytes (MB) to download. For comparison, the LinkedIn app is 195 MB, Instagram is 189 MB, and Facebook is 240 MB. The small download size facilitated the easy participation of the respondents, as a relatively small download time, and limited data cost were required.

The mobile phone app was named "MyClothesSA". After downloading and opening the mobile phone app, the mobile device's volume was programmatically checked to ensure that it was at least 50%. Otherwise, the application automatically adjusted the volume upward to the required minimum level and notified the respondent that the volume level had been raised. Next, respondents received a message to thank them for participation in the study, after which the task that was to follow, as explained. The respondents were also informed about the rotatable images and music options that they would be exposed to.

Once the respondents had gained access to the website, the nature and purpose of the research was explained, indicating that they could exit the study any time if they wished to do so, without any consequences. The respondents were not asked to disclose their names or contact information and were assured of both confidentiality and anonymity, as well as that data would be summarised and only used in an aggregated format. Respondents were also informed of the estimated duration of the survey and that they would not receive any form of remuneration for participation. The respondents' consent to voluntary participation was

confirmed by pressing the "start questionnaire" button on the website. The contact details of the researcher, as well as the supervisor, were made available on the cover screen to allow respondents opportunity to voice concerns directly or to ask questions relating to the study. The detailed consent form is presented in Appendix A.

After that, the mobile phone application directed the respondents to the "home screen", where a respondent could select a clothing shopping category (either children, women, or men), an "about" button and an "exit" button to terminate the study. The category selection button directed the respondent to a shopping page containing four clothing items (for each of the three clothing categories). The visual and auditory cues, such as clothing items and music options, were identical for each respondent, irrespective of the category chosen. When performing the shopping task, the respondent could select the "category" button, which returned them to the home screen. The "about" button displayed the study title, the researcher's details, the purpose expected duration, and the task's instructions.

Figure 15 illustrates the welcome message, task instructions and layout of the home screen.

Welcome message and task instructions	Home screen
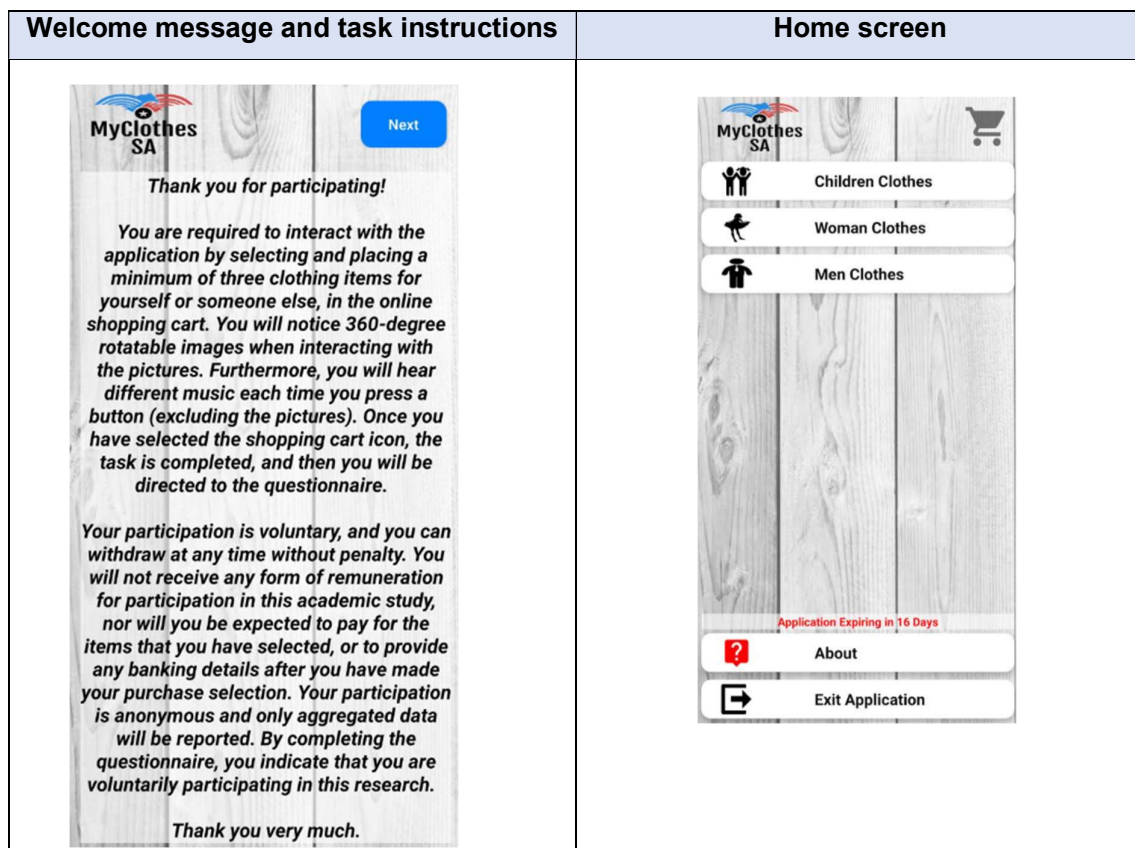
Figure 15: Welcome message and home screen on the mobile phone app
Source: Researcher's own.

The mobile phone application was designed to accept only one completed questionnaire per respondent, through the mobile phone application's cache data. Furthermore, the mobile phone application had a built-in expiry date to ensure that the mobile phone application could not be used once the study was completed. The expiry date was set to 30 days from the start of the data collection after completion of the pilot study.

5.6.3.1. Visual cues

The clothing items were displayed as if on human bodies, not using mannequins and not revealing body parts. The background was similar for all the images to remove bias. To further avoid underlying bias towards particular brands, the products were displayed without any familiar brand insignia, or familiar brand description (Kim, 2019). Instead, a fictitious brand name, 'Brand X', was indicated as suggested in literature (see Section 3.2.3). All the clothing images were 360-degree rotatable and of the same picture quality. Images could be rotated by swiping on a product image. Figure 16 illustrates how a particular image could be rotated.
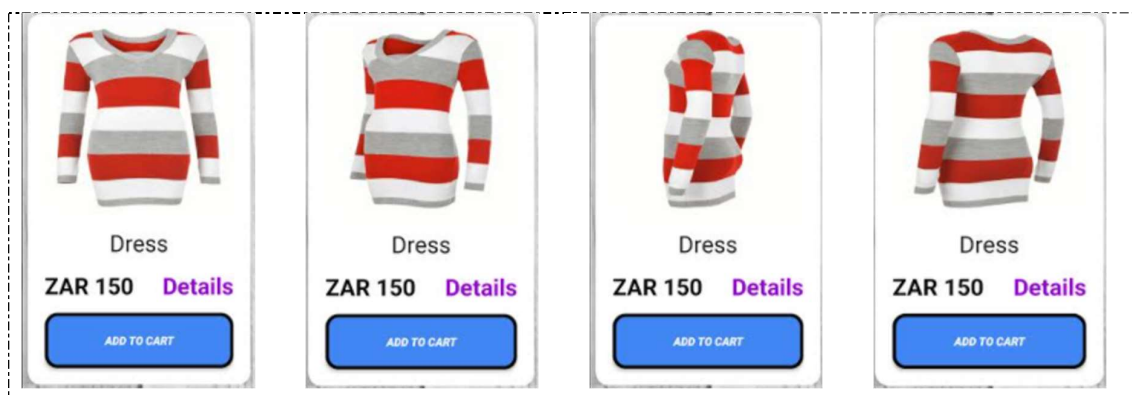
Figure 16: Illustration of 360-degree rotatable images
Source: Researcher's own.

The written product information included details about the colour, style, fibre content, brand, size, product origin, the fictitious brand information, and price, in a manner that is typical of online clothing retail platforms (Kim et al., 2009). The price of the clothing products ranged from R100.00 to R400.00, and prices were visible on the clothing selection screen and the "details" selection link. Figure 17 illustrates the details displayed for the respondent.
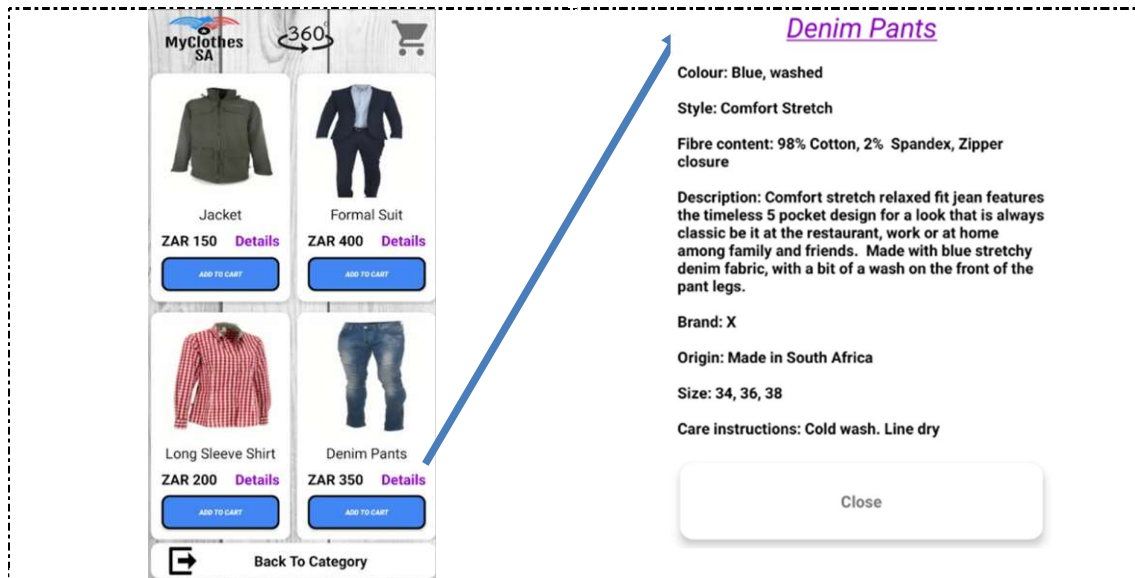
Figure 17: Illustration of clothes details

Source: Researcher's own.

A variety of clothing was selected for inclusion in the shopping task to ensure that millennials who completed the task would be interested. Clothing items for consideration included a formal suit, a shirt, a wetsuit, and denim jeans (see Section 2.2.4). Clothing items such as jeans, shirts and dresses are widely used by researchers in studies across all age groups (Auty & Elliott, 1998; Bhaduri & Stanforth, 2016; Johnson, Reddy-Best, & Sanders, 2020; Soh, Rezaei, & Gu, 2017).

5.6.3.2. Auditory cues

The mobile phone app implemented the frequently applied practice of layering interactive soundtrack music into the app. This implies overlaying supplementary beats or melodic sound clips onto a primary music track (Fraser & Bradford, 2013; Hwang & Oh, 2020; Hwang et al., 2020; Winkler, 2001). This was done because music with a steady tempo of between 90 and 102 beats per minute (bpm) apparently generates a considerable amount of stimulation (Stewart & Koh, 2017). Four soundtracks were included for respondents to select from during the shopping activity. The same music selection was applied for all respondents (Hwang et al., 2020). As the respondents browsed through the mobile phone app, they could activate a new soundtrack by pressing any button on the mobile phone app. This interactive experience was meant to prevent boredom and fatigue, and to create a sense of surprise and fun (Hwang & Oh, 2020).

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Previous research has confirmed a positive relationship between music likeability and familiarity (Allan, 2006; Yalch & Spangenberg, 2000), especially during in-store decision-making (Baker, Levy, & Grewal, 1992). Given South Africa's rich, diverse multi-cultural population, an opportunity for some adjustment was given concerning the background music selection while completing the shopping task (see Section 2.1.2.3). Therefore, the four music soundtracks selected had a beat between 95 and 109 beats per minute (bpm), which was slightly higher than previous research that included music within between 90 and 102 bpm (Helmefalk & Berndt, 2018; Hwang et al., 2020; Schwartz, Ayres, & Douglas, 2017; Stewart & Koh, 2017).

To ensure that the respondents were aware of the interactive music when they commenced with the online shopping task, the mobile device's volume was programmatically adjusted to be at a minimum level of 50%, as explained before, followed by a pop-up text message to confirm the adjustment.

Table 5 presents a summary of the music that was selected for the mobile phone application, including a brief background of the artists.

Table 5: Music selection for the mobile phone application

Artist	Category	Details
Mango Groove	Background	A South African Afropop band. Their music, specifically marabi and kwela, fuses pop and township music.
	Song name	Special Star.
	Web link	https://www.youtube.com/watch?v=N7FN6XflbL8
	Views	33 thousand.
	Beats per minute	95
Johnny Clegg	Background	A South African anti-apartheid musician, singer-songwriter and activist. Sometimes called 'The White Zulu'. His music focused on the music of indigenous South Africans.
	Song name	Dela.
	Web link	https://www.youtube.com/watch?v=sgmdLrKxvxE
	Views	919 thousand.
	Beats per minute	99
Mafikizolo	Background	A South African singing duo who are multiple winners of the South African Music Award. This song, Ndihamba Nawe, was translated into Afrikaans by Kurt Darren, another South African music artist.
	Song name	Ndihamba Nawe ("Kom bietjie hier").
	Web link	https://www.youtube.com/watch?v=fhNwvidyVK8
	Views	554 thousand, and 113 thousand on Kurt Darren version.
	Beats per minute	109
Brenda Fassie	Background	A South African anti-apartheid Afropop singer, songwriter, dancer and activist. Sometimes called MaBrrr. Also described as the "Queen of African Pop", the "Madonna of The Townships" or simply as The Black Madonna.
	Song name	Nakupenda ("I love you").
	Web link	https://www.youtube.com/watch?v=VrrrdQEYxkc
	Views	2.2 million.
	Beats per minute	105

5.7. Questionnaire design

The questionnaire was designed and submitted for ethics approval (Hair et al., 2014) as required by the academic institution. The following section presents detail about the operationalisation of the constructs, the structure of the questionnaire, scales, the finalisation of the questionnaire, and the pilot study.

5.7.1. Operationalisation of the constructs

The various constructs of the study were defined according to existing literature (see Section 1.11), allowing the researcher to select and design suitable measurement scales. Feinberg, Kinnear, and Taylor (2013) suggested that both the definition and measurements were aligned, as indicated in Table 6. This research relied on previous studies to finalise the relevant variables and related constructs for inclusion in the questionnaire (Lee & Park, 2019), and to maximise the validity and reliability of the study. Reliable, valid scales were derived from previous investigations that had been conducted in other contexts for online shopping.

The questionnaire of the online survey incorporated seven constructs measuring a total of 56 items. The questionnaire was structured with seven-point Likert-type "agreement" scales, which ranged from 1 ("strongly disagree") to 7 ("strongly agree"), to capture the respondents' responses to questions related to: visual cue (Harris & Goode, 2010), auditory cue (Hwang et al., 2020), sensory experience (Hsu & Tsou, 2011), purchase intention (Gao & Bai, 2014), telepresence (Baker et al., 2019), customisation (Rose et al., 2012), and product information (Chen et al., 2019; Flynn & Goldsmith, 1999; Retief & De Klerk, 2010). Some of the items were slightly rephrased or adapted to achieve a better fit within the context of this study that specifically reflected on online clothing purchases.

Table 6 presents the definitions of each construct as well as its relevant items.

Table 6: Operationalisation of the constructs used in this study

Construct	Visual Cues		Source
Visual cue Definition: Visual stimuli that are presented to a recipient, such as the user of a mobile shopping application, to generate a response. Visual cues can include visual aspects of a product (such as visual orientation) (Lowe & Haws, 2017, p. 332)	VC1	The mobile phone app is visually attractive (nice looking) to me.	Harris and Goode (2010)
	VC2	The mobile phone app presents visually attractive graphics/ images.	
	VC3	I like the way the mobile phone app looks.	
	VC4	The products are presented in a visually attractive way.	
	VC5	I like the fact that I can view the clothes from various angles on this mobile phone app.	
	VC6	The appearance of this mobile phone app encourages one to use it.	

Construct	Auditory Cues		Source
Auditory Cue Definition: Interactive music is a category of auditory cue: consumer's actions cause changes in the music's tempo, mode, texture, and volume (Hwang et al., 2020, p. 2)	AC1	I like the inclusion of background music in this mobile phone app.	Hwang et al. (2020)
	AC2	I like to hear the background music while using this mobile phone app.	
	AC3	I liked that there was a variety of background music types while using this mobile phone app.	
	AC4	It is nice that the background music changes when one clicks the buttons of this mobile phone app.	
	AC5	The background music enhanced my experience of this mobile phone app.	

Construct	Sensory experience		Source
Sensory Experience Definition: A dimension of customer experience, appealing to the senses, aiming to create experiences through the stimulation of sight and hearing (Gentile et al., 2007, p. 398; Hsu & Tsou, 2011, p. 512)	SE1	Using a combination of audio-visual (hearing and seeing) senses enhances my sensory experience of this mobile phone app.	Hsu and Tsou (2011)
	SE2	It was nice that this mobile phone app engaged more of my senses than only visual stimuli.	
	SE3	Using this mobile phone app was a pleasurable sensory experience.	
	SE4	The sensory experience, when using this app, influenced my mood positively.	
	SE5	The sensory experience, when using this app, positively enhanced my experience of a clothing purchase activity.	

Construct	Purchase intention		Source
Purchase Intention Definition: The likelihood of a customer to accomplish a particular purchase behaviour online (Gao & Bai, 2014, p. 663)	PI1	I am willing to purchase clothing products from a mobile phone app that is similar to this one.	Gao and Bai (2014)
	PI2	The likelihood of me purchasing clothing products using a similar mobile phone app is high.	
	PI3	The probability that I would consider buying clothing through a similar mobile phone app in the near future is high.	
	PI4	I would prefer a mobile phone app similar to this one when buying clothing products from an online retailer that I like.	
	PI5	A mobile phone app like this one would change the way in which I purchase clothing in the future.	

Construct	Telepresence		Source
Telepresence Definition: The degree to which one feels present in an online environment, as opposed to an actual real-world setting (Baker et al., 2019, p. 3)	TP1	Using this online shopping app provided the same (or better) experience as a physical store.	Baker et al. (2019)
	TP2	This mobile clothing shopping app created a new world for me in the comfort of my own space.	
	TP3	I could view and inspect the clothes on this mobile phone app, similarly to what I would in a physical store.	
	TP4	This mobile phone app grabs my attention so that I want to continue the shopping experience.	
	TP5	When I used this mobile phone app for clothing, I lost track of time.	
	TP6	When I used this mobile phone app for clothing, I almost forgot where I was physically.	
	TP7	While shopping on this mobile phone app, I felt like I was in an "imaginary world".	

Construct	Customisation		Source
Customisation Definition: Personal tailoring of a mobile phone application's appearance and functionality (Rose et al., 2012, p. 310)	CU1	I liked the fact that I could control the view of the clothes from various angles on this mobile phone app.	Rose et al. (2012)
	CU2	I liked the fact that the background music responded to my clicking actions on this mobile phone app.	
	CU3	I liked the fact that I could change the background music while using this mobile phone app.	
	CU4	I like the fact that I could control the selection functions on this mobile shopping app.	
	CU5	It was comforting to feel that I could browse for clothing on this mobile phone app at my own pace.	
	CU6	It was comforting to feel that I could browse for clothing on this mobile phone app without the distraction from physical store activities.	
	CU7	I liked that this mobile shopping app personalised my shopping experience when I used it.	

Construct	Product Information		Source
Product Information Definition: Product information denotes the information about a product, its attributes and how the product will perform (Retief & De Klerk, 2010)	**Product Information: subscale for intrinsic formal physical attributes**		**Source**
	IP1	This mobile phone app provides enough information to assess the available colours of the products.	Chen et al., 2019; Flynn & Goldsmith, 1999; Retief & De Klerk, 2010
	IP2	This mobile phone app provides enough information to assess the fibre content (makeup) of the clothing.	
	IP3	This mobile phone app provides enough information to assess the design (style) of the clothing.	
	IP4	This mobile phone app provides enough information to assess the quality of the construction of the clothing.	
	IP5	This mobile phone app provides enough information to assess the functional performance of the textiles and other materials used.	
	IP6	This mobile phone app provides enough information to assess the finishes of the clothing.	
	Product Information: subscale for intrinsic aesthetic attributes		**Source**
	IA1	The way in which the clothing is presented on this mobile phone app is appealing to me.	Chen et al., 2019; Flynn & Goldsmith, 1999; Retief & De Klerk, 2010
	IA2	The mobile phone app evoked my curiosity about the clothing products on display.	
	IA3	The clothing items on this mobile phone app were inspiring.	
	IA4	The display of products on the mobile phone app is attractive.	
	IA5	From the pictures presented on this mobile phone app, I have enough information to assess the appearance of the clothing.	
	Product Information: subscale for intrinsic functional attributes		**Source**
	IF1	This mobile phone app displays the clothing product care instructions that I need.	Chen et al., 2019; Flynn & Goldsmith, 1999; Retief & De Klerk, 2010
	IF2	The app presents enough information to assess the fit of the clothing.	
	IF3	The app presents enough information to assess the durability (service life) of the clothing.	
	IF4	The images of the clothing present a good idea of the suitability of the clothing in terms of my needs.	
	IF5	The clothing product information presented on this mobile phone app is enough to make a decision about the functional attributes.	
	IF6	The information presented on this mobile phone app indicates the purpose of the clothing adequately.	

128

Construct	Product Information			Source
	Product Information: subscale for extrinsic attributes			Source
	EA1	This mobile phone app presents enough information to assess the price of the clothing.		Chen et al., 2019; Flynn & Goldsmith, 1999; Retief & De Klerk, 2010
	EA2	This mobile phone app presents enough information to assess the brand information.		
	EA3	This mobile phone app presents enough information to assess the origin of the clothing.		
	EA4	This mobile phone app presents enough information to assess the sizing of the clothing.		

5.7.2. Question structure and scaling technique

The questionnaire presented of closed-ended questions as preferred in quantitative research (Hair et al., 2021), specifically dichotomous questions (yes or no); multichotomous (male, or female, or other), as well as multi-item scales, specifically seven-point Likert-type agreement scales. Each respondent's stance towards an item was captured on an unambiguous, equidistant scale, which is an assumption of structural equation modelling (SEM) (Babbie, 2016; Hair, Matthews, Matthews, & Sarstedt, 2017; Malhotra, Birks, & Wills, 2012).

Although a five-point Likert-type scale is commonly used, a seven-point Likert-type agreement scale has been found to improve reliability and validity (Churchill & Peter, 1984; Diamantopoulos, Sarstedt, Fuchs, Wilczynski, Kaiser, 2012). Therefore this study made use of a seven-point Likert-type scale. The seven-point Likert-type scales were interpreted as: 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree nor disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree). Respondents could express their stance by selecting any of the Likert-type indicators for each of the items presented. These scales were treated as if the distances between the groups were equal, therefore, as if they were interval-scale variables (Malhotra et al., 2012). Next follows a discussion of the scales of measure.

5.7.3. Scales of measurement

Two measurement scales were used, namely, nominal and interval scales. Nominal scales, also called categorical scales, are the most basic measure used to group respondents into gender categories (Hair et al., 2021): 1 represented "males"; 2 represented "females"; 3 represented "other", and 4 represented "prefer not to disclose". Gender was considered a key demographic characteristic it may have a significant effect on the millennials' product

evaluations, such as how they use and respond to the mobile phone apps or their designs (Mann & Liu-Thompkins, 2019; Pascual-Miguel et al., 2015), as well as their online shopping behaviour (Dharmesti et al., 2019; Valentine & Powers, 2013b). All the interval scales in this study were seven-increment Likert-type agreement scales, as explained before. Table 7 indicates how the questions were structured and also the relevant measurement scales for each section of the questionnaire, while the questionnaire, consent form, and response categories are presented in Appendix A.

Table 7: Question structure and measurement scale

Section	Nature	Question structure	Scaling technique	Measurement scale
Screening questions	Ensure eligibility to participate in the study	Closed-ended	Dichotomous	Nominal
Section A	Gender	Closed-ended	Multichotomous	Nominal
	Monthly income level	Closed-ended	Dichotomous	Nominal
Section B	Visual Cue (6 items)	Closed-ended	Multi-item (semantic differential and Likert-type)	Interval
Section C	Auditory Cue (5 items)	Closed-ended	Multi-item (semantic differential and Likert-type)	Interval
Section D	Sensory Experience (6 items)	Closed-ended	Multi-item (semantic differential and Likert-type)	Interval
Section E	Purchase Intention (4 items)	Closed-ended	Multi-item (semantic differential and Likert-type)	Interval
Section F	Telepresence (7 items)	Closed-ended	Multi-item (semantic differential and Likert-type)	Interval
Section G	Customisation (8 items)	Closed-ended	Multi-item (semantic differential and Likert-type)	Interval
Section H	Product Information (21 items) consisting of: Intrinsic formal physical attributes (6 items) Intrinsic aesthetic attributes (5 items) Intrinsic functional attributes (6 items) Extrinsic attributes (4 items)	Closed-ended	Multi-item (semantic differential and Likert-type)	Interval

5.7.4. Finalisation of the questionnaire

Following ethics approval and before launching the final data collection procedure, the researcher finalised the layout of the questionnaire and prepared a pilot study to detect potential problems with wording, instructions, and task completion (Malhotra et al., 2012). The

execution of the pilot study and the imaginary online shopping task are discussed in Section 5.7.5.

After finalising the pilot study, the questionnaire commenced with a cover page explaining the purpose of the study and that anonymity and confidentiality would be ensured. It also provided the contact details of the researcher and his supervisor. This was followed by screening questions to ensure eligibility for participation in the research, as well as an assurance that respondents could withdraw at any time without penalty. Eligible respondents then gained access to the instructions for the online shopping task, which was followed by the consent form and the online questionnaire, as presented in Appendix A.

5.7.5. Pilot study

In order to test whether the research would generate reliable and valid data, a pilot study was performed to detect any problems that may have jeopardised the quality of the data (Whiting, Symon, Roby, & Chamakiotis, 2018). This allowed the researcher to confirm the clarity of the questionnaire in terms of content, scales, and instructions, and that the website and mobile phone application functioned well (see Section 5.6). The pilot study also gave an indication of the time required for the completion of the entire survey (Dharmesti et al., 2019; Saunders et al., 2016). The first pilot study was conducted among 20 respondents, who were conveniently recruited to match the target population of the research. A few questionnaire items were slightly reworded after the first phase of the pilot study to clarify the content and prevent ambiguity. The clothing literature was also consulted to expand certain sections of the questionnaire. Despite the addition of a few items, it was determined that 20 minutes were sufficient to complete the entire survey. The researcher then made some amendments to the instructions and launched a second pilot study. Again, 20 suitable respondents were recruited to complete the second phase of the pilot survey. This was deemed to be suitable since, for comparison, the pilot study of Whiting et al. (2018) only involved eight respondents in their pilot study. The selected respondents were encouraged to voice any problems that they encountered while completing the survey, either with the questionnaire or the shopping task, for the sake of improving the survey content and instructions. The time required was confirmed after the second phase of the pilot study. Data generated from the two pilot studies were excluded from the final data sets to maximise the reliability of the data.

The second pilot study confirmed that both the website and the mobile phone application functioned as intended and that the visual (clothing) and auditory (music) stimuli were appropriate and acceptable. An indicator displaying 360-degree rotatability was added to each

131

category page to increase respondents' awareness of the rotatability of the clothing images. A percentage bar was also added so that the respondents could keep track of how far they had progressed with the survey.

Data generated from the two phases of the pilot study were statistically analysed to check the suitability of the envisaged statistical procedures in terms of the anticipated outcomes of the study. After finalising the changes, the researcher requested a second round of ethics clearance from the institution to approve the amended questionnaire. This was granted (see Appendix E).

5.8. Unit of analysis

The unit of analysis for this study — indicating who were to be investigated — was consumers from the millennial age cohort who resided in South Africa's Gauteng province (see Section 2.3.4). These consumers have pertinent behavioural characteristics in the marketplace that distinguishes them from other generations, making them a very attractive market segment for retailers (Ryke, 2019; Verdugo & Ponce, 2020; Weber, 2017) (see Section 2.2.2). Various birth date intervals can be used to define the millennial age cohort (see Section 2.2.1). This study, similar to the studies of Diedericks (2019), Ryke (2019) and Weber (2017), used the birth date interval between 1980 and 2000 to define its unit of analysis.

5.9. The sampling procedure

5.9.1. Target population

The target population is the specific group of people that the study aims to investigate (Babin & Zikmund, 2016), therefore, this research targeted millennials born between 1980 and 2000, who resided in Gauteng province. This province is the economic hub of South Africa, where consumers have ample access to retail stores and where good infrastructure allows good internet access. Participation was further limited to individuals who had access to an Android software-based cell phone, which would allow respondents access to the envisaged application; and individuals who could afford to purchase clothing to ensure relevant purchase experience. This implied that they had to have purchased a product online at least once during the preceding twelve months. This time frame was intentionally long but was considered appropriate as the study was conducted during the COVID-19 pandemic when access to stores was limited, and financial limitations prevented many consumers from purchasing products that they could do without. Respondents were required to experience the auditory and visual stimuli included in the app design (see Section 5.6.3), and therefore, millennials with visual

impairment or auditory challenges were not allowed to participate in the study. The eligibility criteria were as follows:

- Birthdate between 1980 and 2000, thus involving millennials who currently have the highest internet usage (Effective Measure, 2017) (see Section 2.2) and who have pertinent behavioural characteristics in the marketplace that distinguish them from previous generations (Ryke, 2019; Verdugo & Ponce, 2020; Weber, 2017).
- Reside in the Gauteng province of South Africa (see Section 2.1.2.2), where infrastructure is well developed and where ample exposure to clothing retailers exists.
- Access to a mobile device operating with Android software, as Android holds over 83% market share locally (Kahla, 2019). This was chosen to reduce the developments costs of the application (Hoehle & Venkatesh, 2015).
- Respondents had to have purchased clothing in the past twelve months as well as purchased any product online in the past twelve months to be familiar with the shopping task (Brace, 2018).
- Middle- or high-income individuals may participate due to their importance in the South African economy (see Section 2.1.2). After-tax, a minimum disposable income of ZAR 9000 per month was indicated to qualify for participation (Burger, McAravey, & van der Berg, 2017; Writer, 2016). Because income level is a sensitive issue, respondents were only asked to indicate whether their income fell within this category. Lower-income levels could not gain access to the mobile phone app.

Figure 18 presents the profile of the target population that was selected for this study.
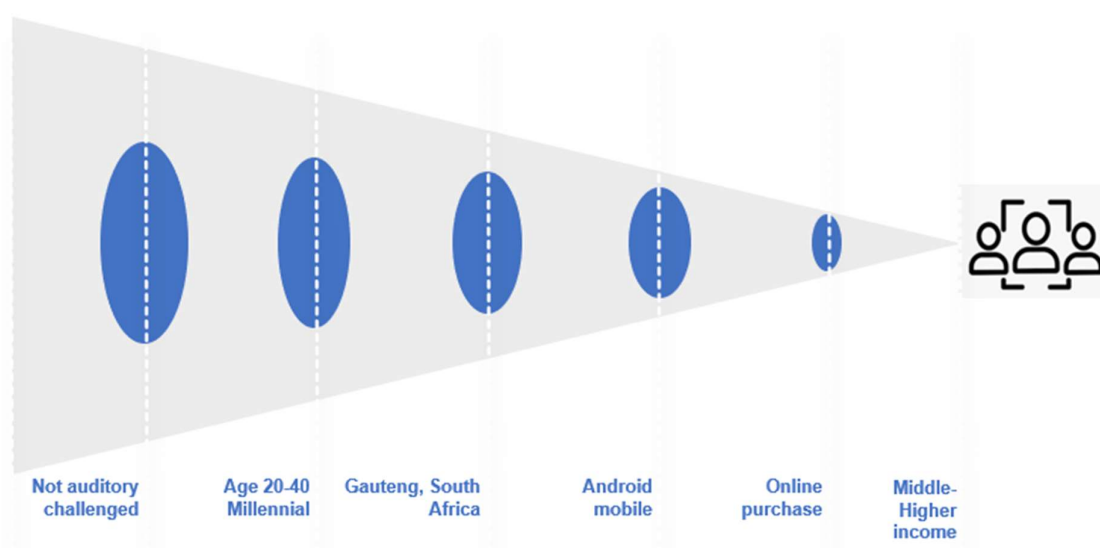
Figure 18: Target population of this study
Source: Researcher's own.

5.9.2. The sampling frame

The sampling frame describes the criteria that differentiate the participants in the final selected sample from the rest of the target population (Babin & Zikmund, 2016). A comprehensive list of all clothing consumers in Gauteng does not exist, so identifying a sample frame was not possible. Additionally, in South Africa, consumers' details are safeguarded by the Protection of Personal Information (POPI) Act of 2013 (Republic of South Africa, 2013).

5.9.3. The sampling procedure

Sampling is generally done to recruit a smaller yet effective subset of the overall target population that can provide sufficient information to answer the research questions (Walsh et al., 2015). Many researchers contend that to produce reliable data and to allow the findings to be generalisable across the overall population, probability sampling techniques should be used. This ensures that the results statistically reflect the views or behaviours of the target population (Rust, Moorman, & van Beuningen, 2016). This study relied on a purposive, non-probability sampling technique because a sampling frame was not available (Bethan & Cano, 2019).

Purposive sampling ensured that respondents were selected in accordance with certain pre-selected characteristics, namely birth date, income level, previous purchase experience of clothing, previous online purchase experience, ownership of an Android phone, and residence in Gauteng, South Africa (see Section 5.9.1). Convenient, snowball sampling was then used to gather the sample, as indicated in the following section.

5.9.3.1. Convenient, snowball sampling

Snowball sampling is an effective means of non-probability sampling where study subjects are recruited following an invitation and where participation in the study is compared to the growth of a rolling snowball (Zafar et al., 2021). This technique is relatively cheap to conduct, easy, convenient, and mostly produces a fast response rate (Lewis-Beck, Bryman, & Futing Liao, 2004). Online websites may also be used to attract attention and to recruit respondents (Buhrmester, Kwang, & Gosling, 2011), producing results that are as reliable as more "traditional" approaches provided the sampling size is fairly large (Birnbaum, 2004; Evans & Mathur, 2005; Miller & Dickson, 2001).

5.9.3.2. Snowball sampling in similar research

Snowball sampling has been applied in similar research and numerous contexts before. Pappas (2018), for instance, performed a quantitative investigation to consider the effects of personalisation on consumers' online shopping perceptions, using snowball sampling to recruit participants, although he cautioned about the generalisability of the findings. Quantitative research into consumers' satisfaction and purchase intentions, using social networking sites, successfully generated a sample of 265 participants through snowball sampling (Bae, 2018). Research on smartphone users was also conducted successfully by Park (2019), while the study of Manis and Choi (2019) on the importance of visual cues managed to attract the interest of 283 participants through snowball sampling, with a 74% response rate. In the same year, snowball sampling was used to study social media retail platforms (Sembada & Koay, 2019) and explore the success of mobile phone applications. Cheng, Lee, and Choi (2019) argued that snowball sampling allowed them to recruit a "representative" sample of mobile device users in China for quantitative statistical analysis, which was encouraging for this research. More recently, Bandara, Fernando, and Akter (2020) also performed snowball sampling to conduct a qualitative study on online shopping, while Chen and Chen (2020) demonstrated the ability to gather useful samples of mobile game shoppers using snowball sampling.

5.9.3.3. Snowball sampling in this research

When performing snowball sampling in this research, the researcher contacted and purposively distributed an invitation for participation to a specific group of people through the social media platform Instagram. In order to avoid sampling error, a large sample size was sought (see Section 5.9.4). Respondents, who had completed the survey, volunteered by distributing the invitation and a survey link to other potential respondents, repeating the process. Consequently, the researcher asked respondents who had completed the survey to share the survey link and invitation with other potential respondents who met the requirements to participate in the research. They were again asked to repeat the invitation sending process. As noted previously, the questionnaire could only be answered once by a respondent and was programmatically controlled in the mobile phone application.

The Instagram social media link as follows: https://www.instagram.com/p/CLd8kBRAOT_/

Figure 19 illustrates the social media post which was used to recruit respondents.
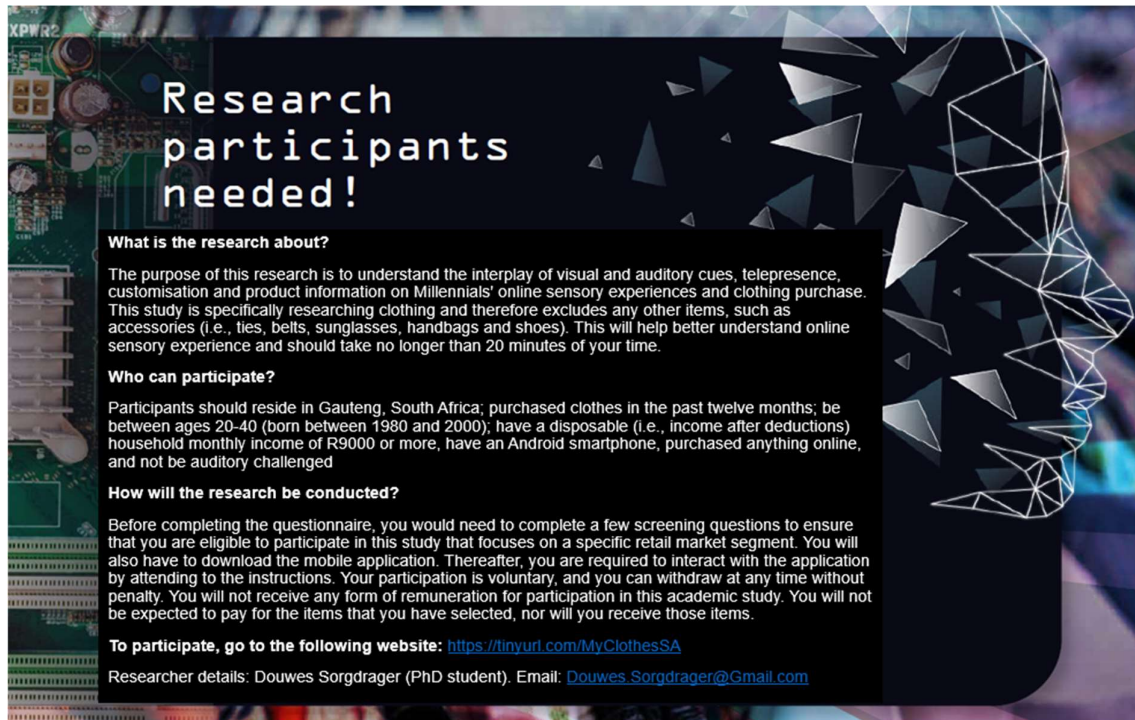
Figure 19: Social media recruitment post

5.9.4. Determining the sample size

In order to calculate the sample size, several inputs are required, such as the number of items in the questionnaire, and the complexity of the model (Hair, Celsi, Money, Samouel, & Page, 2015). For CB-SEM, 10 to 15 responses should be collected per questionnaire item. This study used non-probability sampling, benchmarking it against previous research with similar backgrounds and statistical procedures (Shiu, Pervan, Bove, & Beatty, 2011). The guidelines that were used are summarised in Table 8 below.

Table 8: Sample sizes of previous research studies

Stats	N	Survey items	Sample size / items	Authors
SEM	420	29	14.48	Chopdar and Balakrishnan (2020)
SEM	252	27	9.33	Vakulenko, Shams, Hellström, and Hjort (2019)
SEM	354	29	12.21	Gao and Bai (2014)
SEM	220	61	3.61	Rose et al. (2012)
SEM	257	52	4.94	Harris and Goode (2010)
Average	300.6	39.6	7.59	

136

Based on previous studies, the average benchmark sample size for this study was determined to be 300 participants, resulting in an average of eight respondents per questionnaire item, although this was lower than the minimum requirements proposed by Hair et al., (2015). As this study included 56 measurement items, the recommendations of Hair et al., (2015) that suggest a minimum of 10 to 15 respondents per measurement item, implied an envisaged sample size of between 560 and 840 respondents to be sufficient. This researcher aimed to recruit 840 useful responses. Table 9 presents a summary of the sampling plan used.

Table 9: The sampling plan for this study

Target population	Middle- or higher-income millennials, born between 1980 and 2000, who have purchased clothing in the past twelve months, who have purchased any product online in the past twelve months, residing in Gauteng province of South Africa, with access to an Android mobile device, and not visually or auditorily challenged
Sampling units	Middle- or higher-income class millennial consumers born between 1980 and 2000, who have purchased clothing in the past twelve months, purchased any product online in the past twelve months, residing in Gauteng province of South Africa, with access to an Android mobile device, and not visually or auditorily challenged
Recruitment area	Gauteng province, South Africa
Time	2021
Sampling technique	Snowball sampling, a non-probability purposive sampling technique, by means of social media
Anticipated sample size	840 respondents

5.10. Data collection

Data collection entails a process of collecting useful, quantifiable responses from specific respondents to solve a particular research problem and to provide answers to the associated research questions (see Section 4.2).

5.10.1. Data collection method

The next research design step is the data collection procedure, since this constitutes the strategies used to gather the data from the target population (Skålén, Gummerus, Von Koskull, & Magnusson, 2015). This study depended on an online survey based on specific advantages, such as the low cost to gather data across a large geographical area; ease of participation in an online survey, convenience for respondents to complete the survey wherever they wanted

to, as well as fast and easy access to respondents (Hair et al., 2021). Because the study concerned online shopping, the decision to use an online survey method was also sensible.

Furthermore, this study aimed to implement a real-time data collection procedure, as the dominant approach for collecting consumers' experience feedback in previous studies has been through post-experience evaluations (Baker et al., 2002; Jüttner et al., 2013; Kelleher et al., 2015; Rose et al., 2012). The researchers however recommended that a person's overall experience should rather be measured soon after an experience since consumers' attitudes towards an organisation or retailer could change after their initial experience so that responses that are captured later on, would not necessarily be truthful or valid. Tynan and McKechnie (2009) claim that consumers' judgements are made throughout their purchasing journeys and all across their accumulated touchpoints — not just at their point of interaction. However, it has been argued that this delay creates opportunities for imprecise accounts to be made regarding how the consumer feels during an experience since consumers' recollections of their interactions with organisations/retailers often diminish rather quickly while the results of their transactions may also prejudice them after a period of time (Stein & Ramaseshan, 2019). This phenomenon is referred to as "rose-tinted spectacles" (Palmer, 2010) according to the theory of cognitive dissonance (Festinger, 1957), which posits that consumers often rationalise unpleasant or negative experiences over time and try to justify their purchase decisions later, irrespective of their opinions at the time of the purchase (Macdonald, Wilson, & Konuş, 2012). It is, therefore, best to capture consumers' views immediately after the purchase if the purchase experience is the topic of interest.

In order to gather a valid understanding of a consumer's purchase experience, an assessment should therefore rather be made in real-time, or almost immediately after completion of an interaction, as there would be far less reliance on faded or biased memories (Macdonald et al., 2012). The individual touchpoints should also be measured instantaneously, in real-time, and only the overall experience of the accumulated touchpoints throughout the consumer's journey should be evaluated in a post-experience manner (Stein & Ramaseshan, 2019).

The use of an application on a mobile phone provides an opportunity for data to be collected from that same device in real-time (see Section 5.10.2). Mobile phones provide many benefits because respondents who own a smartphone device, are familiar with how they function, are within close proximity of the device, removing, both the time and location constraints (Kubiak & Krog, 2012). Several other advantages of mobile research over other data collection strategies include higher data collection flexibility, stronger research requirement compliance, monitoring ability, recent participation, and opportunity for immediate feedback (if required)

(Collins et al., 2003). Most importantly, though, they provide researchers with an opportunity for instantaneous data collection and feedback. Surveys conducted on mobile devices, like online questionnaires, generally also flow logically and can accommodate a multitude of scales.

The interactions in this study were performed on a mobile phone (smartphone), using a specific application, through a single touchpoint. The researcher considered it vital that respondents provided an accurate account of their experiences, and therefore a real-time assessment of their perceptions was undertaken, and they could not repeat the exercise.

5.10.2. The data collection procedures

When undertaking the data collection, each respondent viewed the cover letter that explained the purpose of the study. The respondents were not asked to disclose their names or contact details, to ensure confidentiality and anonymity. The respondents were also told of their rights to withdraw, without penalty, at any time during the survey. The approximate completion time required to complete the survey was communicated, also confirming that no form of remuneration would be given for participation, or that any of the items selected in the fictitious online shopping task, would be given to them.

The respondents answered screening questions to ensure that only eligible respondents took part in the study. The respondents who did not fit the eligibility criteria were denied access to the shopping task (see Section 5.6). After completing the screening questions, the respondents were thanked for their contribution; and only respondents who were eligible to participate (see Section 5.9.1) gained access to the mobile phone app download link. The respondents were asked to download the mobile phone app on their Android-supported mobile phones, and each respondent was assigned to the exact same mobile phone app layout (see Section 5.6.1). After completing the shopping task by placing their selected items in the "shopping cart", the respondents were immediately re-routed to the online questionnaire. The respondents were then told that their consent to participate in the research voluntarily was implied upon completing the questionnaire. Once each respondent had completed the questionnaire, he or she was again thanked for their participation.

5.10.3. Time horizon

This study was cross-sectional in nature, as supported by authors such as Saunders et al. (2016), who argued that such designs allow multiple constructs to be concurrently measured; they reflect the situation during a given period in time, and they acknowledge technological

development at a specific point in time. Furthermore, this study aimed for real-time data collection, requiring immediate responses (see Section 5.10.1). The cross-sectional timeline is supported by various researchers in similar contexts (Cunningham & De Meyer-Heydenrych, 2021; Kühn & Petzer, 2018; Mandhlazi et al., 2013; Melović et al., 2021; Olivier & Terblanche, 2018; Patel, Das, Chatterjee, & Shukla, 2020; Tang, 2019). A cross-sectional time horizon was found to be appropriate for this study, with the understanding that, over time, consumers' experiences may differ, and further technological advancements may come into effect.

5.11. Data analysis

Data analysis allows the research to produce findings to answer the research problem and related research questions. Before starting data analysis, the generated data was reviewed for completeness and validity. The data analysis conducted for the study is discussed below in a logical sequence, presenting descriptive statistics first, followed by the preliminary analysis and data distribution, as well as the reliability and validity outcomes. A discussion of structural equation modelling (SEM) follows, with relevant analytical procedures to test the study replications and hypotheses, using a 95% confidence level (p-values below 0.05) as an indication of statistical significance. Discussions are presented in the subsequent sections.

5.11.1. Data preparation

Data preparation after the data gathering is essential (Sekaran & Bougie, 2016). Firstly, the total number of respondents that were ultimately recruited (n = 842) exceeded the required sample size (see Section 5.9.4), confirming the sufficiency of the volume of the dataset. The online questionnaire data was downloaded from the mobile phone app database in Microsoft Excel.csv format, and the data, in raw format, was inspected to ascertain completeness, identify any missing data, and confirm consistency, as suggested by Pallant (2016). No missing data was expected due to the design of the online mobile phone app questions: all were marked as mandatory, and only completed data sets were sent to the database (Hair et al., 2021). After that, the data sets were imported into the software, and the data questions and respondents were labelled in preparation for further analysis. The seven-point Likert-type scales of the online questionnaires were captured as numerical interval-scale values. Nominal data were converted to numerical values for data analysis, whereby both discrete as well as continuous data, was formatted with consistent numerical and decimal formatting.

5.11.2. Descriptive statistics

Descriptive statistics enable researchers to numerically describe certain variables in the research, such as the characteristics of the sample that they have collected, as well as simple

frequencies to describe any pertinent phenomena (Hair et al., 2021). Descriptive statistics also provide researchers with the means to summarise sizeable quantitative data sets; while making use of basic central tendency statistics, such as standard deviations, means and frequency distributions (Bleier et al., 2019; Pallant, 2016). These statistics allow for numerical comparisons of variables (Malhotra et al., 2012). Variables, such as gender, classified as categorical variables, were then assessed, and expressed as frequencies (n) that were summarised in frequency tables for ease of comparison.

Descriptive statistics, such as the mean and standard deviation, were calculated for each construct and item in the study (see Table 6): visual cues, auditory cues, sensory experience, purchase intent, telepresence, customisation, and product information. These descriptive statistics provided the sample's characteristics.

5.11.3. Preliminary analyses and data distribution

Parametric statistical techniques were used, and it was important to investigate the normal distribution of the data (Pallant, 2016) before conducting more advanced statistical tests (Saunders et al., 2016). The following steps were performed to confirm normality and provide preliminary reliability and validity assurances. Firstly, by means of Cook's distance measurement, data was analysed to indicate the presence of any multivariate outliers, since outliers can cause skewness, which results in unacceptable model fit and poor reliability (Hyde, 2014; Pallant, 2016; Zhang, Lin, & Wu, 2009). Secondly, a normality test was conducted because data that is not normally distributed cannot be generalised across the population.

Furthermore, the normality of the data is a prerequisite for linear regression modelling. Owing to the large study sample size, skewness and kurtosis tests were conducted (Dharmesti et al., 2019; Helmefalk & Berndt, 2018; Pallant, 2016; Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016). Skewness provides a measure of the symmetry of the distribution, and kurtosis indicates the peak or high points of the data distribution (Dharmesti et al., 2019; Helmefalk & Berndt, 2018; Pallant, 2016; Sarstedt et al., 2016). A perfect distribution would have a value of 0; however, this is rare, and it is still acceptable if the data are within skewness parameters of -1.5 to +1.5, and a kurtosis parameter of -7 to +7 (Cunningham & De Meyer-Heydenrych, 2021; Pallant, 2016).

Kaiser-Meyer-Olkin (KMO) statistical tests were conducted to determine sampling adequacy, with a minimum value of 0.6 required to conduct factor analysis (Mpinganjira, 2016; Pallant, 2016; Retief et al., 2018; Sethi, Kaur, & Wadera, 2018). Furthermore, Bartlett's test of

sphericity was conducted to confirm redundancy between the variables, requiring a value of less than 0.05 (Pallant, 2016). If these tests failed, the reliability and validity of the study would have been jeopardised, and the questionnaire, sampling and data gathering techniques would have had to be reviewed, updated, and re-conducted (Pallant, 2016).

5.11.4. Reliability and validity measures

When conducting robust research that can stand up to even the harshest of critics, it is important to address any issues that pertain to the reliability and validity of the study. Both the reliability and validity tests need to be acceptable, as a scale might be reliable but not valid if it is consistent but does not measure what it should be measuring (Malhotra et al., 2012). Furthermore, both reliability and validity measures need to be conducted prior to testing a model in CB-SEM, as it ensures that the constructs are correctly represented and measured adequately (Hair et al., 2014). Next follows a discussion on assessing the reliability and validity.

5.11.4.1. Assessing consistency and reliability

Reliability refers to the trustworthiness of the results and conclusions, particularly whether the investigation would yield similar outcomes if another similar study were to be performed using the same strategies (Hair et al., 2021). Achieving the same results would indicate scale consistency. Two indicators were used to test scale reliability: internal consistency and composite reliability (Hair, Matthews et al., 2017).

Firstly, internal consistency indicates how consistently the research instruments can replicate the same results for the constructs when repeated measures of those constructs are done (Hilken, de Ruyter, Chylinski, Mahr, & Keeling, 2017). It investigates associations between scale items to confirm that the various components within the scale each measure the same basic attribute (Hair et al., 2021). This provides an indication that the research instruments are stable, consistent, and dependable (Gabriel et al., 2018). In this research, the internal consistency was optimised by designing the questionnaire with unambiguous terminology that was consistently understood and followed by all who completed it. The two pilot-phase pre-tests helped to confirm this. According to the guidelines of Wu, Mattila, Wang, and Hanks (2016), the internal consistency was calculated with Cronbach's alpha to confirm that the measures across the variables were consistent. Cronbach's alpha is the most common method of assessing internal consistency and following the recommendations of Hair et al. (2016) for scale reliability, this study applied a minimum level of 0.7 as an indication of reliability.

142

The second reliability test, namely: composite reliability (sometimes called construct reliability), provides an estimation of true reliability, where there is no assumption of equal indicator loadings, therefore making up for the shortcoming of Cronbach's alpha by means of conducting SEM (Peterson & Kim, 2013). This value should be between 0 and 1, where a higher number would indicate higher reliability and have a minimum cut-off value of 0.7 (Hair, Black, & Babin, 2018; Hair, Matthews et al., 2017). Logically, values below this cut-off should be removed, as they are not reliable. This study made use of both these reliability tests to assess the reliability and apply the recommended minimum cut-off values.

5.11.4.2. Testing for validity

This study employed an online questionnaire, so it was important to determine to what level the scales measured what they were intended to measure (Hair et al., 2021). Two of these validity measures, namely convergent and discriminant validity (Babbie, 2016), were used to assess the constructs' validity.

Firstly, convergent validity investigates the relationship between constructs by investigating the extent that the scale items positively correlate with the rest of the items in the same construct (Hair, Hult, Ringle, & Sarstedt, 2017). Convergent validity indicates how construct items relate to another, whereby a value greater than 0.65 is deemed to be statistically significant (Hair et al., 2018). Achieving this cut-off level (or higher) indicated that the measurement scale was measuring the intended concept and that further analysis could proceed (Hair et al., 2014).

The second validity test, discriminant validity, tests the relationships between unrelated constructs, in other words, the uniqueness of each construct in the conceptual framework (Hair, Matthews et al., 2017). The Fornell-Larcker citation was applied to assess the discriminant validity, where the developers asserted that discriminant validity could be established if more variance is shared with a construct's own measures than with other constructs (Fornell & Larcker, 1981). Validity is established if the square root of the average variance extracted (AVE) is higher than every correlation pair among the constructs (Hair et al., 2014).

This study used these tests to assess the validity and apply the recommended minimum cut-off values. Owing to the importance of reliability and validity in research, the researcher specifically provided a summary of each type of assessment conducted for this study as

confirmation of the measures that were taken to eliminate errors in the study. Table 10 provides a summary of the reliability and validity cut-off values for each test type.

Table 10: Reliability and validity cut-off values used in this study

Assessment	Cut-off level	Support
Internal consistency	Greater than 0.7	Hair et al. (2016)
Composite reliability	Greater than 0.7	Hair et al. (2018)
Convergent validity	Greater than 0.65	Hair et al. (2018)
Discriminant validity	Square root of AVE to be higher than AVE values	Hair et al. (2014)

5.11.5. Testing for bias

This study considered two types of bias, namely non-response bias and common method variance. Non-response bias is relevant when some respondents of the selected sample have, for some reason, not completed the survey (Rose et al., 2012). This study applied online snowball sampling by means of a social media post. Respondents' details were kept confidential, resulting in no possible way to contact them. The targeted sample population was defined by specific characteristics. Because it was not possible to identify respondents in case of incomplete responses, a larger sample size was targeted (see Section 5.9) to provide sampling adequacy (see Section 5.11.3). The design of the study was such, that only fully completed questionnaires of respondents who qualified for participation, were included in the final sample. Therefore, non-response bias was not relevant.

Secondly, common method variance (CMV) is likely to occur when a single instrument is used to gather data for both independent and dependent variables (Barari et al., 2020; Valaei & Nikhashemi, 2017). One can however not automatically assume that just because data originates from the same type of respondents, that there will automatically be bias in that data (Fuller, Simmering, Atinc, Atinc, & Babin, 2016). To ensure that there is no systematic bias impacting the primary data collection, CMV tests need to be considered (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). This study applied both Harman's (1976) one-factor test as well as the Bagozzi's method (Bagozzi, Yi & Phillips, 1991). Harman's one-factor test, applying SPSS Software, the extraction method of a principal component of one fixed factor with non-rotation method was used (Harman, 1976; Podsakoff and Organ, 1986). The total variance for one factor should not exceed 50% (Podsakoff et al., 2003). Furthermore, the Bagozzi's method (Bagozzi et al., 1991), applying QES software, tests the highest correlation

144

between the research variables. This correlation should be lower than 0.9 (Bagozzi et al., 1991; Valaei & Nikhashemi, 2017).

5.11.6. Structural equation modelling

Structural equation modelling (SEM) is a second-generation statistical technique that combines factor and regression analyses within a mutual statistical model in social-research theory development, which allows for hypothesis testing (Babin & Svensson, 2012; Breitsohl, 2019). The researcher can test models as well as the interrelationships between sets of variables, together with a weighted evaluation of each independent variable, and assess the models' overall fit (Hair et al., 2014). Furthermore, SEM allows researchers to test both the structural model and the measurement model at the same time, and it provides an additional advantage above other statistical tests, such as multiple regression, as the variance explained for the dependent variable is greater (Hair, Hult et al., 2017).

SEM can be separated by means of CB-SEM and PLS-SEM (Hair et al., 2014). PLS-SEM is a suitable tool to use in predicting or developing a theory because it examines and predicts the causal relationships between latent variables by maximising the explained variance of the latent dependent variables (Hair et al., 2014). As a proxy for other SEM methods, PLS-SEM can be useful when assumptions such as normality or sample size are violated or when the measurement model is complex or includes formative indicators (Hair, Risher, Sarstedt, & Ringle, 2019). It is a non-parametric tool that allows the researcher to work with data that is not normally distributed and can converge with samples less than 100; in some instances, allowing for estimations on models with less data than indicators. Additionally, with its structural and statistical capabilities, PLS-SEM is suited to complex research models with many indicators, paths and relationships among key variables and constructs (Hair et al., 2019), and it also involves antecedents and postcedents in the research process (Svensson, 2015), enabling a wide perspective in modelling. Similarly, CB-SEM is suitable for evaluating hypotheses by analysing how well a model can predict a dataset's covariance matrix; however, PLS-SEMs are similar to multiple regression analysis models (Hair et al., 2014), and are more appropriate for explanatory-oriented models, while CB-SEM is better-suited for investigating predictive-oriented models (Sarstedt, Ringle, Henseler, & Hair, 2014). Furthermore, CB-SEM is more reliable as it takes measurement error into account (Strasheim, 2014).

The SEM approach has been supported by various researchers (Bag, 2015; Bagozzi & Yi, 2012; Svensson, 2015) as well as studies in similar contexts (Cunningham & De Meyer-Heydenrych, 2021; Kühn & Petzer, 2018; Mandhlazi et al., 2013; Melović et al., 2021; Olivier

& Terblanche, 2018; Patel et al., 2020; Retief et al., 2018; Tang, 2019). This study, therefore, made use of a combination of different questionnaires that had been authenticated previously, in other research contexts, but not from a developing country perspective or as a combined study. This research made use of CB-SEM approach through EQS software to assess the structural relationships (Bentler, 1995), using all the data collected from the online questionnaire (see Section 5.10). The six sequential stage guidelines of CB-SEM, by Hair et al. (2006), are discussed in the subsequent section.

5.11.6.1.   *Stage one: defining the individual constructs*

The first stage of CB-SEM requires that the constructs be defined, ensuring that the underlying items are appropriate for measuring the construct. This requires a clear definition of each construct to guide the scales' identification. Researchers generally rely on previous research for guidance, preferably those conducted in a similar context (Hair et al., 2006). This study followed this recommendation, relying on the literature review (see Section 5.7). Furthermore, two pilot tests were conducted to ensure that the questionnaire instructions and the items were clearly understood (see Section 5.7.5).

5.11.6.2.   *Stage two: developing and specifying the measurement model*

During the second stage, the researcher identified the variables and configured the possible paths within a proposed model for the study (Hair et al., 2006), as presented in Figure 14. The model was based on the S-O-R framework (Mehrabian & Russell, 1974), indicating visual and auditory cues as the input stimuli, sensory experience as the cognitive interpretation or change that occurs within the organism after exposure to the stimuli, and purchase intentions as the outcome, or response component, in a sequential path. Three moderators were added to the model: First was the moderating effect of telepresence in the relationship between the visual and auditory cues, presenting each cue independently. The second was the moderating effect of customisation in the relationship between the visual and auditory cues and sensory experience, again presenting each cue independently. Lastly was the possible moderating effect of product information on the association between purchase intention and sensory experience. Moderators were included since telepresence and customisation were expected to elicit stronger sensory experiences (Bilgihan et al., 2016; Novak et al., 2000), while relevant product information that is conveyed as part of the stimuli are meant to increase consumers' purchase intentions (Fuentes & Svingstedt, 2017; Weisstein et al., 2016).

5.11.6.3. Stage three: designing a study to product empirical results

The third stage required of the researcher is to ensure that the research design is suitable for model testing, requiring a justification to use either covariances or correlations, identifying suitable scales, the impact of the estimation method, the sample size, and any missing data (Hair et al., 2006). In this study, covariances were used due to their statistical advantages over correlations, such as increased flexibility (Hair et al., 2018). The study also used interval scales, specifically seven-point Likert scales, to quantify all the constructs, further supporting the covariance selection, where interval scales seem more responsive to the calculation method (see Section 5.7.3).

This study did not contain any missing data due to the design of the online mobile phone app questions, which were all marked as mandatory, and only completed data sets were sent to the database (Hair et al., 2021). This sample size was adequate (see Section 5.9.4), exceeding the minimum of 500 required to conduct CB-SEM (Hair et al., 2006). This study used the maximum likelihood (ML) estimation method (Hair et al., 2006).

5.11.6.4. Stage four: assessing the measurement model's validity

During the fourth stage, the measurement model's validity is tested, thus testing the goodness of fit (GOF), as well as the construct validity. Two measures were used in this study to provide a comprehensive model fit analysis, namely, calculating absolute and incremental fit indices (Hair et al., 2006; Hooper et al., 2008), as explained next.

Absolute fit indices are used to determine the extent that the data obtained for the analysis fits the model (Hair et al., 2006). For this purpose, three indices were used, namely: the standardised root mean residual (SRMR), the root mean square error of approximation (RMSEA) and the chi-squared (x^2) statistic. The chi-squared (x^2) statistic is sensitive to the sample size; therefore, it was divided by its degrees of freedom (df). The ratio varies across researchers, ranging from less than 2 to less than 5 (Hooper et al., 2008; Schumacker and Lomax, 2015), but if the ratio is less than 3, the model would be deemed well-fitting (Hair et al., 2006). Next, RMSEA was used, as this study involved a large sample size, and RMSEA is sample-sensitive, like the chi-squared statistic. RMSEA measures how well a model fits over both the sample and the entire population (Hair et al., 2006), where a good fit is presented by RMSEA values between 0.06 and 0.08 (Hooper et al., 2008). The SRMR provides validation to the model by assessing the squared discrepancies between the model-implied correlations and the observed correlations (Hair et al., 2014). Similar to RMSEA, low SRMR values indicate better model fit; therefore, 0.06 or below, indicates a good fit.

Incremental fit indices are employed to assess the fit of a model compared to its null model, meaning that there is no correlation across the observed variables (Hair et al., 2006). For this purpose, two indices were used, namely: the Tucker-Lewis index (TLI) and the comparative fit index (CFI), that contrasts the model's x^2 value against the null model's x^2 value. Values over 0.9 indicate a good fit (Hair et al., 2006), although, a stronger model fit would be a CLI value of greater than 0.95 (Hu & Bentler, 1999). On the contrary, TLI considers the complexity of the model when contrasting the model's x^2 value against the null model's x^2 value (Hair et al., 2006). A TLI value over 0.9 indicates a good fit (Hooper et al., 2008), while a TLI value greater than 0.95 would be a stronger model fit (Hu & Bentler, 1999).

5.11.6.5.　　Stage five: specifying the structure model

The fifth stage requires that the built relationships be allocated and established according to the anticipated conceptual model. Here the researcher here used the assigned relationships to replicate, and develop the study's hypotheses (Hair et al., 2006). This study was framed within the S-O-R framework (Mehrabian & Russell, 1974), whereby existing relationships had previously been demonstrated in a number of contexts, such as developed markets and online environments. Therefore, certain replications were developed in the context of this study and based on the existing literature, hypotheses were also formulated to be tested.

5.11.6.6.　　Stage six: assessing the structural model validity

The sixth stage entails the testing of the structural model for validity in a similar manner to stage four, where the validity of the measurement model is assessed. However, the chi-squared (x^2) statistic should be different for the measurement model and the structural model, as the measurement model assumes that all the models' relationships are correlated. Therefore, the measurement model chi-squared (x^2) statistic should be less (Hair et al., 2006).

Table 11 summarises the indicators and their cut-off values as recommended by Hooper et al. (2008), and Hu and Bentler (1999), whereby the more stringent measure was applied.

Table 11: The model fit indices' cut-off values

Assessment	Cut-off level
Chi-square (x^2) statistic	Less than or equal to 3
RMSEA	Less than 0.06
SRMR	Less than 0.08
CFI	Greater than 0.95
TLI	Greater than 0.95

5.11.7. Moderation analysis

This study included three moderating constructs, namely telepresence, customisation, and product information, to test changes in the relationship within the model. According to Hair et al. (2013), the selected moderators should have strong theoretical support, and these were motivated in the literature review in Chapter Three. A moderating variable can strengthen, weaken, or negate the relationship between the independent and dependent variables. This occurs when constructs change their relationships relative to the other constructs (Hair et al., 2013), providing insight to develop and refine the conceptual models and assessing the size of the effects on the relationships (Hayes & Rockwood, 2017).

Three sets of moderation analysis were conducted: the moderating effect of telepresence was analysed first to clarify the relationships between visual cues, and auditory cues, respectively, and sensory experience. Secondly, the moderating effect of customisation was analysed to observe the relationships between visual cues, and auditory cues, respectively, and sensory experience. Finally, the moderating effect of product information was tested on the relationship between sensory experience and purchase intention.

Moderation analysis was conducted for all three moderating constructs, as per the recommendations of Hayes (2017), by making use of the MS-Excel macro plug-in, PROCESS, also developed by Hayes. Firstly, all the predictors were mean centred, after which the construct details, such as the independent, dependent, and moderating variables, were entered. The PROCESS macro plug-in tested the hypotheses and moderators, providing a p-value to indicate any statistical significance (Hayes, 2017). Furthermore, the PROCESS macro plug-in applied bootstrapping, which is highly recommended by its creator when determining moderating effects. This re-sampling technique made use of the study sample, as well as other

149

samples, to generate confidence levels (Hayes, 2017). When the confidence levels excluded a zero, the p-values were deemed to be significant.

Where significant moderation was found, the Johnson-Neyman technique was used, which allowed for recognition of the significance region, indicating whether or not the moderation was significant (Hayes, 2017). Thereafter, the moderation effects were visually illustrated (Hayes, 2017). Outcomes are presented in Chapter Five as well as illustrated graphically, in Appendix D. Various researchers have supported the moderation approach and use of PROCESS, in similar research contexts, thereby validating its use, in this research (Kühn & Petzer, 2018; Ruzeviciute, Kamleitner, & Biswas, 2020).

5.11.8. *Multivariate analysis of variance*

When considering comparative statistical techniques, Hair et al. (2006) proposed the t-test and analysis of variance (ANOVA) tests. However, a t-test is limited to two levels for an independent variable, whereas ANOVA tests allow for three or more levels (Cooper & Schindler, 2002; Field & Hole, 2003; Hair et al., 2006). ANOVA is also suited for comparisons where the means differ significantly, otherwise known as an omnibus test (Field & Hole, 2003; Hair et al., 2006). Multivariate analysis of variance (MANOVA) is a form of ANOVA that allows for two or more continuous response variables. MANOVA is favoured in cases where there is more than one dependent variable, as was the case in this prevent incorrect conclusions.

The use of MANOVA has been supported by various researchers in similar research contexts (Brasel & Gips, 2014; Liang & Liu, 2019; Seock & Sauls, 2008; Workman & Cho, 2012). This study compared gender demographics on the conceptual model constructs (Figure 14) by means of MANOVA. A Tukey's Honest Significant Difference (HSD) post-hoc comparison test was implemented to calculate the minimum differences necessary between means, to indicate statistical significance. This value termed the honestly significant difference (HSD), is then employed to evaluate any series containing two independent groups, and statistical significance is inferred if the HSD is less than the absolute difference between the two means (Haynes, 2013; Pallant, 2016).

5.11.9. *Summary of the analysis techniques, and software used*

In conclusion, Table 12 provides a summary of the research questions, their related replications, and hypotheses, as well as the statistical techniques chosen for this study.

Table 12: Summary of the research questions, replications/hypotheses, and data analysis technique used

Research question	Replication or hypothesis	Data analysis technique
RQ1	R1, R2	SEM
RQ2	R3	SEM
RQ3	H1a, H1b	Moderation analysis
RQ4	H2a, H2b	Moderation analysis
RQ5	H3	Moderation analysis
RQ6	H4a, H4b	MANOVA

Table 13 provides a summary of the analysis type, relevant statistical techniques, analysis software, and related theoretical support for this study.

Table 13: Summary of the statistical techniques, software used, and theoretical support

Analysis type	Technique	Software tool	Theoretical support for the technique
Descriptive statistics	Frequencies, mean and standard deviation	SPSS	Bleier et al, 2019; Cunningham & De Meyer-Heydenrych, 2021; Melović et al., 2021; Pallant, 2016
Preliminary analysis	Cook's distance measure	SPSS	Hyde, 2014; Pallant, 2016; Zhang et al. 2009
	Skewness and kurtosis	SPSS	Dharmesti et al. 2019; Helmefalk & Berndt, 2018; Pallant, 2016; Sarstedt et al., 2016
	Kaiser-Meyer-Olkin (KMO); Bartlett's test of sphericity	SPSS	Mpinganjira, 2016; Pallant, 2016; Retief et al., 2018; Sethi et al., 2018
Reliability and validity	Internal consistency Composite reliability Convergent validity Discriminant validity	EQS	Bentler, 1995; Hair et al., 2014; Hair et al., 2016; Hair et al., 2018
Common method variance	Harman's one-factor test Bagozzi's method	SPSS QES	Bagozzi et al., 1991; Barari et al., 2020; Fuller et al., 2016; Podsakoff et al., 2003; Podsakoff and Organ, 1986; Valaei & Nikhashemi, 2017
SEM	CB-SEM Model fit indices	EQS	Babin & Svensson, 2012; Breitsohl, 2019; Cunningham & De Meyer-Heydenrych, 2021; Kühn & Petzer, 2018; Retief et al., 2018; Strasheim 2014; Tang, 2019

Analysis type	Technique	Software tool	Theoretical support for the technique
Moderation analysis	Moderation analysis	PROCESS	Hayes, 2017; Kühn & Petzer, 2018; Ruzeviciute et al., 2020
MANOVA	MANOVA	SPSS	Brasel & Gips, 2014; Pallant, 2016; Workman & Cho, 2012

5.12. Ethical considerations

Before engaging in the data collection, an application for ethical clearance was submitted to the Doctoral Research Ethics Committee (REC) at GIBS, together with the research proposal, for approval. Seven areas of ethics were considered and addressed in this research: truthfulness (Cunliffe & Alcadipani, 2016), confidentiality (Jiang, 2019; Welch, Rumyantseva, & Hewerdine, 2016), autonomy (Whiting et al., 2018), informed consent (Cunliffe & Alcadipani, 2016), respondents' welfare (Kaibel & Biemann, 2019), nonmaleficence (Cassell, Radcliffe, & Malik, 2019), equality (distributive justice) and equal access to societal benefits (social justice) (Cassell et al., 2019).

This study was executed in an ethical way to secure ethical and academic integrity. To begin with, respondents willingly opted to be part of the research by going to the website, providing their consent to participate the study. Once on the website, the participants were updated about the purpose of the study, and that their answers would be treated confidentially and anonymously, and that they could exit the study at any time if they wished to do so for whatever reason. Respondents were not requested to disclose their names or contact information, confirming confidentiality and anonymity, also indicating that data would be used in aggregated form for analysis. The approximate length of the survey in terms of time required for completion, was disclosed upfront. Respondents were informed that they would not receive any form of remuneration or receive any of the items selected in the fictitious online shopping task. By clicking on the website button "start questionnaire", respondents willingly consented to participate in the study. Both the researcher's and supervisor's contact details were made available for the respondents to raise any concerns or to ask questions pertaining to the study, and participants could contact the supervisor or researcher directly. Respondents were asked eligibility questions (see Section 5.6.1), and only eligible respondents were able to access the mobile phone app download link to proceed with the online shopping task. The complete consent form is presented in Appendix A.

The data collection procedures have been defined in Section 5.10; however, to summarise, each questionnaire section began on a new page to increase the likelihood that the questionnaires would be completed in full. Respondents could, however, stop the task or

terminate the survey at any time, and exit the mobile phone application, which ensured that continued participation only occurred if the participants were willing to do so.

Once the data was collected, the mobile phone app database data was sent to the researcher; while the data file sent to the mobile phone app database contained only their responses and none of the respondent's personal information to ensure confidentiality and anonymity. The collected data is to be electronically stored, without identifiers, for ten years at the academic institution in accordance with their guidelines. Lastly, the researcher made use of an external statistician for assisting with the intricacies in the statistics (see Appendix F) however, the interpretation was the researchers own.

5.13. Conclusion

This chapter commenced by stating the research questions to aptly frame the research setting before introducing the chosen research paradigm, research design and research strategy, stipulating a positivistic research approach, and a quantitative descripto-explanatory research design. The research strategy encompassed an electronic survey that followed a vignette design, which entailed a fictitious online shopping task. The discussion of the design of the questionnaire includes an explanation for the need to conduct two pilot studies. The focus of the study on millennials as the target population is motivated, followed by an explanation of the sample selection, anticipated sample size, and the non-probability sampling procedure. Recruitment of willing respondents was limited to the Gauteng province in South Africa, using a cross-sectional real-time data collection method whereby respondents had to download a custom designed mobile phone app to gain entry to the survey. Attention is devoted to the time-consuming design of the mobile phone app, that was done by a specialist under instruction of the researcher. Data analysis was explained, focusing on how CB-SEM was used to confirm and test the replications and hypotheses that were captured in the proposed conceptual model. The relevant statistical procedures, including moderation analysis, using the PROCESS macro plug-in, and MANOVA were explained. The chapter concludes, indicating measures that were taken to eliminate error throughout the research process, and to ensure ethical conduct in accordance with the guidelines of the academic institution. The empirical results follow next.

Chapter six: Empirical results

6.1. Introduction

Following an explanation of the research design and methodology, this chapter presents the empirical results of the research, presenting the demographic profile of the sample first, followed by the descriptive statistics and a presentation of the preliminary analysis and the data distribution (see Section 5.11.2). The results pertaining to the SEM (see Section 5.11.6), and the moderation analyses (see Section 5.11.7), required to test the replications and hypothesis of this study, are presented. In particular, CB-SEM (using EQS) was employed to assess the moderation analysis and structural relationships (while determining the interaction with the PROCESS macro plug-in developed by Hayes). The moderation effect was tested using the Johnson-Neyman technique. The MANOVA results are presented to indicate possible gender differences (see Section 5.11.8), and the outcomes pertaining to the testing of the replications and the hypotheses are presented in tabular format. Results are discussed in Chapter Seven.

6.2. The demographic profile of the study's participants

Using non-probability sampling, and stipulating specific inclusion criteria, social media were used to purposively recruit millennials to participate in the survey (Zafar et al., 2021) (see Section 5.10). A total of 842 completed surveys were collected within seven weeks, including 442 male, and 374 female respondents, with 26 opting not to specify or disclose their gender status. Although included in the overall sample, these 26 respondents were excluded from the gender analyses. The final sample size was reasoned suitable to conduct CB-SEM analysis, as well as to conduct male-female gender comparisons. Table 14 presents the gender and household income composition of the sample, in the form of a one-way frequency table (Cunningham & De Meyer-Heydenrych, 2021; Hair et al., 2021; Kühn & Petzer, 2018; Melović et al., 2021; Valaei & Nikhashemi, 2017).

Table 14: Respondents' demographic profile: gender and household income data

Demographic information		Frequency	Percentage
Gender	Male	442	52.5
	Female	374	44.4
	Other	18	2.1
	Prefer not to disclose	8	1.0
	TOTAL	**842**	**100**
Monthly income bracket	Between R9000 and R65 000	597	70.9%
	Above R65 000	245	29.1%
	TOTAL	**842**	**100%**

Note: At the time of the study, USD 1 was equal to approximately ZAR 14.50

In summary 52.5% of the 842 respondents were male, while 44.4% were female. The remaining 3.1% comprised the "other" plus the "prefer not to disclose" categories. In terms of the monthly household income, most of the respondents (70.9%) earned a net monthly income between ZAR 9000 and ZAR 65 000, placing them in the lower middle-income category, with the rest (29.1%) earning more than ZAR 65 000 per month. It should be noted that the research never intended to make any inferences about household income. Income information was merely requested to ensure that all the respondents fell into the middle to upper-income categories, hence, millennials who could more easily afford sophisticated cell phone technology and were more likely to shop online.

6.3. Descriptive statistics

Descriptive statistics enable a researcher to summarise large quantitative data sets in logical categories, using basic statistical procedures, such as calculating means and standard deviations (Bleier et al., 2019; Cunningham & De Meyer-Heydenrych, 2021; Melović et al., 2021; Pallant, 2016). Frequency tables were developed to display the respondents' demographic information. Overall, respondents mostly agreed with the statements measuring "visual cue" (mean = 5.05), "auditory cue" (mean = 4.39), "sensory experience" (mean = 4.8), "purchase intention" (mean = 4.59), "telepresence" (mean = 5.01), "customisation" (mean = 4.38) and "product information" (mean = 4.39). The descriptive statistics of the major constructs

in this study are presented in Table 15, and the summary of the means for the major constructs are presented in Figure 20. Both Table 15 and Figure 20 present the overall means, as well as the means for male and female separately.

Table 15: Summary of the frequencies, mean and standard deviation for the constructs

Construct	Overall			Male			Female		
	N (valid)	Mean	SD	n (valid)	Mean	SD	n (valid)	Mean	SD
Visual cue	842	5.05	0.92	442	5.10	0.86	374	4.99	0.98
Auditory cue	842	4.39	1.22	442	4.52	1.14	374	4.20	1.28
Sensory experience	842	4.80	1.30	442	4.99	1.21	374	4.62	1.34
Purchase intention	842	4.59	0.91	442	4.68	0.88	374	4.51	0.92
Telepresence	842	5.01	0.89	442	5.45	0.50	374	4.58	0.94
Customisation	842	4.38	1.16	442	4.29	1.18	374	4.57	1.01
Product information	842	4.39	0.68	442	4.23	0.68	374	4.60	0.61
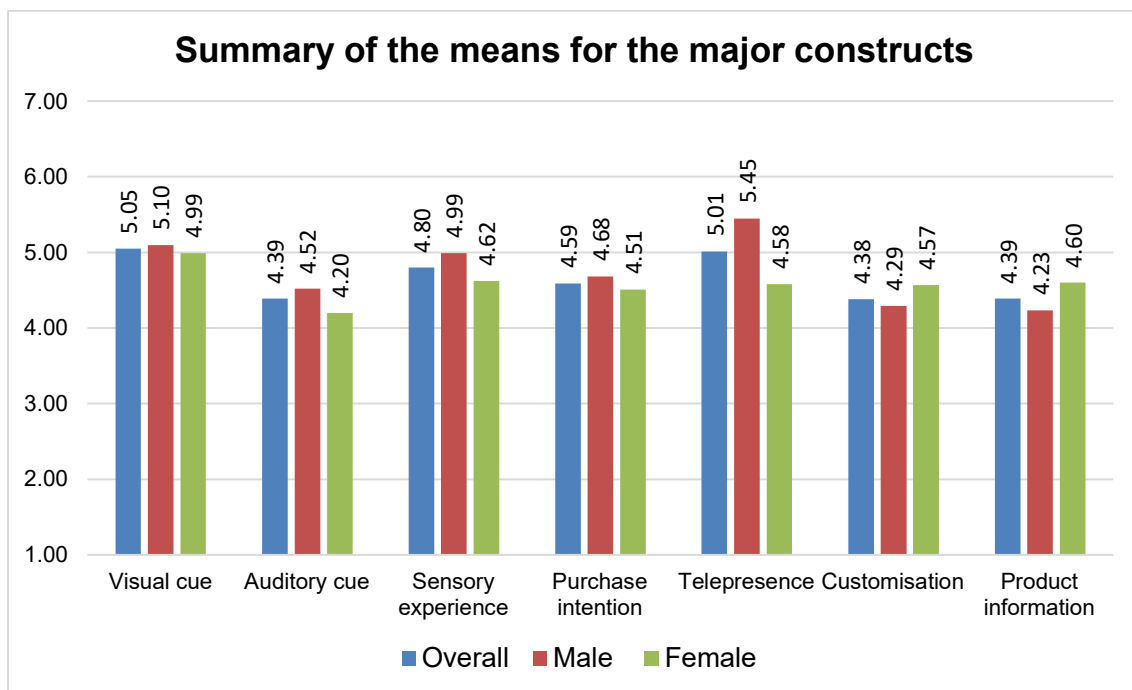
Figure 20: Summary of the means for the major constructs
Source: Researcher's own.

156

The results of the basic descriptive statistics (means and standard deviations) and their related discussions are listed in Appendix B.

6.4. Preliminary analysis and data distribution

This quantitative study relied on parametric statistical techniques, which required a normal distribution across the data (Pallant, 2016). Therefore, the relevant statistical procedures were conducted before proceeding to the more advanced statistical tests (Saunders et al., 2016). The steps performed to confirm the normality of the data and provide preliminary assurance of reliability and validity are presented next.

Firstly, Cook's distance measurement was employed to indicate the presence of any multivariate outliers (Hyde, 2014; Pallant, 2016; Zhang et al., 2009). Generally, possible outliers are more than three times the mean, where points over 4/n should be investigated, while others suggest investigating a D_i value over 1.0. The two dependent variables were checked: sensory experience produced a maximum D_i value of 0.027, while the value for purchase intention was 0.022, hence, confirming that there were no outliers.

Secondly, a normality test was conducted because data that is not normally distributed cannot be generalised across the population. As this study yielded a large sample size, skewness and kurtosis tests were also conducted (Dharmesti et al., 2019; Helmefalk & Berndt, 2018; Pallant, 2016; Sarstedt et al., 2016). The perfect distribution would have a value of 0, although it is common to accept a measurement between -1.5 and +1.5 (Pallant, 2016). The skewness test result produced values between +1.0 and -1.0, which indicated a normal distribution of the data.

The Kaiser-Meyer-Olkin (KMO) statistical tests were then conducted to determine sampling adequacy (Mpinganjira, 2016; Pallant, 2016; Retief et al., 2018; Sethi et al., 2018). According to Pallant (2016), a minimum score of 0.6 for the KMO test is adequate to perform factor analysis. The KMO score for this study was 0.889, which was above the minimum threshold. Furthermore, Pallant (2016) suggests a value of less than 0.05 for Bartlett's test of sphericity. Scores of the KMO and Bartlett's Tests are shown in Table 16, indicating that the test values were well below the suggested threshold, and that the data was suitable to subject to factor analysis

Table 16: Kaiser-Meyer-Olkin and Bartlett's test of sphericity

Kaiser-Meyer-Olkin measure of sampling adequacy.		0.889
Bartlett's test of sphericity	Approx. chi-square	33776.805
	df	1540
	Sig.	0.000

Once the normality of the data was established, the measurement model was examined (Hair et al., 2006), as presented in Sections 6.5.1.1 and 6.5.1.2. Next follows the replication and hypothesis testing.

6.5. The replication and hypothesis testing

In order to test the hypotheses and replications of the research (see Section 4.3), moderation analyses and SEM were performed according to specific procedures and the applicable software (see Sections 5.11.6 and 5.11.7). The analyses are deliberated in the following sections. A confidence level of 95% was applied to test and confirm the hypotheses and replications of this study, where an alpha (p-value) below 0.05 was regarded to show statistical significance.

6.5.1. Structural equation modelling

Stages one to three of SEM (as discussed in Section 5.11.6) were covered in previous sections (see Sections 5.11.6.1, 5.11.6.2 and 5.11.6.3). This section, therefore, commences with the results of stage four, where the reliability and construct validity of the measurement model were assessed. Next, the structural model is approximated and evaluated in terms of the model's fit, allowing the structural paths to be tested, together with the study's hypotheses.

6.5.1.1. Assessment of the measurement model

An evaluation of the measurement model enables the study's psychometric properties to be assessed, so incremental fit and absolute indices were incorporated to facilitate a comprehensive model fit analysis (see Section 5.11.6.4). For this purpose, the following indices were used: chi-squared (x^2) statistic, the root mean square error of approximation (RMSEA), the standardised root mean residual (SRMR), the comparative fit index (CFI) and the Tucker-Lewis index (TLI).

Table 17 presents the model fit indices for the original measurement model, indicating the cut-off values for each (see Section 5.11.6.4).

Table 17: Model fit indices for the original measurement model

Assessment	Cut-off level	Value achieved in this research
Chi-square (x^2) statistic	Less than or equal to 3	3.14
x^2	n/a	582.56
df	n/a	185
RMSEA	Less than 0.06	0.051
SRMR	Less than 0.08	0.034
CFI	Greater than 0.95	0.970
TLI	Greater than 0.95	0.966

Based on the figures presented in Table 17, the measurement model fitted the data well. The chi-square statistic was significant (582.56; p = 0.00), but the critical ratio of the chi-square over degrees of freedom was close to 3 ($\chi 2/df$ = 3.14), indicating a reasonable fit. The fit indices provide support for the scale validity: root mean square error of approximation (RMSEA) = 0.051 [0.046; 0.055]; standardised root mean residual (SRMR) = 0.034; comparative fit index (CFI) = 0.970 and Tucker–Lewis index (TLI) = 0.966.

In addition, the construct validity and reliability were evaluated for each of the original items incorporated in the study. The figures are shown in Table 18.

Table 18: Construct reliability and validity for all original items included in the study

Construct and item		Loading est	AVE	CR	Cronbach's alpha scores
Visual cue					
Visual cue	VC1	0.785	0.576	0.891	0.889
	VC2	0.793			
	VC3	0.787			
	VC4	0.733			
	VC5	0.725			
	VC6	0.727			

Table to be continued on the next page

Construct and item		Loading est	AVE	CR	Cronbach's alpha scores
Auditory cue					
Auditory cue	AC1	0.817	0.721	0.928	0.927
	AC2	0.908			
	AC3	0.808			
	AC4	0.852			
	AC5	0.857			
Sensory experience					
Sensory experience	SE1	0.889	0.806	0.954	0.954
	SE2	0.901			
	SE3	0.895			
	SE4	0.919			
	SE5	0.885			
Purchase intention					
Purchase intention	PI1	0.796	0.659	0.906	0.905
	PI2	0.857			
	PI3	0.856			
	PI4	0.778			
	PI5	0.766			
Telepresence					
Telepresence	TP1	0.714	0.601	0.913	0.913
	TP2	0.748			
	TP3	0.777			
	TP4	0.803			
	TP5	0.801			
	TP6	0.791			
	TP7	0.788			
Customisation					
Customisation	CU1	0.829	0.678	0.936	0.935
	CU2	0.829			
	CU3	0.809			
	CU4	0.825			
	CU5	0.830			
	CU6	0.817			
	CU7	0.824			

Table to be continued on the next page

Construct and item		Loading est	AVE	CR	Cronbach's alpha scores
Product information					
Intrinsic formal physical attributes	IP1	0.919	0.630	0.910	0.910
	IP2	0.796			
	IP3	0.806			
	IP4	0.714			
	IP5	0.794			
	IP6	0.717			
Intrinsic aesthetic attributes	IA1	0.864	0.694	0.919	0.918
	IA2	0.878			
	IA3	0.892			
	IA4	0.783			
	IA5	0.737			
Intrinsic formal physical attributes	IF1	0.837	0.645	0.916	0.915
	IF2	0.828			
	IF3	0.847			
	IF4	0.715			
	IF5	0.742			
	IF6	0.839			
Extrinsic attributes	EA1	0.824	0.636	0.876	0.874
	EA2	0.805			
	EA3	0.778			
	EA4	0.787			

Key: AVE - average variance extracted; CR - composite reliability (also referred to as construct reliability)

For the reliability assessments, two indicators were applied, namely: composite reliability (also referred to as construct reliability, or CR) and internal consistency (see Section 5.11.4). From Table 18, it is clear that all the constructs produced Cronbach's alpha values that exceeded the minimum level of 0.7, ranging from 0.874 to 0.954. The composite reliability also exceeded 0.7, ranging from 0.876 to 0.954, indicating that the constructs could be deemed reliable (Hair et al., 2018, 2021).

Confirmatory factor analysis (CFA) is employed when evaluating construct validity to determine discriminant and convergent validity. When assessing convergent validity, the factor loadings should be above 0.65 and statistically significant (Hair et al., 2014). Table 18 confirms construct validity across all the items. In addition, the constructs' average variance extracted (AVE) should equal or exceed 0.5. The figures in Table 18 indicate that all the figures met the minimum requirements, ranging from 0.576 to 0.806.

In order to assess the discriminant validity, each construct's square root AVE was compared to the correlations between each construct pair (Fornell & Larcker, 1981). Discriminant validity is confirmed by correlations between each pair of constructs being less than the square roots of the AVE. Table 19 presents the correlations with each construct pair (below the diagonal) compared to the square root of the AVE (on the diagonal and in bold).

Table 19: Discriminant validity of the measurement model

	VC	AC	SE	PI	TP	CU	PK
VC	**0.758**						
AC	0.059	**0.848**					
SE	0.379	0.141	**0.898**				
PI	0.112	0.031	0.184	**0.811**			
TP	-0.014	0.080	0.118	0.046	**0.775**		
CU	-0.001	-0.037	0.107	0.065	0.092	**0.823**	
PK	0.158	-0.011	-0.037	-0.042	0.044	-0.031	**0.805**

Key: VC – visual cue; AC – auditory cue; SE – sensory experience; PI – purchase intention; TP – telepresence; CU – customisation; and PK – product information

The figures confirm, discriminant validity since the square root of the AVE exceeded their correlation with the other constructs across each of the constructs.

This study's data was gathered from the same respondents (both the dependent and independent variables apply), which may present a common method variance (CMV) issue (see section 5.11.5). The Harman's single-factor test was employed to check for CMV (Podsakoff and Organ, 1986). The explained variance of the first factor is 12.16%, which is less than recommended cut off of lower than 50 percent (Podsakoff et al., 2003). Furthermore, the Bagozzi's method tests the highest correlation between the research variables. As seen in Table 19, the highest correlation was between visual cues and sensory experience with a value of 0.379, which is lower than the recommended value of less than 0.9. Therefore, both methods confirm that CMV is not considered to be a threat in this study.

6.5.1.2. Assessment of the structural model

The procedure to assess the structural model, was the same as for the assessment of the measurement model (see Section 5.11.6.6). Relationships were typically assigned between two constructs according to the conceptual model when approximating the structural model to test the hypotheses (Hair et al., 2014) (see Section 5.11.6). Before testing any associations, the structural model's goodness of fit (GOF) had to be evaluated, according to the study's conceptual model.

Table 20 presents the structural model's GOF statistics.

Table 20: Statistics pertaining to the model fit for the structural model

Assessment	Cut-off level	Value achieved in this research
Chi-square (x^2) statistic	Less than 3	3.14
x^2	n/a	582.56
df	n/a	185
RMSEA	Less than 0.08	0.051
SRMR	Less than 0.08	0.034
CFI	Greater than 0.9	0.970
TLI	Greater than 0.9	0.966

The figures in the table confirm a reasonably good fit between the data and the measurement model. Since the predicted structural model fitted the data well across many indices of incremental and absolute fit, the structural model for this study was deemed to be suitable (Hair et al., 2014).

SEM was conducted and the structural paths were evaluated. All three relationships were significant at the $p < 0.05$ level. The relationships between sensory experience and (i) visual cue ($p < 0.001$; $\beta = 0.624$); (ii) auditory cue, whereby visual cue ($p < 0.001$; $\beta = 0.140$) were significant. The other relationship between sensory experience and purchase intention ($p < 0.001$; $\beta = 0.135$) was also significant. Table 21 specifies results of the structural paths.

Table 21: Results of the structural model

Structural path	Estimate (β)	p-value	Result
Visual Cue -> Sensory Experience	0.624	<0.001	Significant
Auditory Cue -> Sensory Experience	0.140	<0.001	Significant
Sensory Experience -> Purchase Intention	0.135	<0.001	Significant

* statistically significant at p < 0.05

Figures presented in Table 21, indicate that all the structural paths were statistically significant, concluding the following core findings:

- **Main finding 6.1:** Visual cues have a positive and statistically significant influence on consumers' sensory experience.
- **Main finding 6.2:** Auditory cues have a positive and statistically significant influence on consumers' sensory experience.
- **Main finding 6.3:** Sensory experience has a positive and statistically significant influence on consumers' purchase intention.

The findings of the moderation analyses are presented next.

6.5.2. Moderation analysis

Moderation was tested using the PROCESS macro plug-in, as developed by Hayes (2017); while the Johnson-Neyman technique was used to test whether the moderation was significant. The non-normality of the data was also considered by inspecting the bias correcting bootstrap confidence intervals (see Section 5.11.7).

Three sets of moderation analyses were conducted: Firstly, the relationship between visual cues and sensory experience was tested to consider whether telepresence has a moderating effect on the relationship, also exploring by whether customisation has a moderating effect on the relationship. Secondly, the relationship between auditory cues and sensory experience was tested to indicate whether telepresence has a moderating effect on the relationship, as well as followed by whether customisation has a moderating effect on the relationship. Thirdly, the possibility was examined of whether product information moderates the relationship between sensory experience and purchase intention. Moderation analysis was performed on

164

the overall sample, and the results are summarised in Table 22. Graphical illustrations of these results are shown in Appendix C.

Table 22: Summary of moderating effects in this study

X	M	Y	Internal effect [LLCI; HLCI]	p-value	Result
Visual cue	Telepresence	Sensory experience	0.252 [0.159; 0.346]	0.000*	Significant
	Customisation	Sensory experience	0.121 [0.045; 0.196]	0.002*	Significant
Auditory cue	Telepresence	Sensory experience	0.112 [0.031; 0.192]	0.007*	Significant
	Customisation	Sensory experience	0.074 [0.014; 0.134]	0.016*	Significant
Sensory experience	Product Information	Purchase intention	0.059 [-0.004; 0.121]	0.065	Not significant

Key: * statistically significant at $p < 0.05$; X = exogenous variable, M = moderating variable, Y = endogenous variable, LLCI = lower level confidence interval, HLCI = higher level confidence interval

The results, therefore, indicate that telepresence (p = 0.000), as well as customisation (p = 0.002), significantly moderates the relationship between visual cues and consumers' sensory experiences. Similarly, telepresence (p = 0.007) and customisation (p = 0.016) significantly moderate the relationship between auditory cues and consumers' sensory experiences. However, the moderating influence of product information on the relationship between consumers' sensory experience and their purchase intentions is not statistically significant. Concerning the moderating effect of product information on the relationship between sensory experience and purchase intention (also see Section 5.11.8), possible gender differences in this relationship were examined, and the results are summarised in Table 23.

Table 23: Summary of the moderating effect of product information in the relationship between sensory experience and consumers' purchase intention, by gender

Gender	Sample size (n)	Internal effect [LLCI; HLCI]	p-value	Result
Male	442	0.128 [-0.110; 0.140	0.002*	Significant
Female	374	-0.051 [-0.167; 0.065]	0.390	Not significant
All	842	0.059 [-0.004; 0.121]	0.065	Not significant

Key: * statistically significant at $p < 0.05$; LLCI = lower level confidence interval, HLCI = higher level confidence interval

The figures indicate that product information significantly moderates the relationship between sensory experience and consumers' purchase intentions for males (p = 0.002), but the moderating effect is neither statistically significant for females (p = 0.390), nor for the sample overall (p = 0.065). In summary, based on the statistical outcomes, the following was concluded:

- **Main finding 6.4:** Telepresence has a statistically significant positive moderating effect on the relationship between visual cues and consumers' sensory experience.
- **Main finding 6.5:** Telepresence has a statistically significant positive moderating effect on the relationship between auditory cues and consumers' sensory experience.
- **Main finding 6.6:** Customisation has a statistically significant positive moderating effect on the relationship between visual cues and consumers' sensory experience.
- **Main finding 6.7:** Customisation has a statistically significant positive moderating effect on the relationship between auditory cues and consumers' sensory experience.
- **Main finding 6.8:** For the sample overall, product information does not have a statistically significant moderating effect on the relationship between consumers' sensory experiences and their purchase intention.
- **Main finding 6.9:** Product information has a statistically significant moderating effect on the relationship between men's sensory experience and their purchase intentions (p < 0.05), but the moderating effect of product information is not statistically significant for females, nor for the sample overall (p > 0.05).

6.5.3. *Multivariate analysis of variance*

The MANOVA procedure involved gender as a categorical, independent variable (male, female), and two dependent variables, namely: sensory experience and purchase intention. MANOVA analyses pose certain prerequisites, such as minimum sample size, the presence of outliers, and normality. These have been addressed in Sections 5.9.4 and 6.4, where no serious violations were noted. The MANOVA tests were therefore conducted, and the between-subject findings are summarised next.

The study revealed that statistically significant gender differences exist in consumers' sensory experiences when using a mobile phone app to conduct online clothing purchases. A statistically significant difference was detected in consumers' sensory experiences across the gender categories, $F_{(3, 838)}$ = 9.33; p < 0.0005; partial η^2 = 0.03. Tukey HSD post-hoc tests indicated statistically significant differences between males and females (M_M = 5.26, SD = 1.23; M_F = 4.89, SD = 1.36). The mean difference between males and females was 0.3756 and was significant at the 0.05 level (p < 0.000). Therefore, when measuring the dependent variable,

men's sensory experience was significantly more intense (see Section 6.3), and relatively strong (M_M = 5.26) considering the maximum potential influence (M_{Max} = 7).

Furthermore, the study revealed statistically significant gender differences in consumers' purchase intentions when using a mobile phone app to conduct online clothing purchases: F (3, 838) = 5,38; p = 0.001; partial η^2 = 0.02. Tukey HSD post-hoc tests indicated the following: M_M = 4.46, SD = 0.84; M_F = 4.29, SD = 0.87. The mean difference, 0.1695, was significant at the 0.05 level (p < 0.027), and therefore men's purchase intention (a dependent variable:M_M = 4.46) was relatively strong, and significantly stronger compared to that of their female counterparts (see Section 6.3). Detailed results and a related discussion, is presented in Appendix D.

Therefore, the following main findings related to the gender effects of sensory experience and purchase intention have been found:

- **Main finding 6.10:** Gender has a positive and statistically significant influence on consumers' sensory experience.
- **Main finding 6.11:** Gender has a positive and statistically significant influence on consumers' purchase intention.

6.6. Summary of the results

Table 24 presents a summary of the statistical outcomes produced for each hypothesis and replication of this study, after which the model that was developed for this study is presented.

Table 24: Summary of the statistical outcomes of the tests relating to the replications and hypotheses in this study

Research question	Replication or hypothesis	Main finding	Outcome
RQ1: How do visual and auditory cues influence consumers' sensory experience when using a particular mobile phone app to purchase clothing online?	R1: Visual cues have a significant influence on consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.	6.1	Supported
	R2: Auditory cues have a significant influence on consumers' sensory experience when using a particular	6.2	Supported

167

Research question	Replication or hypothesis	Main finding	Outcome
	mobile phone application to conduct an online clothing purchase.		
RQ2: How does the sensory experience derived from an online shopping encounter, when using a particular mobile phone app to conduct a clothing purchase, influence consumers' purchase intention?	R3: Consumers' sensory experience has a significant influence on their purchase intention when using a particular mobile phone application to conduct an online clothing purchase.	6.3	Supported
RQ3: What is the moderating influence of telepresence in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online?	H1a: Telepresence significantly moderates the relationship between visual cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.	6.4	Supported
	H1b: Telepresence significantly moderates the relationship between auditory cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.	6.5	Supported
RQ4: What is the moderating influence of customisation in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online?	H2a: Customisation significantly moderates the relationship between visual cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.	6.6	Supported
	H2b: Customisation significantly moderates the relationship between auditory cues and consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.	6.7	Supported
RQ5: What is the moderating influence of clothing product information between consumers' sensory	H3: Product information significantly moderates the relationship between consumers' sensory experience and their purchase intention when using a	6.8, 6.9	Supported for males but not supported for females nor

Research question	Replication or hypothesis	Main finding	Outcome
experiences and their purchase intention when using a particular mobile phone app to purchase clothing online?	particular mobile phone application to conduct an online clothing purchase.		the overall sample
RQ6: How does gender influence the relationships in the conceptual model for this study, which specifies specific interactions during an online shopping encounter when using a particular mobile phone app to conduct a clothing purchase?	H4a: Significant gender differences exist in consumers' sensory experience when using a particular mobile phone application to conduct an online clothing purchase.	6.10	Supported
	H4b: Significant gender differences exist in consumers' purchase intention when using a particular mobile phone application to conduct an online clothing purchase.	6.11	Supported

6.7. Conclusion

This chapter has given an overview of the study's empirical results, commencing with a presentation of the composition of the sample's age and income characteristics, and basic descriptive results. The preliminary analysis and details about data distribution followed. The results of SEM analyses were presented, with the results of the moderation analyses, which enabled the testing and confirmation of the replications and the hypotheses. MANOVA results pertaining to gender difference in millennials' sensory experience and purchase intention were presented. The chapter concluded with a table that summarised the outcomes of this study's hypotheses and replications, as well as the proposed model that links all the constructs. An in-depth deliberation of the results follows in Chapter Seven, next.

Chapter seven: Discussion of the results

7.1. Introduction

Following the presentation of the results in the previous chapter, this chapter provides a deliberation of the results by interpreting the results and relating them to the available relevant literature. Measurement scales that were employed in the study, are discussed, indicating how validity and reliability were inferred. A discussion of the results of the replications and hypotheses that were proposed for the research follows. The chapter concludes with the presentation of a revised conceptual model.

7.2. Measurement scales

Each of the constructs satisfied the criteria for reliability, which was determined by acceptable measurements of internal consistency and composite reliability (also called construct reliability, or CR) indicators (see Section 6.5.1). All the constructs achieved Cronbach's alpha values exceeding 0.7 (ranging from 0.874 to 0.954), and the composite reliability scores were all above 0.7 (ranging from 0.876 to 0.954). The constructs were therefore considered to be reliable, indicating that further analyses would be meaningful (Hair et al., 2018, 2021).

In addition, convergent and discriminant validity were assessed through confirmatory factor analysis (CFA). Statistical significance of all the factor loadings, which were also above 0.65, further confirmed construct validity. The average variance extracted (AVE) values were inspected for the constructs, to confirm convergent validity based on AVE equal to, or exceeding 0.5. Scores above 0.5, confirmed the convergent validity. Discriminant validity was tested by comparing the square root of the AVE for each construct to the correlations between each construct pair (Fornell & Larcker, 1981). Discriminant validity was confirmed since the correlations between each construct pair were less than the square root of the AVE. Construct validity was subsequently confirmed (Babbie, 2016; Hair et al., 2014).

7.3. Proposed relationships between the constructs

In total, three replications and seven hypotheses were tested in this study (see Section 4.3). As shown in Table 24, all three replications were supported. Of the seven hypotheses tested, six were supported. One hypothesis, related to product information, was not supported across the gender categories. The following sections provide further insights linking the findings to other pertinent studies to justify or contextualise the findings of this study.

170

7.3.1. *The relationship between visual cues and sensory experience*

A significant positive relationship between visual cues and consumers' sensory experience was expected, as was indicated in the replication (R_1) (see Section 4.3.1). This was confirmed by the structural model results, which indicated a statistically significant and positive relationship between the two constructs ($p = 0.001$; $\beta = 0.624$). R_1 is hence supported, indicating that visual cues positively and significantly influence consumers' sensory experience. Previous research supports this result, concurring that visual cues positively and significantly influence consumers' sensory experience (Krishna, 2012; Spence & Gallace, 2011).

Although a significant positive relationship between visual cues and consumers' sensory experiences in the online South African clothing context was confirmed in this study, this finding is not new at all. Over the years, many marketers have attempted to understand this relationship, considering vision as the most dominant of the human senses and visual cues typically the first sensory cue that is noticed by consumers (Akarsu et al., 2019; Biswas et al., 2014; Helmefalk & Hultén, 2017; Hultén, 2013). The role of visual merchandise presentations has become more imperative for certain products (such as clothing) when shopping online, as the involvement of consumers' senses is very important to properly evaluate clothing merchandise. In physical stores, visual merchandising is a crucial component of in-store clothing presentations (Cant & Wiild, 2020). Therefore, visual cues are very important to conclude online purchase decisions, acknowledging that consumers are accustomed to the interesting and clever display of clothing in physical stores (Kim & Lennon, 2008; Yoo & Kim, 2014). Clothing is a functional commodity but the visual attraction of clothing, and how that could enhance a person's self-image should not be underestimated (Cham et al., 2018).

This incorporated 360-degree rotatable clothing product images in the online clothing retail app, to allow product assessments that are more similar to what is possible in physical stores (Kim et al., 2020), was meant to enhance respondents' visualisation of the clothing products. This notion was supported in Sections 3.1.3.4 and 4.3.1, explaining how visual cues enhance consumers' sensory experiences, also confirming the relevance of visual cues as an input within the S-O-R framework that presents consumers' interpretation of selected cues and how the subsequent outputs would be meaningful to (online) retailers.

7.3.2. *The relationship between auditory cues and sensory experience*

A statistically significant positive relationship was expected between auditory cues and consumers' sensory experience, as noted in the replication (R_2) (see Section 4.3.2) and was confirmed by the results. Specifically, a statistically significant, and positive relationship between the two constructs was confirmed ($p = 0.001$; $β = 0.140$). R_2 is hence supported.

While this research has verified the relationship between auditory cues and sensory experience in the South African online clothing retail context, this finding is not new, and confirms existing theory. Similarly, to visual cues, auditory cues, such as music, create a key ambient condition that influences consumers' sensory experiences and their subsequent emotional and behavioural responses (Bartholmé & Melewar, 2014; Bitner, 1992; Helmefalk & Hultén, 2017; Hultén, 2013). In retail settings, the context of music inherently relates to the sense of hearing or listening (Helmefalk & Hultén, 2017), and retailers use background music to influence the subconscious actions of shoppers, for instance, to create a positive mood state that would increase their willingness to make a purchase (Allan, 2008).

Music, in particular, is regarded as a distinctive component that can create more pleasant consumer experiences in online retail settings (Cuny et al., 2015; Hwang & Oh, 2020). The difference between offline and online retail settings, is that a consumer cannot adjust the music in a physical store. When shopping online, however, it is possible to adjust the music in accordance with their personal preferences. Previous research confirmed that a positive relationship exists between music likeability and familiarity (Allan, 2006; Yalch & Spangenberg, 2000), especially during in-store decision-making processes (Baker et al., 1992). Very important therefore, is that retailers have to be cognisant of the type of music, and the volume, as music could be equally annoying when not applied correctly. When incorporating music in an online app, attentions should also be devoted to how the music is applied.

Given South Africa's richly diverse multicultural population, music was selected for inclusion in the specially designed app to ensure that it would be likeable and familiar to the sample's respondents, which included a diverse group of people in terms of cultural and social affiliation. This would inevitably also be true for any online app that is developed for actual use. Evidence exists that online shoppers indeed devote more attention when hearing music that they enjoy while shopping (Kim & Lennon, 2012). This idea has been corroborated in the discussion of Sections 3.1.3.5 and 4.3.2, confirming that auditory cues influence consumers' sensory experiences. Auditory cues, particularly music, was presented as a worthy cue to consider when designing apps for mobile shopping and when trying to understand consumers'

behaviour. Within the S-O-R framework that framed the design and discussions in this study, this proposed that auditory cues (music) are mentally configured by consumers, and then influence their reactions. The challenge to retailers, would be to incorporate music that customers can associate with, and that is likeable across the broad South African consumer spectrum.

7.3.3. The relationship between sensory experience and purchase intention

A significant positive relationship was expected to be observed between consumers' sensory experience and their purchase intention, as indicated in the replication (R_3) (see Section 4.3.5). This was indeed confirmed by the results of the structural model, based on a statistically significant positive relationship between these two constructs ($p = 0.001$; $\beta = 0.135$). R_3 is hence supported.

While the relationship between consumers' sensory experience and their purchase intention in the South African online clothing retail context was confirmed in this study, this finding is also not new. Previous research indicates that consumers' sensory experience can be particularly influential in terms of their behavioural outcomes, and in driving their purchase intentions (Biswas, 2019; Mehraliyev et al., 2020; Petit et al., 2019). This may be either positive or negative or even create confusion (Mehraliyev et al., 2020). This idea was also corroborated in the discussion in Sections 3.1.1.2 and 4.3.5, explaining that consumers' sensory experiences influence their purchase intentions. Within the S-O-R framework that framed this study theoretically, sensory experience refers to consumers' integration of stimuli (this study incorporated visual and auditory cues) within memory, which then results in related behavioural responses. While favourable experiences are likely to lead to positive outcomes (for the consumer as well as the retailer), all the elements within the S-O-R framework need to be aligned correctly to achieve the desired outcomes. The cues/stimuli are therefore very important in terms of the experience (internal) and the subsequent output (purchase intentions).

7.4. Possible moderating influences in certain relationships

7.4.1. The moderating effect of telepresence

Telepresence was hypothesised to moderate the relationship between visual cues and sensory experience (H_{1a}), proposing that telepresence would moderate the relationship between auditory cues and sensory experience (H_{1b}) (see Section 4.3.3). This was confirmed in the results, as telepresence moderated the relationship between visual cues and consumers'

sensory experience (p = 0.001; β = 0.252), as well as the relationship between auditory cues and consumers' sensory experience (p = 0.007; β = 0.112). Therefore, H1a and H1b were both supported.

Telepresence describes the set of technologies that facilitate the real-time feeling that one is present at a place other than one's current location. Therefore, telepresence in online and mobile commerce applications can enhance user involvement, and influence consumers' purchase behaviour (Hadi & Valenzuela, 2020). Through a telepresence, the real world can be blocked out, and consumers can be influenced to become immersed in the virtual environment and the available sensory information (Cowan & Ketron, 2019). This study presented 360-degree rotatable images and displays that allowed users to experience an immersive and convincing 3D experience when evaluating clothing images, that was more relatable to in terms of physical store displays, and more exciting than viewing static images.

The interactive features of 360-degree rotatable images, together with interactive music, are appreciated as fundamental activators of telepresence (Novak et al., 2000). Also being entertaining (Bilgihan et al., 2016), these features enhance consumers' sensory experience. When designing online and mobile phone applications, technologies should therefore provide an entire telepresence to present an experience that replicates, as closely as possible, the sensory aspects of vision and sound that consumers are accustomed to in a physical store environment. This notion has been corroborated in the discussion in Sections 3.1.4, 3.1.1.2, 4.3.3 and 4.3.5, where it explains that telepresence is a major advantage in that it moderates the relationship between visual and auditory cues and consumers' sensory experience in various different contexts. Considering the S-O-R framework, organisations or retailers need to acknowledge the intricate combination of the relevant stimuli (cues) and how they are presented so that the stimuli would coherently contribute to an immersive experience (that becomes part of consumers' frame of reference of online shopping in the future), and related (desirable) behavioural outputs.

7.4.2. The moderating effect of customisation

This study proposed that customisation would be a moderating factor in the relationship between visual cues that are incorporated in the online app, and consumers' sensory experience of the online encounter (H2a), and that customisation would similarly moderate the relationship between auditory cues and online consumers' sensory experience (H2b) (see Section 4.3.4). The results confirmed that customisation moderates the relationship between visual cues and consumers' sensory experience (p = 0.002; β = 0.121), as well as the

relationship between auditory cues and sensory experience (p = 0.016; β = 0.074). Therefore, H_{2a} and H_{2b} were both supported.

In a physical store, consumers are able to exercise practices of customisation by means of their own rituals or by the routes that they choose to travel among the products (Rose et al., 2012), which signifies unique behaviour. Customisation should be selective and include cautiously contemplated options concerning when and how multisensory experiences could be manipulated (Petit et al., 2019; Velasco et al., 2021). Customisation requires some form of interaction between consumers and an app to personalise their experience, for example, to manipulate 360-degree rotatable pictures, or to change music options, so that it becomes an interactive characteristic. In this study, both 360-degree rotatable pictures and interactive music were used to customise consumers' interactions with the mobile phone application.

Customisation by means of 360-degree rotatable pictures (Kim et al., 2020), and interactive features (Kim et al., 2015), are expected to affect consumers' purchase intentions positively. Consumers who perceive the visual and auditory cues about products in a more eloquent and inviting way, tapered to their needs, and in a controllable way (Mosteller et al., 2014) experience increased enjoyment and a more positive experience (Pappas et al., 2014). Therefore, when designing online and mobile phone applications, technologies should provide the opportunity for a customised experience that places the consumer in control of their visual and sound preferences. This notion has been corroborated in the discussions in Sections 3.1.5, 3.1.4, 3.1.1.2, 4.3.4, and 4.3.5, where it is explained that customisation would moderate the relationship between both visual and auditory cues, and also consumers' sensory experiences, in various different contexts. Therefore, it can be accepted that customisation is an important construct in the S-O-R framework and for organisations or retailers to consider.

7.4.3. The moderating effect of product information

Product information was hypothesised to moderate the relationship between consumers' sensory experiences and customers' purchase intention (H_3) (see Section 4.3.6). However, the results could not support the hypothesis (p = 0.065; β = 0.059) for the sample overall, in the context of this research, thus not supporting H_3. Nonetheless, when investigating possible gender differences, product information significantly and more strongly moderated the relationship between sensory experience and purchase intention for males (p = 0.002; β = 0.128), but not for females (p = 0.390; β = -0.051).

Product information is considered to be an important moderator of consumers' purchasing decision behaviours, as an understanding of the products in terms of how their specifications, related characteristics and subsequent performance characteristics may affect the consumers' rational evaluations of the products and their overall willingness to make a purchase (Ahn et al., 2018; Souiden et al., 2020). Rational decision-making means that a consumer considers all available product characteristics and then selects the product that outweighs the others in terms of benefits (Ahn et al., 2018; Baek et al., 2021; Chandrasekaran, 2012; Ghalachyan & Karpova, 2021; Lee & Lou, 2011).

The findings of studies by Ahn et al. (2018), Baek et al. (2021), Chandrasekaran (2012), Ghalachyan and Karpova (2021) and Lee and Lou (2011) showed a positive and significant relationship between product information with purchase intention, although this evidence could not be confirmed in this study. The literature indicates that emotional consumer choice decisions are made based on how a consumer feels about a product and are not necessarily based on true product characteristics, in which case good performance is often assumed (Cant & Van Heerden, 2021; Erasmus et al., 2014; Olyott, 2018). This might be an explanation for the findings in this study, as clothing purchases could entail emotional deliberation rather than mainly rational ones. Equally, however, a consumer who is equipped with sound product knowledge feels more knowledgeable about a product and more confident to evaluate it (Liu, Li et al., 2019); therefore, a consumer who possesses knowledge upfront does not necessarily require extensive product information about it. Furthermore, not all intrinsic clothing product information, such as comfort and fit of clothing, can be displayed on online platforms, such as mobile phone applications or websites. This places more burden on the display of extrinsic product information, such as size and fibre content information that might not be enough to favourably moderate consumers purchase intention. As a consequence, more needs to be done to elevate consumers' sensory experiences, and that can only be done by paying more attention to external cues and visual and auditory stimuli when designing mobile apps. Another reason for this finding might be that females' clothing purchase decisions may be more strongly based on emotions, while men might be more inclined to make rational clothing purchase decisions. The issue is further explained in Section 7.5.

The moderating influence of product information in terms of consumers' sensory experiences and subsequent clothing purchase decisions, as well as gender differences in millennials use of clothing product information, are discussed in Sections 2.2.3, 3.2.3, 4.3.5 and 4.3.6. The results indicate that clothing product information significantly moderates millennial men's intentions to conclude clothing purchase decisions when using a mobile phone app. The same is however not true for millennial females, a matter that can be investigated in further research.

Men's online clothing retailers, therefore, have to cautiously attend to clothing the product information that they supply when designing mobile apps as that could boost purchases if attended to satisfactorily. Within the S-O-R framework, consumers' sensory experiences when using a clothing app, may be positive (or negative), but the consequences, thus consumers' purchase intentions (particularly men's responses), can be boosted by means of the available clothing product information. The same could not be confirmed for millennial females - a matter that deserves further attention in research, in terms of the type of information that consumers regard useful, and that might positively sway females' purchase intentions.

7.5. Gender differences

The research proposed gender differences in millennials' sensory experience (H4a) (see Section 4.3.7) and purchase intention (H4b) (see Section 4.3.7), following their exposure to selected sensory cues when using a specially designed mobile phone app to conduct online clothing purchases. Bernerth et al. (2018) suggested that gender differences, rather than being considered as a control variable, should be treated through MANOVA tests to examine subtle gender differences in a proposed research model that presents consumers' behaviour. In this study, the results revealed statistically significant differences in millennial males' and females' sensory experiences after exposure to the selected sensory cues ($F_{(3, 838)}$ = 9,33; $p < 0.0005$; partial $\eta2$ = 0.03). The marginal means for males are higher than those of females (means difference = 0.3756). Statistically significant gender differences also emerged for millennials' purchase intention ($F_{(3, 838)}$ = 5,38; $p = 0.001$; partial $\eta2$ = 0.02). The marginal means for males are higher than those of females (means difference = 0.1695). Gender differences for millennials' sensory experience were more severe than for purchase intention. The results supported hypotheses H4a and H4b,

Several studies conducted in brick-and-mortar shopping malls reported significant gender differences concerning consumers' experiences of, and behaviour in the marketplace (Ameen et al., 2021; Haj-Salem et al., 2016; Katrodia et al., 2018; Lucia-Palacios et al., 2018; Olyott, 2018). Research however also indicates that the product purchased, significantly influences the behaviour of males versus females, in that certain product categories are of more interest to females, while product categories such as cars might be of more interest to men (Chebat et al., 2014; Sohail, 2015). Concerning clothing, the product category of interest in this study, recent South African sales figures indicate that the sales of men's clothing have now exceeded the sales of female clothing (MarketLine, 2018), indicating an increased interest in clothing among men, which is not yet fully understood.

Existing theories related to consumers' behaviour in the marketplace (see Section 3.2.1), as well as consumers' purchase decisions (see Section 3.2.2), are influenced by multiple factors, some of which are personal (such as gender and age, which were attended to in this research), as well as situational factors, such as the country and geographic location (which are also acknowledged in this research) (Cant & Van Heerden, 2021; Erasmus & Mpinganjira, 2019). Clothing product information represents an external influence on consumers' decision-making processes. In this study, it was revealed that clothing product information - representing a mix of extrinsic and intrinsic characteristics, that were included to overcome lack of ability physically examine products, significantly moderated the relationship between millennial men's sensory experience and their purchase intention when shopping online, while the same was not true for their female counterparts (see Section 2.2.3 and 3.2.3). Millennial men's increased interest in clothing as a commodity, and subsequent increasing sales figures for male clothing, may explain this finding

In addition, using a mobile phone application to conduct clothing purchases presents an entirely different situation to what many consumers, at this point in time, including millennials, are accustomed to in physical stores — which is an issue that this research aimed to examine. The issue of gender differences in millennials' clothing purchase decisions is discussed in Sections 2.2.3, 4.3.5, and 4.3.7, accentuating the associated complexities of interest in this research during the purchase decision-making process (see Section 3.2.1 and 3.2.2).

7.6.   The revised conceptual model

The conceptual model that was formulated for this study is presented in Figure 14. According to the empirical results presented in Chapter Six, as well as the summarised outcomes of the replications and hypotheses in Table 24, the conceptual model has been revised to reflect the empirical results of this research and is presented in Figure 21 accordingly.

This study's results reveal a statistically significant positive relationship between visual cues (external stimuli) in the online shopping environment, and consumers' sensory experience (their internalisation of the stimuli), with similar outcomes for the effect of auditory cues. A statistically significant positive relationship was also confirmed between millennials' sensory experience when shopping online (their internalised experience of external sensory cues), and millennials' purchase intentions. Within the S-O-R framework, confirmation is provided that visual and auditory cues (when appropriately applied) as external inputs, significantly influence consumers' experience of an online shopping encounter, exerting a significant influence on shoppers' purchase intentions (the outcome of the online shopping encounter).

The moderating effect of telepresence respectively on the relationship between visual cues and consumers' sensory experience, as well as auditory cues and consumers' sensory experience was statistically significant and positive. The moderating effect of customisation on the relationships between visual and auditory cues and consumers' sensory experience was also statistically significant and positive, indicating that consumers' online experience could be significantly enhanced if the clothing app's design acknowledges the importance of telepresence and customisation in terms of the outcomes of a shopping experience. Finally, the moderating effect of product information on the relationship between consumers' sensory experience and their purchase intention was not statistically significant for the sample overall; neither was it statistically significant for females. However, the contrary was true for males, in that the moderating effect of clothing product information was determined to be statistically significant and positive. The results hence confirm gender differences in millennials' product information requirements. The revised model is presented in Figure 21.
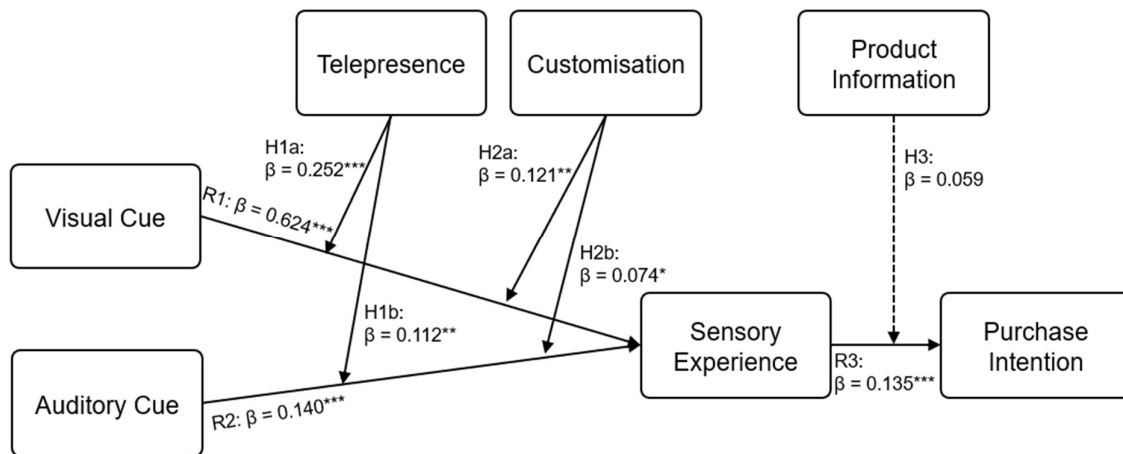
Figure 21: Presentation of the final model

Notes: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; Dotted lines indicate paths that are not statistically significant; solid lines indicate significant paths.

In this research, following the conclusions reached by Bernerth et al., (2018), gender was not captured explicitly in the model as a control variable. Rather, MANOVA was used to examine gender differences, which confirmed revealed statistically significant differences in millennial males' and females' sensory experiences as well as in millennial males' and females' purchase intentions.

7.7. Conclusion

This chapter discussed the findings of this research in terms of the replications and hypotheses, and proposed conceptual model of the study, as illustrated in Chapter Six. The measurement scales that were used in this research were discussed, attending to the quality of the study. Specifically, reliability and validity statistics used to indicate the merit of further analytical procedures, were explicated. Evidence is provided to confirm the proposed relationships between selected constructs in the study, highlighting significant relationships that would positively influence the outcomes (dependent variable: purchase intentions) of an online shopping encounter. The relevance of the effect of the visual and auditory cues (independent variables) on millennials' sensory experience (dependent variable) and subsequent purchase intention (dependent variable), are discussed in terms of the S-O-R framework. All the replications proposed for the study, were statistically supported.

As hypothesised, the respective moderating effects of telepresence, customisation and product information were discussed in terms of their influence on the model. The hypotheses pertaining to the moderating effect of telepresence and customisation, in terms of their influence on the relationships between visual and auditory cues and consumers' sensory experiences, were supported. However, the hypothesis related to the moderating effect of product information was neither supported for the integrated sample nor females, although supported in terms of millennial men's clothing purchase intentions. Gender differences in millennials' sensory experience and purchase intentions were examined and confirmed.

The preceding chapters motivated the relevance of this research, provided a sound theoretical background, and explicated the research design and methodological approach that were adopted for the study, followed by the results, and the findings of the research. The next chapter provides the conclusion of the study.

Chapter eight: Conclusion

8.1. Introduction

The focus of the study: This study was conducted to understand how online shopping, a shopping trend that is gaining momentum in South Africa for multiple reasons, can be improved to enhance, and further encourage this mode of shopping among consumers, specifically in the clothing product category. Per se, online shopping offers multiple financial advantages for retailers, even more so amid trying economic conditions because the overhead costs related to the maintenance of physical stores have become exorbitant (Grewal et al., 2017; Inman & Nikolova, 2017). Furthermore, financial pressure in recent years and additional constraints experienced during the recent COVID-19 health pandemic have caused many international clothing brands to leave the country. Many established clothing retailers simply shut down, while others opted for omni-channel retailing, incorporating online shopping, to survive (Bowker et al., 2020; Omarjee, 2017).

Indisputably, South African online shopping figures are not yet on par with the growth in online sales in more developed countries elsewhere in the world (Statista, 2020c, 2020d). The literature indicates that online shopping holds multiple advantages for consumers, especially in terms of convenience. Particularly advantageous is m-commerce, which provides consumers with the ability to shop around the clock, from wherever they are, using only their smartphones (Dan, 2014; Liu, Lobschat et al., 2019). Unfortunately, online shopping and mobile shopping experiences are still restricted by pertinent limitations that makes it difficult to compare shopping experiences with what is encountered in physical stores.

This research addressed the problem that consumers are still very accustomed to shopping in physical, brick-and-mortar store environments, and while online shopping is a phenomenon that has not yet established itself well in all product categories in South Africa, it is unavoidable that consumers would frame their online shopping experiences with what they are accustomed to in physical stores (Petit et al., 2019). Presently, consumers' online shopping experiences, particularly mobile shopping using their smartphones, are unfortunately still restricted to what the respective technologies can offer (Mpinganjira, 2016). Visual cues, which are product- and shopping-site related, are often readily presented, although visual images are not necessarily optimised to excite the online shoppers (Kim, 2019; Kim et al., 2020; Visinescu et al., 2015). Other sensory cues, namely: haptic (touching), olfactory (smelling) and gustatory (tasting) cues (Biswas, Szocs, et al., 2019; Krishna, 2012) that consumers are exposed to in physical stores, are often not attended to well, are neglected, or are even impossible to replicate in an online

shopping context (Mpinganjira, 2016). While physical stores have experienced multiple challenges in recent years that have led to the closure of many stores across the world (De' et al., 2020; Eger et al., 2021; Koch et al., 2020; Pantano et al., 2020), the in-store environments of physical stores have undergone major changes to lure consumers back to the stores. Experiential retailing, where elements of enjoyment, surprise and excitement are incorporated to stimulate consumers' senses whilst in-store have gained considerable momentum in recent years, elevating the relevance of hedonism to attract and retain customers (Retief et al., 2018). Inevitably, this is extremely difficult to replicate in online shopping. While developments in physical stores are exciting and appreciated, restrictions in terms of the sophistication of online shopping experiences stand in the way of the growth potential of mobile shopping and have been highlighted by several scholars before (Biswas, 2019; Bleier et al., 2019; Petit et al., 2019; Souiden et al., 2019; Yoganathan et al., 2019), and became the topic of interest in this research.

Reasons for focusing on the millennial age cohort: This research particularly focused on the shopping behaviour and preferences of the millennial age cohort, born between 1980 and 2000. The birth years specified by Diedericks (2019), Ryke (2019), and Weber (2017) are applied. An important characteristic of millennials is that they have been exposed to, and experienced technology from an early age and are therefore mostly familiar with technological change, and using technology (Brosdahl & Carpenter, 2011; Lappeman et al., 2020; Twenge et al., 2012), therefore a generation that is likely to shop online. In addition, having entered adulthood only recently, they have considerable potential concerning their contribution to and influence on the marketplace in the future (Bolton et al., 2013; Chang & Watchravesringkan, 2018; Lappeman et al., 2020; Su et al., 2019). More specifically, millennials are of interest to the clothing retail industry due to the cohort's interest in clothing (Cham et al., 2018; Diedericks, 2019; Verdugo & Ponce, 2020; Valaei & Nikhashemi, 2017). Some even describe millennials' fascination with fashion as an obsession (Bakewell & Mitchell, 2003; Valaei & Nikhashemi, 2017) that retailers could capitalise on (Valaei & Nikhashemi, 2017). Clothing is, therefore, an important product category to millennials, due to their personal interest in clothing, and clothing's social significance. Understandably, clothing purchases would require higher involvement from them, increasing the complexity of the clothing decision-making process (Erasmus et al., 2014). Consumer involvement increases when consumers' product choices are driven by a personal, or particular interest in a product, such as clothing (Olyott, 2018) (see Section 2.2.4). Online clothing retailers that wish to attract millennials' attention, are therefore obliged acknowledge this market segment's interest, to reduce perceived risk, and to meet their clothing product expectations (Erasmus et al., 2014).

Several other personal characteristics of millennials are also very attractive to retailers, for example, their willingness to experiment in the marketplace with products and services (Parment, 2013), which means that online shopping would attract their attention. Their strong social affiliation means that they generally frequently mingle with peers, or share information about whatever they are interested in, such as on social media (Bento et al., 2018; Bolton et al., 2013), also indicating that they would share shopping experiences. Millennials have been found to regard shopping as a social event (Diedericks, 2018), sharing online clothing purchase experiences is therefore inevitable. Even more important, is their market size and that they are raising the next generation of consumers (Lappeman et al., 2021). So, if the millennial generation could be convinced to adopt mobile shopping as their mode of preference, it could influence many consumers in the future through consumer socialisation in their homes (Bolton et al., 2013; Chang & Watchravesringkan, 2018; Lappeman et al., 2021; Su et al., 2019).

Clothing as the chosen product category: The product category that this research focused on, in terms of online shopping, is clothing. Being a rather complex product category (Erasmus et al., 2014), an assessment of clothing encompasses an intricate process where both extrinsic and intrinsic product characteristics are considered Retief & De Klerk, 2010). On an online platform, extrinsic properties such as price, brand name and country of origin are generally easy to display. These are also the characteristics that are used as shortcuts (surrogate indicators) to discriminate product quality when a consumer has doubt, for example then reverting to brand names, assuming that certain brand names are of a better quality or more prestigious. Intrinsic properties such as comfort, and texture, are particularly difficult to judge online, while clothing items cannot be tried on to either. Also, with online clothing sales, 2D presentations of merchandise do not do justice to the products, nor would they excite buyers. Online clothing retailers are therefore battling to meet consumers' expectations considering what can be done in physical stores. Therefore, product information that is available and that can be displayed online, should be presented clearly, logically, and visibly to attract online shoppers' attention and to reduce consumers' risk perception (Erasmus et al., 2014; Labuschagne et al., 2012; Retief & De Klerk, 2010). Another issue is that clothing, although functional, also performs a psychological and an aesthetic function, and may be worn to attract attention, or to support or enhance a wearer's self-image (Cham et al., 2018; Diedericks, 2018). This is very important to the millennial cohort who are highly interested in clothing and are often prepared to spend large amounts of money on clothing (Valaei & Nikhashemi, 2017). Due to millennials' interest in clothing, it was envisaged that the study would attract the attention of respondents when invited to participate in the study.

The researcher argued that if clothing purchases are rather complex (Erasmus et al., 2014), it would be even more difficult to deal with online. It is, therefore, crucial that online clothing retailers reconsider their mobile shopping applications and devote more attention to the attraction that m-commerce might have among this generational cohort in boosting clothing retailers' online sales. This would require of retailers' mobile phone applications to be well-designed. Because clothing purchases is not only an activity of purpose, but also associated with excitement and enjoyment (Olyott, 2018), it would make sense to attend to consumers' online sensory experiences when purchasing clothing online, hence, to optimise the contribution that sensory cues could make to retain online shoppers' interest in their merchandise. Focusing on clothing as a product category, provided a worthy challenge, in that the design of a mobile phone app that could successfully facilitate clothing retailers' endeavours to boost online sales, would be well received by the clothing retail industry, and consumers, alike.

Online clothing retail sales: Across industries, the largest global online retail sales revenue stream is clothing, leading the way with a 24% online retail contribution (the details are presented in Section 2.3.3). However, in South Africa, the clothing industry has only recently achieved a 6% online retail sales revenue (Statista, 2020c). Compared to global markets, South Africa as a developing country is, therefore, still lagging with the uptake of online apparel sales (Statista, 2020c, 2020d). This is despite the country's well-developed infrastructure that paved the way for e-commerce and m-commerce to be adapted readily (see Section 2.1.2.4), and recent rapid increases in the infiltration of mobile phones across the population. Almost one-third of South Africans have access to a smartphone (Mpinganjira & Maduku, 2019; Statista, 2020b) that facilitated online shopping. Consequently, despite smartphone applications being available for many years globally, their adoption for online purchases in general, particularly in South Africa, have progressed slower than retailers had anticipated (Kim et al., 2020). This research assumed that disappointingly low online purchase adoption rates, particularly in the clothing category, indicate that something is still lacking with online shopping platforms.

Experience related to shortcomings associated with online shopping: No matter their efforts to supply a broad range of excellent products and services, retailers' focus on products or services alone, is no longer sufficient to gain a competitive advantage (Gentile et al., 2007; Rajaobelina, 2018). Within physical store environments retailers have, for some time now, increasingly adopted the idea of an experience-based economy (Palmer, 2010; Pine & Gilmore, 1998, 1999, 2011; Retief et al., 2018; Schmitt, 1999), incorporating a multitude of atmospheric elements and sensory cues to create in-store experiences that would be more

hedonic in nature, memorable, and leaving customers in awe, so that more enjoyable shopping encounters would influence consumers' purchase decisions favourably (Krasonikolakis et al., 2018; Roggeveen et al., 2020; Spence et al., 2014). The issue of experiential retailing, with all its exciting outcomes (Retief et al., 2018), attracted the attention in this research. It became clear that hedonic experiences have become increasingly important to consumers, and that its equivalent in online shopping has not yet attracted the attention that it deserves. Particularly, shortcomings concerning the incorporation of sensory cues to elevate online shoppers' sensory experiences and boost their purchase intentions is under explored (Bleier et al., 2019; Petit et al., 2019).

At the core of the problem, is that online shoppers cannot handle (clothing) products physically, and mostly, the display of products on online platforms, is not necessarily inspiring. When shopping online, consumers' sensory experiences are mostly shaped by what they can see (visual cues) and hear (auditory cues) (Mpinganjira, 2016). It is however unfortunate that the visual and auditory cues that are incorporated when designing online sites, are not necessarily optimised to attract and retain consumers' attention, and to stimulate a heightened sense of awareness of the merchandise. The term used to describe consumers' awareness of their surroundings while shopping online, is coined telepresence. In literature, telepresence is described as a condition that determines consumers' online sensory experiences (Ye et al., 2020). This concept, when applied skilfully, can be significant to stimulate online shoppers' curiosity, and encourage increased interest in a retailer's offerings. A pleasant, inviting telepresence is likely to encourage online shoppers to linger longer, enhancing their purchase intentions (Ye et al., 2020) - an outcome that retailers so desperately want.

Equally relevant to elevate consumers' online shopping experiences, is customisation, that refers to the generation of unique experiences, thus some form of personalisation of the online shopping experience that creates a sense of personal control while shopping, contributing to pleasant shopping experiences (Rose et al., 2012). Customisation implies that certain elements of the online environment, such as visual and auditory cues could be manipulated in accordance with a consumer's preferences while shopping (Nyadzayo et al., 2019), creating some sense of uniqueness, and a form of personalisation that would create a sense of personal control.

The theoretical perspective adopted for the study: The study was framed within the S-O-R theoretical framework, based on its successful application in previous, similar studies (Bleier et al., 2019; Chopdar & Balakrishnan, 2020; Cunningham & De Meyer-Heydenrych, 2021; Rodríguez-Torrico et al., 2019; Rose et al., 2012). As the theoretical anchor, this framework

allowed the research to consider the influence of selected sensory cues, specifically the incorporation of visual and auditory cues as external stimuli (S) in a skilfully designed mobile phone application to indicate what could be done to boost online clothing sales. This research indicated that sensory cues could, considering available technology, and what could be practically and financially implemented, be manipulated in the online environment. This form of involvement with the mobile phone application personalises the shopping experience, specifically the online shoppers' sensory experience, and cognitive interpretation (O) of an online purchase encounter. Ultimately, this experience enhances consumers' purchase intention - a sought after outcome (R) that retailers would want to achieve from shoppers' online shopping encounters.

The custom designed mobile phone application: Particularly unique in the case of this research, is that a mobile phone application was custom designed for this research under instruction of the researcher by an information technology specialist (see Section 5.6.3). This occurred, following a thorough scrutiny of literature by the researcher, and noting recent developments in retailers' online platforms as well as existing mobile phone applications. The mobile phone app that was designed for this study, could only be downloaded when a respondent was allowed access to the survey. The app allowed the respondents, who had all done online shopping before, to customise their shopping experience by adjusting visual images of clothing products that were on display and manipulating auditory cues (music) to their liking while browsing to complete the assigned shopping task that was presented to them in the form of a vignette. This study was interested in the influence of visual and auditory cues (S) on millennials' sensory experience (O) and purchase intentions when purchasing clothing online (R), culminating as a linear relationship.

The purpose of the research: The research acknowledged shortcomings in clothing retailers' existing online platforms. Progress in online shopping, globally, and realising that South Africa is still lagging in this regard, inspired the researcher to adopt a problem-solving approach to determine how existing shortcomings in the design of online clothing retailers' mobile phone applications that are likely to attract the attention of millennials. The retail industry was hit very hard by the recent, global health pandemic, resulting in many international clothing brands exiting the country, while many prominent clothing retailers had to close their doors after decades of trade. Because the clothing industry is a very important contributor to South Africa's economy, it made sense to focus on the clothing retail industry, specifically on online shopping that is an emerging trend, globally, and that has a promising future, as well as mobile phone applications that have considerable potential in era of technological advancement.

The researcher acknowledged existing challenges that are encountered by clothing retailers concerning online clothing sales, as well as clothing consumers' high expectations concerning clothing merchandising. This research specifically aimed to optimise the potential of mobile phone technology to develop a custom designed mobile phone application as an example of how clothing retailers could enhance their online sales, whilst more aptly attending to consumers' expectations. Presenting a custom designed mobile phone app that was designed based on identified shortcomings in existing online shopping platforms, the newly designed mobile phone app provided respondents the opportunity to adjust and manipulate visual and auditory cues while browsing, to their liking, while conducting an assigned clothing purchase task.

Through interaction with the mobile phone app, the research aimed to examine the relationships between visual and auditory cues, respectively, as external stimuli, and millennials' sensory experiences during the online purchase endeavour. All the respondents had experienced online purchases before, and therefore they were familiar with an online purchase process. The custom designed mobile phone app accommodated selected sensory cues that were possible to manipulate, in a more sophisticated way than is generally done to imitate the kind of experiences that consumers are accustomed to experience in physical stores. Very important to this research, was the outcome after the mobile shopping encounter; thus, the millennials' purchase intentions as an indication of their likelihood to conclude a purchase online, using the app. Potential moderating influences were also acknowledged and examined, specifically, the influence of telepresence and customisation on the relationships between visual and auditory cues, respectively, and the consumers' sensory experiences, as well as how available clothing product information might moderate the relationship between the consumers' sensory experiences, and their purchase intentions.

The need to explore gender differences: Previous studies have confirmed gender differences in consumers' purchase behaviour (Chou et al., 2015; Meyers-Levy & Loken, 2015; Pandey & Chawla, 2018). Accordingly, evidence of gender differences in the shopping behaviour of millennials in the marketplace (Diedericks, 2019; Ryke, 2019) and evidence that clothing sales in the male category has outperformed the sales of female clothing that has been in the leading position for decades, indicated a need to explore gender differences in this research. In this research, following the recommendations raised by other researchers, gender was not treated as a control variable within the model. Instead, possible gender differences were established (see Section 2.2.3 and 4.3.7), whereby the marginal means for males are higher than those of females. The outcomes of the study therefore hold potential for retailers that specialise in male, or female clothing, as well.

Research questions: Six research questions guided the study that aimed to address an existing void in the literature concerning consumers' online or mobile shopping behaviours in emerging-economy settings (Chopdar & Balakrishnan, 2020; Cunningham & De Meyer-Heydenrych, 2021; Diedericks, 2019; Ladhari et al., 2019). Rather than generalising across entire markets, previous literature recommends a focus on specific, viable market segments, owing to shared interests among groups, and shared behaviour that retailers could benefit from as to improve their service offerings (Eastman et al., 2014; Lappeman et al., 2021; Moreno et al., 2017). Furthermore, the influence of sensory cues, when cautiously incorporated as part of consumers' online shopping experiences and subsequent purchase intentions, would contribute to the literature that has to date been constrained by the level of development in technologies, that have not allowed for certain levels of sophistication, and how they can be applied to enhance consumers' shopping experiences. Admittedly, the development of online apps is expensive. Therefore, empirical evidence of the positive contribution that the incorporation of sensory cues could make to enhance consumers' purchase experiences and boost their purchase intentions would be invaluable to retailers to allocate their marketing budgets purposively.

Replications and hypotheses: Following a thorough scrutiny of recent and available literature, replications (reflecting on evidence that exists for different contexts) and hypotheses (that propose novel outcomes that have not been confirmed previously) were developed to guide this research. These were then incorporated in a proposed model that was then statistically tested to verify the anticipated relationships.

Research design and methodology: To meet this study's objectives, a positivist approach was followed, respecting the related assumptions of the research paradigm. Hence, a quantitative survey methodology was followed. The study was cross-sectional and reflected the situation at a specific point in time, considering how technological development and consumer trends, at a particular stage, may differ in the future when conditions have changed (See Chapter Five). Quantitative statistical analyses enabled the assessment of the envisaged relationships in the conceptual model (Figure 14) that was structured within the S-O-R framework, for online shopping in a particular product category (clothing) in South Africa, a developing economy context. The significance of selected moderators concerning consumers' sensory experiences and their purchase intentions were ascertained.

To allow robust statistical analyses to be performed, the constructs in this study were defined and explained in the context of the research in Chapter Three. The constructs were then

operationalised, and an electronic survey was designed in line with the replications, hypotheses, and proposed conceptual model. Snowball sampling, a purposive (targeting millennials in South Africa, in the Gauteng province), non-probability sampling technique was employed to distribute invitations for participation on a social media platform for participation in the research. Eligibility questions were asked to verify that the respondents met the criteria for inclusion in the study. The prerequisites specified the year of birth; the person's prior experience with online shopping in any product category, using mobile technology; and personal experience with clothing purchases during the previous year. The online task required respondents to download a specific app on their Android phones, and to complete an identical, fictitious online shopping task presented as a vignette. This was followed immediately by a structured online questionnaire that reflected on their online shopping experience. The respondents could withdraw at any time, and programmatically, a respondent could not repeat the exercise. The app was also de-activated upon completion of the survey (see the details in Chapter Five).

Data analysis and interpretation: Analysing the data entailed descriptive statistics, which presented an overview and summary of the sample, and the central tendencies within the data, followed by inferential statics using CB-SEM and moderation analyses with the PROCESS macro plug-in. This was done to test and confirm the replications and hypotheses of the study (details are included in Chapter Six). MANOVA was conducted to examine possible gender differences, only focusing on males versus females, as the categories for "other" and "prefer not to disclose" were too small to be analysed separately. These categories were hence ignored for the gender analysis. The researcher made use of an external statistician for assisting with the intricacies in the statistics (see Appendix F) however, the interpretation was the researchers own. Chapter Seven provided a discussion of the results, referring to existing literature, while Chapter eight presents the key findings of the research in relation to the research questions, replications, and hypotheses to indicate the theoretical and business contributions. Limitations experienced are acknowledged, followed by recommendations for future research.

8.2. Key findings related to the research questions for the study

The sub-sections that follow distinguish the discussions in terms of the research questions that guided the investigation.

8.2.1. The influence of visual and auditory cues (RQ1)

This research was interested in the influence of visual and auditory cues on consumers' sensory experiences when using a particular mobile phone app to purchase clothing online (see Sections 3.1.3.4 and 3.1.3.5). Since these relationships had been assessed and verified in various contexts before, replications were posed to confirm the outcomes in the context of this research (see Sections 4.3.1 and 4.3.2). The key relationships tested were the relationship between visual cues and consumers' sensory experience (R_1), as well as the relationship between auditory cues and consumers' sensory experience (R_2).

In this research, the visual cues incorporated in the mobile phone app allowed respondents to rotate 360-degree clothing images while browsing, allowing them to view the images from more angles than what is generally possible when shopping online. Respondents were tasked to select 3 clothing items, that required of them to spend more time browsing the items and exploring the possibilities of the app.

Results indicate that millennials' sensory experience, following their exposure to the visual cues, was significant and positive. Thus, with the inclusion of more sophisticated visual cues (S), respondents' (millennial consumers') sensory experience was significantly enhanced (see Section 7.3.1). Statistically, this relationship also exerted the strongest influence on respondents' sensory experience (O), confirming the importance of attention to visual cues when designing mobile phone apps in terms of their potential influence on consumers' experience (O) when purchasing clothing online (see Section 7.3.1). The outcome was not surprising, as clothing is in essence a visual product, and therefore, effort to enhance the visual interpretation of clothing merchandise, would be appreciated by online shoppers, and worthwhile in terms of retailers' investment.

The relationship between auditory cues that included music, the ability to manipulate sound while browsing, and millennials' sensory experiences of the shopping endeavour was statistically significant and positive. Therefore, appropriate attention to auditory cues as external stimuli (S), in terms of what and how they are implemented, elevate, and positively enhance millennials' online sensory experience (O), which is an important precursor of positive shopping intentions (R) (see Section 7.3.2).

190

Therefore, the positive and significant influence of visual and auditory cues (S) on consumers' or millennials' sensory experiences (O) confirm that these sensory cues are very important, and they deserve more attention when designing mobile phone apps for online clothing retailers. Based on the outcomes of this research, any attempt to cut down on the design costs of apps might be detrimental in terms of consumers' experience of the apps ("once bitten, twice shy"), and jeopardise the likelihood that consumers would use the apps again, in the future. With so much competition in the marketplace, clothing retailers cannot afford to neglect the design of their mobile phone apps, nor neglect to stay abreast of new technological developments. Tech-savvy millennials are likely to be aware of what could be done to improve their shopping experiences, while clothing per se, remains a rather challenging product category to attend to in a highly competitive marketplace where in-store shopping is also advancing.

8.2.2. *The influence of millennials' sensory experience (RQ2)*

This research question focused on how the sensory experience derived from an online shopping encounter when using a particular mobile phone app to conduct clothing purchases will influence consumers' purchase intentions (see Section 3.1.1.2). Since these relationships had been assessed and verified in various contexts before, a replication was posed to confirm the outcomes in the context of this research (see Section 4.3.5). The key relationship tested was the relationship between consumers' sensory experience and purchase intention (R_3).

The key relationship tested, was the relationship between millennials' sensory experience, and their purchase intention (R_3), concluding that a positive and statistically significant relationship exists. Therefore, a pleasant sensory experience (O) is bound to boost consumers' purchase intentions (R) (see Section 7.3.3). This confirms that a pleasant sensory experience positively and statistically significantly influences millennials' purchase intentions when using a mobile phone app to purchase clothing online. Retailers, therefore, have to base their online app design requisites on more than mere functionality and need to admit that consumers have now advanced to, and are accustomed to an "experience-based" economy (Retief et al., 2018) that requires additional effort on the part of retailers to capture their attention, to retain their support, and to lure them from competitors. Admittedly, fierce competition in the marketplace makes it easier for consumers to explore alternative avenues when they are not impressed. First, and longing positive impressions (experiences) are crucial if retailers wish to retain their online shoppers.

8.2.3. The possible moderating effect of telepresence (RQ3)

This research question focused on the possible moderating influence of telepresence in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online (see Section 3.1.4). A hypothesis was proposed that telepresence would moderate the relationship between visual cues and consumers' sensory experiences (H_{1a}) and that the same would apply to the relationship between auditory cues and consumers' sensory experiences (H_{1b}).

The study concludes that telepresence positively and significantly moderates the relationship between visual cues (S) and consumers' sensory experiences (O) (see Section 7.4.1). Telepresence in a mobile phone design, is therefore a very important element to boost or enhance online clothing purchases (see Section 7.4.1). The research, therefore, indicates the importance of telepresence in a mobile phone app to boost or enhance online clothing purchases (see Section 7.4.1). On a practical level and based on the questions in the questionnaire that measured this construct, it means that mobile phone applications should: provide the same (or better) experience as a physical store and create an exciting experience for the shopper in the comfort of his or her own space. A pleasant telepresence provides online shoppers the opportunity to view and inspect clothing on a mobile phone app, becoming immersed in their virtual surroundings, similar to what is experienced in their favourite physical store. This is where the rotatable images of the garments were particularly beneficial to grab shoppers' attention, and to encourage them to continue shopping not to miss out on the experience. Contributing to the telepresence, was the music that could be adapted to a shopper's liking. Inevitable the type and tempo of the music need to be contemplated cautiously to suit the diverse South African market. Finally, the creation of a pleasant telepresence can immerse shoppers so that they lose track of time, forget where they are, not terminating the shopping encounter prematurely.

8.2.4. The possible moderating effect of customisation (RQ4)

This research question focused on possible moderating influence of customisation of selected sensory cues (S) as part of the consumers' sensory experience (O) when using a particular mobile phone app to purchase clothing online (see Section 3.1.5). A hypothesis was proposed that customisation would moderate the relationship between visual cues (independent variables) and consumers' sensory experience (dependent variable) (H_{2a}), as well as between auditory cues (independent variables) and consumers' sensory experience (dependent variable) (H_{2b}).

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Results revealed that customisation positively and significantly moderates the relationship between visual cues and consumers' sensory experience (see Section 7.4.2) and also positively and significantly moderates the relationship between auditory cues and consumers' sensory experience (see Section 7.4.2). An opportunity to customise the sensory stimuli presented by an app, therefore, to adjust visual images (visual cues) and music (auditory cues), provides a sense of personalisation that enhances consumers' sensory experience while shopping. Customisation of sensory stimuli should therefore be prioritised in mobile phone app design to indicate that retailers acknowledge differences in consumers' preferences of atmospheric elements and ambience, and to indicate retailers' willingness to provide a sense of uniqueness - a phenomenon that is especially relevant in the clothing product category (see Section 7.4.2).

8.2.5. The possible moderating effect of product information (RQ5)

This research question focused on the possible moderating influence of product information as an external cue (S) on consumers' sensory experiences (O), and their purchase intention (R) when using a particular mobile phone app to purchase clothing online (see Section 3.2.3). The related hypothesis proposed that clothing product information, because of how it could enhance informed purchase decisions, would moderate the relationship between consumers' sensory experiences and their purchase intentions (H_3).

Literature indicates that the availability of relevant, comprehensible product information reduces consumers' risk perception on multiple levels (psychological, social, functional and performance risk) (Erasmus et al., 2014; Labuschagne et al., 2012; Retief & De Klerk, 2010). In this study, product information did not significantly moderate the relationship between consumers' sensory experiences and their purchase intentions (see Section 7.4.3). Therefore, evidence shows that, amid a positive sensory experience, that creates a sense of pleasure, product-related information does not significantly moderate online consumers' decision outcomes (purchase intentions). One explanation would be that it is not possible to display all the intrinsic clothing product information online, for example information concerning comfort and fit. More effort should therefore be made to display extrinsic information, clearly, such as size of clothing, and care instructions as basic information might not be enough to favourably moderate consumers purchase intention. In addition, more needs to be done to elevate consumers' sensory experiences, by paying more attention to how visual and auditory cues as external stimuli are incorporated when designing mobile phone apps. When investigating possible gender differences, product information positively and significantly moderated the relationship between millennial men's sensory experience and their purchase intentions,

although the same was not true for females, nor for the sample overall. It is possible that millennial men's increased interest in clothing (Diedericks, 2018), as indicated by a remarkable increase in sales figures for men's clothing in recent years could explain this outcome. Probably, millennial men, are more rationally inclined when evaluating clothing merchandise, and would therefore be more interested in clothing product information, such as the brand name, fibre content, and country of origin. While product information may be relevant and important, for the consolidated sample, it is apparently not crucial to boost consumers' sensory experiences, which was the topic of investigation here.

8.2.6. Gender differences (RQ6)

This research questioned possible gender differences in the relationship of this study's conceptual model (see Section 2.2.3). It was proposed that gender would yield different results for millennials' sensory experiences (H_{4a}) (a dependent variable), as well as for millennials' purchase intentions (H_{4b}) (a dependent variable), following exposure to selected sensory cues when shopping online. The results revealed statistically significant differences in millennial males' and females' sensory experiences after exposure to the selected sensory cues as well as significant gender differences for millennials' purchase intention. Gender differences for millennials' sensory experience were more severe than for their purchase intention.

Apparently, therefore, the shopping experiences of females seem to be slightly more emotionally laden, owing to the significantly weaker moderating influence of product information on their responses (see Section 7.5 and 8.2.5); and, thus, their purchase intentions. Significant gender differences in consumers' experience of a mobile phone app and their subsequent behaviour suggest that organisations or retailers need to consider different approaches when marketing and selling gender-specific clothing merchandise.

8.2.7. Summary

The purpose of this research has been achieved because each of the key relationships that were formulated for the research could be tested, and empirical evidence could be provided to answer the research questions appropriately. In conclusion, the effect of gender was tested by means of MANOVA, rather than to consider gender as a control variable within the envisaged conceptual model. Pertinent gender differences were detected and reported, with evidence that millennial men's online purchase decisions are more rational, involving clothing product information, while millennial females' clothing purchase intentions are more strongly directed by emotions based on their sensory-related responses. Relevant parts of the document that

pertain to the research questions are summarised in Table 25, serving as a conclusion surrounding how the purpose of the research was achieved.

Table 25: Sections of the document that relate to the study's research questions

Research question	Theoretical support	Results	Discussion
RQ1: How do visual and auditory cues influence consumers' sensory experience when using a particular mobile phone app to purchase clothing online?	Sections 3.1.3.4 and 3.1.3.5	Section 6.5.1.2	Sections 7.3.1 and 7.3.2
RQ2: How does the sensory experience derived from an online shopping encounter, when using a particular mobile phone app to conduct a clothing purchase, influence consumers' purchase intention?	Section 3.1.1.2	Section 6.5.1.2	Section 7.3.3
RQ3: What is the moderating influence of telepresence in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online?	Section 3.1.4	Section 6.5.2	Section 7.4.1
RQ4: What is the moderating influence of customisation in terms of consumers' experience of selected sensory cues as part of their sensory experience when using a particular mobile phone app to purchase clothing online?	Section 3.1.5	Section 6.5.2	Section 7.4.2
RQ5: What is the moderating influence of clothing product information between consumers' sensory experiences and their purchase intention when using a particular mobile phone app to purchase clothing online?	Section 3.2.3	Section 6.5.2	Section 7.4.3
RQ6: How does gender influence the relationships in the conceptual model for this study, which specifies specific interactions during an online shopping encounter when using a particular mobile phone app to conduct a clothing purchase?	Section 2.2.3	Section 6.5.3	Section 7.5

8.3. Contributions of the study

According to the results reported in Chapter Six and the associated key findings discussed in Chapters Seven and Eight, this study offers numerous valuable practical, methodological, and theoretical contributions, which are discussed below.

8.3.1. Theoretical contribution

An important theoretical contribution of this study pertains to the scarcity of evidence on the use of both visual and auditory cues in online settings and their potential influence on consumers' experience of online shopping encounters and their shopping intentions (Biswas, 2019; Petit et al., 2019; Souiden et al., 2019; Velasco et al., 2021; Yoganathan et al., 2019). Previous research on consumers' online sensory experiences focused predominantly on a single cue (Helmefalk & Berndt, 2018), generally visual in nature, owing to the prevailing technological limitations that made it difficult, impossible, or too expensive to apply effectively otherwise.

Auditory cues were also considered in previous research, but only sporadically (Biswas, 2019; Krishna, 2012), indicating that consumers' perceptions in terms of their exposure to a combination of sensory stimuli have, to date, been restricted to a selected few. This study incorporated both visual and auditory cues in a fictitious online shopping task that was enabled through a custom designed mobile phone application that is attracting considerable interest as part of m-commerce (see Section 5.6.3). The study has provided insight into the reality that both of these sensory cues positively and significantly influence consumers' sensory experiences (see Section 8.2.1), indicating that retailers should upgrade their mobile clothing apps to make their shopping encounters more exciting.

The second theoretical contribution of this study relates to the lack of attention in previous research to the presence of attributes that remind of much appreciated attributes of physical stores as part of the consumers' online shopping experiences (Bilgihan et al., 2016; Bleier et al., 2019; Chen et al., 2019; Dastane et al., 2020; Grewal et al., 2020; Hadi & Valenzuela, 2020; Kim et al., 2015; Novak et al., 2000; Petit et al., 2019; Pfeiffer et al., 2020). This study examined the role of telepresence, customisation, and product information during the online shopping encounter, within the S-O-R framework. In the case of telepresence, respondents were exposed to an app that tried to simulate auditory experiences in a physical store. Regarding customisation, respondents could manipulate the visual and auditory cues to their liking, as a form of personalisation, while the study included a display of extrinsic and intrinsic clothing product attributes to enable informed clothing decisions as if the respondents were

196

present in a physical store. The respective influencing variables were integrated within the S-O-R framework, which guided the flow of the study and aligned the constructs logically (see Sections 8.2.3, 8.2.4 and 8.2.5). Compared to existing online shopping, the online shopping process in this study was therefore more aligned with physical store experiences.

The third contribution of the study relates to the research being framed within the S-O-R framework, as this framework that proposes a linear relationship between external stimuli, cognitive interpretation, and the subsequent behavioural outcome, has not yet been optimised for online research in developing market contexts (Chopdar & Balakrishnan, 2020; Cunningham & De Meyer-Heydenrych, 2021). This theoretical framework guided the alignment of the conceptual model for the research. Therefore, the suitability of the S-O-R framework was successfully applied in the context of a developing market (see Sections 2.1 and 4.1).

The fourth contribution relates to the issue that theories originating from developed markets are not generalisable to a developing country (Izogo & Jayawardhena, 2018; Mukherjee, 2014). This study responds to the recent calls for further research in the context of a developing country setting. South Africa served as an example of a developing market context (see Section 2.1.2), although limiting the recruitment of respondents to the Gauteng province. This was done because Gauteng is the economic hub of the country, with the largest population size, and a well-developed infrastructure allowing for internet access that is a requirement to conduct online shopping seamlessly. The population in this province is also denser than elsewhere in the country, which allowed a large sample to be recruited.

Furthermore, the research contributes to a better understanding of millennials' online clothing shopping purchase behaviour, which is not yet fully understood, having resulted in calls for further research (Diedericks, 2019; Ladhari et al., 2019; Lappeman et al., 2020). Millennials in Gauteng served as the target population (see Section 2.2), while the focus was on the clothing product category, as presented by the online retail clothing industry (see Section 2.3.4). As a result of pertinent differences in consumers' product decisions across different product categories (Erasmus et al., 2014), it is crucial to focus and limit a study to a specific product category, even when online shopping is the focus of the investigation. Retailers that offer diverse products as part of their online sales portfolio need to understand that no approach can be regarded as "one-size-fits-all" across the different product categories. Clothing in particular, is a complex product category that involves a consideration of a multitude of factors during the purchase process. Because of the significance of clothing retail for the South African economy, clothing seemed a worthy category to focus on.

197

Evidence of significant gender differences in millennials' experience of sensory cues in an online shopping environment, as well as significant differences in the value of product information contributes to a better understanding of millennials' expectations, needs and perceptions in the marketplace. Millennial men seem significantly more rationally orientated, valuing objective product information when concluding clothing purchase decisions online, also being fuelled by sensory stimuli. However, their female counterparts seemed more emotionally inclined, significantly valuing sensory stimuli in terms of their overall sensory experience of online shopping and their subsequent purchase intentions. Relevant product information did not significantly moderate millennial females purchase outcomes.

Lastly, the research makes a contribution to calls for further research to explore consumers' online shopping behaviour and their related sensory experiences (Becker & Jaakkola, 2020; Biswas, 2019; Grewal & Roggeveen, 2020; Heller et al., 2019; Moreau, 2020; Reynolds-McIlnay & Morrin, 2019). There have also been promising results in how online shopping, specifically mobile shopping, could be enhanced to encourage this shopping mode. This study assists in filling the gap in the literature to explain consumers' behaviours and the sensory experiences associated with mobile shopping applications (see Sections 3.1.1.2, 3.2.4.2, 7.3.3 and 8.2.2).

8.3.2. Methodological contribution

The first methodological contribution relates to scant assessments of consumers' sensory experiences in real-time (Collins et al., 2003; Kubiak & Krog, 2012; Kumar et al., 2014; Lemke et al., 2011). Delays in data collection, which result in gathering data after a considerable time lapse has occurred between the actual experience and being questioned about it, create opportunities for imprecise accounts to be made regarding how a consumer felt during their shopping experience. Generally, consumers' recollections of their interactions with organisations or retailers diminish rather rapidly, while they could also be prejudiced by the results of their final transactions (Stein & Ramaseshan, 2019). Theoretically, a consumer's satisfaction with a purchase or experience is delayed to primarily only capture the post-purchase experience (Donoghue & De Klerk, 2010; Makopo, Klerk, & Donoghue, 2019). This study implemented quantitative real-time assessments of consumers' sensory experiences, which were collected immediately after the respondents had completed the fictitious online clothes shopping task (see Section 5.10.1). This method provided a more accurate account of the respondents' true responses, providing improved insights for further analysis.

The second contribution relates to scant assessments regarding consumers' sensory experience when using mobile phone applications (Becker & Jaakkola, 2020; Biswas, 2019; Grewal & Roggeveen, 2020; Heller et al., 2019; Moreau, 2020; Reynolds-McIlnay & Morrin, 2019). Smartphones are the devices of choice for South African e-commerce consumers (Pentz et al., 2020). Millennials (the target market) are tech-savvy; hence a mobile phone is an ideal platform to gain insights from this generational cohort. This study made use of a mobile phone application that respondents had to download first before having to complete a custom designed, fictitious online clothes shopping task as well as a questionnaire (see Sections 5.6 and 5.7). This had also not been done before, and the possibilities of implementing such a custom designed mobile app hold considerable potential in how retailers can distinguish themselves. In the technological era that we are living in presently, the potential of technology is not only exciting, but needs to be embraced, to benefit from it. As a similar shopping app could not be found, this app development process reminds of the principle of leapfrogging (Batinge et al., 2017), whereby South Africa, which is still lagging in terms of online sales compares to Western countries, is now contributing ideas to optimise technology to the benefit of retailers and consumers, alike.

Lastly, there is limited evidence of the use of online sensory cues, specifically visual and auditory cues, to boost online shoppers' experiences (Biswas, 2019; Hwang et al., 2020; Kim & Forsythe, 2009; Petit et al., 2019; Souiden et al., 2019; Yoganathan et al., 2019). This study applied a vignette design, using available mobile phone application technology to produce cues that could be manipulated. This is providing valuable insights into how this technique can be conducted practically in future research while also providing ideas about strategies that could be incorporated in actual commercial apps in the future (see Section 5.6.3).

8.3.3. Practical contribution

This study has offered numerous practical insights that are valuable for mobile phone application development. The findings indicate that both visual and auditory cues influence consumers' sensory experiences, which positively influence consumers' purchase intention. Therefore, retailers should consider the inclusion of both sensory cues when designing mobile phone applications if they wish to retain millennials' attention and interest, even more so because millennials are mostly tech-savvy which means that shortcomings in app design would be easily noted.

Furthermore, telepresence and customisation significantly increase the relationships between consumers' exposure to sensory cues and their sensory experiences. The value of

customisation with app design should therefore not be underestimated in terms of providing online shoppers with a sense of control, as well as increased similarity to what they are accustomed to in physical stores. Therefore, retailers should attend to measures to enhance a telepresence and customisation in mobile phone app designs to retain consumer's interest.

Product information is an important element that need to be included in mobile phone apps design to enable online consumers to better discriminate among product alternatives while they are not able to physically examine the products. Therefore, more needs to be done to boost consumers' sensory experiences, and that is possible by paying more attention to the presentation of sensory cues/stimuli when designing mobile apps. In the gaming industry, sound, and visuals are highly relevant - an issue that has not been optimised by clothing retailers yet. Product information, in this study that focused on clothing merchandise, significantly enhanced millennial men's purchase intentions following a positive sensory experience, indicating that millennial men are more inclined to make rational clothing purchase decisions. Millennial men's attention to quality clothing features was also confirmed in another South African study (Diedericks, 2019). Pertinent, significant gender differences in millennials' reactions to sensory cues and product information are valuable to guide retailers in terms of the content that they regard as non-negotiable when designing mobile phone apps for online shopping purposes. These practical insights should be considered by global organisations and managers when competing in the South African market for inclusion in their online solution.

8.3.4. Conclusion

To conclude, the findings of this study have confirmed the validity of the S-O-R framework as a theoretical foundation to understand how consumers' clothing purchase intentions can be influenced when using mobile phone applications. The research was conducted in a developing country, South Africa, indicating that visual and auditory cues (external stimuli: S) influence millennial consumers' experiences of an application (organism: O) and their subsequent purchase intentions (response: R). The moderating effects of telepresence, and customisation on the relationships between visual and auditory cues and consumers' sensory experiences, provide valuable evidence of how retailers could design unique apps to their advantage. The moderating effect of product information on the relationship between consumers' sensory experience and their purchase intentions produced very enlightening evidence concerning the design of apps that can certainly not follow a "one-size-fits-all" approach: gender differences are worth noting. A conceptual model was also presented to indicate the significant relationships among the relevant constructs of this research; although, gender differences are not indicated in the model, as it was not treated as a control variable.

An increase in online shopping, globally, and expectations that online shopping will become more pertinent in developing countries such as South Africa, in the future, provides an opportunity for so-called leapfrogging, indicating a "window of opportunity" (Perez & Soete, 1988). South Africa can be regarded as a latecomer in adopting new technologies and online shopping compared to the front runners in developed countries. Evidence produced in this research, however, provides opportunity for South African clothing retailers to leap over them (Batinge et al., 2017), producing evidence of how mobile phone apps could be enhanced, globally. This would avoid obstacles such as intellectual property rights registered by forerunners that would make app design, locally, even more expensive in the future. In reality, the use of both visual and auditory cues is customary in the design of mobile phone applications for games (Choi et al., 2018), yet, not well applied, if at all, in online retail shopping, providing an opportunity to leapfrog the online retail industry!

8.4.   Limitations of the study

While this research has offered various practical, methodological, and theoretical contributions, certain limitations should be noted. The first was the mobile phone application design and practical use; whereby, the mobile phone app was designed for one mobile operating system, Android, as it was too expensive to include applications for other operating systems as well. This limited the participation of participants with devices using other operating systems in the research. Because the participating respondents were restricted to those who owned Android phones, the generalisability of the results may be influenced. Future designs should consider cross-platform applications or website integration (mobile web) options, which would also remove the requirement to download the mobile phone app and save on data costs for the respondents.

The second limitation was that the study was based on a vignette design, which may have biased or skewed the respondents' responses. During the shopping experience in physical stores, other cues would also be relevant, for instance, the presence of touch or smell. These are all aspects that were not possible to account for due to the current technological limitations of mobile devices. However, future studies may be able to consider alternative ways to investigate these sensory stimuli.

The final limitation pertains to the study's methodological issues. Since the research method was quantitative, assessing the respondents' responses in more depth and qualitative detail

was not possible. Despite these limitations, this research has offered valuable insights for online retailers targeting millennial consumers residing in South Africa's Gauteng province. Nonetheless, these limitations do offer some avenues for future research, as proposed next.

8.5. Recommendations for future research

This study was limited to only one geographic area, namely the Gauteng province in South Africa. This province makes the highest contribution to the overall population of the country, as well as the highest contribution towards its millennial population, also representing as highest income levels in South Africa. There is no reason to think that Millennials in other provinces in the country, who possess smart phone technology, and who shop online, will act differently as the study focused on the capabilities of the mobile phone apps and how millennials respond to it during use. The geographic area in the country where the mobile phone app is used, is not expected to influence millennials' perceptions in any way as the location has no relevance. However, the larger challenge concerns geographical areas outside of South Africa where the socio-cultural context, which influences people's overt behaviour, and where online purchasing is more, or less established compared to South Africa, influence the frame of reference used to conduct online purchases. Future studies could therefore replicate the study or expand the study to explore and compare millennials' behaviour in different circumstances. Business managers could learn from the South African study, and apply the insights concerning the importance of sensory experiences when competing in the local market, and to improve their mobile phone apps to interact with their existing operating markets as the competition among clothing retailers has become particularly rife since the onset of the COVID-19 pandemic in 2020.

Furthermore, only the millennial cohort was selected, making use of the birth date interval between 1980 and 2000. Yet millennials themselves are at different stages of their life, with some, for example, thinking about starting a family or sending their firstborn to high school, while others only now finishing high school. This means that their needs and behaviours might differ even within this age category. Therefore, future research should consider further age segmentation within this cohort, for example, birth dates between 1980 and 1989, versus 1990 to 2000. Furthermore, the study setting selected only clothing as a retail choice, and the vignette focused on a specific purchasing situation for the clothing product category. As information-seeking behaviour might differ across product categories, subsequent studies could focus on categories were, for example, product information might be more crucial such as major household appliances.

In addition, given that visual and auditory cues only partly explain a consumer's sensory experience, future studies could investigate the use of additional senses such as touch when technology is capable of doing so, as well as further functionality such as "zooming in" using one's fingers to touch the product images or squeezing and stretching the clothing fabric online (Silva, Rocha, De Cicco, Galhanone, & Manzini Ferreira Mattos, 2021; Velasco et al., 2021). These should be investigated as a means of increasing consumer interaction. Further research into gender differences, such as type of product information consumers regard useful that might positively sway purchase intentions, could provide additional insights.

8.6. Conclusion

This study was performed as a result of the lag in online clothing purchasing in South Africa compared to developed markets. Millennial consumers form a lucrative target market due to their obsession with clothing and their known technological characteristics, so they were selected as the sample population of this study. Mobile phone applications are expensive to develop, and retailers would benefit from mobile phone apps that are more effective in producing more transactions, as this would assist them in recovering the development costs. The findings indicate that visual and auditory cues significantly enhance millennials' sensory experiences, which positively influence their purchase intentions. Retailers should therefore consider optimising these sensory cues during the design of their mobile phone applications. In addition, telepresence and customisation increase the relationships between the two sensory cues and sensory experience, accentuating the importance of immersive experiences with a form of personalisation in mobile phone app designs. Product information was an important element to be included as part of mobile phone app features. This seemed significantly more relevant to millennial men, indicating more rational decision-making among men when purchasing clothing online. Finally, gender differences in millennial consumers' experiences and behaviours should be noted by clothing retailers so that their consumers' needs are aptly addressed.

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216

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233

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Appendix A – Questionnaire used in this study

The interplay of visual and auditory cues, telepresence, customisation and product information on millennials' online sensory experiences and clothing purchase intentions

Douwes Sorgdrager is currently a student at the University of Pretoria's Gordon Institute of Business Science (GIBS) and is conducting research as part of his doctorial (PhD) study. The research focuses on how visual and auditory cues (what a consumer sees and hears) interplay with millennials' online sensory experiences and their intention to eventually purchase the products that they have been introduced to. The research admits that certain personal and external factors may also influence the experience, for example a consumer's ability to navigate the application and their product knowledge. This research will help to better understand consumers' online sensory experiences and should take no longer than 20 minutes of your time to complete.

Before completing the questionnaire, you will need to complete a few screening questions to ensure that you are eligible to participate in this study which focuses on a specific market segment that retail is particularly interested in. You will also have to download the mobile phone application. Thereafter, you are required to interact with the application by attending to the instructions, namely, to select and place a minimum of three clothing items for yourself or someone else in the online shopping cart. Once you select "shopping cart", the task will be complete, and you will be directed to the questionnaire.

Your participation is voluntary, and you can withdraw at any time without penalty. You will not receive any form of remuneration for participation in this academic study, nor will you be expected to pay for the items that you have selected, or to provide any banking details after you have made your purchase selection. Your participation is anonymous and only aggregated data will be reported. By completing the questionnaire, you indicate that you are voluntarily participating in this research.

Thank you for your valuable contribution!

Kindly go to the following site to start the screening questions: **https://tinyurl.com/MyClothesSA**

This study is specifically researching clothing and therefore excludes any other items, such as accessories (i.e., ties, belts, sunglasses, handbags and shoes).

If you have any concerns, please contact:

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Research supervisor name: Prof. Alet Erasmus

Contact details: ErasmusA@gibs.co.za or 082 784 2467

Screening questions

Please indicate yes or no to the following question:

Screening question		
1. Are you auditorily challenged (have a hearing problem)?	Yes	No

If you answered **yes** to the above question, you do not have to complete the questionnaire. Thank you for your time.

Screening questions continued:

Screening questions continued		
2. Were you born between 1980 and 2000?	Yes	No
3. Do you reside in Gauteng, South Africa?	Yes	No
4. Do you have access to an Android software-based cell phone (smartphone)?	Yes	No
5. Have you purchased clothing for yourself or somebody else during the previous twelve months?	Yes	No
6. Have you purchased online before (can be any product)?	Yes	No
7. Is your net monthly household income (after deductions) R9000 or more?	Yes	No

If you answered **no** to any of the above questions, you do not have to complete the questionnaire. Thank you for your time.

If you qualify to participate in the study, you can now continue to download the mobile phone application (Note: this only appears if the answers all the questions 1 to 7 are "yes").

Section A – Demographic and other information, when starting the mobile phone application

Dear respondent, please ONLY tick ONE option for every question.

A1

Gender	Select
Male	1
Female	2
Other	3
Prefer not to disclose	4

A2

Monthly income bracket	Select
Is your net monthly household income (after deductions) between R9000 and R65 000?	1
Is your net monthly household income (after deductions) above R65 000?	2

Next follows the online shopping task.

You are required to interact with the application by selecting and placing a minimum of three items in the online shopping cart. Once you select "shopping cart", the task will end, and you will be directed to the questionnaire.

SECTION B: Visual Cues

Answer the statements below on a scale of 1 to 7, where 1 is "strongly disagree" and 7 is "strongly agree", to indicate the extent to which you agree with each of the following statements

Visual Cues									
VC1	The mobile phone app is visually attractive (nice looking) to me.	1	2	3	4	5	6	7
VC2	The mobile phone app presents visually attractive graphics/ images.	1	2	3	4	5	6	7
VC3	I like the way the mobile phone app looks.	1	2	3	4	5	6	7
VC4	The products are presented in a visually attractive way.	1	2	3	4	5	6	7
VC5	I like the fact that I can view the clothes from various angles on this mobile phone app.	1	2	3	4	5	6	7
VC6	The appearance of this mobile phone app encourages one to use it.	1	2	3	4	5	6	7

255

SECTION C: Auditory Cues

Answer the statements below on a scale of 1 to 7, where 1 is "strongly disagree" and 7 is "strongly agree", to indicate the extent to which you agree with each of the following statements

Auditory Cues									
AC1	I like the inclusion of background music in this mobile phone app.	1	2	3	4	5	6	7
AC2	I like to hear the background music while using this mobile phone app.	1	2	3	4	5	6	7
AC3	I liked that there was a variety of background music types while using this mobile phone app.	1	2	3	4	5	6	7
AC4	It is nice that the background music changes when one clicks the buttons of this mobile phone app.	1	2	3	4	5	6	7
AC5	The background music enhanced my experience of this mobile phone app.	1	2	3	4	5	6	7

SECTION D: Sensory experience

Answer the statements below on a scale of 1 to 7, where 1 is "strongly disagree" and 7 is "strongly agree", to indicate the extent to which you agree with each of the following statements

Sensory Experience									
SE1	Using a combination of audio-visual (hearing and seeing) senses enhances my sensory experience of this mobile phone app.	1	2	3	4	5	6	7
SE2	It was nice that this mobile phone app engaged more of my senses than only visual stimuli.	1	2	3	4	5	6	7
SE3	Using this mobile phone app was a pleasurable sensory experience.	1	2	3	4	5	6	7
SE4	The sensory experience, when using this app, influenced my mood positively.	1	2	3	4	5	6	7
SE5	The sensory experience, when using this app, positively enhanced my experience of a clothing purchase activity.	1	2	3	4	5	6	7

256

SECTION E: Purchase intention

Answer the statements below on a scale of 1 to 7, where 1 is "strongly disagree" and 7 is "strongly agree", to indicate the extent to which you agree with each of the following statements

Purchase intention									
PI1	I am willing to purchase clothing products from a mobile phone app that is similar to this one.	1	2	3	4	5	6	7
PI2	The likelihood of me purchasing clothing products using a similar mobile phone app is high.	1	2	3	4	5	6	7
PI3	The probability that I would consider buying clothing through a similar mobile phone app in the near future is high.	1	2	3	4	5	6	7
PI4	I would prefer a mobile phone app similar to this one when buying clothing products from an online retailer that I like.	1	2	3	4	5	6	7
PI5	A mobile phone app like this one, would change the way in which I purchase clothing in the future.	1	2	3	4	5	6	7

SECTION F: Telepresence

Answer the statements below on a scale of 1 to 7, where 1 is "strongly disagree" and 7 is "strongly agree", to indicate the extent to which you agree with each of the following statements

Telepresence									
TP1	Using this online shopping app provided the same (or better) experience as a physical store.	1	2	3	4	5	6	7
TP2	This mobile clothing shopping app created a new world for me in the comfort of my own space.	1	2	3	4	5	6	7
TP3	I could view and inspect the clothes on this mobile phone app similarly to what I would in a physical store.	1	2	3	4	5	6	7
TP4	This mobile phone app grabs my attention so that I want to continue the shopping experience.	1	2	3	4	5	6	7
TP5	When I used this mobile phone app for clothing, I lost track of time.	1	2	3	4	5	6	7
TP6	When I used this mobile phone app for clothing, I almost forgot where I was physically.	1	2	3	4	5	6	7
TP7	While shopping on this mobile phone app, I felt like I was in an "imaginary world".	1	2	3	4	5	6	7

SECTION G: Customisation

Answer the statements below on a scale of 1 to 7, where 1 is "strongly disagree" and 7 is "strongly agree", to indicate the extent to which you agree with each of the following statements

Customisation									
CU1	I liked the fact that I could control the view of the clothes from various angles on this mobile phone app.	1	2	3	4	5	6	7
CU2	I liked the fact that the background music responded to my clicking actions on this mobile phone app.	1	2	3	4	5	6	7
CU3	I liked the fact that I could change the background music while using this mobile phone app.	1	2	3	4	5	6	7
CU4	I like the fact that I could control the selection functions on this mobile shopping app.	1	2	3	4	5	6	7
CU5	It was comforting to feel that I could browse for clothing on this mobile phone app at my own pace.	1	2	3	4	5	6	7
CU6	It was comforting to feel that I could browse for clothing on this mobile phone app without the distraction from physical store activities.	1	2	3	4	5	6	7
CU7	I liked that this mobile shopping app personalised my shopping experience when I used it.	1	2	3	4	5	6	7

SECTION H: Product information

Answer the statements below on a scale of 1 to 7, where 1 is "strongly disagree" and 7 is "strongly agree", to indicate the extent to which you agree with each of the following statements

Product Information									
Product Information: Subscale for intrinsic formal physical attributes									
IP1	This mobile phone app provides enough information to assess the available colours of the products.	1	2	3	4	5	6	7
IP2	This mobile phone app provides enough information to assess the fibre content (makeup) of the clothing.	1	2	3	4	5	6	7
IP3	This mobile phone app provides enough information to assess the design (style) of the clothing.	1	2	3	4	5	6	7
IP4	This mobile phone app provides enough information to assess the quality of the construction of the clothing.	1	2	3	4	5	6	7
IP5	This mobile phone app provides enough information to assess the functional performance of the textiles and other materials used.	1	2	3	4	5	6	7
IP6	This mobile phone app provides enough information to assess the finishes of the clothing.	1	2	3	4	5	6	7

Product Information								

Product Information: Subscale for intrinsic aesthetic attributes								
IA1	The way in which the clothing is presented on this mobile phone app is appealing to me.	1	2	3	4	5	6	7
IA2	The mobile phone app evoked my curiosity about the clothing products on display.	1	2	3	4	5	6	7
IA3	The clothing items on this mobile phone app were inspiring.	1	2	3	4	5	6	7
IA4	The display of products on the mobile phone app is attractive.	1	2	3	4	5	6	7
IA5	From the pictures presented on this mobile phone app, I have enough information to assess the appearance of the clothing.	1	2	3	4	5	6	7

Product Information: Subscale for intrinsic functional attributes								
IF1	This mobile phone app displays the clothing product care instructions that I need.	1	2	3	4	5	6	7
IF2	The app presents enough information to assess the fit of the clothing.	1	2	3	4	5	6	7
IF3	The app presents enough information to assess the durability (service life) of the clothing.	1	2	3	4	5	6	7
IF4	The images of the clothing present a good idea of the suitability of the clothing in terms of my needs.	1	2	3	4	5	6	7
IF5	The clothing product information presented on this mobile phone app is enough to make a decision about the functional attributes.	1	2	3	4	5	6	7
IF6	The information presented on this mobile phone app indicates the purpose of the clothing adequately.	1	2	3	4	5	6	7

Product Information: Subscale for extrinsic attributes								
EA1	This mobile phone app presents enough information to assess the price of the clothing.	1	2	3	4	5	6	7
EA2	This mobile phone app presents enough information to assess the brand information.	1	2	3	4	5	6	7
EA3	This mobile phone app presents enough information to assess the origin of the clothing.	1	2	3	4	5	6	7
EA4	This mobile phone app presents enough information to assess the sizing of the clothing.	1	2	3	4	5	6	7

Thank you for taking the time to complete this task and questionnaire!

Appendix B – Descriptive results: results and discussion

This appendix presents a detailed overview of the descriptive results of the research. It is structured into two broad sections: the descriptive statistics results, and deliberations on these results.

Results

Construct: Visual cue

This section presents the descriptive statistics related to the visual cues. The items were graded on seven-point Likert scales as follows: 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree nor disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree) (see Section 5.7.2). Table B.1 lists the standard deviations and mean scores for the visual cue items.

Table B.1: Descriptive statistics for visual cues

Items		Mean	SD
VC1	The mobile phone app is visually attractive (nice looking) to me.	5.05	1.04
VC2	The mobile phone app presents visually attractive graphics/ images.	5.10	1.11
VC3	I like the way the mobile phone app looks.	5.07	1.15
VC4	The products are presented in a visually attractive way.	4.94	1.15
VC5	I like the fact that I can view the clothes from various angles on this mobile phone app.	5.13	1.24
VC6	The appearance of this mobile phone app encourages one to use it.	5.01	1.17
	Overall score	5.05	0.92

Key: SD – standard deviation scores

The visual cues construct comprised of six items that were evaluated on a seven-point Likert scale. As shown in Table B.1, the respondents agreed with the statement VC5 the most: "I like the fact that I can view the clothes from various angles on this mobile phone app" (mean = 5.13; SD = 1.24). Conversely, the respondents disagreed with the statement VC4 the most: "The products are presented in a visually attractive way" (mean = 4.94; SD = 1.15), thus agreeing that the 360-degree rotation pictures are nice to view but disagreeing that the products are presented in an attractive way. The total standard deviation and mean values for the visual cues were 0.92 and 5.05 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the visual cue construct.

Construct: Auditory cue

This section presents the descriptive statistics related to the auditory cues. The items were graded on seven-point Likert scales as follows: 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree nor disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree) (see Section 5.7.2). Table B.2 lists the standard deviations and mean scores for the auditory cue items.

Table B.2: Descriptive statistics for auditory cues

Items		Mean	SD
AC1	I like the inclusion of background music in this mobile phone app.	4.41	1.39
AC2	I like to hear the background music while using this mobile phone app.	4.38	1.38
AC3	I liked that there was a variety of background music types while using this mobile phone app.	4.50	1.28
AC4	It is nice that the background music changes when one clicks the buttons of this mobile phone app.	4.29	1.45
AC5	The background music enhanced my experience of this mobile phone app.	4.36	1.42
	Overall score	4.39	1.22

Key: SD – standard deviation scores

The auditory cues construct consisted of five items measured on a seven-point Likert scale. From Table B.2, the respondents agreed with the statement AC3 the most: "I liked that there was a variety of background music types while using this mobile phone app" (mean = 4.50; SD = 1.28), while the statement respondents somewhat disagreed with the most was AC5: "The background music enhanced my experience of this mobile phone app" (mean = 4.36; SD = 1.42), thus agreeing that the variety of music in the background was liked, but disagreeing that the music enhanced their shopping experience of the mobile phone app. The total standard deviation and mean values for the auditory cues were 1.22 and 4.39 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the auditory cue construct.

Construct: Sensory experience

This section presents the descriptive statistics related to sensory experience. The items were graded on seven-point Likert scales as follows: 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree nor disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree) (see Section 5.7.2). Table B.3 lists the standard deviations and mean scores for the sensory experience items.

Table B.3: Descriptive statistics for sensory experience

Items		Mean	SD
SE1	Using a combination of audio-visual (hearing and seeing) senses enhances my sensory experience of this mobile phone app.	4.85	1.42
SE2	It was nice that this mobile phone app engaged more of my senses than only visual stimuli.	4.80	1.46
SE3	Using this mobile phone app was a pleasurable sensory experience.	4.80	1.39
SE4	The sensory experience, when using this app, influenced my mood positively.	4.76	1.39
SE5	The sensory experience, when using this app, positively enhanced my experience of a clothing purchase activity.	4.78	1.39
	Overall score	4.80	1.30

Key: SD – standard deviation scores

The sensory experience construct consisted of five items measured on a seven-point Likert scale. From Table B.3, the respondents agreed with the statement SE1 the most: "Using a combination of audio-visual (hearing and seeing) senses enhances my sensory experience of this mobile phone app" (mean = 4.85; SD = 1.42). Conversely, the respondents disagreed with the statement SE4 the most: "The sensory experience, when using this app, influenced my mood positively" (mean = 4.76; SD = 1.39), thus agreeing that the combination of auditory and visual senses enhanced their sensory experience on the mobile phone app, but disagreeing that their shopping experience positively influenced their mood when using the mobile phone app. The total standard deviation and mean values for sensory experience were 1.30 and 4.80 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the sensory experience construct.

Construct: Purchase intention

This section presents the descriptive statistics related to the purchase intention. The items were graded on seven-point Likert scales as follows: 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree nor disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree) (see Section 5.7.2). Table B.4 lists the standard deviations and mean scores for the purchase intention items.

Table B.4: Descriptive statistics for purchase intention

Items		Mean	SD
PI1	I am willing to purchase clothing products from a mobile phone app that is similar to this one.	4.54	1.05
PI2	The likelihood of me purchasing clothing products using a similar mobile phone app is high.	4.57	1.00
PI3	The probability that I would consider buying clothing through a similar mobile phone app in the near future is high.	4.61	1.06
PI4	I would prefer a mobile phone app similar to this one when buying clothing products from an online retailer that I like.	4.53	1.09
PI5	A mobile phone app like this one would change the way in which I purchase clothing in the future.	4.69	1.11
	Overall score	4.59	0.91

Key: SD – standard deviation scores

The purchase intention construct consisted of five items measured on a seven-point Likert scale. From Table B.4, the respondents agreed with the statement PI5 the most: "A mobile phone app like this one would change the way in which I purchase clothing in the future" (mean = 4.69; SD = 1.11). Conversely, the respondents disagreed with the statement PI4 the most: "I would prefer a mobile phone app similar to this one when buying clothing products from an online retailer that I like" (mean = 4.53; SD = 1.09), thus agreeing that a mobile phone app like this would change the way the respondent will purchase clothes in future, but disagree in that the respondent does not prefer a similar mobile phone app to this one when purchasing clothing from their liked online retailer. The total standard deviation and mean values for purchase intention were 0.91 and 4.59 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the purchase intention construct.

Construct: Telepresence

This section presents the descriptive statistics related to the telepresence. The items were graded on seven-point Likert scales as follows: 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree nor disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree) (see Section 5.7.2). Table B.5 lists the standard deviations and mean scores for the telepresence items.

Table B.5: Descriptive statistics for telepresence

Items		Mean	SD
TP1	Using this online shopping app provided the same (or better) experience as a physical store.	5.00	1.01
TP2	This mobile clothing shopping app created a new world for me in the comfort of my own space.	5.02	1.09
TP3	I could view and inspect the clothes on this mobile phone app similarly to what I would in a physical store.	4.98	1.11
TP4	This mobile phone app grabs my attention so that I want to continue the shopping experience.	4.96	1.12
TP5	When I used this mobile phone app for clothing, I lost track of time.	5.09	1.13
TP6	When I used this mobile phone app for clothing, I almost forgot where I was physically.	5.06	1.12
TP7	While shopping on this mobile phone app, I felt like I was in an "imaginary world".	4.96	1.13
	Overall score	5.01	0.89

Key: SD – standard deviation scores

The telepresence construct consisted of seven items measured on a seven-point Likert scale. From Table B.5, the respondents agreed with the statement TP5 the most: "When I used this mobile phone app for clothing, I lost track of time" (mean = 5.09; SD = 1.12). Conversely, the respondents disagreed with the statement TP4 the most: "This mobile phone app grabs my attention so that I want to continue the shopping experience" (mean = 4.96; SD = 1.12) and TP7: "While shopping on this mobile phone app, I felt like I was in an 'imaginary world'" (mean = 4.96; SD = 1.13), thus agreeing the respondent lost track of time when using this mobile phone app, but disagree in that the respondent attention was held in that they wanted to continue the shopping experience as well as disagreed with feeling like they were in a 'imaginary world'. The total standard deviation and mean values for telepresence were 0.89 and 5.01 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the telepresence construct.

Construct: Customisation

This section presents the descriptive statistics related to the customisation. The items were graded on seven-point Likert scales as follows: 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree nor disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree) (see Section 5.7.2). Below Table B.6 lists the standard deviations and mean scores for the customisation items.

Table B.6: Descriptive statistics for customisation

Items		Mean	SD
CU1	I liked the fact that I could control the view of the clothes from various angles on this mobile phone app.	4.36	1.37
CU2	I liked the fact that the background music responded to my clicking actions on this mobile phone app.	4.57	1.53
CU3	I liked the fact that I could change the background music while using this mobile phone app.	4.19	1.29
CU4	I like the fact that I could control the selection functions on this mobile shopping app.	4.74	1.50
CU5	It was comforting to feel that I could browse for clothing on this mobile phone app at my own pace.	4.19	1.23
CU6	It was comforting to feel that I could browse for clothing on this mobile phone app without the distraction from physical store activities.	4.14	1.24
CU7	I liked that this mobile shopping app personalised my shopping experience when I used it.	4.44	1.43
	Overall score	4.38	1.16

Key: SD – standard deviation scores

The customisation construct consisted of seven items measured on a seven-point Likert scale. From Table B.6, the respondents agreed with the statement CU4 the most: "I like the fact that I could control the selection functions on this mobile shopping app" (mean = 4.74; SD = 1.50). Conversely, the respondents disagreed with the statement CU6 the most: "It was comforting to feel that I could browse for clothing on this mobile phone app without the distraction from physical store activities" (mean = 4.14; SD = 1.24), thus agreeing the respondent liked to control the selection functions on the mobile phone app, but disagree in that the respondent felt comfort that they could browse for clothing on this mobile phone app without the distraction from physical store activities. The total standard deviation and mean values for customisation were 1.16 and 4.38 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the customisation construct.

Construct: Product information

This section presents the descriptive statistics related to the product information. The items were graded on seven-point Likert scales as follows: 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree nor disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree) (see Section 5.7.2). Table B.7 lists the standard deviations and mean scores for the product information items.

Table B.7: Descriptive statistics for product information

Items		Mean	SD
Product Information: Subscale for intrinsic formal physical attributes		**Mean**	**SD**
IP1	This mobile phone app provides enough information to assess the available colours of the products.	4.35	1.55
IP2	This mobile phone app provides enough information to assess the fibre content (makeup) of the clothing.	3.84	1.35
IP3	This mobile phone app provides enough information to assess the design (style) of the clothing.	4.32	1.43
IP4	This mobile phone app provides enough information to assess the quality of the construction of the clothing.	3.71	1.30
IP5	This mobile phone app provides enough information to assess the functional performance of the textiles and other materials used.	4.27	1.51
IP6	This mobile phone app provides enough information to assess the finishes of the clothing.	3.72	1.26
	Overall score	4.03	1.17
Product Information: Subscale for intrinsic aesthetic attributes		**Mean**	**SD**
IA1	The way in which the clothing is presented on this mobile phone app is appealing to me.	4.38	1.39
IA2	The mobile phone app evoked my curiosity about the clothing products on display.	4.52	1.46
IA3	The clothing items on this mobile phone app were inspiring.	4.60	1.44
IA4	The display of products on the mobile phone app is attractive.	4.67	1.47
IA5	From the pictures presented on this mobile phone app, I have enough information to assess the appearance of the clothing.	4.36	1.37
	Overall score	4.51	1.24
Product Information: Subscale for intrinsic functional attributes		**Mean**	**SD**
IF1	This mobile phone app displays the clothing product care instructions that I need.	4.69	1.32
IF2	The app presents enough information to assess the fit of the clothing.	4.69	1.38
IF3	The app presents enough information to assess the durability (service life) of the clothing.	4.75	1.18
IF4	The images of the clothing present a good idea of the suitability of the clothing in terms of my needs.	4.64	1.21
IF5	The clothing product information presented on this mobile phone app is enough to make a decision about the functional attributes.	4.78	1.28
IF6	The information presented on this mobile phone app indicates the purpose of the clothing adequately.	4.68	1.35
	Overall score	4.70	1.08
Product Information: Subscale for extrinsic attributes		**Mean**	**SD**
EA1	This mobile phone app presents enough information to assess the price of the clothing.	4.33	1.24

Product Information: Subscale for extrinsic attributes		Mean	SD
EA2	This mobile phone app presents enough information to assess the brand information.	4.21	1.28
EA3	This mobile phone app presents enough information to assess the origin of the clothing.	4.37	1.38
EA4	This mobile phone app presents enough information to assess the sizing of the clothing.	4.29	1.28
	Overall score	4.30	1.10

Key: SD – standard deviation scores

The product information construct consisted of four sub scales with results as follows.

The intrinsic formal physical attributes subscale consisted of six items measured on a seven-point Likert scale. From Table B.7, the respondents agreed with the statement IP1 the most: "This mobile phone app provides enough information to assess the available colours of the products" (mean = 4.35; SD = 1.55). Conversely, the respondents disagreed with the statement IP6 the most: "This mobile phone app provides enough information to assess the quality of the construction of the clothing" (mean = 3.71; SD = 1.30), thus agreeing the respondent had enough information about the product colours but disagree in that the respondent had enough information about the product quality construction. The total standard deviation and mean values for the intrinsic formal physical attributes subscale were 1.17 and 4.03 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the intrinsic formal physical attributes subscale.

The intrinsic aesthetic attributes subscale consisted of five items measured on a seven-point Likert scale. From Table B.7, the respondents agreed with the statement IA4 the most: "The display of products on the mobile phone app is attractive" (mean = 4.67; SD = 1.47). Conversely, the respondents disagreed with the statement IA5 the most: "From the pictures presented on this mobile phone app, I have enough information to assess the appearance of the clothing" (mean = 4.36; SD = 1.37), thus agreeing the respondent found the display of products on the mobile phone app attractive but disagree in that the respondent did not have enough information to assess the appearance of the clothing. The total standard deviation and mean values for the intrinsic aesthetic attributes subscale were 1.24 and 4.51 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the intrinsic aesthetic attributes subscale.

The intrinsic functional attributes subscale consisted of six items measured on a seven-point Likert scale. From Table B.7, the respondents agreed with the statement IF5 the most: "The clothing product information presented on this mobile phone app is enough to make a decision

about the functional attributes" (mean = 4.78; SD = 1.28). Conversely, the respondents disagreed with the statement IF4 the most: "The images of the clothing present a good idea of the suitability of the clothing in terms of my needs" (mean = 4.64; SD = 1.31), thus agreeing the respondent found the clothing product information enough to make a decision about the functional attributes but disagree in that the images of the clothing present a good idea of the suitability of the clothing in terms of the respondents' needs. The total standard deviation and mean values for the intrinsic functional attributes subscale were 1.08 and 4.70 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the intrinsic functional attributes subscale.

The extrinsic attributes subscale consisted of four items measured on a seven-point Likert scale. From Table B.7, the respondents agreed with the statement EA3 the most: "This mobile phone app presents enough information to assess the origin of the clothing" (mean = 4.37; SD = 1.38). Conversely, the respondents disagreed with the statement EA2 the most: "This mobile phone app presents enough information to assess the brand information" (mean = 4.21; SD = 1.28), thus agreeing the respondent found the mobile phone app presents enough information to assess the origin of the clothing but disagree in that the mobile phone app presents enough information to assess the brand information. The total standard deviation and mean values for the extrinsic attributes subscale were 1.10 and 4.30 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the extrinsic attributes subscale.

The product information construct consisted of 21 items measured on a seven-point Likert scale across four subscales. From Table B.7, the respondents agreed with the statement intrinsic functional attributes the most (mean = 4.70; SD = 1.08). Conversely, the respondents disagreed with the intrinsic formal physical attributes the most (mean = 4.03; SD = 1.17), thus agreeing the respondent has enough intrinsic functional product information but disagree in that the respondent felt they did not have enough intrinsic formal physical product information. The total standard deviation and mean values for product information were 0.68 and 4.39 respectively, which demonstrates that the respondents, in general, neither agreed nor disagreed with the statements pertaining to the product information construct.

Discussion of descriptive results

This section describes the results for each construct and its corresponding items.

Construct: Visual cue

The overall mean score for the influence of visual cues was M = 5.05 (SD = 0.92). This indicated that, overall, respondents were somewhat positive concerning the items included in this construct (M_{Max} = 7). The mean scores across gender were similar (M_M = 5.10, SD = 0.86; M_F = 4.99, SD = 0.98; M_{Max} = 7). Therefore, both males and females seemed rather excited about the presence of visual cues (see Section 3.1.3.4) However, the descriptive results indicated that the 360-degree rotation pictures were nice to view but disagree that the products were presented in an attractive way. This could be because respondents were able to view products from many angles rather than to be restricted to viewing static images, therefore helping to improve respondent's experiences (Kim et al., 2020; Masters, 2018) (see main finding 5.1). The absence of a mannequin or human models (see Section 5.6.3) might have influenced the attractiveness of the way products were presented (Berg, 2015; Lindström et al., 2016; Plotkina & Saurel, 2020).

Construct: Auditory cue

The overall mean score for the influence of auditory cues was M = 4.39 (SD = 1.22). This indicated that, overall, respondents were slightly positive with regard to the items included in this construct (M_{Max} = 7). The mean scores across gender were similar (M_M = 4.52, SD = 1.14; M_F = 4.20, SD = 1.28; M_{Max} = 7). Therefore, both males and females seemed somewhat excited about the presence of auditory cues (see Section 3.1.3.5). However, the descriptive results indicated that the variety of music in the background was liked, but that there was disagreement that the music enhanced respondents' shopping experience when using the mobile phone app. This could be because respondents are used to background music in-store that adds to the atmosphere and influences respondents' experience (Allan, 2008; Floh & Madlberger, 2013; Hwang & Oh, 2020) (see main finding 5.2). The preference of music genre was not part of the fictitious online task (see Section 5.6) which was found in other studies to influence respondent experience (Hwang et al., 2020). Although the selected music was appropriate for the target population, the music beats per minute (bpm) in the fictitious online task were within the range of 95 to 109 whereas the recommendation was 90 and 102 bpm, (Stewart & Koh, 2017) (see Section 5.6.3.2), which might have affected the influence of the music on the respondents' experience.

Construct: Sensory experience

The overall mean score for the influence of sensory experience was M = 4.80 (SD = 1.30). This indicated that, overall, respondents were slightly positive about the items included in this construct (M_{Max} = 7). The mean scores across gender were similar (M_M = 4.99, SD = 1.21; M_F = 4.62, SD = 1.34; M_{Max} = 7). Therefore, both males and females seemed somewhat excited about the sensory experience (see Section 3.1.1.2). However, the descriptive results indicated that the combination of auditory and visual senses enhanced their sensory experience on the mobile phone app, but that they disagreed that their shopping experience positively influenced their mood when using the mobile phone app. This could be because sensory cues related to visual (seeing) and auditory (hearing) cues are particularly influential in creating a positive experience (Biswas, 2019; Spence et al., 2014) (see main finding 5.1 and 5.2). The respondent could feel that their shopping experience did not positively influence their mood, as the performance, such as quantity of clothes displayed on site, was lower than expected (Barari et al., 2020).

Construct: Purchase intention

The overall mean score for the influence of purchase intention was M = 4.59 (SD = 0.91). This indicated that, overall, respondents were slightly positive with the items included in this construct (M_{Max} = 7). The mean scores across gender were similar (M_M = 4.68, SD = 0.88; M_F = 4.51, SD = 0.92; M_{Max} = 7). Therefore, both males and females seemed somewhat favourable in terms of purchase intention (see Section 3.2.4.2). However, the descriptive results indicated that a mobile phone app like this would change the way the respondent will purchase clothes in future but disagree in that the respondent does not prefer a similar mobile phone app to this one when purchasing clothing from their preferred online retailer. This could be because the use of visual cues, such as 360-degree rotatable pictures and interactive auditory cues might lead to increased sensory experience and elicit stronger purchase intention (Riedel & Mulcahy, 2019) (see main finding 5.3). The mobile phone app was unbranded, and accordingly respondents might prefer branded mobile phone apps from the retailer (Boyd et al., 2019; Li & Fang, 2019).

Construct: Telepresence

The overall mean score for the influence of telepresence was M = 5.01 (SD = 0.89). This indicated that, overall, respondents were somewhat positive towards the items included in this construct (M_{Max} = 7). The mean scores across gender were dissimilar (M_M = 5.45, SD = 0.50; M_F = 4.58, SD = 0.94; M_{Max} = 7), where the mean of males was higher. However, both males

270

and females were somewhat positive, and they seemed rather excited about the presence of telepresence (see Section 3.1.4). However, the descriptive results indicated that the respondent lost track of time when using this mobile phone app, although they disagreed that their attention was held leading them to continue the shopping experience. They also disagreed with feeling like they were in an "imaginary world". This could be because the sensory aspects of sound and vision (Ye et al., 2020) were mimicked in the online store in line with the physical store, where respondents interacted with the 360-degree rotatable pictures and could change the background music (see main finding 5.4 and 5.5). The small sample of clothing items (see Section 5.6.3) could have caused the respondents attention to wander, as the stimulation was limited (Barari et al., 2020), therefore they could have felt that their attention was not held, and felt they were not in an "imaginary world".

Construct: Customisation

The overall mean score for the influence of customisation was M = 4.38 (SD = 1.16). This indicated that, overall, respondents were slightly positive with the items included in this construct (M_{Max} = 7). The mean scores across gender were similar (M_M = 4.29, SD = 1.18; M_F = 4.57, SD = 1.01; M_{Max} = 7). Therefore, both males and females seemed rather excited about the presence of customisation (see Section 3.1.5). However, the descriptive results indicated that while respondents liked to control the selection functions on the mobile phone app they disagreed that they felt comfortable in browsing clothing on the app without the distraction of physical store activities. This could be because respondents have their own unique preferences, and the mobile phone app creates a sense of personal control which enhances the experience (Nyadzayo et al., 2019; Pentz et al., 2020; Rose et al., 2012) (see main finding 5.6 and 5.7). Respondents might be in an environment with distractions that they cannot control, such as at work or in a busy household, consequently feeling that they could not browse for clothing on this mobile phone app without the distraction of physical store activities (Deng & Kahn, 2009; Rose et al., 2012).

Construct: Product information

This construct consists of four subscales, discussed next, concluding with an overall discussion of the constructs.

The intrinsic formal physical attributes subscale mean score for this construct was 4.03 (SD = 1.17). This indicated that, overall, respondents neither agreed nor disagreed, and were therefore neutral with the items included in this construct (see Section 5.7.2). However, the descriptive results indicated that the respondents had enough information about the product

271

colours but disagreed that the respondent had enough information about the product quality construction. This could be because the colours were clearly specified on the mobile phone app (see Section 5.6.3), however, respondents could have felt that the product quality construction could have been elaborated upon more than was done in the mobile phone app (see Section 5.6.3).

The intrinsic aesthetic attributes subscale mean score for this construct was 4.51 (SD = 1.24), which confirmed that the respondents neither agreed nor disagreed, in general, and were therefore neutral towards this construct (see Section 5.7.2). However, the descriptive results indicated that the respondent found the display of products on the mobile phone app attractive but disagreed that they did not have enough information to assess the appearance of the clothing. This could be because respondents were able to view products from many angles rather than to be restricted to viewing static images (Kim et al., 2020; Masters, 2018). The lack of information to assess the clothing appearance could be due to the respondent not being able to "zoom-in" on the clothing (Silva et al., 2021) in order to view details such as thread and stitching pattern.

The intrinsic functional attributes subscale mean score for this construct was 4.70 (SD = 1.08), which confirmed that the respondents neither agreed nor disagreed, in general, and were therefore neutral towards this construct (see Section 5.7.2). However, the descriptive results indicated that the respondent found the clothing product information sufficient to decide on the functional attributes but disagreed that the images of the clothing present a good idea of the suitability of the clothing in terms of the respondents' needs. This could be because the information was clearly specified on the mobile phone app (see Section 5.6.3), however, the absence of a mannequin or human models (see Section 5.6.3) might have influenced the assessment of the suitability of the clothing for the respondents needs (Berg, 2015; Lindström et al., 2016; Plotkina & Saurel, 2020). For example, a model wearing the wetsuit on the beach with scuba gear on the ground.

The extrinsic attributes subscale mean score for this construct was 4.30 (SD = 1.10), which confirmed that the respondents neither agreed nor disagreed, in general, and were therefore neutral towards this construct (see Section 5.7.2). However, the descriptive results indicate that the respondent found that the mobile phone app presented enough information to assess the origin of the clothing but disagreed that the app presented sufficient information to assess the brand information. This could be because the information was clearly specified on the mobile phone app (see Section 5.6.3), however, the brand comprised an unknown name in order to avoid bias (Kim, 2019). However, millennials are inclined to be status conscious, which

explains their interest in clothing, brand consciousness and strong need for recreation, pleasure and excitement (Chang & Watchravesringkan, 2018; Diedericks, 2019; Moreno et al., 2017; Su et al., 2019). Consequently, they felt that brand information could have been further expanded.

When strictly looking at the influence of product information, the overall mean score for the influence of product information on respondents' experience of the mobile phone app was M = 4.39 (SD = 0.68). Overall, therefore, respondents were slightly positive about the information provided. The mean scores across the gender groups also slightly positive for both (M_M = 4.23, SD = 0.68; M_F = 4.60, SD = 0.61). However, the descriptive results indicated that the respondent had sufficient intrinsic functional product information but disagreed that they did not have enough intrinsic formal physical product information. This could be because the intrinsic functional product information was clearly specified on the mobile phone app (see Section 5.6.3), however respondents might have felt that the intrinsic formal physical product information could have been further expanded.

Appendix C – Data analysis reports: moderation analyses

Next, the results of the moderation analysis are presented relating to the moderating effect of telepresence, customisation and product information relating to H1$_a$, H1$_b$, H2$_a$, H2$_b$, and H3 (see Section 6.5.2). This section outlines the interaction graphs, R-square changes, unstandardised beta coefficients, and model summaries where applicable. The analysis made use of ZScores.

Visual cue and sensory experience relationship: the moderating effects of telepresence and customisation

Telepresence and customisation were used as moderators to test whether they moderate the relationships between visual cue and sensory experience. This section outlines the interaction graphs, R-square changes, unstandardised beta coefficients, and model summaries, where applicable.

Table C.1: Model summary of the moderation effect on the visual cue and sensory experience relationship

| Construct	Moderator	Outcome	R	R^2	F	p-value	Result
Visual cue	Telepresence	Sensory Experience	0.448	0.200	41.917	0.000	Significant
	Customisation	Sensory Experience				0.002	Significant

The results in the table confirm that both regression models are significant.

Table C.2: Unstandardised beta coefficients in the model: moderation effect on the visual cue and sensory experience relationship

Visual Cue	B	se	t	p-value	LLCI	ULCI
Constant	4.799	0.04	119.85	0.000	4.721	4.878
Visual cue	0.532	0.045	11.902	0.000	0.444	0.62
Telepresence	0.134	0.045	2.957	0.003	0.045	0.224
Interaction: Visual cue and telepresence	0.252	0.048	5.284	0.000	0.159	0.346
Customisation	0.107	0.035	3.046	0.002	0.038	0.176

274

Visual Cue	B	se	t	p-value	LLCI	ULCI
Interaction: Visual cue and customisation	0.121	0.038	3.145	0.002	0.045	0.196
Telepresence Customisation Combination telepresence and customisation	R2 change due to interaction: 0.027; F = 27.915 R2 change due to interaction: 0.009; F = 9.892 R2 change due to interaction: 0.032; F = 16.958					

As seen in Table C.2 above, telepresence moderates the relationship between visual cue and sensory experience (p = 0.001) (see main finding 5.4), while customisation moderates the relationship between visual cue and sensory experience (p = 0.002) (see main finding 5.6). These interactions are presented in Figures C.1 and C.2.
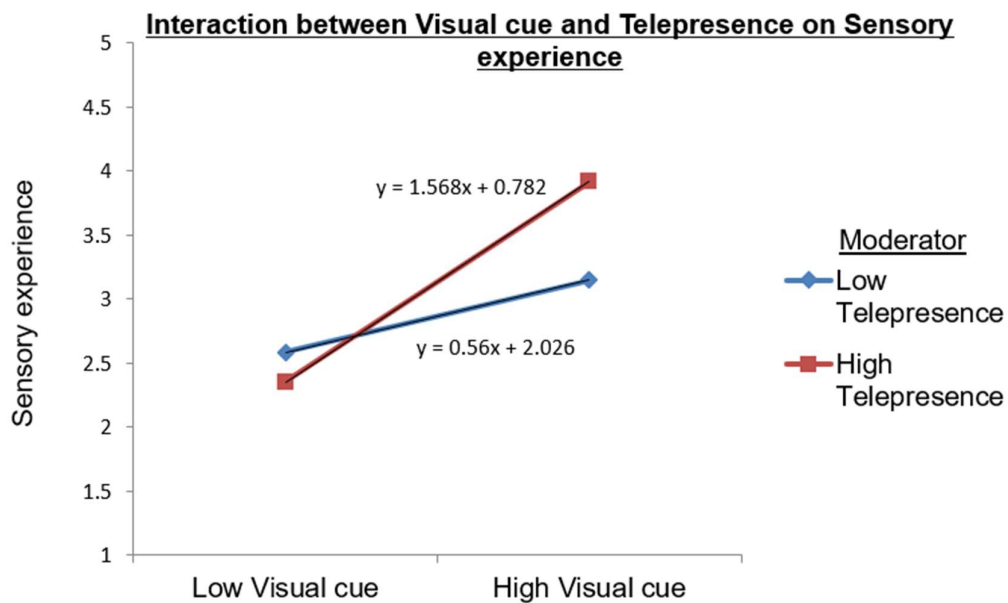
Figure C.1: Effect of telepresence as moderator on the relationship between visual cue and sensory experience

As seen in Figure C.1, the moderating effect of telepresence on the relationship between visual cue and sensory experience positively increases as the score increases and therefore telepresence strengthens the positive relationship between visual cue and sensory experience.
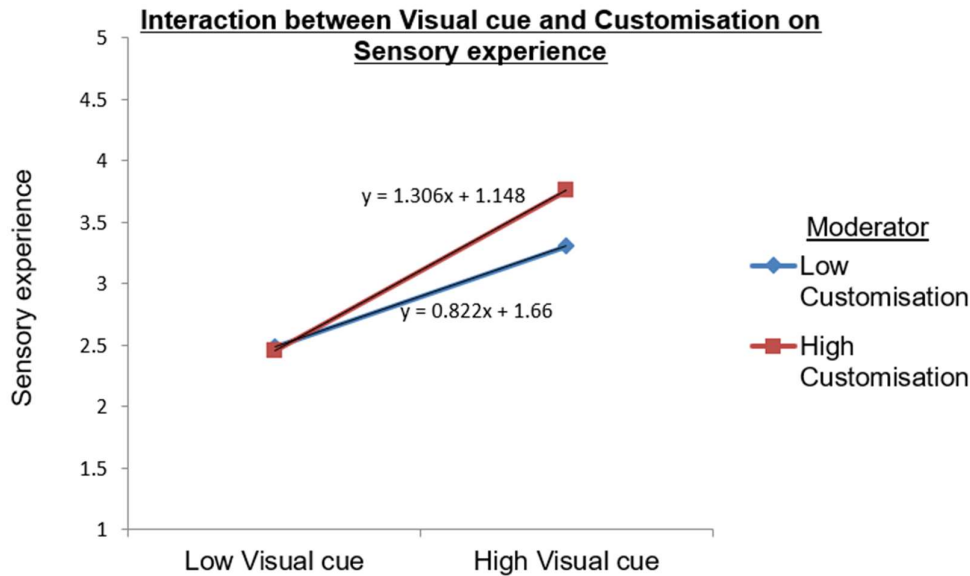
Figure C.2: Effect of customisation as moderator on the relationship between visual cue and sensory experience

As seen in Figure C.2, the moderating effect of customisation on the relationship between visual cue and sensory experience positively increases as the score increases and therefore customisation strengthens the positive relationship between visual cue and sensory experience.

Auditory cue and sensory experience relationship: the moderating effects of telepresence and customisation

Telepresence and customisation were used as moderators to test whether they moderate the relationships between auditory cue and sensory experience. The results are provided in the model summaries, unstandardised beta coefficients, R-square changes and interaction graphs where applicable.

Table C.3: Model summary of the moderation effect on the auditory cue and sensory experience relationship

Construct	Moderator	Outcome	R	R²	F	p-value	Result
Auditory cue	Telepresence	Sensory Experience	0.240	0.057	10.190	0.007	Significant
	Customisation	Sensory Experience				0.016	Significant

276

The results in the table confirm that both regression models are significant.

Table C.4: Unstandardised beta coefficients in the model: moderation effect on the auditory cue and sensory experience relationship

| Auditory Cue	B	se	t	p-value	LLCI	ULCI
Constant	4.791	0.044	109.727	0.000	4.705	4.876
Auditory cue	0.159	0.036	4.416	0.000	0.088	0.23
Telepresence	0.125	0.049	2.538	0.011	0.028	0.222
Interaction: Auditory cue and telepresence	0.112	0.042	2.703	0.007	0.031	0.192
Customisation	0.098	0.038	2.581	0.010	0.023	0.182
Interaction: Auditory cue and customisation	0.074	0.031	2.41	0.016	0.014	0.134
Telepresence	R2 change due to interaction: 0.008; F = 7.304					
Customisation	R2 change due to interaction: 0.006; F = 5.180					
Combination telepresence and customisation	R2 change due to interaction: 0.016; F = 6.877					

As seen in Table C.4 above, telepresence moderates the relationship between auditory cue and sensory experience (p = 0.007) (see main finding 5.5), while customisation moderates the relationship between auditory cue and sensory experience (p = 0.016) (see main finding 5.7). These interactions are presented in Figures C.3 and C.4.
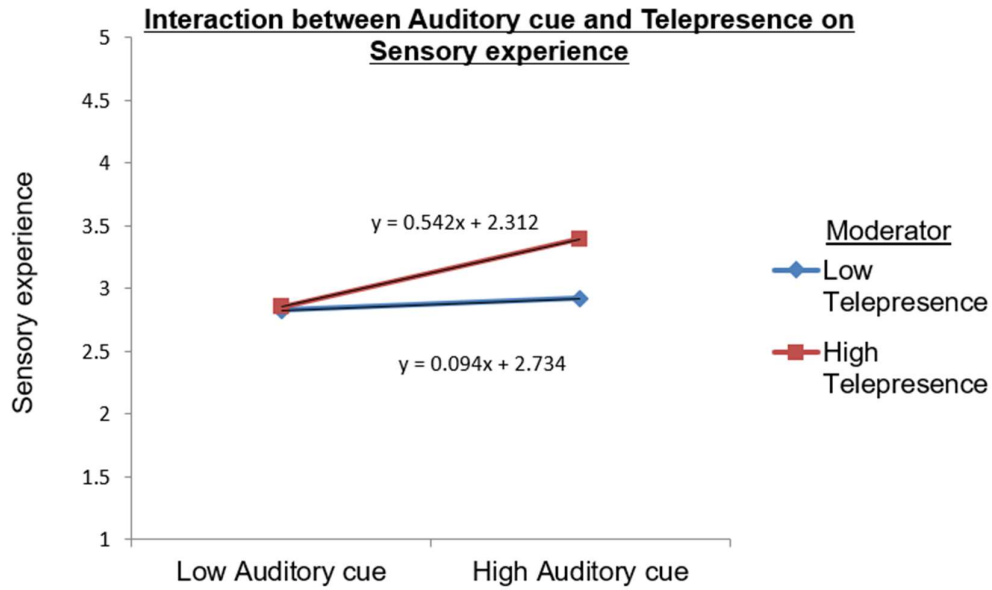
Figure C.3: Effect of telepresence as moderator on the relationship between auditory cue and sensory experience

As seen in Figure C.3, the moderating effect of telepresence on the relationship between auditory cue and sensory experience positively increases as the score increases and therefore telepresence strengthens the positive relationship between auditory cue and sensory experience.
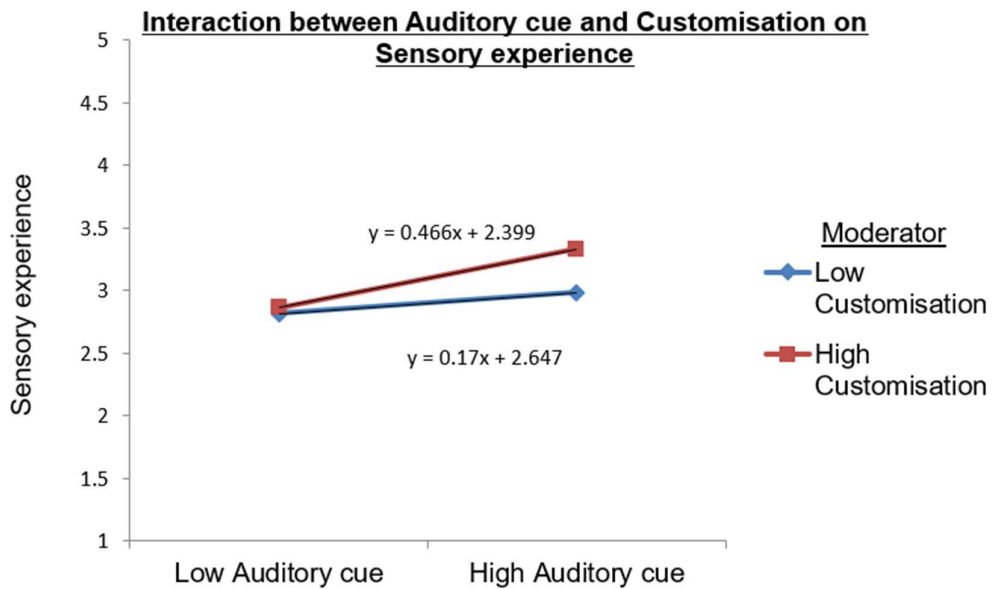
Figure C.4: Effect of customisation as moderator on the relationship between auditory cue and sensory experience

278

As seen in Figure C.4, the moderating effect of customisation on the relationship between auditory cue and sensory experience positively increases as the score increases and therefore customisation strengthens the positive relationship between auditory cue and sensory experience.

Sensory experience and purchase intention relationship: the moderating effect of product information

Product information was used as a moderator to test whether it moderates the relationships between sensory experience and purchase intention. This section outlines the interaction graphs, R-square changes, unstandardised beta coefficients, and model summaries, where applicable.

**Table C.5: Model summary of the moderation effect product information**

Construct	Moderator	Outcome	R	R²	F	p-value	Result
Sensory experience	Product information	Purchase Intention	0.197	0.039	11.321	0.065	Not Significant

The regression models are not significant, as the p-value exceeds 0.05 (Pallant, 2016).

Table C.6: Unstandardised beta coefficients in the model: product information as moderator

Sensory experience	B	se	t	p-value	LLCI	ULCI
Constant	4.591	0.031	149.801	0.000	4.531	4.652
Sensory experience	0.124	0.024	5.216	0.000	0.077	0.171
Product information	-0.035	0.046	-0.754	0.451	-0.125	0.055
Interaction: Sensory experience and product information	0.059	0.032	1.847	0.065	-0.004	0.121
Product information	R2 change due to interaction: 0.004; F = 3.413					

As seen in Table C.6 above, product information does not moderate the relationship between sensory experience and purchase intention (p = 0.065) (see main finding 5.8).
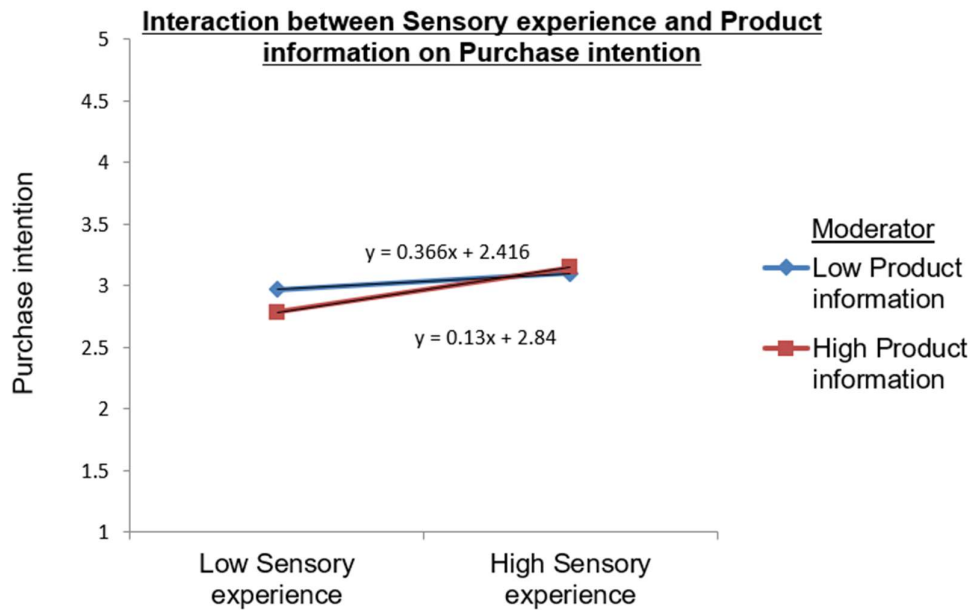
Figure C5: Effect of product information as moderator on the relationship between sensory experience and purchase intention

As seen in Figure C.5, in terms of the moderating effect of product information on the relationship between sensory experience and purchase intention, product information strengthens the positive relationship between sensory experience and purchase intention, but the influence is not significant ($p = 0.065$) (see main finding 5.8).

Further analysis was conducted making use of gender as a categorical variable. Product information was used as a moderator to test whether it moderates the relationships between sensory experience and purchase intention. This section outlines the interaction graphs, R-square changes, unstandardised beta coefficients, and model summaries, where applicable.

Table C.7: Model summary of the moderation effect of product information – gender

| Gender	Sample (n)	R	R^2	F	p-value	Result
Male	442	0.234	0.055	8.420	0.002	Significant
Female	374	0.160	0.026	3.243	0.390	Not significant
All genders	842	0.197	0.039	11.321	0.065	Not significant

Table C.7 makes use of sensory experience as the construct, product information as the moderator and purchase intention as the outcome. The regression model for "male" is

280

significant (p = 0.02), however for "female" (p = 0.390) and the combination of genders (p = 0.065), the regression model is not significant, as the p-value exceeds 0.05 (Pallant, 2016)

Table C.8: Unstandardised beta coefficients in the model: product information as moderator – male

Sensory experience	B	se	t	p-value	LLCI	ULCI
Constant	4.676	0.041	114.364	0.000	4.595	4.756
Sensory experience	0.130	0.034	3.851	0.000	0.064	0.197
Product information	0.150	0.063	0.234	0.815	-0.110	0.140
Interaction: Sensory experience and product information	0.128	0.040	3.165	0.002	0.049	0.208
Product information	R2 change due to interaction: 0.022; F = 10.020					

As seen in Table C.8 above, product information moderates the relationship between sensory experience and purchase intention (p = 0.002) for males (see main finding 5.9). The interaction is presented in Figure C.6.
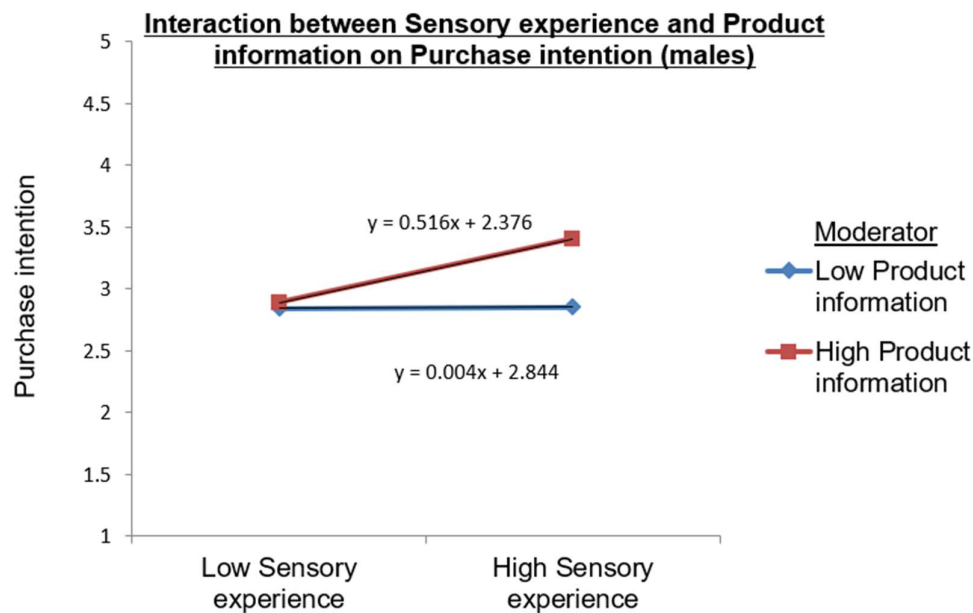
Figure C6: Effect of product information as moderator on the relationship between sensory experience and purchase intention – males
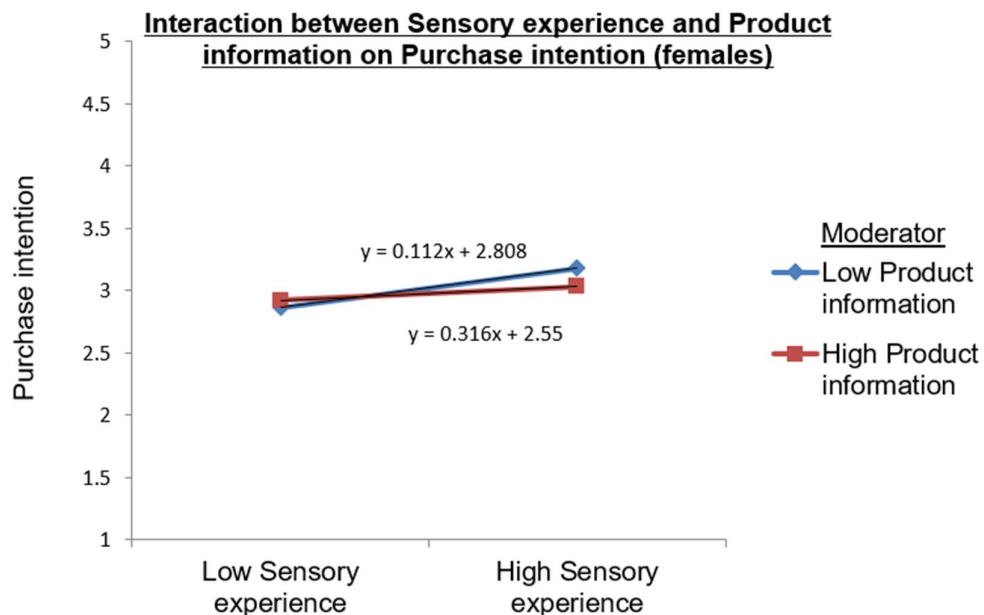
As seen in Figure C.6, with regard to the moderating effect of product information on the relationship between sensory experience and purchase intention. Product information strengthens the positive relationship between sensory experience and purchase intention.

Table C.9: Unstandardised beta coefficients in the model: product information as moderator – female

Sensory experience	B	se	t	p-value	LLCI	ULCI
Constant	4.508	0.047	95.900	0.000	4.415	4.601
Sensory experience	0.107	0.036	3.015	0.003	0.037	0.177
Product information	-0.024	0.078	-0.303	0.762	-0.178	0.131
Interaction: Sensory experience and product information	-0.051	-0.059	-0.860	0.390	-0.167	0.065
Product information	R2 change due to interaction: 0.002; F = 0.740					

As seen in Table C.9 above, product information does not moderate the relationship between sensory experience and purchase intention (p = 0.390) for females. The interaction is presented in Figure C.7.

Figure C7: Effect of product information as moderator on the relationship between sensory experience and purchase intention – females

As seen in Figure C.7, in terms of the moderating effect of product information on the relationship between sensory experience and purchase intention, product information dampens the positive relationship between sensory experience and purchase intention.

Appendix D – Data analysis reports: MANOVA

This appendix presents the MANOVA results relating to gender (see Section 6.5.3). This section provides the model summaries and graphs where applicable.

The effect of gender on sensory experience

A between-subjects analysis was conducted for the dependent variable, sensory experience.

Table D.1: The between-subjects effect of gender on sensory experience

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	47.014[a]	3	15.671	9.330	0.000	0.032
Intercept	1844.235	1	1844.235	1097.951	0.000	0.567
Gender	47.014	3	15.671	9.330	0.000	0.032
Error	1407.594	838	1.680			
Total	23091.249	842				
Corrected Total	1454.608	841				
a. R Squared = 0.032 (Adjusted R Squared = 0.029)						

As seen in Table D.1, there was a statistically significant difference in sensory experience based on gender, $F (3, 838) = 9,33$; $p < 0.0005$; partial $\eta^2 = 0.03$ (see main finding 5.10). Next follows multiple comparisons, making use of Tukey HSD (Pallant, 2016).

Table D.2: Multiple comparisons of the effect of gender on sensory experience

(I) Gender		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Female	.3756[*]	0.09106	0.000	0.1412	0.6100
	Other	0.6880	0.31164	0.122	-0.1142	1.4902
	Don't want to disclose	1.5006[*]	0.46235	0.007	0.3105	2.6908
Female	Male	-.3756[*]	0.09106	0.000	-0.6100	-0.1412
	Other	0.3125	0.31274	0.750	-0.4926	1.1175
	Don't want to disclose	1.1251	0.46309	0.072	-0.0670	2.3172
Other	Male	-0.6880	0.31164	0.122	-1.4902	0.1142
	Female	-0.3125	0.31274	0.750	-1.1175	0.4926

284

(I) Gender		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	Don't want to disclose	0.8126	0.55071	0.453	-0.6050	2.2303
Don't want to disclose	Male	-1.5006*	0.46235	0.007	-2.6908	-0.3105
	Female	-1.1251	0.46309	0.072	-2.3172	0.0670
	Other	-0.8126	0.55071	0.453	-2.2303	0.6050

The mean difference is significant at the 0.05 level

As seen in Table D.2, there is a significant mean difference between males and females of 0.3756. Next, Figure D.1 displays the results of Table D.2 graphically.
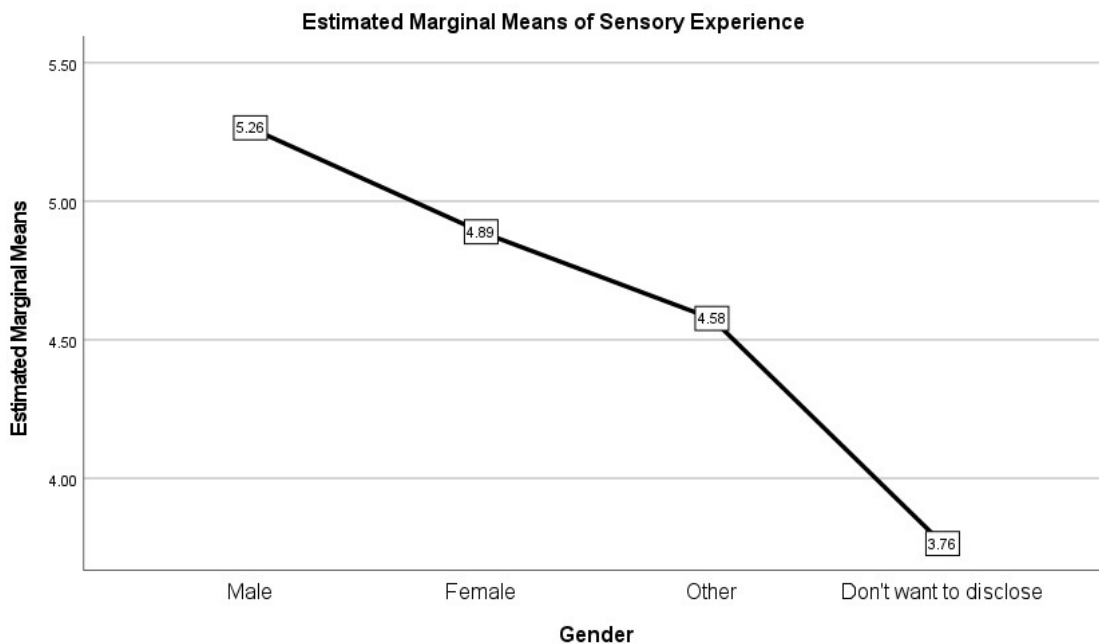
Figure D.1: Estimated marginal means of sensory experience

According to Figure D.1, it is clear that the marginal means for males are higher than those of females when measuring the dependent variable, sensory experience.

The effect of gender on purchase intention

A between-subjects analysis was conducted for the dependent variable, purchase intention.

Table D.3: The between-subjects effect of gender on purchase intention

| Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	11.952[a]	3	3.984	5.376	0.001	0.019
Intercept	1490.804	1	1490.804	2011.895	0.000	0.706
Gender	11.952	3	3.984	5.376	0.001	0.019
Error	620.954	838	0.741			
Total	16726.429	842				
Corrected Total	632.905	841				
a. R Squared = .019 (Adjusted R Squared = .015)						

As seen in Table D.3, there was a statistically significant difference in purchase intention based on gender, $F(3, 838) = 5,38$; $p = 0.001$; partial $\eta^2 = 0.02$ (see main finding 5.11). Next follows multiple comparisons, making use of Tukey HSD (Pallant, 2016).

Table D.4: Multiple comparisons of the effect of gender on purchase intention

(I) Gender		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Female	.1695[*]	0.06048	0.027	0.0138	0.3252
	Other	.6184[*]	0.20699	0.015	0.0856	1.1512
	Don't want to disclose	0.4412	0.30708	0.477	-0.3493	1.2317
Female	Male	-.1695[*]	0.06048	0.027	-0.3252	-0.0138
	Other	0.4489	0.20772	0.135	-0.0858	0.9836
	Don't want to disclose	0.2717	0.30758	0.813	-0.5201	1.0635
Other	Male	-.6184[*]	0.20699	0.015	-1.1512	-0.0856
	Female	-0.4489	0.20772	0.135	-0.9836	0.0858
	Don't want to disclose	-0.1772	0.36577	0.963	-1.1187	0.7644
Don't want to disclose	Male	-0.4412	0.30708	0.477	-1.2317	0.3493
	Female	-0.2717	0.30758	0.813	-1.0635	0.5201
	Other	0.1772	0.36577	0.963	-0.7644	1.1187

The mean difference is significant at the 0.05 level

As seen in Table D.4, there is a significant mean difference between male and female of 0.1695. Next, the results of Table D.4 are displayed graphically in Figure D.2.
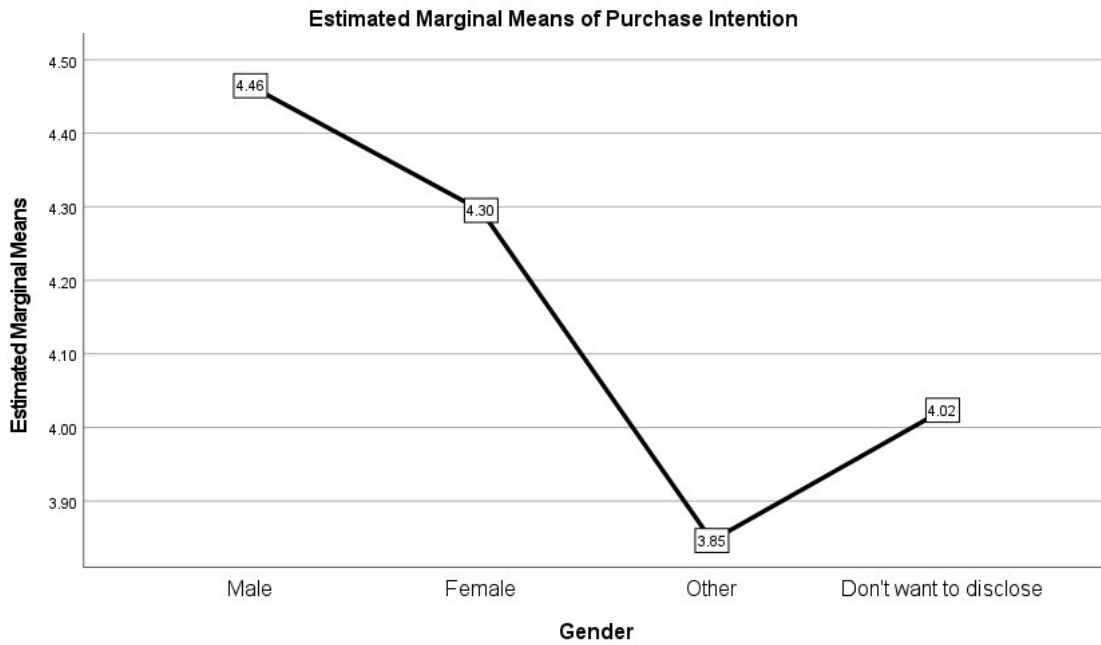
Figure D.2: Estimated marginal means of purchase intention

According to Figure D.2, it is clear that the marginal means for males are higher than those of females when measuring the dependent variable, purchase intention.

Appendix E – Ethical clearance for this study

Gordon Institute
of Business Science
University of Pretoria

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Dear Douwes Sorgdrager

09 February 2021

ETHICS APPLICATION: Douwes Sorgdrager (Student Number: 19396563)

Research Title: The Interplay of Visual and Auditory Cues, Telepresence, Customisation and Product Information on Millennials' Online Sensory Experiences and Clothing Purchase Intentions

On behalf of the Gordon Institute of Business Science Doctoral Research Ethics Committee, I am pleased to confirm that your application for ethical clearance, for the above research is approved, on the basis described in the application form and supporting documentation received on 28th of January 2021.

We wish you success in your studies.

Yours Sincerely

Professor Gavin Price
Doctoral Research Ethics Committee Chairperson

Appendix F – Letter from statistical consultant

Jaclyn de Klerk
MCom Statistics (UP)
JDK Consulting
jaclyn@jdk-consulting.co.za
082 689 4675

28 April 2021

To whom it may concern,

STATISTICAL CONSULTING FOR DOUWES SORGDRAGER

With this letter, I would like to confirm that I provided statistical consulting services to Douwes Sorgdrager, a PhD candidate in Marketing Management at the University of Pretoria's Gordon Institute of Business Science.

Kind regards

Jaclyn de Klerk

Jaclyn de Klerk
MCom Statistics (UP)
Director

Cell: 082 689 4675
Email: jaclyn@jdk-consulting.co.za

Appendix G – Letter confirming editing

Alexa Barnby

Language Specialist

Editing, copywriting, indexing, formatting, translation

BA Hons Translation Studies; APEd (SATI) Accredited Professional Text Editor, SATI

Mobile: 071 872 1334
Tel: 012 361 6347   alexabarnby@gmail.com

16 July 2021

To whom it may concern

This is to certify that I, Alexa Kirsten Barnby, an English editor accredited by the South African Translators' Institute, have edited the doctoral thesis titled "The interplay of visual and auditory cues, telepresence, customisation and product information on millennials' online sensory experiences and clothing purchase intentions?" by Douwes Sorgdrager.

The onus is on the author, however, to make the changes and address the comments made.

Professional
EDITORS
Guild

Alexa Barnby
Full Member

Membership number: BAR001
Membership year: March 2021 to February 2022
Accredited professional text editor: English (SATI)

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