

# How does the level/type of interactivity in an omni-channel environment affect the attitudes, involvement and engagement of retail shoppers?

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## Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signature.....

Date.....

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## Ethical Approval

AUT University Ethics Committee (AUTEC) approved the ethics application for this research on 22<sup>nd</sup> June 2015. Application number 15/193 (refer to Appendix A).

## Abstract

Recently, the emergence of innovative technologies and interactive devices has enabled retail shoppers to redefine the retail world. These shoppers are increasingly demanding a seamless shopping experience from retailers that translates across all channels (i.e. the physical store, online store and mobile technologies). This transformation of the retail world is known as omni-channel retailing of which technology is a key component because it facilitates interactivity within this fast paced environment. To date, scant research exists on omni-channel retailing and most importantly there has been no empirical investigation that examines the effect of interactivity on retail shoppers' attitudes, involvement and engagement.

Therefore, the purpose of this paper is to fill this apparent gap in the literature and to empirically test the impact of different levels and types of interactivity in an omni-channel retail environment by examining how the interactivity affects the attitudes, involvement and engagement of retail shoppers. By conducting a laboratory experiment where shoppers were exposed to different types of interactivity in the context of fashion retail, this research analyses and discusses the responses of 99 female adult respondents.

The results of this study indicate that retail shoppers' attitudes and engagement can be affected by different levels and types of interactivity in an omni-channel retail environment, however, there was no significant effect found between interactivity and shoppers' involvement. This study finds that in the omni-channel retail environment, interactivity has a marginally positive effect on shoppers' attitude although interactivity in an online store elicits a negative effect on attitude. In addition, it was found that interactivity has a minimal effect on retail shopper's engagement in an omni-channel environment where mobile technology has a moderate level of engagement whereas the physical store has a low level of engagement.

This study is particularly useful for retailers as it presents new knowledge about what types of interactivity should and should not be implemented into specific channels of an omni-channel retailing business strategy to evoke certain attitudinal and engagement-related effects with retail shoppers.

## Chapter One: Introduction

### 1.1 Background to the Research

This chapter provides a brief introduction to this research. First of all, background information about fashion shopping and omni-channel retailing is described. Next, the research aim, the justification for the research, methodology, and the structure of this thesis are defined.

#### 1.1.1 Fashion Shopping

Fashion clothing refers to “all items that adorn the body” (such as clothing, jewellery and accessories) (Hourigan & Bougoure, 2012, p.127) and humans have even referred to clothing as a “second skin” (Horn, 1965). An enduring belief is that humans experience life through fashion clothing (Woodward, 2007). Fashion shopping is a consumption behaviour that enables individuals to express themselves with possessions like fashion clothing in social situations through self-identification and distinction (Gronow, 1997). This activity can provide consumers with both utilitarian and/or hedonic value (Bannister & Hogg, 2004). Thus, it is the general understanding that fashion shopping is a common and significant activity in society. Given that the fashion industry is very competitive and at the same time is unpredictable, because it has short product life cycles and high profitability due to low margins and high rates of impulse buying (Masson, MacKerron & Fernie, 2007), research into this area is of interest. Recently, the fashion marketplace has been redefined by changing consumer attitudes, new channels and innovative technologies (Padilla, Robb, & Chantler, 2013). A myriad of shopping channels are now available, from which consumers can shop for fashion clothing. This extends beyond the physical store and involves the online store and mobile technology or a fusion of these channels can be utilised (Grewal & Levy, 2009; Drapers, 2012). In this competitive market, all channels should be considered to enhance the consumer experience (Verdict, 2010; Bhalla, 2014; Forrester Research, 2014; Piotrowicz & Cuthbertson, 2014). This discussion introduces a relatively new concept known as omni-channel retailing, which has also been referred to as “the future of shopping” (Rigby, 2011).

## 1.1.2 Omni-channel Retailing

### 1.1.2.1 *What is omni-channel retailing and what caused the shift in retailing?*

Innovative technologies and interactive tools have redefined the retail world and as a result, consumers are increasingly demanding a seamless retail experience (Baird & Kilcourse, 2011; Fenwick, Ramachandran, White, & Zgutowicz, 2013; Piotrowicz & Cuthbertson, 2014). Shoppers have become channel agnostic where they expect to interchange simultaneously between channels (i.e. the physical store, online store, and mobile devices) during search and purchasing activities all within a single transaction, at any time and at any place (Forrester, 2013; Deloitte, 2014; Piotrowicz & Cuthbertson, 2014; Verhoef, Kannan & Inman, 2015). They also expect to be engaged by retailers with compelling and personalised service at every touch point during their shopping excursion (PriceWaterhouseCoopers, 2012; Bardwell, 2013; Forrester Research, 2014; Verhoef *et al.*, 2015). Welcome, the era of omni-channel retailing – a movement that is currently disrupting older retail models and transforming the retail industry (Baird & Kilcourse, 2011; Rigby, 2011; Brynjolfsson, Hun, & Rahman, 2013; Bell, Gallino, and Moreno, 2014; Piotrowicz, & Cuthbertson, 2014). Omni-channel retailing is a retail business strategy that seeks to enhance the customer shopping experience by integrating all physical and digital channels (Rigby, 2011; Bhalla, 2014; Verhoef *et al.*, 2015). The idea is for companies to manage channels as a cohesive whole instead of as separate components so that the channel does not define the interaction between the retailer and the consumer but rather; a holistic brand experience is encompassed. Omni-channel consumers have been referred to as the “stop-start shopper” because they “hop” along a number of touch points and channels over a boundless timeframe to purchase a good (Bardwell, 2013). In the same vein, since consumers have become more informed and are more methodical in their shopping behaviour as they increasingly conduct research prior to purchasing and evaluate product information in multiple ways, the connected consumer has also evolved from the omni-channel environment (Berman & Thelen, 2004; Forrester, 2013; Deloitte, 2014). To optimize on this emerging trend, retailers have combined traditional and online retail activities and introduced new cross-channel services such as “click and collect”, “order-in-store, deliver at home”, “order online, return to store” and “showrooms” for example (Piotrowicz & Cuthbertson, 2014; Bhalla,

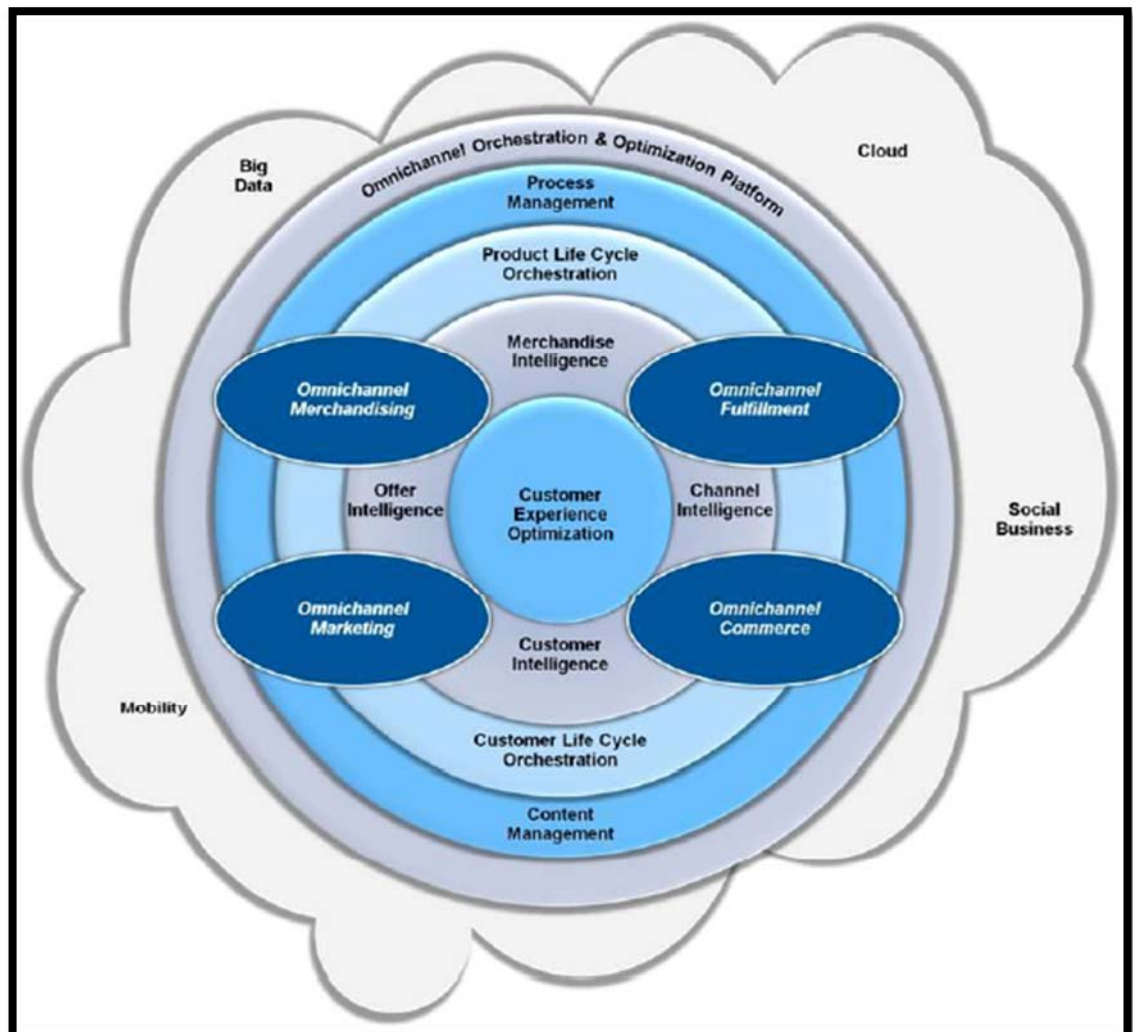
2014). The difference between multi-channel and omni-channel retailing is that while multi-channel retailing infers a separation between the physical and online store, in the omni-channel retail environment, both customers and firms can move seamlessly and interchangeably between these channels and touch points (Piotrowicz & Cuthbertson, 2014, Verhoef *et al.*, 2015).

#### *1.1.2.2 Why is omni-channel retailing important?*

In the retail world, omni-channel retailing is perceived as a brand differentiator and adapting to this movement is now a “must” for businesses (Bardwell, 2013; Bhalla, 2014; Forrester Research, 2014; Piotrowicz & Cuthbertson, 2014; Tetteh & Xu, 2014). It has even been suggested that if organisations do not adapt to omni-channel retailing, they are at risk of losing substantial business (Rigby, 2011; Bardwell, 2013). The reasons for this is that omni-channel retailing helps shape customers' purchasing decisions, makes access to products easier for consumers, and results in increased customer satisfaction, loyalty, retention and brand equity (Tetteh & Xu, 2014; Forrester Research, 2014). Research indicates that omni-channel shoppers spend 3.5 times more and shop more regularly than do single- and multi-channel customers (Bodhani, 2012; Bardwell, 2013). Other findings show that when customers buy from two or more channels, retailers enjoy lower attrition rates and consumers purchase a wider variety of products across a range of product categories (Stone, Hobbs, & Khaleeli, 2002; Neslin, Grewal, Leghorn, Shankar, Teerling, Thomas, & Verhoef, 2006). Further studies indicate that consumers will interact with these channels and touch points on average and approximately 56 times from their first point of interest to their final purchase action (Gartner, 2007; Cisco, 2010). The impact of these interactions can either impede or strengthen the customer relationship. Digitizing traditional platforms not only drives consumer engagement but it also directs traffic to websites, provides effective price comparison and product optimization, helps strengthen trust between brands and consumers, has a positive effect on customer lifetime value, gives companies a competitive advantage over traditional retailers and enhances long-term profitability. As such, the ability to drive engagement is the outcome of developing a superior customer experience (Piotrowicz & Cuthbertson, 2014; Bhalla, 2014). The aforementioned advantages present key opportunities for retailers. Figure 1 (the omni-

channel retail architecture) illustrates how omni-channel empowers retailers to engage shoppers, manipulate their behaviour, and permits them to receive feedback at every stage through the retail cycle.

**FIGURE 1 - OMNI-CHANNEL RETAIL ARCHITECTURE**



**SOURCE: BARDWELL (2013)**

## 1.2 Research Aim

The primary aim for this research is to empirically test the impact of different levels and types of interactivity in an omni-channel retail environment by examining how the interactivity affects the attitudes, involvement and engagement of retail shoppers. This research has been applied to a women's fashion apparel context so only female respondents have been included in this study and the focus is from a customer experience perspective. In order to test the research aim, a laboratory experiment was conducted. This involved the creation of three scenarios that displayed different levels and types of interactivity in the main channels of an omni-channel fashion retail environment (i.e. a physical store, an online store, and mobile technology) through videos. Data was analysed in a quantitative manner to capture retail shopper behaviour (i.e. involvement and engagement) and attitudinal responses to the various interactive devices. This research, therefore, seeks to answer the research question that is: *How does the level/type of interactivity in an omni-channel environment affect the attitudes, involvement and engagement of retail shoppers?*

## 1.3 Justification for Research

While existing retail research has focused on retail channels in isolation i.e. from a single- and/or multi-channel retailing perspective, there is a need to investigate shopping behaviour from an omni-channel and customer-centric retailing perspective (McCormick, Cartwright, Perry, Barnes, Lynch & Ball, 2014). It has been found that around about one third of retailers have started to invest in some level of omni-channel retailing (Forrester Research, 2014) and although this demonstrates the rising trend that retailers are modifying their business strategies to embrace this emerging omni-channel retailing movement, general research into this realm is extremely limited. The reason why omni-channel retailing research is insufficient is because omni-channel retailing is a new concept so there are misunderstandings about what omni-channel retailing really is, what it should be and how it's cross-channel structure works (Tetteh & Xu, 2014). Unfortunately, this has led retailers to resort to the use of trial-and-error tactics in an effort to adapt to omni-channel retailing (Drapers, 2012).

Today, the fashion industry is becoming more and more polarised as retailers compete with one another to target the same consumers with similar products (Floor, 2006). This indicates a need for retailers to differentiate themselves in the competitive omni-channel retail environment. Previous fashion retail-related findings have shown that females have a more positive attitude (Pentecost & Andrews, 2010), are more involved (O'Cass, 2004) and fashion conscious (Parker, Hermans & Schaefer, 2004), shop more frequently (Raajpoot, Sharma & Chebat, 2007) and are more prone to impulse buying (Pentecost & Andrews, 2010) in contrast to males. Although these findings indicate that females are a key target market for fashion shopping (and are therefore the focal point for this study) none of these studies have been explored from an omni-channel retail environment viewpoint. Since technology facilitates interactivity in the retail world (Day, 1998; Shankar & Malhotra, 2009; Berman & Evans, 2010; Varadarajan, Srinivasan, Vadakkepatt, Yadav, Pavlou, Krishnamurthy & Krause, 2010; Fenwick *et al.*, 2013; McCormick *et al.*, 2014; Lazaris & Vrechopoulos, 2014), technology is an important feature of this study. Interestingly, research concerning the impact of technology advancement in the context of fashion in an omni-channel retail environment has not yet been investigated (Kim, Ahn & Forney, 2014). Nor has the possibility of a relationship between technology investment and omni-channel retailing (Gagliardi, 2015). With relevance to literature based on interactivity, some studies have established a link between value and interactivity (e.g. Ghose & Dou, 1998), while other studies have not (e.g. Bezjan-Avery, Calder, & Iacobucci, 1998). More importantly, the levels of interactivity have scarcely been researched (Teo, Oh, Liu, & Wei, 2003) and considering the fact that shoppers respond differently to different types of technology (McCormick *et al.*, 2014), the application of these themes to an omni-channel retail environment would produce significant findings.

Across literature, the underlying issue is that there is no empirical evidence that provides a comprehensive examination of the effect of interactivity on retail shoppers' attitudes, involvement and engagement in an omni-channel environment. It is these fundamental gaps in the current omni-channel retailing literature that reveal a palpable need to build on deficient

academic omni-channel retailing studies. Adding substance to the omni-channel retailing body of knowledge would provide a better understanding of omni-channel shopper behaviour and present a consumer-centric perspective by focusing on retail shoppers' experiences (Neslin, *et al.*, 2006; McCormick *et al.*, 2014). The purpose of this research then is to examine how different levels and types of interactivity in an omni-channel environment affect the attitudes, engagement and involvement of retail shoppers. A key managerial implication for this research is that it will provide academics and practitioners with a better understanding of how retail shoppers' attitudes, involvement and engagement can be affected and, therefore, manipulated (to achieve certain effects) by different types of interactivity in an omni-channel retail environment.

## 1.4 Methodology

The design of this research is based on the analysis of a sample of 99 female adult participants who are regular fashion shoppers and are familiar with at least two shopping channels (e.g. the physical store, online store and/or mobile technology). A pencil and paper type experiment was conducted to gain insight into participants' attitudes, involvement and engagement with different interactive features in an omni-channel fashion retail environment. Participants were asked to complete a questionnaire that featured a number of questions and attitudinal scales. They were also exposed to three short videos that illustrated interactive shopping scenarios in either 1) a physical store, 2) an online store and 3) mobile technology. The videos that participants were exposed to during the experiment were as follows. For the physical store 1) a virtual mirror (i.e. image-interactivity technology), 2) touchscreen technology, and 3) self-service technology were shown. For an online store 1) virtual try-on technology, 2) videos of real models and 3) live pop-up chats were shown. Lastly, for mobile technology, 1) QR codes, 2) online product reviews, and 3) mobile payment technology was shown. This process took participants approximately 15-20 minutes. The findings were analysed using quantitative methods where ANOVA tests, one-way T-tests and Tukey's HSD tests were conducted on the data, and correlations and patterns of association were observed.

## 1.5 Structure of the Thesis

In this section, a brief explanation of each chapter in this thesis is presented.

The first chapter introduced the background information for this study and focused on the topics: fashion shopping and omni-channel retailing. Then the research aim and research question, justification for the research, and an overview of the methodology were described.

The second chapter presents a comprehensive literature review that provides the theoretical framework for this research and identifies gaps in previous studies. Areas of interest pertaining to this research that is featured in the literature review are shopper behaviour, attitude, involvement, engagement, interactivity and technology adoption. The section on interactivity explicates the term as it explains what interactivity is, provides a rationale from a marketing perspective as to why it exists, presents a discussion about where interactivity takes place and elucidates the different types of interactivity that are featured in this study. Based on the findings of this review of the literature, hypotheses are then developed and explained.

In the third chapter, the methodology of this research is outlined. First, the research question and hypotheses development are presented along with the most appropriate approach to answering the research question. This section includes a description of the research design, sample and sampling method, research measures, interactivity design and video selection, and data collection and data analysis procedures.

Sequentially, the fourth chapter presents the quantitative findings from the data analysis. This includes the questionnaire responses and data coding information and shows the findings from the ANOVA tests, one-way T-tests and Tukey's HSD tests that were conducted. Descriptions of what these findings mean are also provided in this chapter.

Lastly, the fifth chapter restates the research aim and concludes with an in-depth discussion of the findings of this study (as mentioned in chapter four) that answers the research question. In the conclusion, theoretical and practical implications are examined and managerial implications; limitations and interesting areas for future research are discussed.

## Chapter Two: Literature Review

The purpose of this review of literature is to analyse and discuss concepts that are relevant to this research. Several literature areas are pertinent to this study including studies concerning shopper behaviour, attitude, involvement, engagement, interactivity, and technology adoption.

### 2.1 Shopper Behaviour

For decades, researchers and practitioners have been challenged with the overarching question of “what motivates consumers to shop?” when it is apparent that a number of motives exist (Westbrook & Black, 1985; Parsons, 2002). To understand the phenomenon of what influences consumers to embark on the product acquisition process, the area of shopper’s motivational orientation can be considered. Shopping orientations relate to the overall disposition of consumers concerning their shopping activities (Gehrt & Carter, 1992). Shoppers with different motivational orientations have different needs, possess differing characteristics and behave in different ways (Shim & Kotsiopoulos, 1993). Individuals’ perceptions, preferences, involvement and attitude relative to varying acts of shopping operationalize these orientations (Brown, Pope & Voges, 2001). The majority of consumer orientation-based typologies recognise utilitarian (or task-oriented) and hedonic (or recreation-oriented) motivations as a central facet of shopping behaviour (Babin, Darden & Griffin, 1994; Dhar & Wertenbroch, 2000; Childers, Carr, Peck & Carson, 2001; Voss, Spangenberg & Grohman, 2003). As such, consumers are identified as being either “problem solvers” (utilitarian or task-oriented) or individuals who seek “fun, fantasy, arousal, sensory stimulation or enjoyment” (hedonic or recreation-oriented) (Hirschman and Holbrook, 1982, p. 132). It is the general notion that utilitarian shoppers want to purchase products in a timely and efficient fashion with minimal irritation, whereas hedonic consumers enjoy the serendipity of the shopping process as they experience it as an adventure and as a form of entertainment (Childers, *et al.*, 2001). In essence, recreation-oriented or hedonic consumption is characterised by multisensory and affective experiences that generate emotional responses depictive of fun, pleasure and excitement (Hirschman & Holbrook,

1982; Sherry 1990; Babin, *et al.*, 1994). Whereas utilitarian consumption is typified by task-related goals that consumers construct in a cognitive manner and goods serve an instrumental and practical function (Bloch & Bruce, 1984; Babin, *et al.*, 1994; Strahilevitz & Myers, 1998; Dhar & Wertenbroch, 2000). Although it has been suggested that hedonic and utilitarian dimensions are separate constructs (Dhar & Wertenbroch, 2000; Voss, *et al.*, 2003), there is a growing recognition among scholars that individuals possess both motivational orientations and that they are motivated by both utilitarian (e.g. efficiency and price) and hedonic (e.g. affect, social interaction and entertainment) needs (Batra & Ahtola, 1990; Babin *et al.*, 1994; Arnold & Reynolds, 2003). Specifically, it has been proven that consumer value is holistic as it consists of both intrinsic (or hedonic) and extrinsic (or utilitarian) dimensions which means that consumers are both logical and emotional beings (Babin *et al.*, 1994).

From another perspective, other types of motives can be linked to shopping patronage, that is functional and non-functional motives (Tauber, 1972; Parsons, 2002). Functional aspects of shopping motivation include convenience, price and product range whereas non-functional aspects comprise of social and personal motives. The Internet tends to focus on functional components whereas experiential physical stores are more non-functional (Sheth, 1983). Tauber (1972) suggests that shopping behaviour is motivated by a range of psychological needs that transcend beyond those relating to the acquisition of a product. He posits that the analysis of shopping motivation involves evaluating the satisfactions that shopping activities produce, as well as the satisfactions from the merchandise being purchased. These motives are referred to as being social and personal motives. Expressly, personal motives include role-playing, diversion, self-gratification, physical activity and sensory stimulation whereas social motives involve meetings with others, peer group influence, status, and bargaining (Tauber, 1972). Other findings suggest that in relation to physical stores, there are six elements of hedonic shopping i.e. adventure, social, gratification, idea, role, and value (Arnold & Reynolds, 2003). Motivational aspects can be applied in an online context as well. With relevance to the Internet, convenience is the main motive for users to conduct online shopping activities because it allows consumers to shop

in the comfort of their own homes whilst reduces the amount of time spent in searching for product information, browsing for alternative products and conducting transactions and it also avoids frustrations like the costs associated with travel, parking, and store queues. These functions have been made easily accessible through technology on the Internet like search engines and the mere click of a mouse (Newman & Staelin, 1972; Beatty & Smith, 1987; Bakos, 1991; Burke, 1998; O'Cass, 2001; Pastore, 2001; Goldsmith & Flynn, 2005). Some consumers view online shopping as more effective than physical shopping due to interactive tools such as chat rooms and search engines (Parsons & Conroy, 2006). It could be questioned that this convenience factor could better match utilitarian shoppers in comparison to hedonic shoppers as online shopping makes shopping tasks easier. However, although online shopping appears to be more convenient, the advantage of physical stores is that they enable experiential interaction with products where consumers can physically touch various products (Alba, Lynch, Weitz, Janiszewski, Lutz & Sawyer, 1997; Rosen & Howard, 2000). This is particularly important with product categories such as fashion clothing.

Several studies have documented the influence that motivational orientations have on shopper behaviour in singular retail settings. For instance, shoppers motivational orientations have been extensively researched in store atmospheric literature in a traditional physical store setting (e.g. Hirschman & Holbrook, 1982; Donovan & Rossiter, 1982; Batra & Ahtola, 1990; Babin, *et al.*, 1994; Dhar & Wertenbroch, 2000), with contemporary research examining effects in an online environment (e.g. Childers, *et al.*, 2001; Parsons & Conroy, 2006; Eroglu, Machleit & Davis, 2007; Yoo, Lee & Park, 2010; Porat, & Tractinsky, 2012; Wu, Lee, Fu & Wang, 2014) and some studies have focused on these effects from a mobile technology perspective (Wakefield & Whitten, 2006). However, there appears to be no studies that have investigated a holistic effect of all environmental settings (i.e. an omni-channel environment), which examines how shoppers' motivational orientations could potentially affect their shopping behaviour in response to different types of interactivity. Therefore, this could be an interesting area for exploration.

## 2.2 Attitudes

It is understood that utilitarian and hedonic components are essential to attitude formation towards products and brands (Voss, *et al.*, 2003). Thus, in order to better understand shopping orientations, the examination of consumer attitudes is necessary. Attitude refers to an individual's tendency to react (in a positive or negative manner) to an object, person or situation. Attitude is made up of four parts i.e. affective (or emotional) feelings, cognitive (or thinking) elements, conative (or behavioural) actions and (favourable or unfavourable) evaluative responses to stimuli (Engel, Blackwell & Miniard, 1995; Moye & Kincade, 2003). It is believed that attitude is formed through one's internalization of value that is shaped by their affective and cognitive evaluations, and affective and cognitive dimensions also influence the conative component (Rosenberg, 1960; Rokeach, 1972). The theory of planned behaviour (Ajzen, 1985) postulates that an individual's attitude predetermines the decisions they will make. Retail-related research shows a positive relationship between attitude and retail patronage where shoppers will decide on where to shop based on their attitude towards a particular retail environment (Korgaonkar, Lund & Price, 1985; Eastlick & Liu 1997). Further research has shown that if shoppers have a favourable attitude towards an object (or environment) then this will positively influence their information search behaviour with that particular brand which will increase their likelihood to purchase (Duncan & Olshavsky, 1982; Blackwell, Miniard & Engel, 2001). User attitude is also important because it demonstrates whether a user will use a certain system (Ajzen, 1989). Attitudinal research is, therefore, useful because it helps academics and practitioners to measure and better understand consumer behaviour, forecast future trends, identify problems such as an increase or decrease of sales for certain products and services, and it ultimately helps to construct an enhanced marketing mix (Moye & Kincade, 2003).

The affective component of attitude is essential because it is understood that an individual cannot form an attitude without first feeling emotions towards an object (Oskamp, 1991). Given the importance of the affective state, Mehrabian and Russell's (1974) Dimensions of Emotions PAD model is noteworthy as it is an effective measure for the emotions i.e.

pleasure, arousal and dominance (PAD) thus, relates to attitude. The PAD model suggests that different environments evoke avoidance or approach behaviours and that sensory stimuli can be used in retail store environments to elicit emotional responses from shoppers. Approach behaviours comprise of happy emotions and are centered on one's willingness to be in and return to an environment whereas avoidance behaviours are the opposite, as they are associated with negative feelings where individuals wish to escape that particular environment and not return (Mehrabian & Russell, 1974). In relation to environmental situations, pleasure refers to the extent to which a person has happy and hedonic feelings, while arousal relates to the extent to which an individual feels stimulated and excited and dominance refers to the extent to which a person feels unrestricted and in control of a situation (Mehrabian & Russell, 1974; Donovan & Rossiter, 1982). Sensory stimuli are physical aspects within an environment that have either a visual (e.g. merchandising, window displays, lighting, and colour), aural (e.g. sound and music), olfactory (e.g. scent), gustatory (e.g. taste) and/or tactile (e.g. touch and feel) component (Kotler, 1974). All of these features can be applied to a physical store, whilst visual and aural aspects are applicable to online retail environments and mobile technology. Although studies have investigated how store atmospheres affect consumers' emotions and thus influence shopping behaviour, few studies have linked these findings to consumer attitude (Yoo, Park & MacInnis, 1998). Other research has also suggested that motivational orientations moderate the effects of arousal that shoppers feel towards the pleasantness of an environment (Kaltcheva & Weitz, 2006). Specific findings indicate that for pleasantly perceived shopping environments, this has a positive influence on approach shopping behaviours but for environments that are highly arousing, utilitarian consumers find these environments unpleasant whilst hedonic shoppers have rich shopping experiences.

Literature concerning the relationship between attitudes and different channels of omni-channel retailing (i.e. the physical store, online store and mobile technology) reveal the following findings. When comparing channels, studies indicate that direct experiences lead to greater consistency between attitudes and behaviours than do indirect experiences (Fazio & Zanna, 1978; Cetola, 1988). This implies that physical environments (such as a physical store)

have more of an impact on attitude than non-physical environments (such as an online store or mobile technology). It has also been found that consumers with high satisfaction towards websites have more positive attitudes than those consumers who have the need to handle products prior to purchase in a physical store (O'Cass, 2001). In terms of isolating these channels and observing the effect of interactivity on attitudes, a great deal of research has focused on this area but the majority of studies have been confined to the online retail environment (e.g. Wu, 1999; Coyle & Thorson, 2001; Kettanurak, Ramamurthy & Haseman, 2001; Jee & Lee, 2002; Liu & Shrum, 2002; McMillan & Hwang, 2002; Liu, 2003; McMillan, Hwang & Lee, 2003; Teo, *et al.*, 2003; Fiore, Kim & Lee, 2005; Sicilia, Ruiz & Munuera, 2005; Tremayne, 2005; Wu, 2005; Thorson & Rogers, 2006; Sohn, Ci & Lee, 2007; Song & Zinkhan, 2008). Several studies show that in an online setting, interactivity has a positive impact on user attitude (Wu, 1999; Kettunurak *et al.*, 2001; Jee & Lee, 2002; McMillan *et al.*, 2003; Lee, Yurchisin & Lin, 2010) however; other findings indicate no effect between interactivity on attitudes (Coyle & Thorson, 2001). More recent research has begun to look into the relationship between interactivity and attitude in the context of mobile advertising (e.g. Haghirian & Madlberger, 2005; Lee, 2005; Choi, Hwang & McMillan, 2008) with studies showing that in response to interactivity on mobile devices, a positive attitude is influenced by entertainment and credibility (Haghirian & Madlberger, 2005; Choi *et al.*, 2008).

Surprisingly, what appears to be missing from literature is sufficient evidence that examines the effect of interactivity on attitudes in the physical store. There is also no existing research on this topic in relation to an omni-channel retail environment. Based on these findings, it is evident that an investigation into how interactivity affects attitudes in an omni-channel retail environment would be valuable.

## 2.3 Involvement

According to Dittmar (1992, p. 205), "an individual's identity is influenced by the symbolic meanings of his or her own material possessions, and the way in which s/he relates to those possessions". A possession that is significant in society is fashion apparel. In order to understand the behaviour of consumers in relation to their possessions, it is necessary to analyse the involvement that consumers associate with these possessions (Zaichkowsky, 1986). Involvement is defined as the psychological experience of the motivated consumer (Cohen, 1983). Involvement can be enduring, situational, cognitive or affective (Hoyer & MacInnis, 2010). Past research has sought to understand how consumers become involved with products and literature has examined the impact that involvement has on consumer behaviour (Browne & Kaldenberg, 1997). The most popular type of involvement that has been studied is the enduring involvement that people have with an object or product. Enduring involvement is defined as being "motivated by the product's relatedness to the self and/or the pleasure obtained from ownership and use" (Bloch, 1986, p.52). Enduring involvement has been associated with individuals' enjoyment of shopping as well (Mittal & Lee, 1989). On the other hand, cognitive involvement is situational and relates to the cognitive elaboration that occurs within a communication process (Liu & Shrum, 2002). Varying degrees of involvement can occur where an individual's level of involvement with an object can either be high or low. High involvement demands more cognitive capacity than low involvement because more effort is required to process information. Findings indicate that fashion clothing is a high involvement product category, as it requires consumers to interact with it by viewing, touching and trying it on during the evaluation process (Workman, 2010). High involvement is also associated with enhanced individual interest (Bloch & Richins, 1983). Involvement can also be linked to motivational orientation. The involvement theory (Zaichowsky, 1985) posits that due to personal relevance, consumers with a purchase task have higher levels of involvement towards utilitarian products. Conversely, the involvement level is lower for consumers who partake in shopping without a purchase task (Laurent & Kapferer, 1985). It has further been found that hedonic shopping activities can produce heightened levels of involvement and arousal and induce a sense of escapism (Bloch & Richins, 1983; Hirschman, 1983).

Involvement in a fashion-related context is recognised as an understudied area. Over time, the consumption of clothing has changed as fashion products are increasingly purchased for their symbolic meaning rather than for utility purposes (Hirschman & Holbrook, 1982; Belk, 1988). Today fashion products are being used by consumers for materialistic reasons to enhance ones' self image as a way of gaining social recognition (Belk, 1988; Miller, McIntyre & Mantrala, 1993; Solomon, 1996) and to communicate visual identity cues to others (Holman, 1980; O'Cass & McEwen, 2004). A developing stream of literature is fashion-clothing involvement (or FCI), which explains the significance and relevance of fashion clothing in consumer's lives (O'Cass, 2000; Bloch, Commuri & Arnold, 2009). Interestingly, some consumers find the process of acquiring and consuming fashion clothing to be more involving than others (Hourigan & Bougoure, 2012). O'Cass (2000) created a continuum of fashion clothing involvement that ranges from complete detachment (or automaticity) and requires a low level of involvement with fashion related objects (including clothing and activities) to total attachment (or absorption) that requires a high level of involvement. This idea suggests that the more importance consumer's attach to fashion clothing as being a part of their lives, the more involvement consumer's will expend during fashion-related activities. High involvement with fashion products can influence an individual's self-concept and indicates greater relevance to the self (Belk, 1988; O'Cass, 2000). With high FCI, consumers will spend more time and effort searching for relevant information (Griffith, Kramph & Palmer, 2001). This helps explain why fashion blogs and online stores are popular information sources (Hourigan & Bougare, 2012). From another angle, the Elaboration Likelihood Model (ELM) of persuasion can be mentioned. The ELM was developed to understand attitude formation in relation to decision-making through different levels of involvement (Petty & Cacioppo, 1984). It suggests that for fashion shopping, highly involved consumers follow a central route in the decision-making process because they are motivated and think fashion is personally relevant, whereas low involved consumers use a peripheral route (Josiassen, 2010). In terms of gender, it is known that women buy more fashion clothing than men (Beaudry, 1999) and findings further indicate that females are more oriented towards higher levels of involvement with fashion clothing than males (Hourigan & Bougare, 2012). In addition, it is also understood that technology

and the Internet are changing consumer's level of involvement with fashion products (Loker & Ashdown, 2008).

A considerable amount of literature has studied the relationship between interactivity and involvement, with much research focusing on this relationship in an online context (e.g. Parsons *et al.*, 1998; Liu & Shrum, 2002; Fiore & Jin, 2003; Fiore, *et al.*, 2005; Kim, Fiore & Lee, 2007; Liu & Shrum, 2009; Jiang, Chang, Tan & Chua, 2010). Existing studies suggest that interactivity produces experiences that have a degree of cognitive involvement by way of active control and two-way communication. For active control to take place, users need to be cognitively active and able to make decisions. For users to experience significant interactivity with new media (e.g. the Internet), users require more cognitive processing in comparison to traditional media. With traditional media, the communication process is one-way and involves the user to encode a message and then send it to an audience. The audience then receives and decodes this message in a passive manner. Whereas with new media; a more engaging two-way communication process is required. In this process, the users fulfill a dual function where they can create, send and receive the message. This engagement leads to enhanced interactivity, which then results in increased user involvement. Thus, synchronized (two-way) communication is more engaging for users and requires higher involvement as opposed to unsynchronized (one-way) communication (Parsons *et al.*, 1998; Liu & Shrum, 2002; Jiang *et al.*, 2010). Another study by Liu & Shrum (2009) found that in low-involvement conditions, interactivity acts as a peripheral cue and results in positive attitudes whereas, in high-involvement conditions, interactivity has a positive influence on experienced users' attitudes but a negative effect on inexperienced users' attitudes. Evidently, there is a lack of research that examines the effect of interactivity on involvement in retail channels other than an online environment i.e. the physical store and mobile technology, as well as an omni-channel retail environment.

## 2.4 Engagement

Engagement is a behavioural manifestation toward a brand or organisation that progresses beyond transactions and is derived from motivational forces. These behavioural manifestations are said to be either positive or negative (Verhoef, Reinartz & Krafft, 2010; Van Doorn, Lemon, Mittal, Nass, Pick, Pirner & Verhoef, 2010). Engagement has been defined as “the state of being involved, occupied, retained, and intrinsically interested in something” (Kim, Kim & Wachter 2013, p.361). From a strategic viewpoint, customer engagement has been defined as “the creation of experiences that allow companies to build deeper, more meaningful and sustainable interactions between the company and its customers or external stakeholders” (Economist Intelligence Unit, 2007). Implicitly, from a marketing perspective these definitions infer that customer engagement is a process that develops through a relationship, where customers become emotionally attached to organisations (Gallup Consulting, 2006) and as a result customer satisfaction, loyalty and retention can be influenced. These relationships can range from short or long-term and cursory to intimate (Sashi, 2012). Customer engagement literature has largely focused on behavioural metrics and there has been an emphasis on purchase behaviour (e.g. Bolton, 1998; Reinartz & Kumar, 2000; Verhoef, 2003). Research also shows that customer engagement can be measured through sales volume, customer satisfaction and the frequency of visits (to a store or website) (Forrester Consulting, 2008).

It has been suggested that to attain an interaction with consumers, marketers must capture their audiences' interest and entice them to participate through engagement. To engage users, marketers must execute a creative strategy to showcase interactive media (i.e. the form) and exhibit content that users deem valuable (i.e. the substance). Content should be well presented, easy to understand and inspirational (Parsons *et al.*, 1998). In relation to online retail environments, a level of challenge is necessary to capture consumers' constant engagement (Nantel, 2004). To understand the nature of customer engagement, Van Doorn *et al.* (2010) posit that there are five dimensions of which consumers may engage which is through valence, form (or modality), scope, the nature of its impact, and individual goals. Conversely, other factors of engagement that have been conceptualised in other literature are:

perceived usability, focused attention, endurability, novelty, aesthetics, and felt involvement (O'Brien & Toms, 2010). Another form of engagement that exists is media engagement. Media engagement is centered on the consumer's psychological experience during media consumption where there is a strong connectedness between the consumer and the media (Calder & Malthouse, 2008).

Interestingly, from a company-consumer perspective, engagement is as an interactive element of co-creation (Van Doorn *et al.*, 2010). Co-creation is a value creation tool where value is created through company-consumer interactions in varying exchange points via a creative process of co-design and co-production (Prahalad & Ramaswamy, 2000, 2002, 2004; Vargo & Lusch, 2004). Presently, interactive technologies facilitate co-creation (Harrison & Barthel, 2009). The key components of co-creation are customer participation, dialogue creation and personalised experiences. The dialogue between the company and customer needs to be engaging as this garners enhanced company-consumer experiences. Experience is a product attribute where value can be added to differentiate goods (Pine & Gilmore, 1999). For an effective user experience to manifest the user must first be motivated to interact with technology and as a consequence of co-creation, innovative core offerings are produced (Lusch & Vargo, 2006; Van Doorn *et al.*, 2010; Piotrowics & Cuthbertson, 2014). Shopping research indicates that motivation and engagement have been previously examined, although studies have been limited to intrinsic and extrinsic motivation. Literature has also shown that for utilitarian and hedonic motivational orientations relative to engagement, both functional and enjoyable aspects are integrated into users' experiences with computers so that users stay involved in this interaction. Thus, understanding the relationship between motivation and engagement is useful in designing and assessing interactive technologies (O'Brien, 2010). Few studies have investigated the relationship between interactivity and engagement. Some research has recently looked into this topic from an educational viewpoint and in an online context (e.g. Sims, 1996; Kim *et al.*, 2007; Mollen & Wilson, 2010; Blasco-Arcas, Buil, Hernández-Ortega & Sese, 2013). Evidently, there is no research that examines the effect of interactivity on engagement in a physical store or in an omni-channel retail environment.

## 2.5 Interactivity

### 2.5.1 What is Interactivity?

Across literature, interactivity has been defined in numerous ways (Rafaeli, 1988; Biocca, 1998; Ha & James, 1998; Haeckel, 1998; Vorderer, 2000; Liu & Shrum, 2002) hence; interactivity is an ambivalent and incoherent term. If the term “interact” is broken down into its Latin origins, it means to “act upon each other and to have reciprocal effects or influences” (Lee, Park & Jin, 2006, p. 263) thus; the basic premise underpinning interactivity is that it is an influential exchange mechanism that enables two-way communication. Blattberg and Deighton (1991) suggest that interactivity is a means for individuals to communicate with organisations through a medium, irrespective of distance or time. Whilst Steuer (1992) describes interactivity as the real-time ability for users to participate in, as well as change, the content of a mediated environment. These varying definitions of interactivity can be examined from either a mechanical or a marketing perspective. In mechanical terms, interactivity is a multidimensional construct that is measured by the speed, range of ways that content can be manipulated, and mapping capabilities i.e. how alike the manipulation in the mediated environment is in comparison to the real environment (Steuer, 1992). Whereas from a marketing position, interactivity enables consumers to express themselves through their purchases and in response, sellers can concomitantly utilise information technology (IT) and engage in database analysis to effectively address individuals in accordance to their specific needs (Blattberg & Deighton, 1991; Deighton, 1996). Over time, the interpretation of interactivity has changed in terms of its complexity and wide-ranging application. This is due to the emergence of the Internet and IT-enabled interactivity as these technologies have transformed traditional marketing methods into new business models (perceived by some marketers as enablers), and rendered old frameworks as obsolete (whereby viewed as disruptors) (Webster, 1996; Hoffman & Novak, 1997; Varadarajan, *et al.*, 2010). For instance, Webster (1996) suggests that the four P’s of product, price, promotion and place is no longer relevant and that interactive technologies such as the Internet should be considered as a potential element of the new marketing mix (Carter, 1996; Parsons *et al.*, 1998).

Recently, marketing and interactivity terms have converged and new terms such as marketing interactivity (e.g. Haeckel, 1998) and/or interactive marketing (e.g. Day, 1998; Shankar & Malhotra, 2009) have emerged. Interactive marketing is described as “an integrated exchange process by which an organisation uses the understanding of customer behaviour, technology, and other resources to create and manage customer value and collaborative relationships and enhance shareholder value through relevant brands, products/service offerings, ideas and messages communicated and delivered to the right customers through appropriate channels and contact points at appropriate times” (Shankar & Malhotra, 2009, p.1). At this point “the use of information *from* the customer rather than *about* the customer” is important (Day, 1998, p. 47). This information from customers has led customers to co-create offerings, which is increasingly influencing marketing activities (Shankar & Malhotra, 2009). When considering the application of interactive technologies, it is necessary to understand how people work with each other and also how they use technology to gain a common purpose thus, collaboration is a fundamental concept of interactivity (Haeckel, 1998). Interactive technology is defined as the “methods, tools or devices that allow various entities (individuals, machines or organisations) to engage in mediated communication to facilitate the planning and consummation of exchanges between them” (Varadarajan *et al.*, 2010, p. 97). In relation to the relationships between stakeholders in the retail environment, entities of relevance are the retailer, their customer base (i.e. existing and potential clients), employees, suppliers and other partners. Other terms that have since been developed are “real-time marketing” (McKenna, 1997) and “digital marketing” (Parsons, *et al.*, 1998). The aforementioned concepts encapsulate the idea of delivering improved customer relationships along with personalized and customized goods by way of communication between companies and customers. These findings indicate that from a marketing perspective, interactivity enables the reciprocal communication between sellers and buyers that is beneficial to both entities because co-creation can occur.

From an advertising perspective, other definitions of interactivity have been classified according to the interaction between the user and 1) machines, 2) other users, and 3) messages (Cho & Leckenby, 1997). User-machine interaction reflects earlier definitions of interactivity where the focus is on human interaction with computers. This is however not all encompassing of the interactivity term, as it does not consider advanced technology like the Internet (Liu & Shrum, 2002). Nowadays, other mediums such as the Internet and mobile technology facilitate interactivity (Varadarajan *et al.*, 2010; Rigby, 2011; Taylor & Levin, 2014). As a consequence, user-user interaction and user-message interaction were conceptualised (Liu & Shrum, 2002). User-user interactivity refers to the interpersonal communication between individuals with the notion that within a computer-mediated environment, the more interpersonal the communication is the more interactive that particular communication is (Ha & James, 1998). However, the problem with user-user interaction is that it does not combat the restrictions of traditional interpersonal communication. Lastly, user-message interaction refers to the user's ability to control and alter messages (e.g. Steuer, 1992). In the past, the ability for users to control messages was limited whereas now, with the advancement of the Internet users can freely control the messages they receive and they have the opportunity to manipulate these messages as well.

To clarify the confusions involved with the interactivity term, Lee, Park and Jin (2006) explicated interactivity by categorizing it into three perspectives that are centered on extant literature. The categories are technology-oriented, communication setting-oriented, and individual-oriented (see Table 1). The technology-oriented perspective has defined interactivity as a component of modern technologies (that is commonly associated with a computer), which enables an individual's participation within a communication setting (Steuer, 1992; Biocca, 1998). On the other hand, the communication setting-oriented approach contends that interactivity is a process-related feature of a communication setting (Rafaeli, 1988; Rafaeli & Sudweeks, 1997). Lastly, the individual-oriented perspective has regarded interactivity from a technology user's viewpoint (Rogers, 1995; Ha & James, 1998).

**TABLE 1 – EARLY DEFINITIONS OF INTERACTIVITY**

| <i>Approach</i>                         | <i>Authors</i>  | <i>Definitions</i>   |
|---|---|--|
| Technology - oriented approach          | Biocca (1998),<br>Steuer (1992),<br>Walther & Burgoon (1992)                        | “Interactivity is the name given to the properties of a medium that simulate the properties of human interaction with the physical world and/or other humans (intelligent beings)” (Biocca, 1998, p.5).<br>“Interactivity is the extent to which users can participate in modifying the form and content of a mediated environment in real time (Steuer, 1992, p.84)   |
| Communication setting-oriented approach | Rafaeli (1988),<br>Chafee, Rafaeli & Lieberman (1985),<br>Rafaeli & Sudweeks (1997) | “A relationship between interactants A and B over time is interactive if an act by A at one time is constrained by an act of B at an earlier time that was constrained by an act of A yet an earlier time” (Chafee <i>et al.</i> , 1985, p.9)<br>“Interactivity is an expression of the extent that in a given series of communication exchanges, any third (or later) transmission (or message) is related to the degree to which previous exchanges referred to even earlier transmissions” (Rafaeli, 1988, p.111) |
| Individual-oriented approach            | Rogers (1995), Ha & James (1998)  | “Interactivity should be defined in terms of the extent to which the communicator (Web page providers) and the audience respond to, or are willing to facilitate, each other’s communication needs (such as playfulness, choice, connectedness, information collection, and reciprocal communication)” (Ha & James, 1998, p.461)<br>“the degree to which participants in a communication process can exchange roles and have control over their mutual discourse” (Rogers, 1995, p.314)                              |

**SOURCE: LEE ET AL., (2006)**

Ha and James (1998) developed an interesting conceptualisation of interactivity comprising of five dimensions: playfulness, choice, connectedness, information collection, and reciprocal communication. However, problems have arisen with these different definitions of interactivity (Lee *et al.*, 2006). Technology-oriented definitions are problematic because different mediums have different levels of interactivity depending on how different individuals use that particular medium. Further, a limitation with communication setting-oriented definitions is that they assume that participants within a communication setting desire the same rate of information exchange and that this information exchange is the initial

circumstance for interactivity. In argument of the latter, it is uncommon to have a symmetrical information flow and it is also possible for interactivity to take place without the exchange of information. Lastly, individual-oriented definitions are of concern because they were developed from human to human interaction so do not consider human to computer interaction (e.g. Rogers, 1995; Ha & James, 1998). There have also been issues with the measurement of interactivity as Newhagen, Cordes and Levy (1995) state that the level of interactivity changes depending on individuals' perceptions, whilst Schneiderman (1987) contends that it can only be changed through technological aspects. To resolve the issues with the early definitions of interactivity, Lee *et al.*, (2006) posit that interactivity should be considered as a perceived characteristic of a communication act that can change in accordance with the perception of the user. This thought is in line with Bucy (2004) who advises that interactivity should be recognised as a perceptual variable as it relates the concept to regular media experience and also "enables measurement through attitudinal and emotional scales" (p.377). Lee *et al.* (2006) postulate that interactivity requires two conditions: that is 1) that interaction occurs between at least two participants, and 2) that the effects between the interacting participant's act are reciprocal on the communication process. Based on this notion, a new psychologically-oriented definition was conceptualised: *"Interactivity is a perceived degree that a person in a communication process with at least one more intelligent being can bring a reciprocal effect to other participants of the communication process by turn-taking, feedback, and choice behaviours"* (Lee *et al.*, 2006, p. 263). In light of this definition, the level of analysis is the individual; the unit of analysis is the participant partaking in the communication process, and this can differ depending on the individuals and the communication processes. This means that for different individuals in the same communication setting or who are using the same technology, different levels of interactivity can occur. This definition can be applied to a variety of communication settings, which include mediated, interpersonal, as well as human-computer interactive situations. However, since it is unknown how different individuals respond to different types of interactivity in an omni-channel retail environment, empirical evidence would help validate this claim.

### 2.5.2 Why do we have Interactivity?

A core concept of interactivity is the reciprocal communication process between senders and receivers (Rafaeli, 1988; Haeckel, 1998; Vorderer, 2000; Kioussis, 2002; Lee *et al.*, 2006; Varadarajan *et al.*, 2010). This process has provided improved connectivity among people and machines via IT-enabled interactivity and interactive media (Cho & Leckenby, 1997; Ha & James, 1998). It was predicted that interactivity would change the way consumers “shop, play and learn” (Jensen, 1998, p.185) and alter how businesses market their products. A number of scholars even envisaged that interactive media would supersede traditional media (Rust & Varki, 1996; Parsons *et al.*, 1998; Childers *et al.*, 2001). Since the recent rise of a new and highly attractive consumer market, interactivity has played a key function (Parsons *et al.*, 1998). The implementation of interactive technologies in retail settings has changed communicative and product acquisition processes (Hoffman & Novak, 1996; Yadav & Varadarajan, 2005) whilst influenced retailers’ strategies, operative functions and competitive nature (Varadarajan *et al.*, 2010). As such, interactivity has created new types of company-consumer interactions. Expressly, interactivity has provided firms with the ability to engage customers by delivering and co-creating fun and satisfying experiences, strengthened relationships, offered cross-channel support, allowed instant access to market data and competitor information in real time – reducing the information symmetry between consumers and retailers, created an effective and additional sales channel, developed transaction capabilities, resulted in customized and personalized goods, enabled firms to transform themselves – all at a low cost which has optimized the buying process for both sellers and buyers (Schaffer & Hannafin, 1986; Rafaeli, 1989; Szuprowicz, 1996; Honeycutt, Flaherty & Benassi, 1998; Evans & King, 1998; Parsons *et al.*, 1998; Coviello, Milley & Marcolin, 2001; Varadarajan *et al.*, 2010). Although opportunities have been created, interactivity also poses a threat to businesses. With increased buyer bargaining power through reduced costs and unlimited information access, seller’s bargaining power has decreased as price competition has increased (Bakos, 1997). Thus, understanding the technological differences between traditional and new media in today’s market and how interactive features of new media operate is critical (Alba *et al.*, 1997; Coyle & Thorson, 2001).

### 2.5.3 Where does the Interactivity take place?

As previously established, interactivity occurs within a communication setting (Rafaeli, 1988; Chafee *et al.*, 1985; Steuer, 1992; Rafaeli & Sudweeks, 1997; Biocca, 1998; Lee *et al.*, 2006) and can be applied to mediated, interpersonal, and human-computer environments (Lee *et al.*, 2006). The Internet has been referred to as the “ultimate interactive medium” (Deighton, 1996, p. 152) and it is understood that information technology (IT) is another medium that has vastly enhanced interactivity (Coviello *et al.*, 2001). In the omni-channel retail environment, interactivity can occur through a number of channels and touch points (i.e. communication settings) where the retailers’ physical store, online store, and consumers’ smartphones are significant interaction points (Rigby, 2011). Research shows that more than three quarters of consumers use multiple devices during their shopping activities and these devices are increasingly being used simultaneously, as users switch between a tablet device to a smartphone (comScore, 2013). Understanding the technology-driven differences of each communication setting (or channel) in terms of the interactive experiences they provide will help businesses gain success in the omni-channel retail environment (Taylor & Levin, 2014). It is for this reason that it is necessary to explore where exactly in the omni-channel retail environment the interactivity takes place.

#### 2.5.3.1 Physical Retail Environment

Physical stores are viewed as the foundation of omni-channel retailing as a recorded 95 percent of sales are captured in brick-and-mortar channels. The physical store also plays a central role in online purchases, as two thirds of consumers use the physical store before and/or after making an online purchase. This is particularly relevant to product categories with a high touch-and-feel component like fashion apparel (Kearney, 2014). Given the significance of the physical store being the crux of retailer-customer value creation, an examination of how consumers respond to certain elements of a physical store is needed. Two main types of interactivity are said to exist in physical stores, i.e. personal service and store atmosphere and design (Kearney, 2014). Creating a servicescape (or store-as-a-brand strategy) where the optimization of the design and layout, sensory stimuli, customer-employee interactions and

visual merchandising is important because it provides a competitive advantage that differentiates retailers from others (Kotler, 1974; Bitner, 1992; Merrilees & Miller, 2001; Floor, 2006; Kumar & Kim, 2014). It is known that traditional (or physical) retail environments convey a stores' purpose and communicate a specific image to its customers, subsequently harnessing the potential to influence consumer behaviour (Kotler 1974; Saffer, 1996; Parsons, 2011). Retailers are able to create unique shopping environments by manipulating sensory stimuli that can evoke emotional responses and change consumer's moods (Gardner, 1985; Spies, Hesse, & Loesch, 1997), influence consumer patronage and purchase decisions (Schlosser, 1998; Parsons, 2011), induce the amount of time and money spent in store (Donovan & Rossiter, 1982), manipulate consumers' spatial impressions (Harrell & Hutt, 1976), affect customers' evaluation and satisfaction level (Bitner, 1990), and have an impact on impulse buying (Bellizzi & Hite, 1992). Sensory stimuli are stimulus that affect the senses and are an effective marketing tool that retailers can use to improve store environments (Baker, Grewal, & Levy, 1992). It is therefore essential for retailers to create the right retail environment to achieve desired effects (Custers, de Kort, IJsselsteijn, & de Kruiff, 2010). The creation of an atmosphere that features interactive and hedonic dimensions is also imperative in influencing consumers' purchasing decisions, which is particularly relevant for fashion clothing products (Porat & Tractinsky, 2012). A key benefit of physical stores (in comparison to online stores and mobile technology) is that they provide a sensory brand experience where consumers can physically interact with products by touching and feeling them and this can lead to instant gratification (Alba *et al.*, 1997; Rosen & Howard, 2000; Kearney, 2014; Brynjolfsson, Hu & Rahman, 2013). Customers can also use interactive technology in physical stores to assist with their shopping experience (e.g. self-service kiosks, touch-screen technology, mobile technology, etc.). It is the general conception that individuals react differently to different sensory stimuli (Babin, Hardesty, & Suter, 2003) however there is limited research into how consumers respond to interactive stimuli (or interactivity) in the physical store.

### 2.5.3.2 Online Retail Environment

Interactivity has revolutionized traditional media into new forms of media such as interactive online retail environments (Jensen, 1998; Parsons *et al.*, 1998; Coyle and Thorson, 2001). This has consequently enhanced the buying process for both consumers and companies (Parsons *et al.*, 1998; Childers *et al.*, 2001). The main driver behind this change has been the Internet (Ha & James, 1998; Burke, 1999; Childers *et al.*, 2001; Bhalla, 2014; McCormick *et al.*, 2014). The online retail (or e-tail) environment has experienced substantial growth as the Internet is frequently accessed by millions of users, which indicates a massive opportunity for businesses (Ha & James, 1998; Parsons & Conroy, 2006; Wang, Minor & Wei, 2011). Previous e-tail research has been centered on human-computer interaction, usability and website design (Chen, Wu & Yen, 2009). As a retail channel, Internet-based technology is useful for projecting a brand's image and showcasing its products (e.g. online stores), it improves the persuasion and comprehension competencies of websites, acts as an information research tool for consumers (e.g. search engines, product and price comparison tools), allows consumers to see a broad choice set in terms of pricing and products, has wide-reaching exposure capabilities, offers reciprocal two-way communication functions for customers (e.g. feedback forums, product reviews, online surveys, email contact, live chats, and blogs), has transformed supply and distribution channels (e.g. inventory databases and customer relationship management systems), enhances retailer's operational efficiency, presents entertaining interactive experiences (e.g. videos, animation, online communities, virtual try-on avatars), the ability to purchase goods remotely has taken over the catalogue channel, it supports firms in converting offline customers to loyal online customers, and can be operated at a low cost (Ha & James, 1998; Childers *et al.*, 2001; Pastore, 2001; Shah & Murtaza, 2005; Mylonakis, 2005; Lustria, 2007; Varadarajan *et al.*, 2010). From a consumer perspective, online retail environments can cater to both motivational shopping orientations. For instance, goal-oriented (or utilitarian) shoppers engage in online shopping because it is convenient and accessible, information is readily available, the product selection is broad, and there is also the absence of sociality with others like salespeople or spouses that is sometimes preferred (Klein, 1998; Hoque & Lohse, 1999). Websites also provide engaging entertainment-based experiences that alternatively

serve recreation-oriented (or hedonic) users as well (Babin *et al.*, 1994; Hoffman & Novak, 1996; Childers *et al.*, 2001). Although the majority of online consumers tend to be goal-oriented, recreation-oriented shopping is desirable as it results in repeated visits and increased impulse purchases (Klein, 1998). In comparison to traditional (or physical) retail spaces, online retail environments lack olfactory, tactile and gustatory sensory elements but do make use of visual and aural dimensions. Aural (such as background music) and visual stimuli are effective in facilitating consumers with viewing products (Parsons, 2002). The major challenge for online environments, however, is the inability to touch and feel products (Varadarajan *et al.*, 2010). Nevertheless, online retail environments can have similar effects on consumer's psychological responses and behaviour as physical retail environments through the use of e-atmospherics (Eroglu, Machleit & Davis, 2003; Poncin & Mimoun, 2014).

Hoffman and Novak (1996) postulate that two types of interactivity apply to the online environment, namely person-interactivity (which refers to the ability for an individual to communicate with others via the Internet) and machine-interactivity (which is the ability for a person to access multimedia material). In terms of research on the effects of interactivity in online retail environments, findings show that consumers perceive higher levels of trustworthiness towards websites if there are high levels of interactivity (Merrilees & Fry, 2003). Other findings show that the interactivity in images presented on websites, stimulate positive approach behaviours (Fiore & Jin, 2003). It has also been found that the level of interactivity and the amount of information that a website provides, has a positive influence on consumer satisfaction (Ballantine, 2005). Further, there is little evidence that investigates the perceptions of information searchers as opposed to the perceptions of online buyers in an online environment (Zeithaml, Parasuraman & Malholtra, 2000). These findings are limited and further investigation into how interactivity affects users in an online setting is required.

### 2.5.3.3 Mobile Technology

A smartphone can be defined as a mobile phone that contains an operating system, which performs the same functions as a computer, has Internet access and allows for application use (Ratchford, 2015). Today, the functionalities of smartphones surpass traditional telephony needs as they now feature a range of value-added mobile services (Dahlberg, Mallat, Ondrus & Zmijewska, 2008). Consumers are increasingly engaging with smartphone-enabled mobile applications (or mobile apps) to aid their purchasing decisions and this is influencing shopping behaviour across channels (Taylor & Levin, 2014, Ratchford, 2015; Verhoef *et al.* 2015). There are many different types of mobile apps available on the market with some accessible via free download. A retailer app is essentially an online store that is devoted to a particular retailer. Retailer apps provide an innovative solution for retailers because they allow retailers to collect customer information whilst enabling consumers to share information with other consumers (Taylor & Levin, 2014). Other mobile apps allow customers to access information as they have the ability to scan barcodes, provide product and price comparisons and present online product reviews. These types of mobile apps have a significant impact on retailers because enabling customers to access price and product comparison information via smartphones while in store poses a threat to retailers. It is therefore important for retailers to develop apps that offer incentives and provide customer-centric information, as this will help to increase purchase intention and improve brand awareness (McCormick *et al.*, 2014). Due to the substantial growth of global smartphone usage, mobile apps signify an opportunity for omni-channel retailers. In the US market alone 83 percent of smartphone owner's use their phone in store (Google, 2015) and 38 percent of smartphone users used a mobile app to purchase goods from a retailer (Adobe, 2013). Around the world, mobile app usage is expected to rise (Taylor & Levin, 2014) and it is predicted that every smartphone owner will succumb to the growing "app culture" in the near future (Johnson, 2010). In order for retailers to remain relevant and optimize a seamless omni-channel experience, adapting to this trend by integrating a mobile channel into business strategies is crucial (Rigby, 2011). However, research involving mobile technology is limited and shows a need to better understand the usability of smartphone devices (Taylor & Levin, 2014).

#### 2.5.4 What types of Interactivity do we have?

It has been ascertained that interactivity takes place in communication settings and in the context of the omni-channel retail environment, relevant communication settings are a retailers' physical store, online store and a consumer's smartphone. It has further been established that technology and the Internet are the main enablers of interactivity. Interactivity has also transformed traditional media into new interactive media (Jensen, 1998; Parsons *et al.*, 1998; Coyle and Thorson, 2001; Pavlou & Stewart, 2002; Song & Zinkhan, 2008). At this point, it is necessary to distinguish the differences between traditional media and interactive media. Two main factors differentiate interactive new media from traditional media: 1) in comparison to traditional media that only offers one-way communication, interactive new media allows companies to create a dialogue with consumers and 2) new media enables companies to reach a large individual consumer market whereas traditional media is marketed to the mass market (Ha & James, 1998).

##### *2.5.4.1 Interactivity in Physical Stores*

As previously identified, much physical store-related research is based on the effects of store atmospherics. However, there is a need to explore the effects of interactivity in physical stores. Recently, physical stores have adopted a number of interactive technologies to assist with different functions. For instance, touchscreen technology and self-service technology have widely been implemented into stores while image-interactivity technology (such as virtual mirrors) is a relatively new technological innovation that is being introduced. These aforementioned types of interactivity in the physical store and relevant studies concerning them are discussed.

##### *2.5.4.1.1 Touchscreen Technology*

In retail, the usage of touchscreen technology via devices (such as tablets) is growing with shopping activities. Touchscreen technology provides a different form of interaction with products in comparison to desktop computers, as the presentation and processing capabilities

are different (McCormick *et al.*, 2014). With touchscreen technology, users are able to modify objects by touching a screen and this provides an engaging and rich shopping experience. Newer technology such as multi-touch user interfaces allows users to complete more advanced functions than standard single finger tapping and pointing actions. Users can now make hand gestures and complete multiple finger actions that involve swiping, rotating, flicking and pinching movements (Wu & Balakrishnan, 2003; Orzechowski, Padilla, Atkinson, Chantler, Baurley, Berthouze, Watkins & Petreca, 2012). Touchscreen technology is also available on smartphones and some brands are using touchscreen devices to replace traditional point-of-sale (POS) systems (McCormick *et al.*, 2014). There are a number of benefits involved with touchscreen technology. For instance, touchscreen technology enables customers to be more in control of their shopping experience, it provides useful information that assists with purchasing decisions, and access to coupons and other incentive programmes is beneficial. Retailers can use the technology as a tool to inform customers about certain products and/or services and promotions, information can be easily modified and updated, customer details can be captured, customer service is improved as employees are facilitated with supplementary interactive information devices that enhance the selling process whereby operating costs are reduced and sales are increased (Touchpoint Interactive Media, 2013). In light of these facts, it can be stated that touchscreen technology can provide both a utilitarian and hedonic shopping experience. It can also be specified that literature pertaining to the examination of an effect of interactivity from a touchscreen technology perspective on consumer behaviour, is non-existent.

#### *2.5.4.1.2 Self-service Technology*

Self-service technology (or SST) is another form of technology that retailers are increasingly implementing into physical stores through interactive devices like self-service kiosks. In essence, self-service technology replaces personnel with technology and enables customers to serve themselves (Curran & Meuter, 2005; Wang, 2012). There are two forms of self-service technology (Kallweit, Spreer & Toporowski, 2014). The first is transaction-based technology that allows customers to scan, purchase and place an order for items (Cunningham, Young &

Gerlach, 2008), and the more recently developed version is information-related technology, which allows for a more personalized experience as customers can access information about products without any employee assistance and interaction (Wang, 2012). The benefits of self-service technology is that it is: convenient, enables retailers to provide a broad product range, presents handy product information, collects information about customers, decreases waiting and transaction times, reduces costs and increases productivity (Weijters, Rangarajan, Falk & Schillewaert, 2007; Makarem, Mudambi & Podoshen, 2009; Collier & Sherrell, 2010; Ding, Hu, Verma & Wardell, 2010; Pantano, 2014). Although there are benefits involved, self-service technology also has drawbacks. For example, it has been found that some customers are hesitant to adopt this technology. Not only does SST require a higher level of involvement from customers but some consumers may not feel the need to change and learn new technology, so may stick to their normal shopping routine (Langeard, Bateson, Lovelock, & Eigler, 1981). Others experience anxiety when confronted with new technologies (Mick & Fournier, 1998) and some consumers appreciate social interaction so prefer engaging with real people (Zeithaml & Gilly, 1987). To alleviate these issues, it is recommended that SST should include entertaining aspects to engage with customers (Wang, 2012). Prior to implementation, retailers should trial the technology on a large group of customers to justify implementation-related costs (Curran & Meuter, 2005). Some retailers have even implemented both types of SST into stores so that consumers have multiple service options and sales are not lost, as employees can actively close sales if self-service kiosks are not being used (McCormick *et al.*, 2014). Based on these findings it can be stated that the main motive for self-service technology is to serve task-related or utilitarian shoppers. In addition, the effect of interactivity via self-service technology in an omni-channel retail environment is unknown.

#### *2.5.4.1.3 Image Interactivity Technology - Virtual Mirrors*

In relation to fashion retail stores, specialised technological innovations have been developed to enhance the shopper's experience (Poncin & Mimoun, 2014). One such innovation is image interactivity technology (or IIT) (Varadarajan *et al.*, 2010; McCormick *et al.*, 2014). IIT allows retailers to create and manipulate images of products using a number of features (McCormick *et al.*, 2014). For instance, virtual mirrors are interactive mirrors that customers can interact

with. Through augmented reality technology (ARTI), customers are able to upload a photograph of their body, then superimpose the photo frame and virtually fit garments to their personal image without the hassle of getting changed (Varadarajan *et al.*, 2010; McCormick *et al.*, 2014). Virtual mirrors also allow for the use of digital signage and for videos to be played on the mirror (that also acts as a screen). Some virtual mirrors have infused radio-frequency identification (RFID) technology (i.e. technology that can read tags containing electronically stored information attached to objects) which means that garments are automatically identified, and product information and supplementary products are displayed on the mirror when the customer views themselves (Melià-Seguí, Pous, Carreras, Morenza-Cinos, Parada, Liaghat, & De Porrata-Doria, 2013). Some virtual mirrors (e.g. magic mirrors) also enable the customer to take photos of themselves where they can manipulate the background, add magazine logos, compare different looks and share the image with friends via social media platforms (McCormick *et al.*, 2014). Research shows that virtual mirror technology enhances shoppers' satisfaction level and patronage intentions (Poncin & Mimoun, 2014). Augmented reality technology has also been shown to increase purchase intention and positively affect consumer behaviour through the simulation of mental imagery (Huang & Liu, 2014). Virtual mirrors have blurred the lines between online and offline retailing as they have enabled customers to interact with products through the use of a mirror instead of the customer having to get changed into different clothing products multiple times in a fitting room (Kim & Forsythe, 2008a). This process is convenient for customers as they can virtually try-on more garments (instead of physically) and the retailer has an opportunity to up-sell additional goods to customers as well. From these findings, it is apparent that virtual mirrors provide both a hedonic and utilitarian shopping experience. However, research investigating the effects of interactivity through this medium, in relation to an omni-channel retail environment is lacking.

#### *2.5.4.2 Interactivity in Online Stores*

As earlier established in this review of literature, the primary challenge for online retailers is the inability of offering a touch and feel element that is important with fashion products (Schifferstein & Cleiren, 2005; Workman, 2010). Consumers, therefore, associate higher perceived risk with online fashion shopping due to the uncertainty in terms of the size and fit of fashion items (Tong, 2010). This has resulted in lost sales opportunities and diminished customer loyalty in online retail environments along with high product returns (Kim & Lennon, 2008). Although research indicates that consumer's preference increases when tactile attributes of products such as fashion clothing are described in online environments (McCabe & Nowlis, 2003; Kim & Lenon, 2008), this is not a solution to the online problem. In order to address this tactile impediment, a number of innovative technologies have been developed. However, the majority of these new technologies are still in their infancy stage and their overarching effects are largely unknown (Kim & Lenon, 2008; McCormick *et al.*, 2014). Some emerging types of interactivity in online environments are virtual try-on technology, videos of real models and live pop-up chats. These interactive tools and relative findings are discussed.

##### *2.5.4.2.1 Image Interactivity Technology - Virtual Try-On*

Image interactivity technology (or IIT) effectively makes online fashion shopping activities a tangible experience and this consequently increases instrumental value for consumers (Fiore, Kim & Lee, 2005; Yu, Lee & Damhorst, 2012). IIT allows retailers to create and manipulate images of products using different features such as zoom capabilities, 2D and 3D rotation, mix-and-match technology, and virtual try-on technology (McCormick *et al.*, 2014). There are different types of virtual try-on technology. 3D virtual try-on uses computer-generated mannequins or avatars that are constructed based on the customer's body measurements, and the shopper is able to view what their own avatar looks like dressed up in various fashion products. This technology is handy for showing what size would be the best fit for a specific individual (McCormick *et al.*, 2014). Body scanning technology is a method used for custom clothing offerings or improving the fit of clothing (Loker & Ashdown, 2008). It gives a more accurate understanding of a customer's overall body composition as it not only includes body

measurements but it considers body size and body type as well. Through the use of multiple cameras and light source lasers, body scans produce an exact three-dimensional replicate of the customer's body that can be observed in a rotational view. This is a significant improvement from the normal two-dimensional reflection consumers see in the mirror (Simmons, Istook & Devarajan, 2004; Loker & Ashdown, 2008). Once a customer's body has been scanned, this information can then be matched with brands and products that are most suited to that particular body type. This data can also be downloaded by smartphone apps for the customers' future reference (e.g. Bodymetrics, 2015). Mix-and-match technology involves the process of photographing real-life mannequins dressed in fashion products and editing these mannequins out, then replacing them with virtual mannequins that represent a fashion brand. Shoppers can use a "drag and drop" function that mixes and matches products on the virtual mannequin. This is a cost-efficient method to using real-life models and also standardizes the photography procedure (Fiore *et al.*, 2003). With relevance to Hoffman and Novak's (1996) different types of online interactivity, it can be confirmed that virtual try-on technology is machine-interactivity.

Studies involving IIT have uncovered a number of findings. For example, it has been demonstrated that zoom and 3D virtual try-on technology induce positive attitudes towards retailers and decrease perceived risk (Lee, Yurchisin & Lin, 2010). 3D virtual try-on has also been found to have a positive impact on utilitarian value and purchase intention (Merle, Senecal & St-Onge, 2012) whilst interactivity enhances hedonic-related consumer value (Yoo, Lee & Park, 2010). Conversely, other findings have shown that 3-D images and virtual models are not important in online fashion shopping but close-ups of images and large pictures are (Kim, Kim, & Lennon, 2006). Rotation has been found to have a positive effect on consumer's cognitive, affective and conative outcomes (Park, Stoel & Lennon, 2008). Mix-and-match technology has shown to positively influence consumer's attitude towards a website, time spent on a website, intention to purchase goods as well as intention to revisit the website (Fiore *et al.*, 2003). Overall, the use of IIT in online retailing produces positive effects as it enhances consumer's purchase intention, intention to revisit, amount of time spent on a website and general perception of a website (Fiore *et al.*, 2003; Schlosser, 2003; Kim, Fiore

& Lee, 2007; Park *et al.*, 2008; Lee *et al.*, 2010; Merle *et al.*, 2012). Also, evidence suggests that consumers perceive less risk in terms of product performance when online product experiences present sensory elements such as visual and tactile dimensions and include a functional aspect such as a simulation of product features (Park *et al.*, 2008). Although some image interactivity technologies such as zoom and rotation capabilities are now fully functional and widely adopted, other technologies like virtual try-on are not as well established and require further development (Kim & Lennon, 2008; McCormick *et al.*, 2014). Together, these studies indicate that virtual try-on technology can be used for both utilitarian and hedonic purposes. Although considerable research has examined the various effects of interactivity via virtual try-on technology, there is a general paucity of literature examining these effects in an omni-channel retail environment context.

#### *2.5.4.2.2 Videos of Real Life Models*

Other techniques are being used to interact with consumers in a more subtle way via online retail environments. Online visual merchandising in apparel websites (or VMD) is one such technique. The purpose of VMD is for retailers to attract shoppers and potential buyers' attention by effectively displaying its products to consumers. In an online environment, this is done by creating experiences that imitate in-store experiences (Diamond & Diamond, 2003; Ha, Kwon, & Lennon, 2007). A feature that has been recently introduced into online fashion retail environments is the use of videos of real life models modeling fashion items (Padilla, Robb & Chantler, 2013). These videos can be referred to as rich media. Rich media is multi-media content that uses motion and sensory elements (such as audio, video and animation) to provide an interactive experience to users (Chabrow, 2006). In relation to Hoffman and Novak's (1996) classification of different types of online interactivity, these videos can be classed as machine-interactivity. Although the use of videos on websites is increasing because they provide a more realistic visual perception of what fashion clothing looks like on real people (as opposed to single static images), the production of the videos is a complicated and costly process (Padilla *et al.*, 2013). An even newer trend is that retailers are allowing consumers to upload videos of themselves modeling clothing to online stores as a form of

advertising (Forbes, 2015). Certain effects have been found in relation to rich media featured in online store environments. It has been found that website graphics make online environments more interesting (Rowley, 2002) and videos; music and enlarged vibrant images entice consumers to visit online stores (Harris, 1998). Being able to view fashion products in multiple ways allows consumers to visualize how garments look on real people and can potentially reduce perceived risk (Allen, 1999; Ha *et al.*, 2007). The ability to view products close up prior to purchase increases purchase intention (Emarketer, 2001) and 3D view enhances presentation (Allen, 1999) although 3D view is scarcely used (Park & Stoel, 2002). The use of real life models to display how fashion garments drape naturally is also important (Then & DeLong, 1999). Some online retailers provide the ability of being able to interact with the model through touchscreen technology by manipulating her movements and making her walk in another direction or turn around so users can see a realistic rotational view of the garments (McCormick *et al.*, 2014). A recent eye tracking experiment further shows that people pay more attention to interactive objects (like videos of models) and thus are more engaged (Padilla *et al.*, 2013). Considering all of this evidence, it can be stated that videos of real models provide both utilitarian and hedonic motives for retail shoppers. A large and growing body of literature has investigated the interactive effects of rich media (through video), however, this feature and its potential effects on consumer behaviour has not yet been examined from an omni-channel retail perspective.

#### *2.5.4.2.3 Live Pop-Up Chats*

Another interactive feature that has been implemented into online retail environments is live pop-up chats. A live pop-up chat is a communicative tool that allows for a two-way dialogue to be created. The way it works is that a message bar will “pop up” at the bottom of the users screen when a retailer’s online store is visited and real salespeople will greet, address and assist consumers with their enquiries and problems via an “online chat” that takes place in real time. Given the fact that online environments are devoid of face-to-face interactions (Cai & Jun, 2003) and that service quality has a significant impact on consumer’s satisfaction and intention to shop online, this chat function is crucial to enabling communication between entities as well as delivering exceptional customer service in a virtual environment (Cai &

Jun, 2003). Few studies have examined how live pop-up chats affect online shopper's behaviour. However, what is understood is that interactivity over the Internet allows consumers to actively partake in the persuasion process, as users are able to control the messages they are exposed to in mediated environments (Pavlou & Stewart, 2002; Song & Zinkhan, 2008). Users are also able to choose and, therefore, have control over the content, time and communication act that they participate in (Li, Daugherty & Biocca, 2002). This is known as active control. Users achieve active control when they are more cognitively involved in an interactive online activity, which then generates engagement as it allows users to communicate in real-time (Cho & Leckenby, 1999; McMillan, 2000; Liu & Shrum, 2002; Stewart & Pavlou, 2002). In other words, high levels of interactivity stimulate higher user involvement (Liu & Shrum, 2002; Rosenkrans, 2009). A potential issue with live pop-up chats could be that the positioning of the chat on the website could affect the users experience (Ha *et al.*, 2007). For example, advertising studies conducted in an online context show that the position of online ads is important in capturing viewers' attention, maintaining their interest, and shaping their decisions (Heo & Sundar, 2000; Rosenkrans, 2009). Overall, there seems to be evidence to indicate that live pop-up chats can be classed as person-interactivity (Hoffman & Novak, 1996) that serves utilitarian purposes. However, very little is known about the effects of live pop up chats particularly in relation to an omni-channel retail environment.

#### 2.5.4.3 Interactivity in Mobile Technology

Mobile devices feature an array of interactive tools that assist retail shoppers with their omni-channel shopping experience. Interactive tools that are currently being adapted by mobile users are QR codes, online product reviews and mobile payment options. These different types of interactivity in mobile technology are discussed.

##### 2.5.4.3.1 QR Codes

QR coding is a system that retailers can use to assimilate online and offline communication through the usage of smartphones. QR codes possess the same function as barcodes as they have a machine-readable label encoded with information that is presented in a matrix of visual patterns. The encoded information identifies whether the item is a product, service, organization or advertisement. The difference between barcodes and QR codes is that barcodes are one-dimensional where information is presented in vertical lines whereas QR codes are two-dimensional and feature both vertical and horizontal lines. This allows for the storage of more information (McCormick *et al.*, 2014). QR codes can hold as much as 7,089 numeric characters, 4,296 alphanumeric characters or letters, and 2,953 bytes of binary data (Gao, Rau & Salvendy, 2007; Rouillard, 2008). QR stands for “quick response” as QR codes allow for the high-speed encoding and decoding of data (Rouillard, 2008). The use of barcodes has been effective in e-commerce as they have assisted with retail transactions, supply-chain management and the tracking of goods. The use of digital barcodes is effective in m-commerce as it is a simple, wireless and cost-effective means to providing users with data such as product identification and information, displaying advertisements and promotional content like coupons, and it assists with trading activities (pre-sale, sale-and-buy, post-sale) as well as payment options. Another benefit of QR codes is their minimal code size (Ohbuchi, Hanaizumi & Hock, 2004; Rouillard, 2008). Due to the fact that QR codes do not require any keyboard data entry thus cannot be read by humans without machines, finding adequate scanning interface technology has been challenging (Gao *et al.*, 2007; Rouillard, 2008). Today, QR codes can be read by using a QR decoder and this technology can be downloaded to smartphones (Ohbuchi *et al.*, 2004; Gao *et al.*, 2007; McCormick *et al.*, 2014). The advent of image processing and multi-media capabilities on smartphones has meant that smartphones

now act as portable digital barcode scanning devices (Gao *et al.*, 2007). Also, since smartphones comprise of built-in cameras, it has been found that using digital barcodes enhances the experience of mobile users (Gao, Prakash & Jagatesan, 2007). These functions reflect both utilitarian and hedonic shopping motives. Collectively, these studies highlight the need for an examination of the effects of QR codes on consumer behaviour.

#### *2.5.4.3.2 Online Product Reviews*

Product information plays a significant role in consumer's purchasing decisions (Mitchell & Boustani, 1994; Kim & Lennon, 2000). Online product reviews are another popular interactive tool that consumers are increasingly using to become informed and knowledgeable shoppers. The Internet has enabled shoppers to research product information and offer feedback through online reviews, which can be done via wireless devices such as smartphones (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004). Nowadays many shoppers conduct thorough online research prior to purchasing goods with as much as 84 percent of shoppers being influenced by consumer-generated online reviews and 62 percent of them already know what they want to purchase before even entering a physical store (Bazaar Voice, 2013). In the virtual realm, online reviews that comprise of electronic word-of-mouth (or eWOM) are an information source that consumers seem to trust (BrightLocal, 2013, 2014). Electronic word-of-mouth is an extension of traditional word-of-mouth that has a similar function but occurs in a different (online) setting and has more reach. It is further described as having an interactive component i.e. two-way communication that is based upon an experience or good (Arndt, 1967; Day, 1971; Harrison-Walker, 2001). Antecedents of eWOM are either based on incentives (that lead to gratification and/or revenge), concern for other consumers, improving the self, product involvement motivations and interaction (Dichter, 1966; Sundaram, Mitra, & Webster, 1998; Hennig-Thurau *et al.*, 2004; Cheung & Thadani, 2012; Cantallops & Salvi, 2014). Effects of online reviews have been studied with research indicating that reviews help shape consumers' choices (Sun, Youn, Wu & Kuntaraporn, 2006) by enhancing consumer's perceived usefulness (Racherla & Friske, 2012) and they can affect sales and the product lifecycle as well (Chevalier & Mayzlin, 2006). Online product reviews are recognised as having utilitarian and hedonic shopping motivations. Although some effects of online product reviews have been

researched, this concept has not yet been applied to or tested in an omni-channel retail context.

#### *2.5.4.3.3 Mobile Payment Technology*

Mobile commerce (or m-commerce) is the activity of carrying out electronic business transactions through wireless devices (Ting-Peng & Chih-Ping, 2004; Chiang & Li, 2010). Mobile payment technology is a recent innovation to solving purchasing and payment retail activities. It enables companies to conduct transactions with customers through smartphones and other wireless devices at any location in the store instead of over the counter (Tech Target, 2007-2015; Boston Retail Partners, 2015). It is expected that mobile payment technology will decrease and substitute the use of bank notes and coins, and also debit and credit cards. There are a number of mobile payment options available but an increasing trend is mobile point-of-sale (mPOS) technology. It allows a consumer to pay for items simply by selecting an icon on their smartphone screen, choosing a payment method and waving their phone over an electronic reader connected to a point-of-sale system (Au & Kauffman, 2008). This is convenient for shoppers as it alleviates waiting times in queues to purchase items. Shoppers can speed up the transaction process to make purchases by serving themselves through their smartphones or by interacting with sales personnel equipped with wireless devices that feature mPOS technology. It is also a cost-effective solution for retailers as it frees up sales people and allows them to move around the store rather than being stationed behind the service counter at all times (Tech Target, 2007-2015; Boston Retail Partners, 2015). The mobile payment options that are predicted to become market leaders are those with added value, are easy to use, secure and cost-effective (Dahlberg *et al.*, 2007; Au & Kauffman, 2008). The information presented thus far indicates that mobile payment options serve utilitarian needs. Overall, existing research concerning the effects of mobile payment technology is limited and this exposes a need to investigate this technology further and in particular, in an omni-channel retail environment.

## 2.6 Technology Adoption

When technological developments were introduced in the late 19<sup>th</sup> and 20<sup>th</sup> centuries, although they were not a creation of the retailing industry – retail was one of the early adopters of these technologies (Tamilia, 2007). Since then, technology has been used widely throughout the retailing sector. Technology is important because it facilitates communication between entities, strengthens relationships with retailers, customers and suppliers, merges channels, improves the points of interaction for retailers, and enhances consumers' shopping experience (Berman & Evans, 2010; McCormick *et al.*, 2014; Lazaris & Vrechopoulos, 2014). Fashion retailers have also broadly adopted technological innovations. Specialised innovative technologies are currently being designed by fashion retailers to improve the retailing process – from the product development stage to the supply chain division through to the distribution of goods to customers (McCormick *et al.*, 2014). More recently, the retailing industry has had to pursue innovative technology due to the rise of the omni-channel shopper and the rapid pace at which consumers have adopted new technologies (McCormick *et al.*, 2014). Technology has successfully been implemented into a number of service industries to assist front-line staff with customer interaction. However, the challenge with technology implementation is to stimulate consumer adoption and usage of new technologies. It is therefore essential that we understand how new technologies should be designed, managed and promoted to have a decent chance at consumer acceptance (Curran & Meuter, 2005). In terms of the consumer adoption process of interactive technologies, previous literature has analysed a number of aspects such as consumers' attitudes towards technology (Reinders, Dabholkar & Frambach, 2008), cognitive effects (Simon & Usunier, 2007), impersonal features of interactive technology (McCartan-Quinn, Durkin & O'Donnell, 2004), purchase uncertainty (Pavlou, Liang & Xue, 2007), and trust (Pavlou & Gefen, 2004). In addition, the effects of interactive technologies on consumers' experiences have also been examined in research. For instance, consumers' experiences have been enhanced through: image interactivity technology or IIT (Fiore, Kim & Lee, 2005), virtual try-on technology (Nantel, 2004; Kim & Forsythe, 2008a) and sensory enabling technology (Kim & Forsythe, 2008b) although positive effects are not consistent across varying customer bases (Burke, 2002). It is also evident that the simultaneous use of multiple channels has been adopted by a younger demographic who regularly engage in this type of activity, as

opposed to older consumers (Kearney, 2014). New technologies have become an important part of conducting research with online shopping and this has been widely adopted by Generation Y and in particular female consumers (Ruane & Wallace, 2013).

Theories that have been developed to explain technology use or the adoption of technology are the theory of planned behaviour (Ajzen, 1991), the diffusion of innovation theory (Rogers, 1995) and the technology acceptance model (TAM) (Davis, 1989), which is an extension of the theory of reasoned action (Ajzen & Fishbein, 1980). The technology acceptance model (TAM) posits that a number of factors influence a person's attitude when they are presented with new technology. It consists of two main antecedents that are: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness refers to the extent to which the use of technology will improve a user's performance and perceived ease of use relates to the extent to which an individual believes that particular technology will assist with their shopping experience. Although situational variables have not been considered in TAM such as perceived risk or need for interaction (Curran & Meuter, 2005), a new addition to this model is the enjoyment construct (Davis, 1989). Varying effects have been found with different interactive technology. Haeckel (1985) also devised an assimilation of new technologies model that suggests that users solve new problems with technology that is familiar to them. In other words, once the technology has been adopted, only then will it be integrated into a consumer's problem-solving process. Enhanced user learning is also believed to occur when the active control component of interactivity is present and users are more cognitively involved with their experience, so messages are better understood and remembered (Liu & Shrum, 2002).

The TAM model has been widely applied to retail research and in relation to shopping motivational orientations, the perceived usefulness of interactive media is reflective of utilitarian shoppers whereas enjoyment is depictive of the hedonic shoppers (Childers *et al.*, 2001). There have also been current efforts to understand the adoption of mobile technology by applying TAM (e.g. Rao & Troshani, 2007; Maity, 2010) and the theory of planned behaviour

to m-commerce (e.g. Khalifa & Shen, 2008). However, the drawback with these studies is that they do not factor in respondents' expectations of how well they think the technology will perform (Levin & Taylor, 2014). Research involving m-commerce adoption shows that age, usage (Bigne, Ruiz & Sanz 2007), gender, ethnicity (Lee & Lee, 2010), involvement, innovativeness (Roach, 2009), social and economic factors (Phau & Teah, 2009), as well as cultural and technological aspects (Ktoridou, Epaminonda & Kaufmann, 2008) affect consumer's willingness to adopt mobile technology. Negative effects of consumers' experience with interactive devices have also been found. For instance, online product reviews are believed to create a negative experience due to the fact that they provide misleading product information (Hu, Pavlou & Zhang, 2009), and forcing consumers to adopt technology-based self-service (TBSS) has damaging outcomes such as negative attitudes and word-of-mouth as well as brand switching (Reinders *et al.*, 2008). In addition, a primary limitation of consumers' adoption to online retailing is the product delivery and fulfillment options (McCormick *et al.*, 2014). Further research shows that consumers are more likely to shop online when they perceive low risk with the product or service and well-known brands will generate more interest than lesser-known brands (Lee & Tan, 2003). To alleviate future issues in an omni-channel environment, research indicates that technology should aim to solve problems and not create new ones. The fact that technology can appeal to some consumers and not all consumers should be considered. New technology should further be sufficiently tested prior to implementation and it should also complement the staff in-store but not replace them (McCormick *et al.*, 2014). Together, these studies provide important insights into the technology adoption of various technologies in different channels of omni-channel retailing. However, the interactive effects of different types of technology are largely unknown in the context of an omni-channel retail environment.

## 2.7 Hypotheses Development

This section presents the hypotheses development for this study in relation to the preceding review of literature. It also provides a brief discussion of the expected findings of this research.

### Overview

To date, there is no existing literature that has investigated the effects of interactivity on retail shoppers' attitudes, involvement and engagement in the context of an omni-channel retail environment. This study, therefore, aims to fill this gap in literature by way of an empirical examination that answers the proposed research question:

*How does the level/type of interactivity in an omni-channel environment affect the attitudes, involvement and engagement of retail shoppers?*

### Hypothesis 1a Development - Attitude

As discussed in the review of literature, the effect of interactivity relative to attitudes has been researched but most studies have been confined to an online context with some studies being extended to mobile devices. To date, no study has empirically investigated this effect in an omni-channel retail environment. Studies also indicate that when individuals are exposed to interactivity, this has a positive influence on their attitude (Wu, 1999; Kettunurak *et al.*, 2001; Jee & Lee, 2002; McMillan *et al.*, 2003; Lee, Yurchisin & Lin, 2010). However, other findings demonstrate no effect between interactivity and attitude (Coyle & Thorson, 2001). In addition, given that the Mehrabian and Russell's (1974) Dimensions of Emotions PAD model is useful in measuring emotions but studies have scarcely been linked to attitude, this scale will be used in this study. Therefore, it can be hypothesized that: *Hypothesis 1a: The level/type of interactivity in an omni-channel environment will affect the attitudes of retail shoppers. Specifically, shoppers will have a more positive attitude to mobile technology than the physical and online stores.*

### **Hypothesis 1b Development - Involvement**

In consideration of the facts pertaining to literature indicating that females are more involved in fashion than males (Hourigan & Bougare, 2012), fashion shopping is a high involvement activity (Workman, 2010), and technology and the Internet can change consumers' involvement with fashion products (Loker & Ashdown, 2008), this study is based on females and expects to find that interactivity will affect retail shoppers' involvement. Interestingly, literature has not yet explored the effect of interactivity on retail shoppers' involvement in the context of omni-channel retailing. Studies further indicate that interactivity produces experiences that have a degree of cognitive involvement (due to active control and two-way communication) and this engagement leads to enhanced interactivity and user involvement (Parsons *et al.*, 1998; Pavlou & Stewart, 2002; Song & Zinkhan, 2008; Li *et al.*, 2002; Liu & Shrum, 2002; Rosenkrans, 2009; Jiang *et al.*, 2010). Based on these findings, it can be hypothesized that: *Hypothesis 1b: The level and type of interactivity in an omni-channel environment will affect the involvement of retail shoppers. Specifically, shoppers will have greater involvement with the online store than the physical store or mobile technology.*

### **Hypothesis 1c Development - Engagement**

The review of literature specifies that the effect of interactivity on retail shoppers' engagement has not yet been examined in the context of a physical store or in a holistic omni-channel retail environment. In addition, previous literature has suggested that interactive content must be creative and useful to the user if it is perceived to be engaging. This study therefore features different types of interactivity that possess a variation of utilitarian (task-oriented) and hedonic (recreation-oriented) motivational orientations. Other research has indicated that depending on the user, their experience with a particular type of interactivity (or media) determines their level of engagement (Calder & Malthouse, 2008). It can therefore be hypothesized that: *Hypothesis 1c: The level and type of interactivity in an omni-channel environment will affect the engagement of retail shoppers. Specifically, shoppers will have higher engagement to mobile technology than the physical and online stores.*

## Chapter Three: Methodology

This chapter provides a detailed account of the methodology that was used for this study. It begins by introducing the research question and hypotheses. Then, an outline of the research design and justification for these methods is presented. Next, the sampling method and details of the sample are defined. Thereafter the research measures, and interactivity design and video selection are described. Lastly, the data collection and data analysis procedures are explained.

### 3.1 Research Question and Hypotheses

This thesis is about the effect of interactivity in an omni-channel environment on shopper behaviour. To be specific, this research examines how interactive features in a physical store, online store and mobile technology in the context of fashion retail; affect retail shoppers' attitudes, involvement and engagement. The research question is: *How does the level/type of interactivity in an omni-channel environment affect the attitudes, involvement and engagement of retail shoppers?*

The hypotheses for this research are:

**Hypothesis 1a:** *The level and type of interactivity in an omni-channel environment will affect the attitudes of retail shoppers. Specifically, shoppers will have a more positive attitude to mobile technology than the physical and online stores.*

**Hypothesis 1b:** *The level and type of interactivity in an omni-channel environment will affect the involvement of retail shoppers i.e. there will be a difference on the scales. Specifically, shoppers will have greater involvement with the online store than the physical store or mobile technology.*

**Hypothesis 1c:** *The level and type of interactivity in an omni-channel environment will affect the engagement of retail shoppers. Specifically, shoppers will have higher engagement to mobile technology than the physical and online stores.*

The following sections will discuss the research methods used to test these hypotheses.

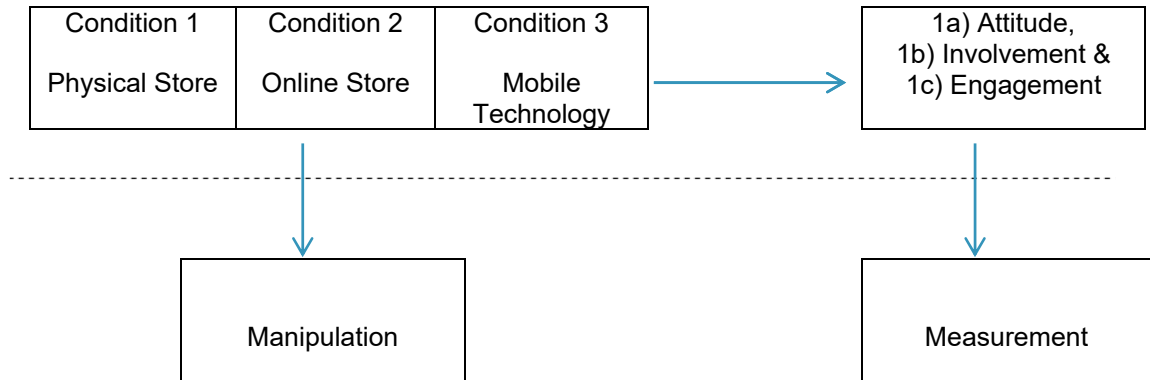
### 3.2 Research Design

For this research, the method of inquiry is quantitative in nature. A true laboratory experiment was conducted using a between-subjects design with a sample of 99 participants. Experiments are beneficial because they are the most effective method to testing a theory and explaining causal relationships (Mook, 1983; Iacobucci & Churchill, 2010). This particular design is useful as large samples can be used and multiple variables can be tested simultaneously in a short timeframe. In a laboratory experiment, the researcher creates an artificial situation and manipulates the independent variable so that effects in the dependent variables can be observed. All components but the independent variable remain constant (Field, 2009). In this study, the independent variable is the interactivity (shown in the videos) and the dependent variables are retail shoppers' attitudes, involvement and engagement (in relation to the interactivity). In order to gain insight into retail shoppers' attitudes, involvement, and engagement with different interactive features in an omni-channel fashion retail environment, a paper-and-pen scenario approach was used and between-group differences were looked for. Although scenario-based research has been criticised due to a lack of realism, it is useful because it provides a way to control for factors that would otherwise be difficult to control for in a real life store environment (Field, 2009). In this case, this research allows for the examination of how retail shopper's respond to different interactive devices within an omni-channel environment. It also allows for a comparison of effects across these interactive features and by comparing these effects, inferences can be made with respect to shoppers' attitudes, involvement and engagement. Three different treatment conditions that reflected an omni-channel retail environment were created for this research i.e. a physical store, online store and mobile technology. Subjects were then randomly assigned to one of these three experimental conditions. Depending on the treatment condition participants had been assigned to, they were then asked to engage in fashion shopping by either 1) imagining a visit to a physical store, 2) engaging in an online store situation or 3) partaking in an activity via a mobile device. For each scenario, participants were exposed to three short videos that showed three different types of interactive features. Videos were not randomised. Figure 2 illustrates the experiment design.

**Figure 2 - Experiment Design**

IV = Interactivity (in videos)

DV = Consumers'



As shown in Figure 2, the interactive features (or the manipulations) were the videos. The videos were as follows: for the physical store, interactivity was illustrated through 1) image interactive technology (or IIT) in the form of a virtual mirror, 2) touch screen technology and 3) self-service technology. For an online store, interactivity was displayed via 1) virtual try-on technology, 2) videos of real life models and 3) live pop-up chats. Lastly, the interactive tools for mobile technology were 1) QR codes, 2) online product reviews and 3) mobile payment (or mPOS) technology. Respondents' attitudes, involvement and engagement were measured through exposure to these short videos. Participants were asked to complete a questionnaire that featured a number of questions and rating scales relating to the interactivity in the videos and retail settings they had been exposed to, and fashion shopping in general. This process took participants approximately 15-20 minutes. The findings were analysed using quantitative methods. Specifically, one-way ANOVA tests were conducted on the data, followed by one-way T-tests and Tukey's HSD tests. Data was analysed by observing patterns of association through correlations after these tests were run. Lastly, SPSS software was used to analyse the data.

To verify that this experiment was real (and not artificial), a high level of internal validity was accomplished by ensuring subjects were randomly assigned to conditions (i.e. random assignment) and the environment was also controlled in a laboratory setting (Churchill, 1999). External validity was achieved by ensuring a heterogeneous sample was selected where respondents' age, ethnicity and occupation varied. Construct validity was met by making sure the independent variable was substantial (i.e. the interactivity in the videos) and that it was captured by the dependent variables (i.e. retail shoppers' attitudes, involvement and engagement). This was accomplished in a pretest where Ph.D. students assessed the videos and the questionnaire before the experiment was run to try out different versions of the independent variable (interactivity) and to prevent any misinterpretation of the interactive stimuli. In addition, and centered on the work of Aronson and Carlsmith (1963), experimental realism was met by ensuring that respondents were fully immersed in their role as participants. This was done by asking respondents to imagine themselves in a real life shopping scenario and by presenting real life scenarios to respondents (in the videos on screen). Psychological realism was achieved as all participants were familiar with the activity of fashion shopping and viewing videos online and mundane realism was also achieved because the events of this experiment (i.e. fashion shopping) are likely to occur in the participant's real world.

### 3.3 Sample and Sampling Method

This research is based on the analysis of a sample of 99 female adult respondents. Altogether there were 152 respondents who partook in this research which comprised of 99 females and 53 males. Due to the fact that females are the ideal target market for fashion shopping, only the data from the female respondents has been included in this study. The reason why males participated but their responses were not included in this study was because data collection took place in a classroom setting so, in order to keep the class productive and not disrupt it, males were also asked to participate. The respondents who participated in this research were undergraduate students aged between 20-55 years of age from the Faculty of Business and Law at Auckland University of Technology (AUT) in Auckland, New Zealand. Auckland is known for its diverse assortment of different ethnicities so this indicates that a heterogeneous

sample was being used (Auckland Council, 2013). This faculty was selected because it was convenient for the primary researcher. The criteria for the recruitment process was that participants were 1) female, 2) aged 20 years of age or over and 3) had visited a physical store, an online store and/or used mobile technology to shop for fashion items. Participants were chosen by way of random sampling. Random sampling is a sampling method where a random sample of the population is selected. It is suitable because it enables all members of a population to have an equal chance of being selected (Field, 2009).

### 3.4 Research Measures

For this study, the primary objective is to examine retail shoppers' attitudes, involvement and engagement towards interactive features in an omni-channel retail environment. Therefore, a questionnaire featuring a number of self-report instruments was used to measure respondents' attitudes, involvement and engagement (refer to Appendix D for an example of the questionnaire). To measure participants' attitude or liking towards the different levels and types of interactivity shown in the videos, the Dimensions of Emotions: Pleasure, Arousal and Dominance (PAD) Scale by Mehrabian and Russell (1974) was employed. The PAD Scale is composed of 18 semantic differential items with 6 items representing each dimension (PAD) on a 7-point scale. As stated in chapter 2, this scale posits that people's emotional responses to their environment are categorised into the dimensions of pleasure, arousal and dominance that influence approach-avoidance behaviours. Pleasure relates to positive and affective feelings that range from happy to melancholic. Arousal refers to an energized state and includes feelings that vary from sleepy to stimulated. Dominance then is the extent to which an individual feels unrestricted or in control of a situation. The PAD Scale was applied to questions 1, 2 and 3 of the questionnaire. To measure participants' involvement with the fashion shopping activities, Zaichowsky's (1985) Personal Involvement Inventory (PII) Scale was used. Involvement is defined by Zaichowsky (1985, p. 342) as "a person's perceived relevance of the object based on inherent needs, values and interests". The PII Scale consists of 20 semantic differential items scored on a 7-point scale and this was used in question 4 of the questionnaire. To measure participants' engagement (or liking) with the retail setting,

Fisher's (1974) Environmental Quality Scale was implemented. This model is made up of 13 semantic differential items scored on a 7-point scale and it measures affect in terms of perceived environmental state. The last section of the questionnaire comprised of questions of personal preference towards fashion shopping and also included demographic variables. For instance, question 6 asked participants basic dichotomous questions (i.e. answer yes or no) about their enjoyment, frequency, time-constraints towards fashion shopping, the importance of brand name, whether they were employed in fashion retailing, and disposable income details. The last part of the questionnaire (questions 7-12) was a classification section that asked participants for information about their age, gender, student status (i.e. full-time or part-time student), occupation, industry of employment and major they currently study.

### 3.5 Interactivity Design and Video Selection

In order to test retail shoppers' attitudes, involvement and engagement in response to different levels and types of interactivity, the questionnaire was constructed from a scenario-based approach and videos showing different interactive features in a physical store, online store and mobile technology were the manipulation. Thus, the selection of the videos was important. To start, a collection of videos were gathered by the primary researcher from YouTube that showed interactive content within the different channels of an omni-channel environment. The primary researcher and primary supervisor then evaluated the effectiveness of the interactivity in these videos and consequently arranged a pre-test with three Ph.D. students at Auckland University of Technology (AUT). In the pre-test, the primary researcher asked for the opinions of the Ph.D. students to first explain what they thought the videos were about and then once the actual type of interactivity was revealed, they were asked whether the video content effectively portrayed these particular types of interactivity. Useful insight into how individuals interpreted the interactivity in the various videos was discussed and valuable feedback was gained.

The final video selection was then based on the outcome of the pre-test (see Appendix E for screenshots and URL links of the final video selection). In the end, the selection of videos was as follows: for the physical store, videos from YouTube showing interactivity through 1) image interactive technology in the form of a virtual mirror, 2) touchscreen technology and 3) self-service technology were chosen. For an online store, a video from YouTube showing interactivity through 1) virtual try-on technology was selected. The other 2 videos for the online environment were recorded by the primary researcher so did not feature any background music. These videos showed interactivity on fashion apparel websites through 2) a video of a real-life model modelling clothes and 3) a live pop-up chat. For mobile technology, videos from YouTube with interactivity showing 1) QR codes, 2) online product reviews and 3) mobile payment technology were selected. Videos were reasonably short as they were between 1-3 minutes in length. All interactive stimuli featured both utilitarian and hedonic components apart from the self-service technology, live pop-up chat and mobile payment technology, that reflected strictly utilitarian motives. The purpose for including a variation of shoppers' motivational orientations through the interactivity in the videos was to see whether there would be any moderating effect on participants' attitudes, involvement and engagement.

### 3.6 Data Collection Procedure

After ethics approval was granted from the AUT Ethics Committee (see Appendix A), research was undertaken at Auckland University of Technology (AUT) in November 2015. For a laboratory experiment to be successful, the researcher must first set the stage for the experiment, then construct the independent variable, measure the dependent variable and complete a post-experimental follow-up (Wilson, Aronson & Carlsmith, 2010). The data collection procedure for this research is described as follows.

**Step 1:** The stage for this experiment was set to take place in undergraduate marketing workshops. These workshops were pre-selected by the primary researcher and a treatment condition was allocated to each workshop. Once in the workshop, the primary researcher explained the purpose of the research to students whilst handing out a Participant Information Sheet and a Consent Form (see Appendix B and C) to each individual. The Participant Information Sheet was to provide students with a rationale for the research and to inform participants that their participation in the data collection was optional where they were under no obligation to participate. Students were also informed that they would be anonymous in the research so they were not at any risk of losing confidential information. Once students had been given the opportunity to read and understand these documents and had been offered a chance to ask further questions about the research, students who wished to participate were then asked to sign the Consent Forms. Once the signed consent forms were retrieved, questionnaires were handed out and instructions were relayed to participants by the primary researcher.

**Step 2:** The next step was to perform the experiment by showing participants the videos. For each of the three conditions, participants were exposed to three videos on the screen at the front of the class and asked to complete the questionnaires. The videos showed different interactive features in different settings of an omni-channel environment (i.e. a physical store, an online store and a mobile device or smartphone). The content of the videos was dependent of the treatment condition that participants had been assigned to. For example, participants in

the physical store condition were shown videos illustrating interactivity in the physical store, and so forth. Participants in each of the three conditions were not advised about the other conditions and were not informed of the expected outcome of the research. This is due to the possibility of the Hawthorne effect occurring, which is a condition in an experimental setting where participants are able to alter aspects of their behaviour because they have figured out the expectations of the researcher (McCarney, Warner, Iliffe, Haselen, Griffin, & Fisher, 2007). All participants were also given the same set of instructions and the same questionnaire to complete. For these reasons the issue of standardization was overcome as the primary researcher controlled the manipulation in each setting by keeping everything in the conditions constant, apart from the content in the videos. It also meant that all participants were in the same psychological state (Wilson *et al.*, 2010).

**Step 3:** Once the first video was shown, participants were instructed to complete the first question in the questionnaire and then pause there. After the second video was played, participants were asked to complete the second question of the questionnaire only. After the third and last video was screened, participants were then instructed to complete the remainder of the questionnaire. Once all of the participants had completed their questionnaires the primary researcher collected the questionnaires. The data collection procedure took 15-20 minutes in total for each treatment condition. For the post-experimental follow-up, participants were asked whether they would like to obtain findings from this research and if so it was required of them to make a note of this on their signed Consent Form.

### 3.7 Data Analysis Procedure

In this study, the dependent variable is the retail shoppers' attitudes, involvement and engagement and it has been established that the independent variable is the interactivity (in the videos). The data for this research is derived from the female participants' self-reported answers in the questionnaires and statistical analysis was performed using SPSS software. The data analysis procedure was as follows.

**Step 1:** To commence the data analysis procedure, the data must be cleaned (Field, 2009). The first part of the data cleaning process involved separating the questionnaires by gender and preparing the female participants' questionnaires for analysis. This involved a manual check to see whether all of the questions in the questionnaires had been answered. There were 8 unanswered questions identified among the 99 completed questionnaires from female participants. It was necessary to check for and be aware of any unanswered questions to account for the missing values that would show up as a result in the data view of SPSS. Questionnaires were then numbered from 1 to 99. It was important to number the questionnaires for the purpose of data entry. In other words, because questionnaires were anonymous, participants' questionnaires were numbered so there was some form of individual identification in SPSS.

**Step 2:** The data from the questionnaires was then manually input into the data view of SPSS and variable view settings were set according to the data. Altogether, there were 34 questionnaires for the physical store scenario (condition 1), 37 questionnaires for the online store scenario (condition 2) and 28 questionnaires for the mobile technology scenario (condition 3).

**Step 3:** Next, data checks were conducted on the data. To be specific, this included a descriptive statistics test, a frequency check and a check for normal distribution. Skew and kurtosis checks showed that there was no skew greater than 2 and no kurtosis greater than 7,

which is sufficient in relation to the normal distribution. Data checks ensure the accuracy of the data (Field, 2009).

**Step 4:** Once the descriptive statistics, frequency check and a normal distribution were confirmed, item scores were then checked. Mehrabian and Russell's (1974) Dimensions of Emotions PAD Scale was composed of 18 semantic differential items with 6 items representing each dimension (i.e. pleasure, arousal and dominance) scored on a 7-point scale. Scores were also checked for Zaichowsky's (1985) Personal Involvement Inventory (PII) Scale (which is a unidimensional model composed of 20 semantic differential items scored on a 7-point scale) and Fisher's (1974) Environmental Quality Scale (that comprised of 13 semantic differential items scored on a 7-point scale). Having obtained and checked the scores for this data, further tests were then conducted. The groups were compared on each item of the scales.

**Step 5:** To establish whether there was any effect of the interactivity on participant's attitudes, involvement and engagement, a general linear model with the three scenarios (i.e. physical store, online store and mobile technology) was created. Tests were run on the data in the following order. First, an ANOVA test was run in conjunction with Tukey's HSD (honest significance difference) tests. Then, one-way T-tests were run on any significant findings from the ANOVA. An ANOVA is an analysis of variance test that is useful for comparing significant differences between means. Tukey's HSD test is a post-hoc analysis test that should be used concomitantly with an ANOVA to ensure that means are significantly different from one another (Field, 2009). The one-way between subjects ANOVA was conducted to compare the effect of the interactivity (or independent variable) on participants' attitudes, involvement and engagement (or dependent variables) in the physical store, online store and mobile technology conditions. In the next chapter, the means from this data will be compared and causal relations will be inferred based on this comparison. In particular, means will be compared between the three conditions (or scenarios i.e. the physical store, online store and mobile technology). For any means that show a significant difference, a T-test was run. A T-test is more precise and

presents the direction of that difference (Field, 2009). For example, in relation to hypothesis 1a, a T-test will compare participants' attitudes within all three conditions.

The next section (chapter 4) presents the findings from the data and the SPSS output files are attached in the appendix (refer to Appendix E).

## Chapter Four: Findings

This chapter presents and explains the findings from the questionnaires that were administered in the experiment (as outlined in chapter 3) that was conducted to empirically test the hypotheses for this research. The hypotheses are:

**Hypothesis 1a:** *The level and type of interactivity in an omni-channel environment will affect the attitudes of retail shoppers i.e. there will be a difference on the scales. Specifically, shoppers will have a more positive attitude to mobile technology than the physical and online stores.*

**Hypothesis 1b:** *The level and type of interactivity in an omni-channel environment will affect the involvement of retail shoppers. Specifically, shoppers will have greater involvement with the online store than the physical store or mobile technology.*

**Hypothesis 1c:** *The level and type of interactivity in an omni-channel environment will affect the engagement of retail shoppers. Specifically, shoppers will have higher engagement to mobile technology than the physical and online stores.*

The first part of this chapter provides an overview of the outcome of the tests. In other words, what is expected as a result of the analysis will be discussed for each hypothesis. Next, the findings of the ANOVA tests, one-way T-tests and Tukey's HSD tests are displayed and descriptions of these findings are given, including comparisons made between each of the treatment conditions.

## 4.1 Questionnaire Responses

This research was based on the responses of a total of 99 female adult participants. As mentioned in chapter 3, these participants were randomly assigned to three different treatment conditions (or scenarios). In condition one, participants were exposed to interactive features in a physical store. In the second condition, participants observed interactive features in an online store and in the third condition, participants viewed interactivity via mobile technology. 34 questionnaires were completed for condition (or scenario) one, 37 questionnaires for condition (or scenario) two and 28 questionnaires for condition (or scenario) three.

There were also 8 unanswered questions among the questionnaires. Table 2 shows the descriptive statistics for the sample. Descriptive statistics describe data by summarizing the sample as well as the research measures. This process was run on all of the variables. The results from table 2 confirm that the data in this research came from a total of 99 participants and it also reflects the amount of participants in each condition (or scenario) as stated above. In addition, a frequency analysis was also run to reinforce data cleaning where some minor errors were identified and remedied but this was elaborated on in step 1 of section 3.7.

**TABLE 2 - DESCRIPTIVE STATISTICS**

|       |       | Scenario  |         |               | Cumulative<br>Percent |
|-------|-------|-----------|---------|---------------|-----------------------|
|       |       | Frequency | Percent | Valid Percent |                       |
| Valid | 1     | 34        | 34.3    | 34.3          | 34.3                  |
|       | 2     | 37        | 37.4    | 37.4          | 71.7                  |
|       | 3     | 28        | 28.3    | 28.3          | 100.0                 |
|       | Total | 99        | 100.0   | 100.0         |                       |

## 4.2 Data coding

The questionnaire featured a total of 12 questions (refer to Appendix D). Questions 1 to 3 examined participants' emotional responses/attitudes to different levels and types of interactivity. Mehrabian and Russell's (1974) PAD Scale was used to measure this. The wording of these questions was similar and an example of one of these questions is: *"Using the following scale, please indicate the extent to which these words best describe how the shopping scenario you can see makes you feel."* Options to these answers included a list of 18 items that depicted emotions of pleasure, arousal and dominance on a 7-point Likert scale (from numbers 1 to 7). Participants were to complete one question at a time, after exposure to each of the three videos.

Question 4 of the questionnaire asked for participants' level of involvement towards a range of shopping activities. Zaichowsky's (1985) Personal Involvement Inventory (PII) Scale was used to measure this. The question was worded as follows: *"Thinking about fashion shopping that is shopping for clothes, shoes and accessories please use the following scale to indicate the response that best suits the statement that follows."* There were 20 items available for this answer to select from a 7-point Likert scale ranging from *"Important to me"* to *"Unimportant to me"*.

The purpose of question 5 was to analyse participants' level of engagement with the retail setting they were exposed to. For this to occur, Fisher's (1974) environmental model was used as it asked for participants' liking of environmental characteristics of each condition. The question was worded as follows: *"For each of the following descriptions, please indicate by circling an appropriate number, what you think about the retail setting you have seen. This was either a physical store, online store or mobile technology."*

## 4.3 Testing the Hypotheses

### 4.3.1 Hypothesis 1a

Hypothesis 1a is: *The level and type of interactivity in an omni-channel environment will affect the attitudes of retail shoppers. Specifically, shoppers will have a more positive attitude to mobile technology than the physical and online stores.*

This hypothesis is based on the assumption that participants' attitudes will be affected as a result of being exposed to the interactivity in the videos. In other words, there should be a significant difference (on the scales) pertaining to participants' attitudes between the three conditions (i.e. a physical store, online store and mobile technology).

If there is a difference on the scales that is statistically significant, then the hypothesis will be accepted. On the other hand, if there is no difference, the hypothesis will be rejected.

#### 4.3.1.1 ANOVA Findings for Hypothesis 1a

Table 3 presents the findings for the ANOVA that was run to test hypothesis 1a (findings are sourced from Appendix F). The one-way between subjects ANOVA was conducted to compare the effect of the interactivity (i.e. the independent variable) in the videos on participants' attitudes (i.e. the dependent variable) in an omni-channel environment (i.e. the physical store, online store and mobile technology conditions).

**TABLE 3 - ANOVA FINDINGS FOR HYPOTHESIS 1A**

| Construct   | PAD       | F     | df | Sig.   | Hypothesis |
|-------------|-----------|-------|----|--------|------------|
| Happy       | Pleasure  | 0.170 | 2  | .844   | Reject     |
| Pleased     | Pleasure  | 0.107 | 2  | .899   | Reject     |
| Satisfied   | Pleasure  | 0.141 | 2  | .869   | Reject     |
| Contented   | Pleasure  | 1.216 | 2  | .298   | Reject     |
| Hopeful     | Pleasure  | 0.047 | 2  | .954   | Reject     |
| Relaxed     | Pleasure  | 3.234 | 2  | .041*  | Accept     |
| Stimulated  | Arousal   | 3.945 | 2  | .020*  | Accept     |
| Excited     | Arousal   | 3.427 | 2  | .034*  | Accept     |
| Frenzied    | Arousal   | 6.340 | 2  | .002** | Accept     |
| Jittery     | Arousal   | 4.165 | 2  | .016*  | Accept     |
| Wide awake  | Arousal   | 3.615 | 2  | .028*  | Accept     |
| Aroused     | Arousal   | 1.766 | 2  | .173   | Reject     |
| Controlling | Dominance | 0.675 | 2  | .510   | Reject     |
| Influential | Dominance | 1.135 | 2  | .323   | Reject     |
| In control  | Dominance | 4.368 | 2  | .014*  | Accept     |
| Important   | Dominance | 0.164 | 2  | .849   | Reject     |
| Dominant    | Dominance | 3.487 | 2  | .032*  | Accept     |
| Independent | Dominance | 0.719 | 2  | .488   | Reject     |

P = < .001 \*\*\*

< .010 \*\*

< .050 \*

#### 4.3.1.2 Description of ANOVA Findings for Hypothesis 1a

The findings featured in Table 4 show that there was no significant effect of the interactivity on participant's feeling: *happy, pleased, satisfied, contented, hopeful, aroused, controlling, influential, important, or independent* within and between any of the three conditions. However, there was a statistically significant effect of the interactivity on participant's feeling: *stimulated, relaxed, excited, frenzied, jittery, wide-awake, in control, and dominant* for the three conditions. In addition, and in relation to Mehrabian and Russell's (1974) Emotions of Dimensions PAD Scale, there was no significant effect of the interactivity for the pleasure dimension but there were significant effects for both the arousal and dominance dimensions. The following is a description of the findings for each of these constructs.

##### **Arousal**

###### **Stimulated/Relaxed**

- There was a significant effect of the interactivity on participants' feeling *stimulated* at the  $p < .05$  level for the three conditions ( $F(2, 293) = 3.945, p = .020$ ).

###### **Relaxed/Bored**

- There was a significant effect of the interactivity on participants' feeling *relaxed* at the  $p < .05$  level for the three conditions ( $F(2, 294) = 3.234, p = .041$ ).

###### **Excited/Calm**

- There was a significant effect of the interactivity on participants' feeling *excited* at the  $p < .05$  level for the three conditions ( $F(2, 294) = 3.427, p = .034$ ).

### **Frenzied/Sluggish**

- There was a significant effect of the interactivity on participants' feeling *sluggish* at the  $p < .01$  level for the three conditions ( $F(2, 292) = 6.340, p = .002$ ).

### **Jittery/Dull**

- There was a significant effect of the interactivity on participants' feeling *dull* at the  $p < .05$  level for the three conditions ( $F(2, 293) = 4.165, p = .016$ ).

### **Wide-awake/Sleepy**

- There was a significant effect of the interactivity on participants' feeling *wide-awake* at the  $p < .05$  level for the three conditions ( $F(2, 294) = 3.615, p = .028$ ).

### **Dominance**

#### **In control/Cared for**

- There was a significant effect of the interactivity on participants' feeling *cared for* at the  $p < .05$  level for the three conditions ( $F(2, 294) = 4.368, p = .014$ ).

#### **Dominant/Submissive**

- There was a significant effect of the interactivity on participants' feeling *dominant* at the  $p < .05$  level for the three conditions ( $F(2, 294) = 3.487, p = .032$ ).

#### 4.3.1.3 One-way T-Test and Tukey's HSD Test Findings for Hypothesis 1a

Since some ANOVA findings for hypothesis 1a were found to be statistically significant, a post hoc test was necessary. Tukey's HSD post hoc test was selected for this and Table 4 presents the findings (refer to Appendix F). The purpose of this test is to compare the conditions between one another (Field, 2009) so in this case the physical store (1), online store (2) and mobile technology (3) conditions have been compared. Conditions were compared at the 0.05 significance level.

**TABLE 4 - TUKEY'S HSD FINDINGS FOR HYPOTHESIS 1A**

| Construct  | PAD       | Condition | Mean | SD    |
|------------|-----------|-----------|------|-------|
| Relaxed    | Pleasure  | 1         | 3.39 | 1.536 |
|            |           | 3         | 3.54 | 1.646 |
|            |           | 2         | 3.92 | 1.520 |
| Stimulated | Arousal   | 1         | 3.43 | 1.570 |
|            |           | 3         | 3.35 | 1.556 |
|            |           | 2         | 3.90 | 1.433 |
| Excited    | Arousal   | 1         | 3.40 | 1.702 |
|            |           | 3         | 3.46 | 1.807 |
|            |           | 2         | 3.97 | 1.713 |
| Frenzied   | Arousal   | 1         | 3.66 | 1.156 |
|            |           | 3         | 3.73 | 1.289 |
|            |           | 2         | 4.21 | 1.212 |
| Jittery    | Arousal   | 1         | 3.94 | 1.182 |
|            |           | 3         | 4.10 | 1.385 |
|            |           | 2         | 4.42 | 1.187 |
| Wide-awake | Arousal   | 3         | 3.62 | 1.605 |
|            |           | 1         | 3.68 | 1.422 |
|            |           | 2         | 4.12 | 1.360 |
| In control | Dominance | 1         | 3.46 | 1.645 |
|            |           | 3         | 3.57 | 1.539 |
|            |           | 2         | 4.05 | 1.476 |
| Dominant   | Dominance | 1         | 3.53 | 1.384 |
|            |           | 3         | 3.94 | 1.476 |
|            |           | 2         | 4.00 | 1.321 |

#### 4.3.1.4 Description of T-Test and Tukey's HSD Findings for Hypothesis 1a

##### Relaxed/Bored

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 2 i.e. the online store (M=3.92, SD=1.520) was significantly different than condition 1 i.e. the physical store (M=3.39, SD=1.536) and condition 3 i.e. mobile technology (M=3.54, SD=1.646) (see Figure 3 and Table 5). In other words, participants who had been shown videos of interactivity in the online store felt less *relaxed* than did the participants exposed to videos of interactivity in the physical store and mobile technology. In contrast, participants in the physical store and mobile technology scenarios felt more *relaxed* than those in the online store.

FIGURE 3 – ONE-WAY T-TEST FINDINGS FOR RELAXED

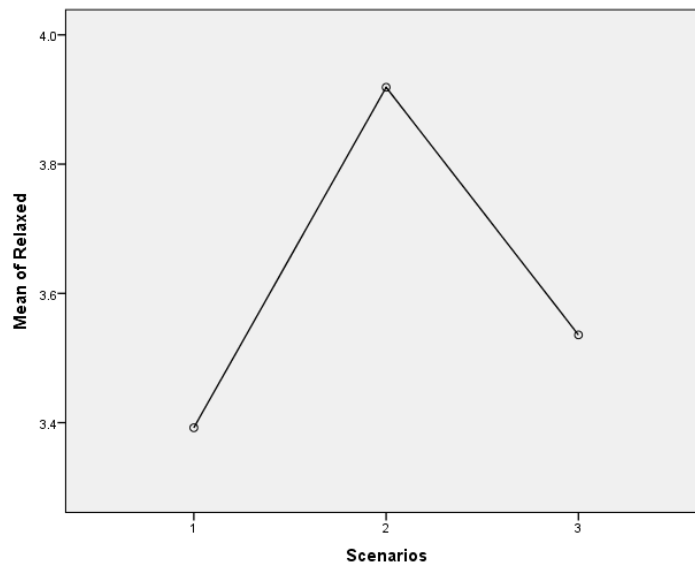


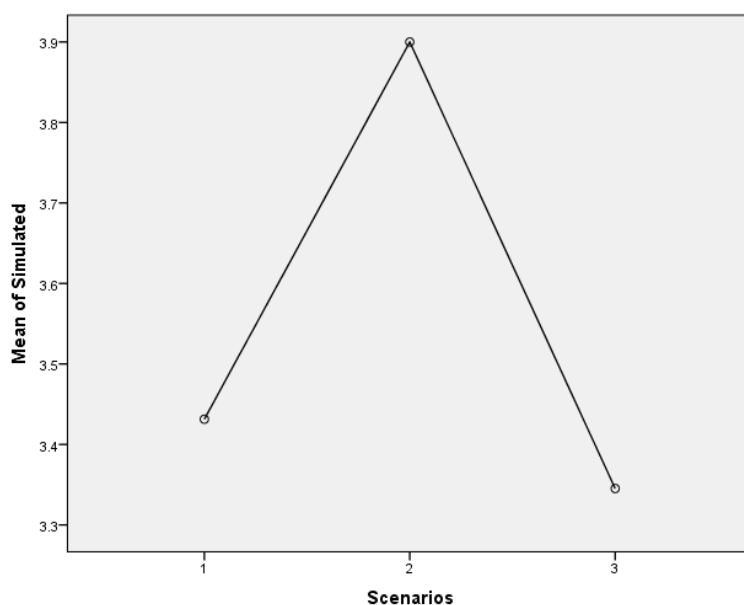
TABLE 5 - TUKEY'S TEST FINDINGS FOR RELAXED

| Relaxed                  |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1         | 102 | 3.39                    |      |
|                          | 3         | 84  | 3.54                    | 3.54 |
|                          | 2         | 111 |                         | 3.92 |
|                          | Sig.      |     | .797                    | .202 |
| Tukey B <sup>a,b</sup>   | 1         | 102 | 3.39                    |      |
|                          | 3         | 84  | 3.54                    | 3.54 |
|                          | 2         | 111 |                         | 3.92 |

### Stimulated/Relaxed

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 2 i.e. the online store (M=3.90, SD=1.433) was significantly different than condition 1 i.e. the physical store (M=3.43, SD=1.570) and condition 3 i.e. mobile technology (M=3.35, SD=1.556) (see Figure 4 and Table 6). In other words, participants who had been shown videos of interactivity in the online store felt less *stimulated* than did the participants exposed to videos of interactivity in the physical store and mobile technology. In contrast, participants in the physical store and mobile technology scenarios felt more *stimulated* than those in the online store.

**FIGURE 4 – ONE-WAY T-TEST FINDINGS FOR STIMULATED**



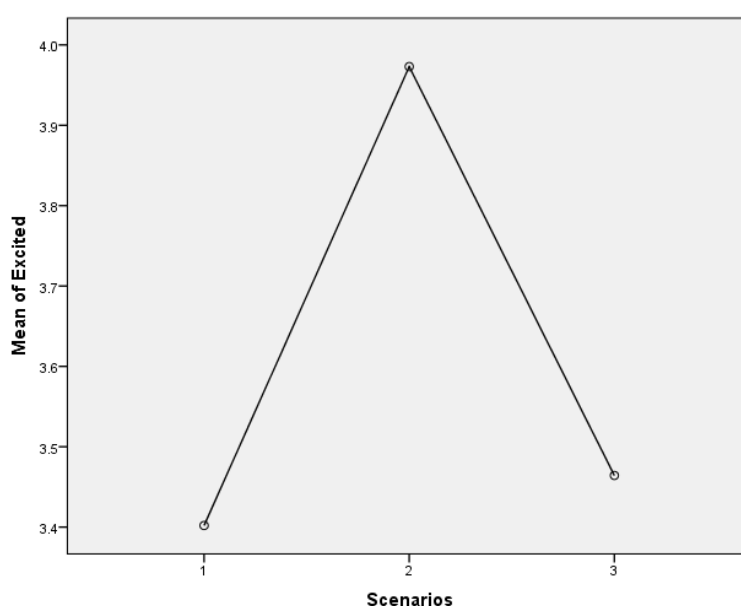
**TABLE 6 - TUKEY'S TEST FINDINGS FOR STIMULATED**

| Simulated                |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 3         | 84  | 3.35                    |      |
|                          | 1         | 102 | 3.43                    | 3.43 |
|                          | 2         | 110 |                         | 3.90 |
|                          | Sig.      |     | .917                    | .081 |
| Tukey B <sup>a,b</sup>   | 3         | 84  | 3.35                    |      |
|                          | 1         | 102 | 3.43                    | 3.43 |
|                          | 2         | 110 |                         | 3.90 |

## Excited/Calm

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 2 i.e. the online store (M=3.97, SD=1.713) was significantly different than condition 1 i.e. the physical store (M=3.40, SD=1.702) and condition 3 i.e. mobile technology (M=3.46, SD=1.807) (see Figure 5 and Table 7). In other words, participants who had been shown videos of interactivity in the online store felt less *excited* than did the participants exposed to videos of interactivity in the physical store and mobile technology. In contrast, participants in the physical store and mobile technology scenarios felt more *excited* than those in the online store.

**FIGURE 5 – ONE-WAY T-TEST FINDINGS FOR EXCITED**



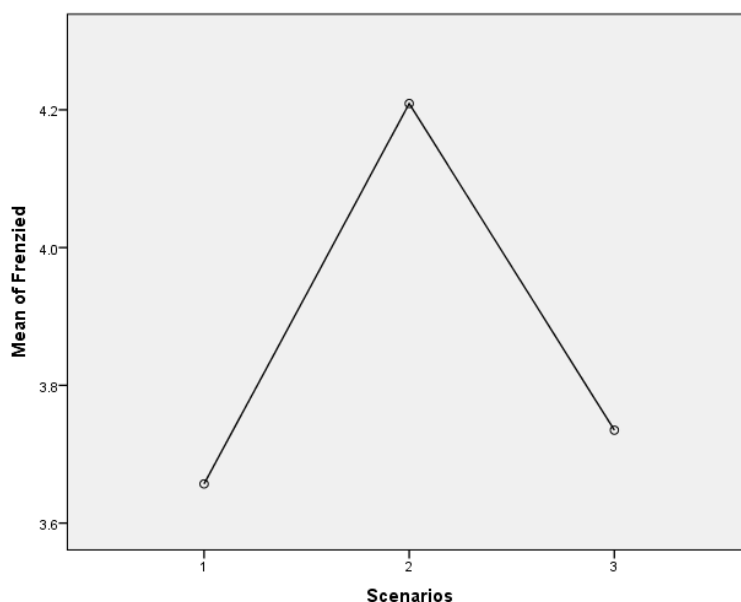
**TABLE 7 - TUKEY'S TEST FINDINGS FOR EXCITED**

| Excited                  |           |     |                            |
|--------------------------|-----------|-----|----------------------------|
|                          |           |     | Subset for alpha =<br>0.05 |
|                          | Scenarios | N   | 1                          |
| Tukey HSD <sup>a,b</sup> | 1         | 102 | 3.40                       |
|                          | 3         | 84  | 3.46                       |
|                          | 2         | 111 | 3.97                       |
|                          | Sig.      |     | .058                       |
| Tukey B <sup>a,b</sup>   | 1         | 102 | 3.40                       |
|                          | 3         | 84  | 3.46                       |
|                          | 2         | 111 | 3.97                       |

## Frenzied/Sluggish

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 2 i.e. the online store (M=4.21, SD=1.212) was significantly different than condition 1 i.e. the physical store (M=3.66, SD=1.156) and condition 3 i.e. mobile technology (M=3.73, SD=1.289) (see Figure 6 and Table 8). In other words, participants who had been shown videos of interactivity in the online store felt more *sluggish* than did the participants exposed to videos of interactivity in the physical store and mobile technology. In contrast, participants in the physical store and mobile technology scenarios felt more *frenzied* than those in the online store.

**FIGURE 6 – ONE-WAY T-TEST FINDINGS FOR FRENZIED**



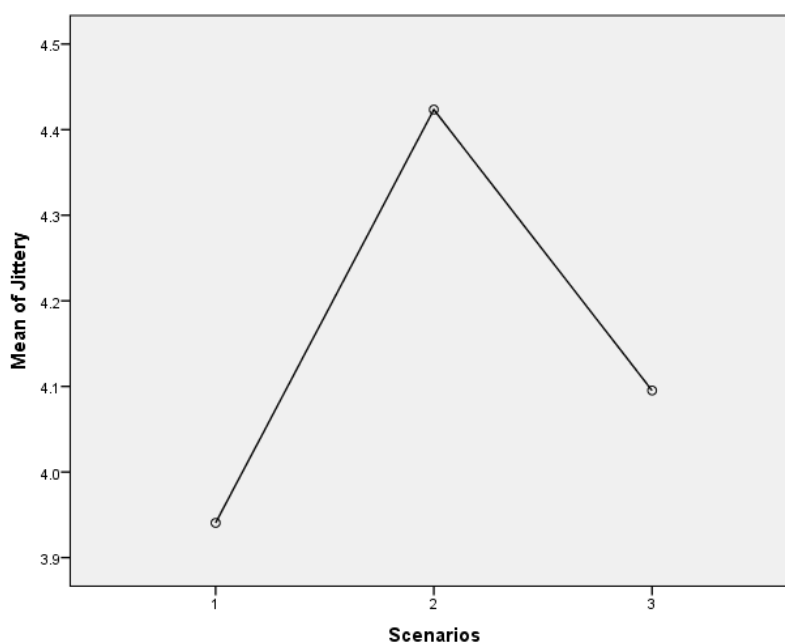
**TABLE 8 - TUKEY'S TEST FINDINGS FOR FRENZIED**

| Frenzied                 |           |     |                         |       |
|--------------------------|-----------|-----|-------------------------|-------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |       |
|                          |           |     | 1                       | 2     |
| Tukey HSD <sup>a,b</sup> | 1         | 102 | 3.66                    |       |
|                          | 3         | 83  | 3.73                    |       |
|                          | 2         | 110 |                         | 4.21  |
|                          | Sig.      |     | .896                    | 1.000 |
| Tukey B <sup>a,b</sup>   | 1         | 102 | 3.66                    |       |
|                          | 3         | 83  | 3.73                    |       |
|                          | 2         | 110 |                         | 4.21  |

## Jittery/Dull

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 2 i.e. the online store (M=4.42, SD=1.187) was significantly different than condition 3 i.e. mobile technology (M=4.10, SD=1.385) and condition 1 i.e. the physical store (M=3.94, SD=1.182) (see Figure 7 and Table 9). In other words, participants shown videos of interactivity in the online store felt *dull* than did the participants exposed to videos of interactivity in the physical store and mobile technology. In contrast, participants in the physical store scenario felt jittery and less dull in the mobile technology scenario compared to those in the online store.

**FIGURE 7 – ONE-WAY T-TEST FINDINGS FOR JITTERY**



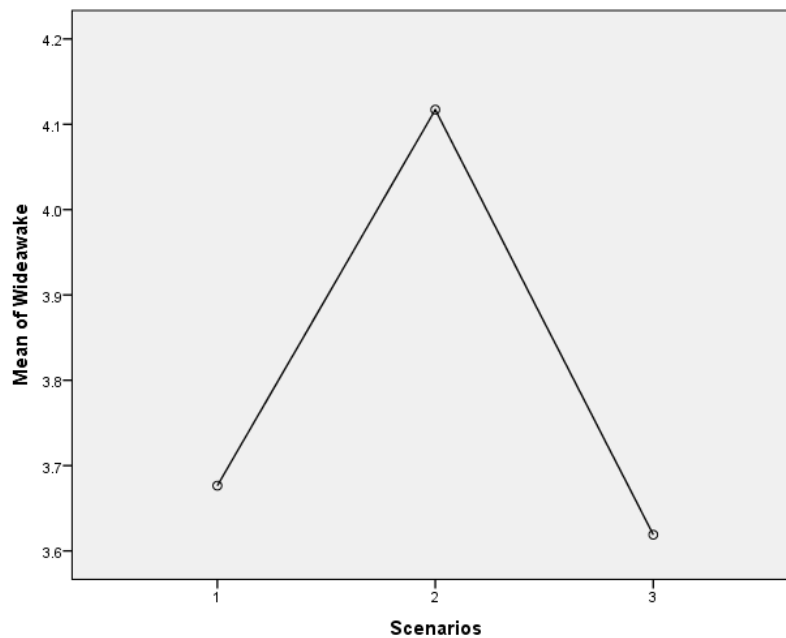
**TABLE 9 - TUKEY'S TEST FINDINGS FOR JITTERY**

| Jittery                  |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1         | 101 | 3.94                    |      |
|                          | 3         | 84  | 4.10                    | 4.10 |
|                          | 2         | 111 |                         | 4.42 |
|                          | Sig.      |     | .662                    | .159 |
| Tukey B <sup>a,b</sup>   | 1         | 101 | 3.94                    |      |
|                          | 3         | 84  | 4.10                    | 4.10 |
|                          | 2         | 111 |                         | 4.42 |

### Wide awake/Sleepy

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 2 i.e. the online store (M=4.12, SD=1.360) was significantly different than condition 1 i.e. the physical store (M=3.68, SD=1.422) and condition 3 i.e. mobile technology (M=3.62, SD=1.605) (see Figure 8 and Table 10). In other words, participants who had been shown videos of interactivity in the online store felt *sleepy* than did the participants exposed to videos of interactivity in the physical store and mobile technology. In contrast, participants in the physical store and mobile technology scenarios felt more *wide-awake* than those in the online store.

**FIGURE 8 – ONE-WAY T-TEST FINDINGS FOR WIDE AWAKE**



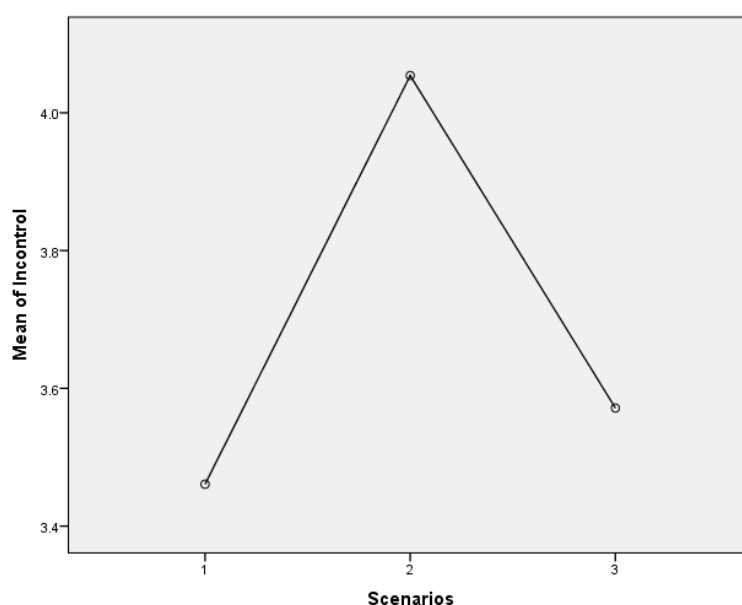
**TABLE 10 - TUKEY'S TEST FINDINGS FOR WIDE AWAKE**

| Wideawake                |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 3         | 84  | 3.62                    |      |
|                          | 1         | 102 | 3.68                    | 3.68 |
|                          | 2         | 111 |                         | 4.12 |
|                          | Sig.      |     | .959                    | .088 |
| Tukey B <sup>a,b</sup>   | 3         | 84  | 3.62                    |      |
|                          | 1         | 102 | 3.68                    | 3.68 |
|                          | 2         | 111 |                         | 4.12 |

### In control/Cared for

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 2 i.e. the online store (M=4.05, SD=1.476) was significantly different than condition 1 i.e. the physical store (M=3.46, SD=1.645) and condition 3 i.e. mobile technology (M=3.57, SD=1.539) (see Figure 9 and Table 11). In other words, participants who had been shown videos of interactivity in the online store felt more *cared for* than did the participants exposed to videos of interactivity in the physical store and mobile technology. In contrast, participants in the physical store and mobile technology scenarios felt more *in control* than those in the online store.

**FIGURE 9 – ONE-WAY T-TEST FINDINGS FOR IN CONTROL**



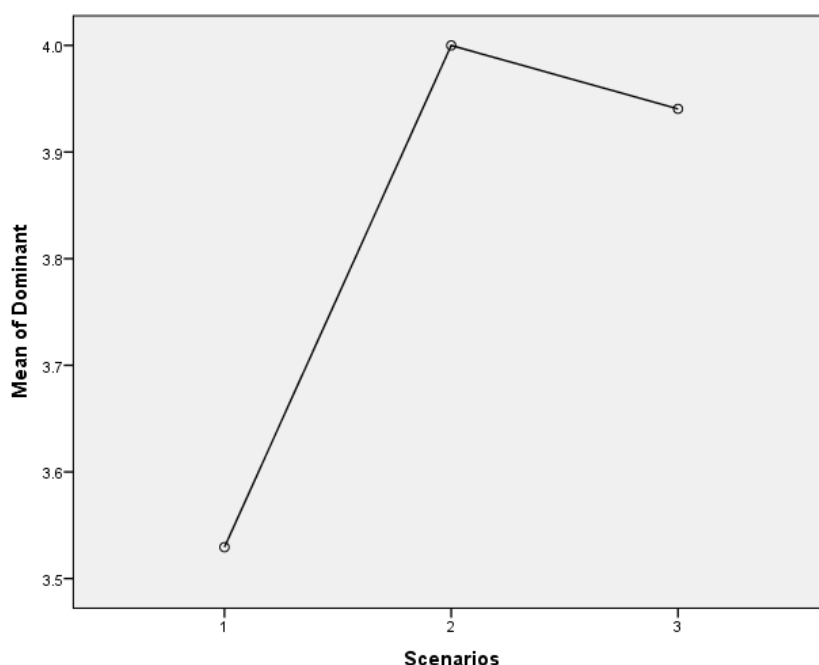
**TABLE 11 - TUKEY'S TEST FINDINGS FOR IN CONTROL**

| Incontrol                |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1         | 102 | 3.46                    |      |
|                          | 3         | 84  | 3.57                    | 3.57 |
|                          | 2         | 111 |                         | 4.05 |
|                          | Sig.      |     | .872                    | .078 |
| Tukey B <sup>a,b</sup>   | 1         | 102 | 3.46                    |      |
|                          | 3         | 84  | 3.57                    |      |
|                          | 2         | 111 |                         | 4.05 |

### Dominant/Submissive

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 1 i.e. the physical store (M=3.53, SD=1.384) was significantly different than condition 3 i.e. mobile technology (M=3.94, SD=1.476) and condition 2 i.e. the online store (M=4.00, SD=1.321) (see Figure 10 and Table 12). In other words, participants who had been shown videos of interactivity in the physical store felt more *dominant* than did the participants exposed to videos of interactivity in the online store and mobile technology. In contrast, participants in the online store and mobile technology scenarios felt less *dominant* than those in the physical store.

**FIGURE 10 – ONE-WAY T-TEST FINDINGS FOR DOMINANT**



**TABLE 12 - TUKEY'S TEST FINDINGS FOR DOMINANT**

| Dominant                 |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1         | 102 | 3.53                    |      |
|                          | 3         | 84  | 3.94                    | 3.94 |
|                          | 2         | 111 |                         | 4.00 |
|                          | Sig.      |     | .098                    | .952 |
| Tukey B <sup>a,b</sup>   | 1         | 102 | 3.53                    |      |
|                          | 3         | 84  | 3.94                    | 3.94 |
|                          | 2         | 111 |                         | 4.00 |

#### 4.3.1.5 Overall Description of Findings for Hypothesis 1a

The one-way between-subjects ANOVA test findings mean that there was a statistically significant effect of the interactivity on participant's feeling: *stimulated, relaxed, excited, frenzied, jittery, wide-awake, in control, and dominant* for the three conditions. Further inferences can be made when relating the findings to the pleasure, arousal and dominance dimensions of Mehrabian and Russell's (1974) Dimensions of Emotions PAD Scale. For instance, for all three conditions there was no effect of the interactivity on the pleasure dimension but for the arousal dimension (which refers to an energized state), the positive emotions that were felt were: *stimulated, excited, and wide-awake* and an equal amount of negative emotions were also felt: *relaxed, sluggish and dull*. For the dominance dimension (which refers to the extent to which an individual feels unrestricted or in control of a situation), positive emotions felt were: *in control* and *dominant*. Overall, this indicates that more positive emotions were felt (than negative), which therefore means that interactivity had a marginally positive effect on participants' attitude for the physical store, online store and mobile technology. This, in turn, evokes approach behaviours.

When comparing the physical store, online store and mobile technology with one another, the one-way T-Test and Tukey's HSD test findings reveal that participants who were shown videos of interactivity in an online store felt less *stimulated, less relaxed, less excited, more sluggish, more dull, more sleepy* and more *cared for* in comparison to participants who were shown videos of interactivity in a physical store and mobile technology. On the contrary, participant's exposed to videos of interactivity in a physical store and mobile technology felt more *relaxed, more stimulated, more excited, more frenzied, more jittery, more wide-awake, and more in control* than those in the online store condition. In addition, participant's shown videos of interactivity in the physical store felt more *dominant* in comparison to participant's who observed videos of interactivity pertaining to an online store and mobile technology (who felt less *dominant*). When observing the PAD Scale, the emotion: *relaxed/bored* is part of the pleasure dimension. Given that pleasure is an affective state that represents positive feelings and participants' in the online store condition (i.e. scenario 2) felt less *relaxed* than they did

*bored*, it can be stated that these participants' felt a positive emotion. With relevance to the arousal dimension, since participants in the online store condition (i.e. scenario 2) felt less: *stimulated*, and *excited*, and more: *sluggish*, *dull* and *sleepy*, it can be stated that their state of arousal demonstrated negative emotions. Lastly, and in relation to the dominance dimension, since participants in the online store condition (i.e. scenario 2) felt more *cared for* instead of *in control*, it can be stated that this is a negative emotion of dominance. On the other hand, participants in the physical store condition (i.e. scenario 1) felt *dominant* instead of *submissive* and this is a positive emotion. It can therefore be stated that for all aforementioned emotions except *dominant*, the findings indicate that between conditions, participants felt negative emotions towards the interactivity in the online store condition (i.e. scenario 2) in comparison to the physical store (i.e. scenario 1) and mobile technology (i.e. scenario 3). This means that the interactivity in the online store was pleasurable to a minor degree, it was not highly arousing and participants did not feel in control. These results further indicate avoidance behaviours towards the online store environment. In addition, this means that the interactivity in the physical store and mobile technology conditions was more arousing than in the online store. But for the physical store condition, participants felt a positive emotion (i.e. *dominant*) towards the interactivity in comparison to the online store and mobile technology. This means that the interactivity in the physical store made participants feel less restricted.

In general, it can be stated that participants exposed to the online store condition had a negative attitude towards different levels and types of interactivity in comparison to participants in the physical store and mobile technology conditions. Based on these findings, hypothesis 1a is accepted. That is, that the level and type of interactivity in an omni-channel environment does affect the attitudes of retail shoppers because there was a significant difference on the scales.

#### 4.3.2 Hypothesis 1b

Hypothesis 1b is: *The level and type of interactivity in an omni-channel environment will affect the involvement of retail shoppers. Specifically, shoppers will have greater involvement with the online store than the physical store or mobile technology.*

This hypothesis was formulated based on the notion that participants' level of involvement with shopping activities will be affected after exposure to the interactivity in the videos. In other words, there should be a significant difference (on the scales) relating to participants' involvement between the three conditions (i.e. a physical store, online store and mobile technology).

If there is a difference on the scales that is statistically significant then hypothesis 1b will be accepted. On the contrary, if there is no difference on the scales, the hypothesis will be rejected.

#### 4.3.2.1 ANOVA Findings for Hypothesis 1b

Table 13 presents the findings for the ANOVA that was run to test hypothesis 1b (findings are derived from Appendix F). The one-way between subjects ANOVA was conducted to compare the effect of the interactivity (i.e. the independent variable) in the videos on participants' involvement (i.e. the dependent variable) in an omni-channel environment (i.e. the physical store, online store and mobile technology conditions).

**TABLE 13 - ANOVA FINDINGS FOR HYPOTHESIS 1B**

| Construct           | F     | df | Sig. | Hypothesis |
|---------------------|-------|----|------|------------|
| Important to me     | .492  | 2  | .613 | Reject     |
| Of no concern to me | .417  | 2  | .660 | Reject     |
| Irrelevant to me    | .301  | 2  | .741 | Reject     |
| Meaningful to me    | 1.412 | 2  | .249 | Reject     |
| Useless to me       | 2.867 | 2  | .062 | Reject     |
| Valuable to me      | .840  | 2  | .435 | Reject     |
| Trivial to me       | .115  | 2  | .891 | Reject     |
| Beneficial to me    | 1.023 | 2  | .363 | Reject     |
| Matters to me       | .013  | 2  | .987 | Reject     |
| Uninteresting to me | .056  | 2  | .945 | Reject     |
| Significant to me   | .416  | 2  | .661 | Reject     |
| Vital to me         | .102  | 2  | .903 | Reject     |
| Boring to me        | .961  | 2  | .386 | Reject     |
| Unexciting to me    | 1.060 | 2  | .351 | Reject     |
| Appealing to me     | 1.141 | 2  | .324 | Reject     |
| Mundane to me       | .190  | 2  | .827 | Reject     |
| Essential to me     | .510  | 2  | .602 | Reject     |
| Undesirable to me   | .028  | 2  | .973 | Reject     |
| Wanted by me        | .907  | 2  | .407 | Reject     |
| Not needed by me    | 2.569 | 2  | .082 | Reject     |

P = < .001 \*\*\*

< .010 \*\*

< .050 \*

#### 4.3.2.2 Overall Description of Findings for Hypothesis 1b

The results from Table 13 show that there was no statistical significance for any of the constructs in relation to participants' involvement towards shopping activities, therefore, hypothesis 1b is rejected. This means that the level and type of interactivity in an omni-channel environment does not affect the involvement of retail shoppers because there was no significant difference on the scales.

Basically, participants did not feel like shopping for fashion was *important, of no concern, irrelevant, meaningful, useless, valuable, trivial, beneficial, matters, uninteresting, significant, vital, boring, unexciting, appealing, mundane, essential, undesirable, wanted, and not needed* by them.

Looking at Zaichowsky's (1985) Personal Involvement Inventory (PII) Scale, the results show that participants had very little variance towards how involved they were in the shopping activities. Due to the lack of variance, types of interactivity did not impact involvement.

#### 4.3.3 Hypothesis 1c

Hypothesis 1c is: *The level and type of interactivity in an omni-channel environment will affect the engagement of retail shoppers. Specifically, shoppers will have higher engagement to mobile technology than the physical and online stores.*

This hypothesis is based on the idea that participants' engagement with a shopping environment will be affected by exposure to the videos. In other words, there should be a significant difference (on the scales) relating to participants' engagement with the interactivity between the three conditions (i.e. a physical store, online store and mobile technology). Participants' engagement is represented through their liking towards certain environmental characteristics.

If there is a difference on the scales that is statistically significant then hypothesis 1c will be accepted. On the other hand, if there is no difference, the hypothesis will be rejected.

#### 4.3.3.1 ANOVA Findings for Hypothesis 1c

Table 14 presents the findings for the ANOVA that was run to test hypothesis 1c (findings are sourced from Appendix F). The one-way between subjects ANOVA was conducted to compare the effect of the interactivity (i.e. the independent variable) in the videos on participants' engagement (i.e. the dependent variable) in an omni-channel environment (i.e. the physical store, online store and mobile technology conditions).

**TABLE 14 - ANOVA FINDINGS FOR HYPOTHESIS 1C**

| Construct    | F     | df | Sig.   | Hypothesis |
|--------------|-------|----|--------|------------|
| Colourful    | 4.172 | 2  | .018*  | Accept     |
| Negative     | 1.466 | 2  | .236   | Reject     |
| Stimulating  | .668  | 2  | .515   | Reject     |
| Attractive   | 1.399 | 2  | .252   | Reject     |
| Tense        | .681  | 2  | .509   | Reject     |
| Comfortable  | .658  | 2  | .520   | Reject     |
| Depressing   | 4.796 | 2  | .010** | Accept     |
| Good         | .657  | 2  | .520   | Reject     |
| Unlively     | 4.705 | 2  | .011*  | Accept     |
| Bright       | .259  | 2  | .772   | Reject     |
| Unmotivating | .605  | 2  | .548   | Reject     |
| Pleasant     | .854  | 2  | .429   | Reject     |
| Interesting  | 1.971 | 2  | .145   | Reject     |

P = < .001 \*\*\*

< .010 \*\*

< .050 \*

#### 4.3.3.2 Description of Findings for Hypothesis 1c

The findings from Table 14 in relation to engagement show that there was no significant effect of the interactivity on participants' thinking that any of the three conditions (i.e. the physical store, online store and mobile technology) were: *negative, stimulating, attractive, tense, comfortable, good, bright, unmotivating, pleasant* or *interesting*. However, there was a statistically significant effect of the interactivity on participant's thinking the three conditions were: *colourful, depressing* and *unlively*. The following is a description of the findings for each of these constructs.

##### **Colourful/Drab**

- There was a significant effect of the interactivity on participants' feeling *drab* at the  $p < .05$  level for the three conditions [ $F(2, 96) = 4.172, p = 0.018$ ].

##### **Depressing/Cheerful**

- There was a significant effect of the interactivity on participants' feeling *cheerful* at the  $p < .01$  level for the three conditions [ $F(2, 96) = 4.796, p = 0.010$ ].

##### **Unlively/Lively**

- There was a significant effect of the interactivity on participants' feeling *lively* at the  $p < .05$  level for the three conditions [ $F(2, 96) = 4.705, p = 0.011$ ].

#### 4.3.3.3 One-way T-Test and Tukey's HSD Test Findings for Hypothesis 1c

Since some ANOVA findings for hypothesis 1c were found to be statistically significant, a post hoc test was necessary. Tukey's HSD post hoc test was selected for this and Table 15 presents the findings (derived from Appendix F). The purpose of this test is to compare the conditions between one another (Field, 2009) so in this case the physical store (1), online store (2) and mobile technology (3) conditions will be compared. Conditions were compared at the 0.05 significance level.

**TABLE 15 - TUKEY'S HSD TEST FINDINGS FOR HYPOTHESIS 1C**

| Construct  | Condition | Mean | SD    |
|------------|-----------|------|-------|
| Colourful  | 3         | 2.71 | 1.357 |
|            | 2         | 3.38 | 1.320 |
|            | 1         | 3.74 | 1.504 |
| Depressing | 1         | 4.53 | 1.237 |
|            | 2         | 4.97 | 1.067 |
|            | 3         | 5.46 | 1.261 |
| Unlively   | 1         | 4.21 | 1.431 |
|            | 2         | 4.62 | 1.233 |
|            | 3         | 5.25 | 1.351 |

Results in Table 16 show that the constructs: *depressing* and *unlively* increased substantially, however, *colourful* decreased and these changes are statistically significant. This means that there was a significant difference in the scores for the constructs: *colourful*, *depressing* and *unlively*.

#### 4.3.3.4 Description of T-Test and Tukey's HSD Findings for Hypothesis 1c

##### Colourful/Drab

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 1 i.e. the physical store (M=3.74, SD=1.504) was significantly different than condition 3 i.e. mobile technology (M=2.71, SD=1.357) and condition 2 i.e. the online store (M=3.38, SD=1.320) (see Figure 11 and Table 16). In other words, participants who had been shown videos of interactivity in the physical store thought that this retail environment was less *colourful* in comparison to the online store and mobile technology. In contrast, interactivity in the online store and mobile technology was perceived to be more *colourful* than the physical store.

FIGURE 11 – ONE-WAY T-TEST FINDINGS FOR COLOURFUL

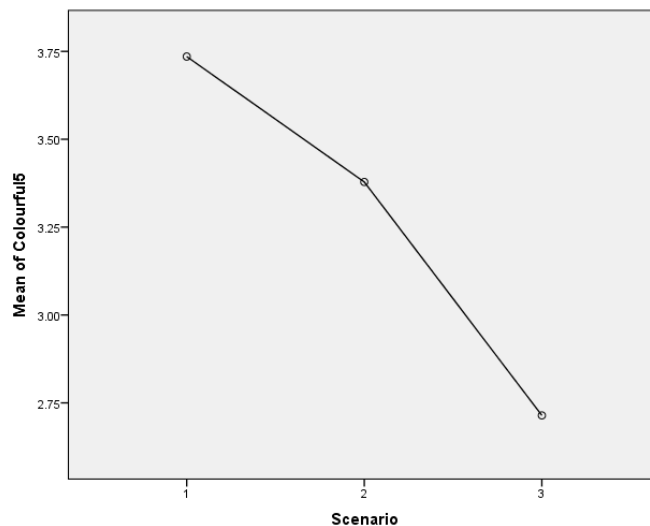


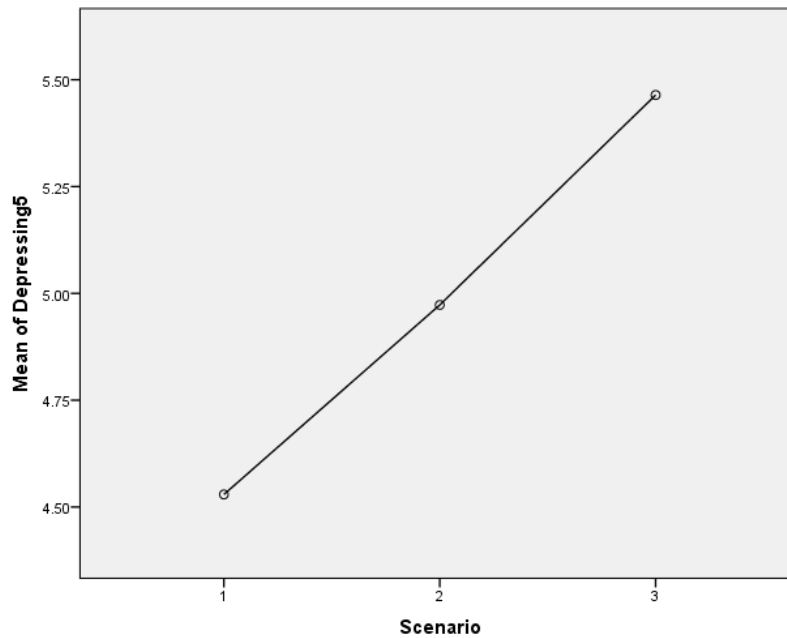
TABLE 16 - TUKEY'S TEST FINDINGS FOR COLOURFUL

| Colourful5               |          |    |                         |      |
|--------------------------|----------|----|-------------------------|------|
|                          | Scenario | N  | Subset for alpha = 0.05 |      |
|                          |          |    | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 3        | 28 | 2.71                    |      |
|                          | 2        | 37 | 3.38                    | 3.38 |
|                          | 1        | 34 |                         | 3.74 |
|                          | Sig.     |    | .139                    | .559 |
| Tukey B <sup>a,b</sup>   | 3        | 28 | 2.71                    |      |
|                          | 2        | 37 | 3.38                    | 3.38 |
|                          | 1        | 34 |                         | 3.74 |

## Depressing/Cheerful

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 3 i.e. mobile technology (M=5.46, SD=1.261) was significantly different than condition 1 i.e. the physical store (M=4.53, SD=1.237) and condition 2 i.e. the online store (M=4.97, SD=1.067) (see Figure 12 and Table 17). In other words, participants who had been shown videos of interactivity in mobile technology thought that this retail environment was more *cheerful* in comparison to the physical and online stores. In contrast, interactivity in the physical and online stores was perceived to be less *cheerful* than the mobile technology.

**FIGURE 12 – ONE-WAY T-TEST FINDINGS FOR DEPRESSING**



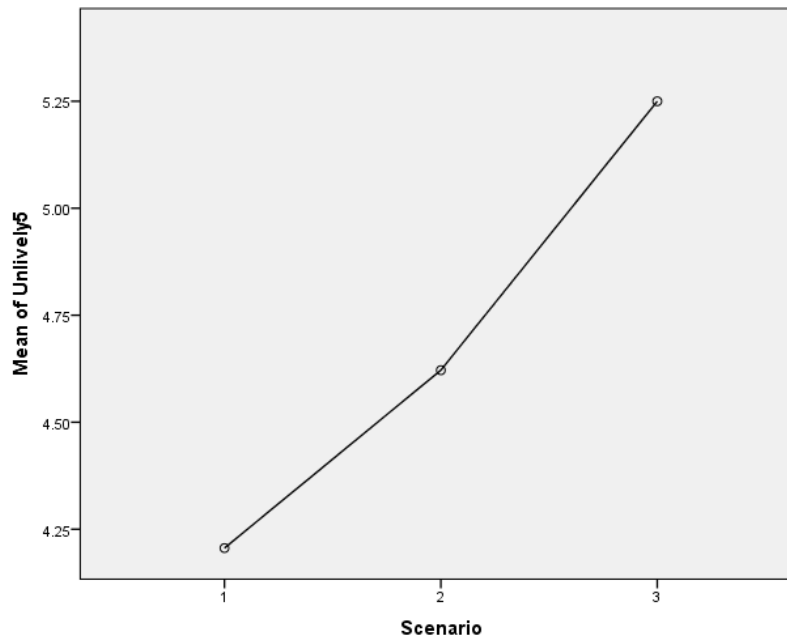
**TABLE 17 - TUKEY'S TEST FINDINGS FOR DEPRESSING**

| Depressing5              |          |    |                         |      |
|--------------------------|----------|----|-------------------------|------|
|                          | Scenario | N  | Subset for alpha = 0.05 |      |
|                          |          |    | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1        | 34 | 4.53                    |      |
|                          | 2        | 37 | 4.97                    | 4.97 |
|                          | 3        | 28 |                         | 5.46 |
|                          | Sig.     |    | .290                    | .220 |
| Tukey B <sup>a,b</sup>   | 1        | 34 | 4.53                    |      |
|                          | 2        | 37 | 4.97                    | 4.97 |
|                          | 3        | 28 |                         | 5.46 |

## Unlively/Lively

Post hoc comparisons using the Tukey HSD test indicated that the mean score for condition 3 i.e. mobile technology (M=5.25, SD=1.351) was significantly different than condition 1 i.e. the physical store (M=4.21, SD=1.431) and condition 2 i.e. the online store (M=4.62, SD=1.233) (see Figure 13 and Table 18). In other words, participants who had been shown videos of interactivity in mobile technology thought that this retail environment was *livelier* in comparison to the physical and online stores. In contrast, interactivity in the physical and online stores was perceived to be less *lively* than the mobile technology.

**FIGURE 13 – ONE-WAY T-TEST FINDINGS FOR UNLIVELY**



**TABLE 18 - TUKEY'S TEST FINDINGS FOR UNLIVELY**

| Unlively5                |          |    |                         |      |
|--------------------------|----------|----|-------------------------|------|
|                          | Scenario | N  | Subset for alpha = 0.05 |      |
|                          |          |    | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1        | 34 | 4.21                    |      |
|                          | 2        | 37 | 4.62                    | 4.62 |
|                          | 3        | 28 |                         | 5.25 |
|                          | Sig.     |    | .424                    | .145 |
| Tukey B <sup>a,b</sup>   | 1        | 34 | 4.21                    |      |
|                          | 2        | 37 | 4.62                    | 4.62 |
|                          | 3        | 28 |                         | 5.25 |

#### 4.3.3.5 Overall Description of Findings for Hypothesis 1c

Overall, the one-way between-subjects ANOVA test findings show that participants had some variance towards the type of retail environment setting. This means that participants liked some (but not all) aspects of the physical store, online store and mobile technology. Given that findings confirmed only three out of ten constructs that were statistically significant, it can be stated that for the physical store, online store and mobile technology, interactivity only had a minimal effect on participants' engagement.

When making comparisons between the physical store, online store and mobile technology conditions, the one-way T-Test and Tukey's HSD test findings show that participants in the physical store condition (i.e. scenario 1) thought this environment was less *colourful* than the online store condition (i.e. scenario 2) and mobile technology (i.e. scenario 3), which were found to be more *colourful* than the physical store. This infers that a low level of engagement was felt by participants in response to the interactivity in the physical store environment. In addition, the findings from these tests showed that participant's in the mobile technology condition (i.e. scenario 3) thought this environment was more *cheerful* and *lively* than the physical (i.e. scenario 1) and online (i.e. scenario 2) stores, which were found to be less *cheerful* and *lively* in comparison to mobile technology. This infers that the interactivity shown in the mobile technology was more engaging.

Based on these facts, hypothesis 1c is accepted. That is, that the level and type of interactivity in an omni-channel environment does affect the engagement of retail shoppers because there was a significant difference on the scales.

## Chapter Five: Discussion

The final chapter of this thesis discusses the conclusions of this research. First, the research aim is reiterated and then an elaborate discussion based on the key findings from chapter 4 in relation to the literature review is presented. Next, managerial implications of the findings and what they mean to academics and practitioners are discussed. Subsequently, the limitations of this study along with suggestions for future research are explained.

### 5.1 Discussion of Findings and Conclusion

As previously established in chapter one, omni-channel retailing is a new area of research that has been relatively untapped in an academic sense. Thus, the opportunity was presented to further investigate this topic. To date, there has been no experimental evidence that examines the effect of interactivity on retail shoppers' attitudes, involvement, and engagement in an omni-channel retail environment. As such, this is the underlying reason for this research.

The primary aim of this research was to empirically test the impact of different levels and types of interactivity in an omni-channel retail environment by examining how the interactivity affected the attitudes, involvement and engagement of retail shoppers. In other words, the main purpose of this research was to answer the research question: *How does the level/type of interactivity in an omni-channel environment affect the attitudes, involvement and engagement of retail shoppers?*

In order to achieve this, hypotheses were developed and tested by examining the effect of interactive features in a physical store, online store and mobile technology in the context of fashion retail; on shoppers' attitudes, involvement and engagement. The responses of 99 adult female respondents were analysed from a customer experience perspective and the findings are discussed.

## **Attitude**

In the review of literature in chapter 2, it was established that the effect of interactivity in relation to attitudes had been researched but most studies were confined to an online context and to some extent, mobile devices. This revealed a disparity in research pertaining to the effect of interactivity on attitudes in a physical store and the need to test this effect in an omni-channel retail environment emanated. The majority of preceding research highlighted that when users are exposed to interactivity, this had a positive influence on their attitude. Based on these studies, it was predicted that different levels and types of interactivity in an omni-channel retail environment would affect retail shoppers' attitudes. The results of hypothesis 1a indicated that the level and type of interactivity in an omni-channel environment does have an effect on retail shoppers' attitudes because there was statistically significant evidence to support this. Specific results indicated that for the various retail environments in omni-channel retailing i.e. the physical store, online store and mobile technology, retail shoppers generally feel relaxed, excited, sluggish, dull, wide-awake, stimulated, in control, and dominant when exposed to different levels and types of interactivity. According to Mehrabian and Russell's (1974) Dimensions of Emotions PAD Scale, these findings indicate that the interactivity for all retail settings in an omni-channel environment had no effect on the pleasure dimension, but for the arousal dimension, emotions were equally positive and negative, and positive emotions were felt in relation to the dominance dimension. Due to the fact that results reflected a ratio of more positive emotions (than negative), it can be stated that interactivity had a marginally positive influence on retail shoppers' attitudes in an omni-channel retail environment. Interestingly, the exhibited interactivity in this study failed to make retail shoppers feel happy, pleased, satisfied, contented, hopeful, aroused, controlling, influential, important, or independent. It is further unknown why results did not demonstrate any effect on pleasure. However, the key finding: that different levels and types of interactivity affect retail shoppers' attitudes contests Coyle and Thorson's (2001) outcome that showed no effect between interactivity and attitude but supports numerous other studies which indicated that attitudes can be affected by interactivity.

As discussed in chapter 2, it had been discovered that direct experiences (e.g. the physical store) have more of an impact on attitude than indirect experiences (e.g. the online store and mobile technology) (Fazio and Zanna, 1978; Cetola, 1988). However, although findings for hypothesis 1a indicate that interactivity has a marginally positive influence on retail shoppers' attitudes in an omni-channel retail environment (i.e. the physical store, online store and mobile technology), further findings are counterintuitive. Moreover, cross-comparison results show that retail shoppers have a negative attitude towards the interactivity in online stores because they felt bored, calm, sluggish, dull, sleepy, cared for, and relaxed. In relation to Mehrabian and Russell's (1974) Dimensions of Emotions PAD Scale, these emotions indicate that the interactivity in the online store was not pleasurable, had a low level of arousal, and shoppers did not feel in control of the situation, therefore as a result of these emotions, avoidance behaviours can be expected. Ultimately these findings indicate the opposite to previous research because they demonstrate that indirect experiences (i.e. the online store) have more of an impact on attitude than direct experiences (i.e. the physical store). This finding is also inconsistent with other studies that indicated that interactivity has a positive influence on attitude in an online environment (e.g. Wu, 1999; Kettunurak *et al.*, 2001; Jee & Lee, 2002; McMillan *et al.*, 2003; Lee, Yurchisin & Lin, 2010) because the results of this study demonstrate a negative influence on attitude in the online store.

This discrepancy could be attributed to the fact that there was no background music in the videos that showed 1) real life models and 2) live pop-up chats for the online store, therefore, this could have induced negative attitudes. Extant store atmospheric literature suggests that the presence of music within different environments can influence cognitive, affective and behavioural aspects (Jain & Bagdare, 2011) and can have a direct effect on consumers' attitudes, felt pleasure, mood and patronage (Dubé, Chebat & Morin, 1995; Areni, 2003). Thus, perhaps the presence of music in these particular videos could have resulted in a different effect. Other external factors that could influence an individuals' response can depend on the context of the shopping activity. For example, the time of day, emotions, and financial situation could affect shopper behaviour (Piotrowics & Cuthbertson, 2014). Another reason for the result of a negative attitude towards interactivity in the online store for this study could relate to the

Technology Acceptance Model (TAM) (Davis, 1989), which posits that different factors influence an individuals' attitude when presented with new technology. Perhaps retail shoppers did not associate any perceived usefulness, perceived ease of use or enjoyment (i.e. the key components of TAM) with the different types of interactivity (in the online store) they were exposed to, therefore, felt negative emotions towards it. This could further explain why there was no effect on the pleasant dimension as it is possible that retail shoppers did not feel any enjoyment towards the interactivity. A final thought pertaining to the negative attitude result for this study could relate to Haeckel's (1985) Assimilation of New Technology model, which states that people will only adopt and use new technology they are familiar with. Further research states that forcing users to adopt new technology will result in negative attitudes, negative eWOM and brand switching behaviour (Reinders *et al.*, 2008). Perhaps the participants in the online store scenario of this study were not familiar with the different types of interactivity that was shown to them, therefore there was a negative outcome.

When comparing the attitudinal responses to interactivity between the physical store, online store and mobile technology for this study, findings indicated that in an online store retail shoppers feel less: stimulated, relaxed, and excited, but more: sluggish, dull, sleepy and cared for by interactivity in comparison to the physical store and mobile technology. These findings also indicated that interactivity in a physical store and mobile technology makes retail shoppers feel more: relaxed, stimulated, excited, frenzied, jittery, wide-awake, and in control towards interactivity than retail shoppers in an online store. This means that interactivity in the physical store and mobile technology is more arousing than in the online store. In addition, results of this study indicated that interactivity in a physical store makes retail shoppers feel more dominant than retail shoppers in an online store or mobile technology scenario (as they feel less dominant).

Previous retail research has established that depending on a shoppers' attitude towards a given retail environment, this will determine whether shoppers will search for information, visit, shop and purchase products at a particular store (Duncan & Olshavsky, 1982; Korgaonkar,

Lund & Price, 1985; Eastlick & Liu 1997; Blackwell *et al.*, 2001). In relation to the finding that retail shoppers have a marginally positive attitude towards interactivity in an omni-channel retail environment, it can be expected that this would stimulate approach behaviours. Conversely and in consideration of this study's finding that retail shoppers have a negative attitude towards interactivity in an online store, this infers that avoidance behaviours will transpire. It can therefore be stated that in an omni-channel retail environment, there is a low likelihood of retail shoppers using online stores for retail patronage purposes and to assist with their purchasing decisions because of their negative attitude and the possibility to exhibit avoidance behaviour towards it. It can then also be expected that physical stores and mobile technology are the preferred shopping channels in an omni-channel environment because this study found no direct effect in terms of a negative influence on attitudes towards the interactivity of these retail environments.

## **Involvement**

With relevance to involvement, the discussion in the literature review ascertained that females are more involved in fashion than males (Hourigan & Bougare, 2012), fashion shopping is a high involvement consumption activity, due to it having a high touch and feel component (Workman, 2010) and technology and the Internet can change consumer's level of involvement with fashion items (Loker & Ashdown, 2008). Past research has also suggested that interactivity produces experiences that have a degree of cognitive involvement (due to active control and two-way communication) and that this engagement leads to enhanced interactivity and user involvement (Parsons *et al.*, 1998; Pavlou & Stewart, 2002; Song & Zinkhan, 2008; Li *et al.*, 2002; Liu & Shrum, 2002; Rosenkrans, 2009; Jiang *et al.*, 2010). It was for these reasons that the experiment for this study was conducted in the context of fashion retail, females were targeted to be the sample, and it was expected that because the interactivity for this study was projected through technology, new media and the Internet, that different levels and types of interactivity would affect retail shoppers' level of involvement in an omni-channel retail environment. Surprisingly, the results of this study for hypothesis 1b indicated no significant differences with involvement, which means that the level and type of

interactivity in an omni-channel retail environment does not affect the involvement of retail shoppers in any way. This finding was unexpected and with reference to Zaichowsky's (1985) Personal Involvement Inventory (PII) Scale, the results mean that retail shoppers do not think shopping for fashion is important, of no concern, irrelevant, meaningful, useless, valuable, trivial, beneficial, matters, uninteresting, significant, vital, boring, unexciting, appealing, mundane, essential, undesirable, wanted, and not needed by them. This study was therefore inconsistent with previous literature as it was unable to find any effect between interactivity and involvement, therefore, it could not prove that females are highly involved in fashion shopping or that technology, new media and the Internet plays a role in influencing individuals' involvement. No link between involvement and shopping motivational orientation (i.e. utilitarian and hedonic motivations) was made in this study either. The potential reasons for these generic results could be due to the fact that the sample was homogenous and there were also no extreme variables.

## **Engagement**

The review of literature showed that preceding studies had not yet examined the effect of interactivity on retail shoppers' engagement in the context of a physical store or an omni-channel retail environment. According to earlier literature, for interactive forms of media to be perceived as engaging, the content should be creative and useful to the user (Parsons *et al.*, 1998) and in online environments, some degree of challenge is necessary to capture and maintain users' constant engagement (Nantel, 2004). In light of these findings, this study included different types of interactivity that featured a variation of utilitarian and hedonic shopping motivational orientations to ensure that there was a creative component to the interactivity and/or that the interactivity was useful. Other research has shown that depending on the user, their experience with a particular type of interactivity (or media) determines their level of engagement (Calder & Malthouse, 2008). It was the expectation of this study then that different levels and types of interactivity in an omni-channel retail environment would affect retail shopper's engagement. The results of this study revealed some interesting findings. Overall the findings for hypothesis 1c indicate that retail shoppers' engagement can be

affected by the level and type of interactivity in an omni-channel retail environment. However, findings are somewhat contradictory as they indicate that participants had some variance towards the type of retail environment setting, which means that participants liked some but not all aspects of the interactivity in the physical store, online store and mobile technology. Specifically, results of this study indicated that for each retail setting of an omni-channel environment, retail shoppers do not think interactivity is: negative, stimulating, attractive, tense, comfortable, good, bright, unmotivating, pleasant or interesting. Although, retail shoppers do think that interactivity in omni-channel environments is drab, cheerful and lively (as these characteristics were found to be statistically significant). These results, however, contradict each other as the characteristic 'drab' has a negative connotation whilst 'cheerful' and 'lively' are positive characteristics. Also, since only three out of ten constructs were found to be significant, it can be stated that interactivity only had a minimal effect on participants' level of engagement in an omni-channel retail environment. In comparison to previous literature, research suggests that for users to have an effective experience, the user must be motivated to interact with technology, as this facilitates co-creation (Lusch & Vargo, 2006; Harrison & Barthel, 2009; Van Doorn *et al.*, 2010; Piotrowics & Cuthbertson, 2014). Perhaps this explains why only a minimal effect on engagement was found because shoppers were not highly motivated to use the interactive technologies in this study. The results from this study also indicate that within the omni-channel retail environment, retail shoppers find that interactivity in the online store and mobile technology is more colourful than in the physical store (which is less colourful). This infers a low level of engagement towards the interactivity in the physical store. Results also indicate that retail shoppers think interactivity in mobile technology is more cheerful and lively than in the physical and online stores. This infers a higher level of engagement towards interactivity in mobile technology. Based on these findings, it can be stated that different levels and types of interactivity affect retail shoppers' engagement in an omni-channel retail environment.

## Shopping Motivational Orientation

This study featured a variation of different types of interactivity that represented different shopping motivational orientations. For instance, utilitarian motives were present in self-service technology (in the physical store), the live pop-up chat (in the online store), and the mobile payment technology (in mobile technology). Both utilitarian and hedonic motives were portrayed through the touchscreen technology and the virtual mirror (in the physical store), virtual try-on technology and the video of a real model (in the online store), and QR codes and online product reviews (in mobile technology). There was a possibility of motivational orientation having an influence on retail shoppers' attitudinal, involvement, and engagement-related responses to different types of interactivity because past research has been able to demonstrate influential effects of motivational orientation on consumer behaviour in response to sensory stimuli in different environments (e.g. Hirschman & Holbrook, 1982; Donovan & Rossiter, 1982; Batra & Ahtola, 1990; Babin, *et al.*, 1994; Dhar & Wertenbroch, 2000; Childers, *et al.*, 2001; Parsons & Conroy, 2006; Eroglu *et al.*, 2007; Yoo *et al.*, 2010; Porat, & Tractinsky, 2012; Wu *et al.*, 2014; Wakefield & Whitten, 2006). However, and unfortunately, any such relationship was difficult to establish in this study because this research was not specifically designed to measure this effect. A significant finding in previous shopping motivational orientation research is that motivational orientation moderates the effect of arousal that shoppers feel towards the pleasantness of an environment. This means that for pleasantly perceived shopping environments, there is a positive influence on approach shopping behaviours but for environments that are highly arousing, utilitarians find these environments unpleasant whilst hedonic shoppers have rich shopping experiences (Kaltcheva & Weitz, 2006). In relation to the Dimensions of Emotions PAD Scale (Mehrabian & Russell, 1974), the results of this study found no effect of interactivity in an omni-channel environment on the pleasant dimension but it was found that the interactivity in the physical store and mobile technology was more arousing than in the online store. There was also a minimal effect found on retail shoppers' engagement. Based on these findings, the general response from shoppers in relation to the different levels and types of interactivity in an omni-channel retail environment was that they did not have a pleasurable experience and hedonism was minimal. These findings are surprising given the

fact that much of the interactivity in this study featured hedonic components. Furthermore, this study was unable to support Kaltcheva and Weitz (2006) moderation effect finding because this study found no effect between interactivity and pleasantness.

### **Interactivity**

In accordance with previous studies centered on interactivity (e.g. Schneiderman, 1987; Cordes & Levy, 1995; Bucy, 2004; Lee *et al.*, 2006), the findings from this study support the notion that interactivity can change depending on the perceptions of the user. This is reflected in the significant changes in the scales pertaining to participants' attitudinal and engagement-related responses to different types of interactivity. In other words, in this study users perceived different levels of interactivity based on their emotions towards the different types of interactivity as well as their liking towards the environmental (or communication) setting that featured the interactivity (i.e. the physical store, online store and mobile technology).

### **Online Store**

Much can be deliberated on when considering the findings of this study concerning the online environment. Looking at the different types of interactivity that were chosen for this study, general comparisons to previous studies can be made. In relation to the virtual try-on technology, prior studies have shown that image-interactive and mix-and-match technology have a positive impact on consumers' attitude as it increases consumers' purchase intention, intention to revisit, amount of time spent on a website and general perception of a website (Fiore *et al.*, 2003; Schlosser, 2003; Kim, Fiore & Lee, 2007; Park *et al.*, 2008; Lee *et al.*, 2010; Merle *et al.*, 2012). Due to the fact that this study found an overall negative attitude towards the interactivity in the online store, this contends previous research in this area. With relevance to the videos of real models (i.e. rich media), preceding studies have indicated the following findings. One study showed that online images evoke positive approach behaviours (Fiore & Jin, 2003) and another study found that the rotation function positively affects cognitive,

affective and conative outcomes (Park *et al.*, 2008). Additional research has shown that consumers pay more attention to interactive objects (such as models) and are more engaged (Padilla *et al.*, 2013) whereas other research has shown that 3-D images and virtual models are not important (Kim *et al.*, 2006). The results of this study are in agreement with Kim *et al.*'s (2006) finding that 3-D images and virtual models are not important but contend all other studies, as this study reported negative avoidance behaviours and only minimal engagement with interactivity was found.

### **Physical Store**

With relevance to chapter 2 of this thesis, the literature review states that the physical retail environment projects a specific image to customers, which can potentially influence consumer behaviour (Kotler 1973/4; Saffer, 1996; Parsons, 2011). Although the results of this study indicate that the interactivity in the physical store (and mobile technology) is more arousing (as these conditions make retail shoppers feel more: stimulated, excited, frenzied, jittery, and wide-awake) in comparison to the online store, the results also indicate that the physical store has a low level of engagement (as it is less colourful than the online store and mobile technology). This infers that although the interactivity in the physical store puts retail shoppers into an energized arousal state, it does not necessarily provide a highly engaging retail environment. However, other studies suggest that the physical store offers a tangible sensory experience with fashion items that is an advantage over the online store and mobile technology as touching and feeling clothing leads to instant gratification (Alba *et al.*, 1997; Rosen & Howard, 2000; Kearney, 2010; Brynjolfsson, Hu & Rahman, 2013). In addition, the results of this study indicate that retail shoppers feel more dominant (and in control) towards interactivity in a physical store compared to the other two retail environments. This could be attributed to the fact that touchscreen and self-service technology allow consumers to be in control of their own shopping experience as it enables them to participate in shopping activities whilst requiring none or limited assistance from sales personnel (Touchpoint Interactive Media, 2013). Further research has suggested that retail shoppers' experiences can be enhanced through image-interactive technology (Fiore, Kim & Lee, 2005; Huang & Liu, 2014) and virtual

try-on technology (Nantel, 2004; Kim & Forsythe, 2008a). The results of this study can support this notion because results indicated that interactivity has a marginally positive influence on attitude in an omni-channel retail environment.

### **Mobile Technology**

The results of this study indicated that retail shoppers think interactivity in mobile technology is more cheerful and lively than in the physical and online stores. This infers that interactivity in mobile technology has a moderate level of engagement (and is more engaging than the other channels). In the review of literature, it was distinguished that mobile technology was an emerging area enclosed by scant research, therefore there are limited findings to compare with the results of this study. There are no prior studies that have examined the effects of interactivity via QR codes or mobile payment technology, however; findings relevant to online product reviews are available. Previous research has demonstrated that online product reviews produce both positive and negative effects. For instance, online product reviews have been found to shape consumers' choices (Sun *et al.*, 2006) by enhancing consumer's perceived usefulness (Racherla & Friske, 2012) and they can also positively affect sales as well as the product lifecycle (Chevalier & Mayzlin, 2006). On the other hand, negative effects include negative experiences with online product reviews because product information can be misleading (Hu *et al.*, 2009). This study corroborates the idea that there are positive effects associated with retail shoppers' engagement with mobile technology, as results show that different levels and types of interactivity are engaging in mobile technology. However, much research examining the potential effects of interactivity in mobile technology on retail shoppers is needed.

### **Overall Conclusion**

Overall, this research has proven that retail shopper's attitudes and engagement can be affected by the level and type of interactivity in an omni-channel retail environment but there was no impact of interactivity on retail shoppers' involvement.

## 5.2 Managerial Implications

In general, this research has significant managerial implications for both academics and practitioners because omni-channel retailing literature is so scarce. This study makes a theoretical and empirical contribution to the emerging omni-channel retailing literature in terms of interactivity. In addition and to my knowledge, this research is the first attempt to empirically examine the effect of interactivity on retail shoppers' attitudes, involvement and engagement in an omni-channel retail environment. This study shows that retail shoppers' attitudes and engagement can be affected by different levels and types of interactivity in an omni-channel retail environment, however, there was no impact on retail shoppers' level of involvement.

Specifically, and in relation to attitudinal responses, this study demonstrates that different levels and types of interactivity have a marginally positive influence on retail shoppers' attitudes in an omni-channel environment. As mentioned in the review of literature and discussion of findings section, although a lot of literature has focused on the effect of interactivity on attitudes in an online context (and to some extent mobile technology), no research has examined the effect of interactivity on retail shoppers' attitudes in an omni-channel retail environment. This study clearly demonstrates this effect as well as the notion that retail shoppers' attitudes can be affected by interactivity in other channels within an omni-channel retail environment i.e. the physical store and mobile technology - not just in an online environment.

This study also shows that the interactive features: virtual try-on technology, videos of real models, and live pop up chats in an online store has a negative influence on retail shoppers' attitudes. For managers, to combat the issue of shoppers obtaining a negative attitude towards interactivity presented in online stores, retailers should introduce different types of interactivity (other than what was featured in this study) as perhaps shoppers would have more positive attitudes if there were more pleasurable and engaging interactive online experiences to enjoy. Alternatively, the aforementioned interactive features of this study could be improved to obtain more favourable attitudes from shoppers. Further research is needed in this area to establish what other types of interactivity might induce a positive effect on retail shoppers' attitudes

within an online environment. This action is crucial when considering the fact that the online store is an important interaction point of the omni-channel retail environment.

Given that this study found a negative attitude towards certain types of interactivity in an online store but overall, retail shoppers had a marginally positive attitude towards interactivity in an omni-channel environment, this study was also able to establish that the physical store and mobile technology are retail shoppers preferred shopping channels in an omni-channel retail environment.

This study further makes a significant contribution to existing customer engagement literature, as it is the first empirical investigation to find any effect between interactivity and engagement in the context of an omni-channel retail environment. In particular, it shows that different levels and types of interactivity have a minimal effect on retail shopper's engagement in an omni-channel environment and that the physical store is a less engaging environment whereas mobile technology is more engaging. These findings reveal a need for retailers to either introduce new types of interactivity (other than virtual mirrors, touchscreen and self-service technology) or to improve existing interactivity in physical stores to provide more exciting and hedonic experiences. From this study, it can also be confirmed that the use of QR codes, online product reviews and mobile payment technology are a relatively effective way of increasing retail shoppers' engagement in the mobile technology channel, although these interactive features could be further improved.

Unfortunately, this study was not able to identify any significant effect between interactivity and involvement in an omni-channel retail environment. Therefore, this area needs to be further investigated.

Ultimately, this thesis provides academics and practitioners with a deeper understanding of how different types of interactivity affect retail shoppers' attitudes and engagement in an omni-channel retail environment. This study presents groundbreaking new knowledge to retailers that can assist with enhancing omni-channel retailing business strategies as this research specifies what types of interactivity should/should not be implemented into certain channels to evoke desired/undesired attitudinal and engagement-related effects.

### 5.3 Limitations

A number of important limitations should be acknowledged for this study. The main weakness of this study relates to the data analysis procedure. To explain, in this study participants were exposed to three different types of interactivity for each channel of an omni-channel retail environment (i.e. the physical store, online store and mobile technology) but for each type of interactivity, results were not individually analysed, rather they were analysed as a whole (that represented all three types of interactivity). Therefore, it was difficult to identify and explain individual effects between each type of interactivity in this study when the holistic effect of three types of interactivity was being analysed. For example, it was difficult to interpret the individual interactive effect of a virtual mirror in the physical store, when the holistic interactive effect of touchscreen technology, self-service technology and a virtual mirror for the physical store (relative to retail shoppers' attitudinal, involvement and engagement-related responses), was being analysed. It was further problematic when trying to compare these holistic results with previous studies that focus on individual effects of one type of interactivity, not holistic effects of multiple types of interactivity.

Another source of uncertainty was the video selection for this study. As mentioned in the discussion of findings section in this chapter, the fact that two of the videos (that were shown to participants to portray interactivity in the online store) did not have any background music (but all other videos featured background music) could have been a limitation to this study, as perhaps this interfered with participants' responses to interactivity. Also, perhaps selecting other types of interactivity for the online store that are different to what was included in this study could have quite possibly produced different results.

An additional arguable weakness of this study could be the chosen research design. For instance, this study was conducted as a laboratory experiment, which was composed of an artificial setting. In this case, the setting was student workshops at Auckland University of Technology (AUT). The potential issue with this is that it means the method was not tested in a real setting (i.e. a field experiment) and this could possibly restrict the results of this study

(Field, 2009). Also, although this research was experimental in nature, it was strictly quantitative thus did not consider the possibility of any qualitative input. The benefit of qualitative research is that it provides rich and descriptive insight into human behaviour in comparison to quantitative research, which is empirical and systematic (Creswell, 2007). Perhaps undertaking a qualitative approach would have produced more meaningful findings, however, this idea cannot be confirmed.

The generalisability of the results of this study is also subject to several limitations. With relevance to the sample for this study, this research is only applicable to the female population as male participants were specifically excluded from this study. Female respondents were the only gender included in this study because it had been established that there are behavioural differences between genders when shopping for fashion items and females are the ideal target market for fashion shopping (O'Cass, 2004; Parker *et al.*, 2004; Raajpoot *et al.*, 2007; Pentecost & Andrews, 2010). Due to the fact that this research examined the responses of only student participants, it is likely that these results would vary for other participants who are not students. It can be assumed that individuals who earn more money than students would possess different behavioural functions such as preferences and shopping expenditure patterns therefore including other participants would produce different results. In addition, since the participants in this study reside in Auckland, New Zealand, it could also be questioned as to whether the findings of this study are applicable to other global geographic regions. Although this issue can be argued as it is understood that Auckland has a diverse collective of different ethnicities (Auckland Council, 2013) and, therefore, is an appropriate representation of the general population. Lastly, with a small sample size, caution must be applied, as the findings might not be transferrable to the general population.

## 5.4 Further Research

This research has introduced many areas in need of further investigation. One of the strengths of this study is that it represents a comprehensive examination of the holistic omni-channel retail environment and demonstrates how different levels and types of interactivity affect retail shoppers' attitudes and engagement, however, there was no effect found between interactivity and involvement. Further experimental research should be carried out to establish how interactivity affects retail shoppers' level of involvement in a fashion-shopping omni-channel context. In future, a heterogeneous sample should be chosen in order to achieve this.

To remedy the main limitation, future research should entail the individual analysis of each type of interactivity. Future research should also focus on determining which types of interactivity in an online store will induce a more positive attitude in an omni-channel retail environment. In terms of types of interactivity, this research only looked at image-interactive technology via a virtual mirror, touchscreen technology and self-service technology in physical stores, virtual try-on technology, videos of real models, and live pop-up chats in an online store, and QR codes, online product reviews and mobile payment technology for mobile technology. Future research could explore the effects of other interactive devices and technology in an omni-channel retail environment. For instance, it has been predicted that emerging technologies like google glass and 3D printing will further advance change in retail so these items could be worthy of research (Piotrowicz & Cuthbertson, 2014; Bhalla, 2014). Interchanging banners and online blogs in online stores would also be interesting forms of interactivity that could be investigated.

To further validate the findings from this study, future research should involve testing the method of this study in a field experiment as opposed to a laboratory experiment. This would involve testing the variables in a real fashion retail setting. Field experiments are advantageous because they allow researchers to observe more natural behaviour, although extraneous variables are difficult to control (Field, 2009). Another possible approach for future research would be to investigate this research question from a qualitative perspective or even

use a mixed-method approach. Since qualitative findings can extract deep and meaningful data in comparison to systematic quantitative data, a qualitative approach would produce interesting findings and a cross-comparison to quantitative findings could be made.

More broadly, what is now needed is to ensure the findings of this study are generalizable to the general population and to other industries. Future research should involve obtaining a more diverse sample of participants as this might provide different results. For instance, including participants of varying socio-economic levels would produce interesting results. This study included only students whom, in general, are either employed part-time or unemployed. Including other participants that are not students who are employed full-time and thus are earning a higher income than average students would provide different results. The inclusion of male participants' responses would also be interesting as cross-comparisons between genders could be made. This study could also venture beyond the boundaries of New Zealand and be tested in other geographic regions such as America, Europe and Asia as well as between different ethnic groups. Future research could examine the potential effects that interactivity would have on age and shopping motivational orientation in an omni-channel retail environment. In addition, testing this study in the context of other industries (than fashion retail) and including other products (than fashion items) would provide thought-provoking results.

It would also be interesting to assess the effects of the Technology Acceptance Model (TAM) (Davis, 1989) in relation to attitudinal responses on different levels and types of interactivity in an omni-channel retail environment. This would include evaluating retail shoppers' perceived usefulness, perceived ease of use and enjoyment level with interactive devices.

Overall, academic research investigating shopping behaviour in an omni-channel retail environment is deficient so there is a palpable need to add to and extend this literature.

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## Appendices

### Appendix A – Ethics Approval



A U T E C  
S E C R E T A R I A T

22 June 2015

Andrew Parsons

Faculty of Business and Law

Dear Andrew

Re Ethics Application: **15/193 How does the level/type of interactivity in an omni-channel environment affect the attitudes, engagement and involvement of retail shoppers?**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 22 June 2018.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 22 June 2018;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>. This report is to be submitted either when the approval expires on 22 June 2018 or on completion of the project.

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz).

All the very best with your research,

Kate O'Connor  
Executive Secretary  
**Auckland University of Technology Ethics Committee**

Cc: Jaimee Raymond

A u c k l a n d U n i v e r s i t y o f T e c h n o l o g y E t h i c s C o m m i t t e e

WA505F Level 5 WA Building City Campus

Private Bag 92006 Auckland 1142 Ph: +64-9-921-9999 ext 8316 email [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)

# Participant Information Sheet



Date Information Sheet Produced:

14<sup>th</sup> May 2015

## Project Title

How does the level and type of interactivity in an omni-channel environment affect the attitudes, engagement and involvement of retail shoppers?

## An Invitation

My name is Jaimee Raymond and I am marketing student who is currently doing research for my Master of Business degree, at AUT University in Auckland, New Zealand. The purpose of the research is to understand how different levels and types of interactivity influence consumers' attitudes, engagement and involvement within an omni-channel retail environment. Your thoughts and opinions towards this particular topic is a key component for this study. Therefore, I would very much appreciate your participation in this research by completing the attached questionnaire. Please be advised that this is entirely voluntary. If you choose to participate, you may withdraw at any time without any consequences.

## What is the purpose of this research?

This research aims to investigate consumer's attitudes, engagement and involvement towards different levels and types of interactivity within an omni-channel retail environment. This survey is intended to study what attitudes, engagement and involvement retail shoppers have about interactive features in an omni-channel environment.

This project fulfils a requirement of my programme of study, the Master of Business degree in marketing. It will be published as a thesis in both printed and electronic formats and could be shared in academic journals.

## How was I identified and why am I being invited to participate in this research?

You have been identified to participate in this research because you are a) an adult over the age of 20 years old, b) female and c) are familiar with purchasing goods via a physical store, online store or mobile technology and d) are a current student enrolled in MARS papers at either level 6 or level 7. On the basis of the selection criteria, you will be a valuable contributor to this research, and are invited to participate in the study. Your views are very important to the study that may potentially be of use to retail managers in improving their retail strategies.

## What will happen in this research?

This research involves the completion of the attached survey questionnaire. The questionnaire describes a variety of shopping scenarios and your task is to provide answers to how you would respond to these. It requires 15-20 minutes of your time and a consent form needs to be signed prior to the activity to ensure that you understand any risks involved.

## What are the discomforts and risks?

I very much appreciate the time that you are dedicating to completing the attached questionnaire, which is 15-20 minutes out of your day to help with my research.

**How will these discomforts and risks be alleviated?**

Your contribution to this research is highly valued. Also, a friendly reminder that I will ensure your information will be kept confidential at all times.

**What are the benefits?**

Omni-channel retailing is a new area of research that requires more knowledge. This research will, therefore, be useful in developing a better understanding of what types and levels of interactivity are/are not effective in influencing retail shopper's attitudes, engagement and involvement in an omni-channel environment. Another benefit is that this research will help me to obtain my qualification.

**How will my privacy be protected?**

Your answers to the questionnaire will be kept anonymous. There is no way that these will link to your personal details, as well. No person will be identified in the presentation of findings. If you wish to know the results of this study, I may ask for your e-mail address but kindly take note that this will only be used to provide you a summary of findings. This information will be kept separate from your survey responses, so that your identity cannot be matched to your survey responses.

**What are the costs of participating in this research?**

I ask 15-20 minutes of your time to participate in this research by completing the questionnaire.

**What opportunity do I have to consider this invitation?**

After reading this Participant Information Sheet, you may or may not decide to participate in this study and you have the timeframe of 1 week to respond to your invitation.

**How do I agree to participate in this research?**

To agree to participate in this research, please sign the attached Consent Form.

**Will I receive feedback on the results of this research?**

I would be pleased to send you the results of this study if you indicate this on the Consent Form.

**What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Professor Andrew Parsons*, Email: *andrew.parsons@aut.ac.nz*, phone: +64 (9) 921 9999 ext. 5040.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTC, Kate O'Connor, *ethics@aut.ac.nz*, 921 9999 ext 6038.

**Whom do I contact for further information about this research?**

**Researcher Contact Details:**

Jaimee Raymond, Email: *jraymond@hotmail.com*.

**Project Supervisor Contact Details:**

*Professor Andrew Parsons*, Email: *andrew.parsons@aut.ac.nz*, phone: +64 (9) 921 9999 ext. 5040.

**Approved by the Auckland University of Technology Ethics Committee on 22<sup>nd</sup> June 2015, AUTC  
Reference number 15/193.**

## Consent Form



**Project title: *How does the level and type of interactivity in an omni-channel environment affect the attitudes, engagement and involvement of retail shoppers?***

**Project Supervisor: *Professor Andrew Parsons***

**Researcher: *Jaimee Raymond***

- ☐ I have read and understood the information provided about this research project in the Information Sheet dated 15 May 2015.
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- ☐ If I withdraw, I understand that all relevant information will be destroyed.
- ☐ I agree to take part in this research.
- ☐ I wish to receive a copy of the report from the research (please tick one): Yes ☐ No ☐

Participant's signature:.....

Participant's name:.....

Participant's Contact Details (if appropriate – i.e. you want a copy of the report):

.....  
.....  
.....  
.....

Date:

***Approved by the Auckland University of Technology Ethics Committee on 22<sup>nd</sup> June 2015 AUTEC Reference number 15/193.***

*Note: The Participant should retain a copy of this form.*

## Appendix D – Questionnaire



### QUESTIONNAIRE ON INTERACTIVITY IN RETAIL SHOPPING

**Purpose:** The objective of this questionnaire is to obtain your responses in relation to your attitude, involvement and engagement to interactive features within a retail environment.

**Instructions:** You will be shown 3 shopping scenarios that will be projected on screen. After viewing the first scenario, please complete question 1. After viewing the second scenario, please complete question 2. After viewing the third scenario, please complete question 3. Then please complete questions 4, 5 and 6 and the classification section at the end (i.e. questions 7, 8, 9, 10, 11 and 12).

When answering the questions we would like you to consider yourself in the context of shopping for fashion, for yourself. It is not a special occasion, just typical clothes shopping.

**Please view the first shopping scenario on screen.**

**\*Please do not turn the page until instructed by the researcher.**

1) Using the following scale, please indicate the extent to which these words best describe how the shopping scenario you can see makes you feel (by circling the appropriate number):

|             |   |   |   |   |   |   |   |             |
|-------------|---|---|---|---|---|---|---|-------------|
| Happy       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unhappy     |
| Pleased     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Annoyed     |
| Satisfied   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unsatisfied |
| Content     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Gloomy      |
| Hopeful     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Despairing  |
| Relaxed     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Bored       |
| Excited     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Calm        |
| Frenzied    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Sluggish    |
| Jittery     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Dull        |
| Wide awake  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Sleepy      |
| Aroused     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unaroused   |
| Controlling | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Controlled  |
| Influential | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Influenced  |
| In control  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Cared for   |
| Important   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unimportant |
| Dominant    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Submissive  |
| Independent | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Guided      |
| Stimulated  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Relaxed     |

**Please view the second shopping scenario on screen.**

**\*Please do not turn the page until instructed by the researcher.**

2) Now that you have viewed a different shopping scenario, using the following scale please indicate the extent to which these words best describe how you are now feeling about shopping for fashion (by circling the appropriate number):

|             |   |   |   |   |   |   |   |             |
|-------------|---|---|---|---|---|---|---|-------------|
| Relaxed     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Bored       |
| Stimulated  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Relaxed     |
| Influential | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Influenced  |
| Satisfied   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unsatisfied |
| Jittery     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Dull        |
| Aroused     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unaroused   |
| Excited     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Calm        |
| In control  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Cared for   |
| Dominant    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Submissive  |
| Contented   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Gloomy      |
| Hopeful     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Despairing  |
| Pleased     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Annoyed     |
| Frenzied    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Sluggish    |
| Controlling | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Controlled  |
| Wide awake  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Sleepy      |
| Independent | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Guided      |
| Happy       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unhappy     |
| Important   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unimportant |

**Please view the third and last shopping scenario on screen.**

**\*Please do not turn the page until instructed by the researcher.**

3) Now that you have viewed another shopping scenario, please indicate the extent to which these words best describe how you now feel about fashion shopping by circling the appropriate number on the following scale:

|             |   |   |   |   |   |   |   |             |
|-------------|---|---|---|---|---|---|---|-------------|
| Important   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unimportant |
| Stimulated  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Relaxed     |
| Frenzied    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Sluggish    |
| Satisfied   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unsatisfied |
| Excited     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Calm        |
| Aroused     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unaroused   |
| Independent | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Guided      |
| In control  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Cared for   |
| Dominant    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Submissive  |
| Pleased     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Annoyed     |
| Hopeful     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Despairing  |
| Happy       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unhappy     |
| Controlling | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Controlled  |
| Wide awake  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Sleepy      |
| Influential | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Influenced  |
| Relaxed     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Bored       |
| Jittery     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Dull        |
| Contented   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Gloomy      |

4) Thinking about fashion shopping that is shopping for clothes, shoes and accessories please use the following scale to indicate the response that best suits the statement that follows.

Fashion shopping is.....

|                     |   |   |   |   |   |   |   |                      |
|---------------------|---|---|---|---|---|---|---|----------------------|
| Important to me     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unimportant to me    |
| Of no concern to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Of concern to me     |
| Irrelevant to me    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Relevant to me       |
| Meaningful to me    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Meaningless to me    |
| Useless to me       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Useful to me         |
| Valuable to me      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Worthless to me      |
| Trivial to me       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Fundamental to me    |
| Beneficial to me    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Not beneficial to me |
| Matters to me       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Doesn't matter to me |
| Uninteresting to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Interesting to me    |
| Significant to me   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Insignificant to me  |
| Vital to me         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Superfluous to me    |
| Boring to me        | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Interesting to me    |
| Unexciting to me    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Exciting to me       |
| Appealing to me     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unappealing to me    |
| Mundane to me       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Fascinating to me    |
| Essential to me     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Nonessential to me   |
| Undesirable to me   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Desirable to me      |
| Wanted by me        | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unwanted by me       |
| Not needed by me    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Needed by me         |

5) For each of the following descriptions, please indicate by circling an appropriate number, what you think about the retail setting you have seen. This was either a physical store, online store or mobile technology.

The retail setting was....

|              |   |   |   |   |   |   |   |               |
|--------------|---|---|---|---|---|---|---|---------------|
| Colourful    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Drab          |
| Negative     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Positive      |
| Stimulating  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Boring        |
| Attractive   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unattractive  |
| Tense        | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Relaxed       |
| Comfortable  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Uncomfortable |
| Depressing   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Cheerful      |
| Good         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Bad           |
| Unlively     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Lively        |
| Bright       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Dull          |
| Unmotivating | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Motivating    |
| Pleasant     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Unpleasant    |
| Interesting  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Uninteresting |

6) In relation to your personal shopping experience, please answer the following questions (by ticking the relevant box):

|   | Yes                      | No                       |
|---|--------------------------|--------------------------|
| 6a) Do you enjoy shopping for fashion items?  | <input type="checkbox"/> | <input type="checkbox"/> |
| 6b) Would you consider yourself to be a frequent fashion shopper?                     | <input type="checkbox"/> | <input type="checkbox"/> |
| 6c) Do you find yourself limited for time when you shop for fashion-related products? | <input type="checkbox"/> | <input type="checkbox"/> |
| 6d) Is brand name important to you in choosing a fashion item?                        | <input type="checkbox"/> | <input type="checkbox"/> |
| 6e) Are you currently employed in fashion retailing?                                  | <input type="checkbox"/> | <input type="checkbox"/> |
| 6f) Do you have disposable income to shop for fashion-related products?               | <input type="checkbox"/> | <input type="checkbox"/> |
| 6g) On average, how much do you spend on fashion products in one month?               |                          |                          |
| a) Less than \$100  | <input type="checkbox"/> |                          |
| b) Between \$100-\$200  | <input type="checkbox"/> |                          |
| c) Over \$200   | <input type="checkbox"/> |                          |

**CLASSIFICATION SECTION:** Please provide the following details as well.

\* The following questions are for classification purposes only. Your answers will remain confidential and you will not be identified individually in any way.

7) What is your age group? (Please tick)

Less than 20 years  
20-24 years  
25-29 years  
30-34 years  
35-39 years  
40-44 years  
Over 45 years

|  |
|--|
|  |
|  |
|  |
|  |
|  |
|  |
|  |

8) Are you? (Please circle)

1. Female
2. Male

9) What is your student status? (Please circle)

1. Full time
2. Part time

10) Are you: (please circle)

1. Employed full time
2. Employed part time
3. Not otherwise employed (skip to Q11)

11) In what type of industry are you employed?  
(E.g. retail, fast food, financial services, etc.)

---

12) What is your major or specialized area of study:

---

If you would like to receive a copy of the results from this study, please request this on the Consent Form

Thank you for taking the time to complete this questionnaire 😊

## Appendix E – Interactivity Design and Video Selection

### Testing Interactivity

#### 1) Physical Store

##### 1a) Virtual mirror/fitting room

Neimin Marcus (1:55 mins)

<http://www.dailymail.co.uk/sciencetech/article-2906563/The-end-fitting-room-queues-Smart-mirrors-lets-virtually-try-clothes-order-drinks.html>



##### 1b) Touchscreen information kiosk

Rebecca Minkoff debuts first interactive store (1:54 mins)

<http://www.retailcustomerexperience.com/videos/rebecca-minkoff-debuts-first-interactive-store/>



### 1c) Self-service kiosk

Clothing store utilises technology instead of salespeople (1:29 mins)

<https://www.youtube.com/watch?v=r-9tYnXntrQ>

## Seattle High-Tech Clothing Store Runs Without People

Like 340 Tweet 321 +1 21 14 Text

By Maria Nikias Mar 21, 2013 12:02pm



### 2) Online Store

#### 2a) Virtual try-on technology

New technology lets you try on virtual clothes before you buy (2:05 mins)

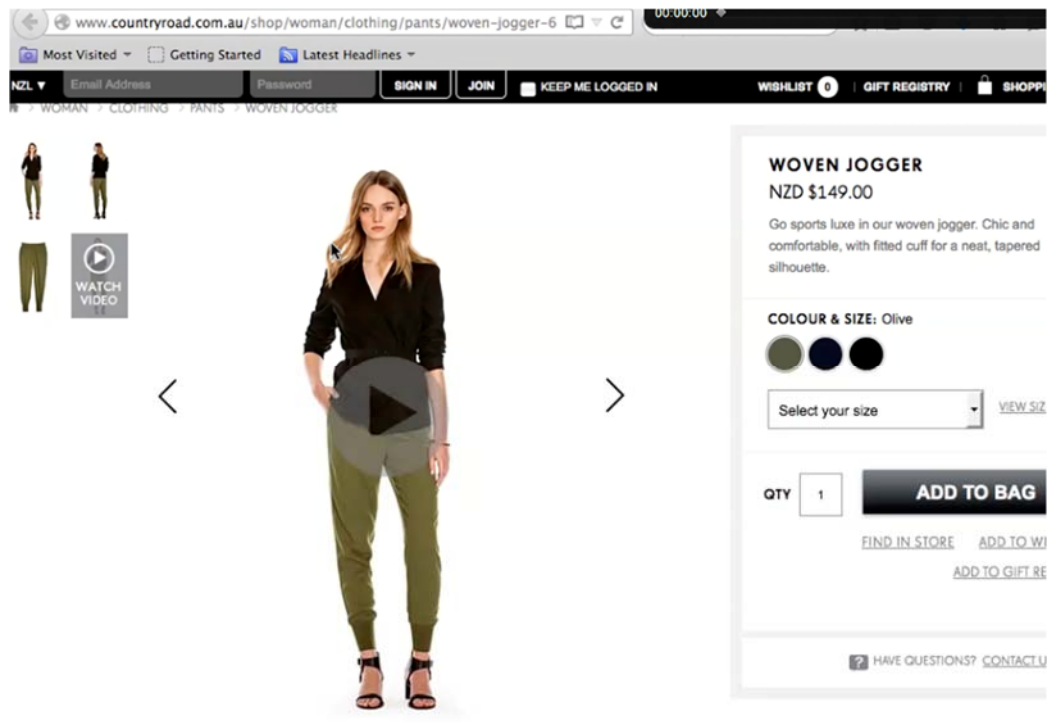
[https://www.youtube.com/watch?v=\\_1GyAO5IFpE](https://www.youtube.com/watch?v=_1GyAO5IFpE)



## 2b) Videos of models

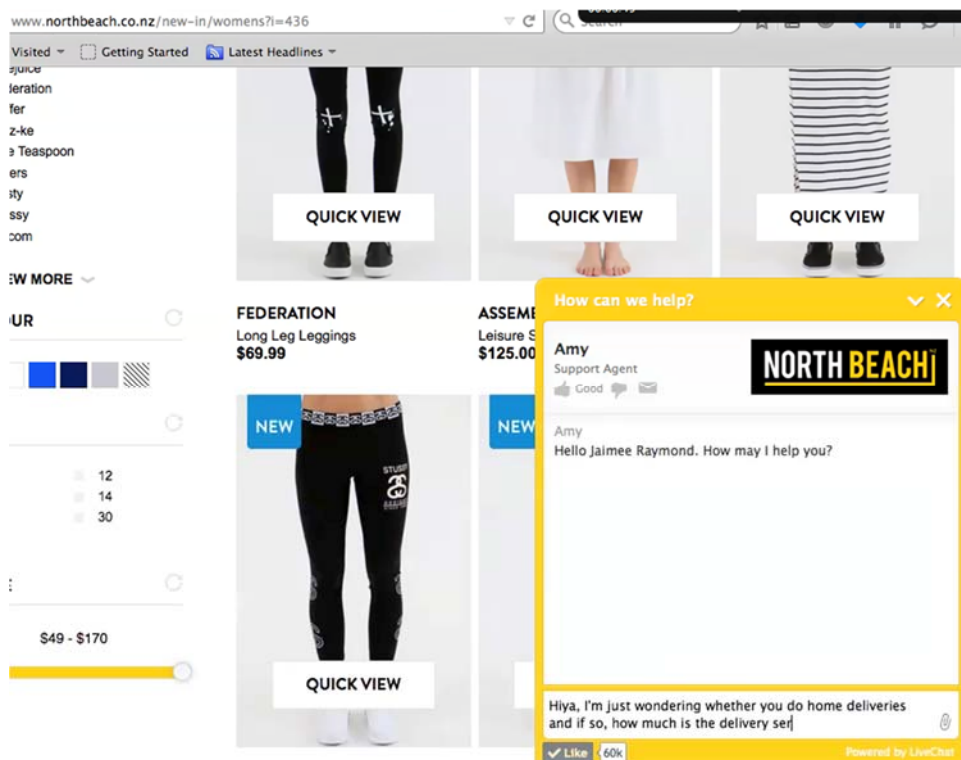
Country Road website – Jogger pant

<http://www.countryroad.com.au/shop/woman/clothing/pants/woven-jogger-60176659>



## 2c) Live pop-up chats

North beach clothes store



### 3) Mobile Technology

#### 3a) QR codes – product/brand information

QR Codes Hit Fifth Avenue in High Fashion (1:27 mins)

<https://www.youtube.com/watch?v=KD8DAcT3a9w>



#### QR Codes Hit Fifth Avenue in High Fashion

#### 3b) Online product reviews

Shaanxo clothing haul & try on's. Winter essentials & cute dresses (17:00 mins). First 2 minutes shown.

<https://www.youtube.com/watch?v=Id0v9N3Defc>

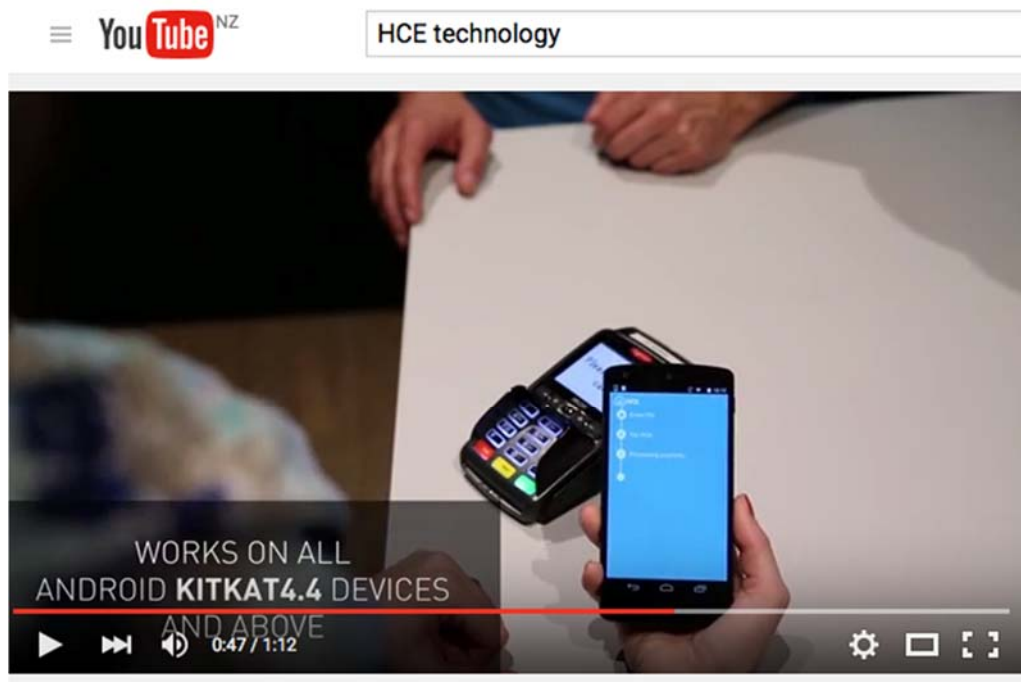


#### Clothing Haul & Try On's ♡ Winter Essentials & Cute Dresses!

### 3c) POS technology

Wirecard | HCE Technology and mobile app payment simplifies the POS process (1:12 mins)

<https://www.youtube.com/watch?v=yIqZz1IqeSo>



Wirecard | HCE Technology and mobile app payment simplifies the POS process

## Appendix F – Findings

### Hypothesis 1a: ANOVA Findings (Attitude)

|             |                | ANOVA          |     |             |       |      |
|-------------|----------------|----------------|-----|-------------|-------|------|
|             |                | Sum of Squares | df  | Mean Square | F     | Sig. |
| Happy       | Between Groups | .915           | 2   | .458        | .170  | .844 |
|             | Within Groups  | 791.536        | 294 | 2.692       |       |      |
|             | Total          | 792.451        | 296 |             |       |      |
| Pleased     | Between Groups | .593           | 2   | .296        | .107  | .899 |
|             | Within Groups  | 815.798        | 294 | 2.775       |       |      |
|             | Total          | 816.391        | 296 |             |       |      |
| Satisfied   | Between Groups | .765           | 2   | .382        | .141  | .869 |
|             | Within Groups  | 798.454        | 294 | 2.716       |       |      |
|             | Total          | 799.219        | 296 |             |       |      |
| Contented   | Between Groups | 4.681          | 2   | 2.341       | 1.216 | .298 |
|             | Within Groups  | 562.255        | 292 | 1.926       |       |      |
|             | Total          | 566.936        | 294 |             |       |      |
| Hopeful     | Between Groups | .227           | 2   | .113        | .047  | .954 |
|             | Within Groups  | 712.422        | 293 | 2.431       |       |      |
|             | Total          | 712.649        | 295 |             |       |      |
| Relaxed     | Between Groups | 15.782         | 2   | 7.891       | 3.234 | .041 |
|             | Within Groups  | 717.477        | 294 | 2.440       |       |      |
|             | Total          | 733.259        | 296 |             |       |      |
| Excited     | Between Groups | 20.665         | 2   | 10.333      | 3.427 | .034 |
|             | Within Groups  | 886.331        | 294 | 3.015       |       |      |
|             | Total          | 906.997        | 296 |             |       |      |
| Frenzied    | Between Groups | 18.732         | 2   | 9.366       | 6.340 | .002 |
|             | Within Groups  | 431.350        | 292 | 1.477       |       |      |
|             | Total          | 450.081        | 294 |             |       |      |
| Jittery     | Between Groups | 12.908         | 2   | 6.454       | 4.165 | .016 |
|             | Within Groups  | 453.981        | 293 | 1.549       |       |      |
|             | Total          | 466.889        | 295 |             |       |      |
| Wideawake   | Between Groups | 15.285         | 2   | 7.643       | 3.615 | .028 |
|             | Within Groups  | 621.611        | 294 | 2.114       |       |      |
|             | Total          | 636.896        | 296 |             |       |      |
| Aroused     | Between Groups | 8.548          | 2   | 4.274       | 1.766 | .173 |
|             | Within Groups  | 711.512        | 294 | 2.420       |       |      |
|             | Total          | 720.061        | 296 |             |       |      |
| Controlling | Between Groups | 2.772          | 2   | 1.386       | .675  | .510 |
|             | Within Groups  | 601.468        | 293 | 2.053       |       |      |

|             |                |         |     |        |       |      |
|-------------|----------------|---------|-----|--------|-------|------|
|             | Total          | 604.240 | 295 |        |       |      |
| Influential | Between Groups | 5.115   | 2   | 2.557  | 1.135 | .323 |
|             | Within Groups  | 662.225 | 294 | 2.252  |       |      |
|             | Total          | 667.340 | 296 |        |       |      |
| Incontrol   | Between Groups | 21.083  | 2   | 10.542 | 4.368 | .014 |
|             | Within Groups  | 709.590 | 294 | 2.414  |       |      |
|             | Total          | 730.673 | 296 |        |       |      |
| Important   | Between Groups | .966    | 2   | .483   | .164  | .849 |
|             | Within Groups  | 867.485 | 294 | 2.951  |       |      |
|             | Total          | 868.451 | 296 |        |       |      |
| Dominant    | Between Groups | 13.428  | 2   | 6.714  | 3.487 | .032 |
|             | Within Groups  | 566.114 | 294 | 1.926  |       |      |
|             | Total          | 579.542 | 296 |        |       |      |
| Independent | Between Groups | 4.396   | 2   | 2.198  | .719  | .488 |
|             | Within Groups  | 899.106 | 294 | 3.058  |       |      |
|             | Total          | 903.502 | 296 |        |       |      |
| Simulated   | Between Groups | 18.146  | 2   | 9.073  | 3.945 | .020 |
|             | Within Groups  | 673.908 | 293 | 2.300  |       |      |
|             | Total          | 692.054 | 295 |        |       |      |

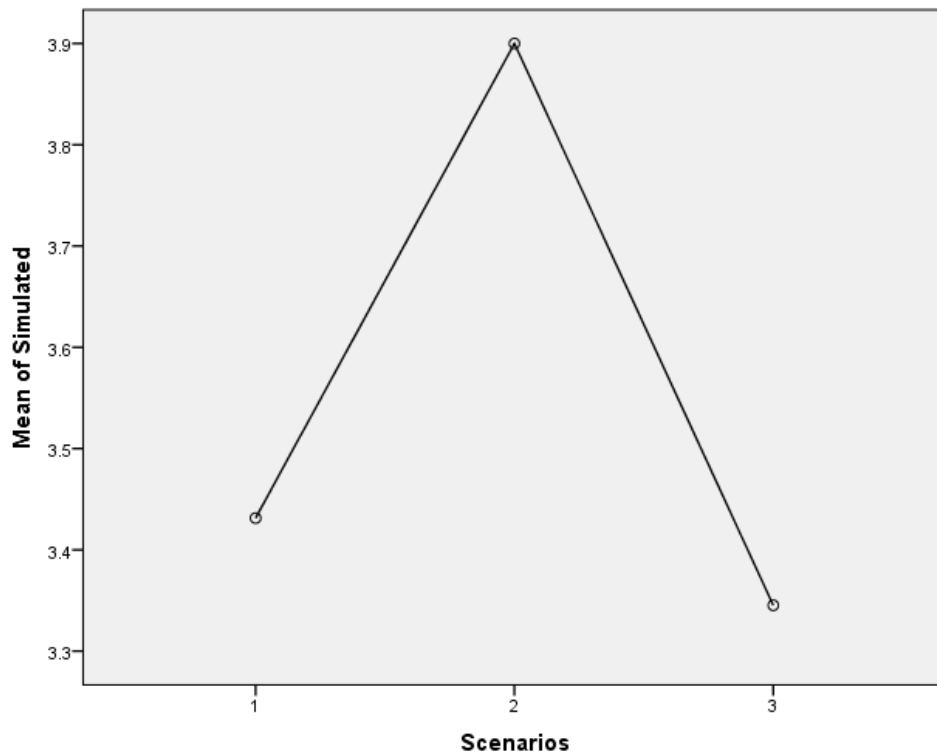
### Hypothesis 1a: ANOVA Findings (Attitude) Descriptive Statistics

| Descriptives |       |     |      |       |      |                                  |             |   |   |
|--------------|-------|-----|------|-------|------|----------------------------------|-------------|---|---|
|              |       |     |      |       |      | 95% Confidence Interval for Mean |             |   |   |
|              |       |     |      |       |      | Lower Bound                      | Upper Bound |   |   |
| Happy        | 1     | 102 | 3.35 | 1.739 | .172 | 3.01                             | 3.69        | 1 | 7 |
|              | 2     | 111 | 3.42 | 1.564 | .148 | 3.13                             | 3.72        | 1 | 7 |
|              | 3     | 84  | 3.29 | 1.617 | .176 | 2.93                             | 3.64        | 1 | 7 |
|              | Total | 297 | 3.36 | 1.636 | .095 | 3.17                             | 3.55        | 1 | 7 |
| Pleased      | 1     | 102 | 3.42 | 1.788 | .177 | 3.07                             | 3.77        | 1 | 7 |
|              | 2     | 111 | 3.47 | 1.536 | .146 | 3.18                             | 3.76        | 1 | 7 |
|              | 3     | 84  | 3.36 | 1.677 | .183 | 2.99                             | 3.72        | 1 | 7 |
|              | Total | 297 | 3.42 | 1.661 | .096 | 3.23                             | 3.61        | 1 | 7 |
| Satisfied    | 1     | 102 | 3.44 | 1.686 | .167 | 3.11                             | 3.77        | 1 | 7 |
|              | 2     | 111 | 3.50 | 1.662 | .158 | 3.18                             | 3.81        | 1 | 7 |
|              | 3     | 84  | 3.37 | 1.581 | .173 | 3.03                             | 3.71        | 1 | 7 |
|              | Total | 297 | 3.44 | 1.643 | .095 | 3.25                             | 3.63        | 1 | 7 |

|             |       |     |      |       |      |      |      |   |   |
|-------------|-------|-----|------|-------|------|------|------|---|---|
| Contented   | 1     | 102 | 3.60 | 1.352 | .134 | 3.33 | 3.86 | 1 | 7 |
|             | 2     | 111 | 3.66 | 1.534 | .146 | 3.37 | 3.95 | 1 | 7 |
|             | 3     | 82  | 3.35 | 1.211 | .134 | 3.09 | 3.62 | 1 | 7 |
|             | Total | 295 | 3.55 | 1.389 | .081 | 3.39 | 3.71 | 1 | 7 |
| Hopeful     | 1     | 102 | 3.41 | 1.673 | .166 | 3.08 | 3.74 | 1 | 7 |
|             | 2     | 110 | 3.42 | 1.436 | .137 | 3.15 | 3.69 | 1 | 7 |
|             | 3     | 84  | 3.48 | 1.571 | .171 | 3.14 | 3.82 | 1 | 7 |
|             | Total | 296 | 3.43 | 1.554 | .090 | 3.25 | 3.61 | 1 | 7 |
| Relaxed     | 1     | 102 | 3.39 | 1.536 | .152 | 3.09 | 3.69 | 1 | 7 |
|             | 2     | 111 | 3.92 | 1.520 | .144 | 3.63 | 4.20 | 1 | 7 |
|             | 3     | 84  | 3.54 | 1.646 | .180 | 3.18 | 3.89 | 1 | 7 |
|             | Total | 297 | 3.63 | 1.574 | .091 | 3.45 | 3.81 | 1 | 7 |
| Excited     | 1     | 102 | 3.40 | 1.702 | .169 | 3.07 | 3.74 | 1 | 7 |
|             | 2     | 111 | 3.97 | 1.713 | .163 | 3.65 | 4.30 | 1 | 7 |
|             | 3     | 84  | 3.46 | 1.807 | .197 | 3.07 | 3.86 | 1 | 7 |
|             | Total | 297 | 3.63 | 1.750 | .102 | 3.43 | 3.83 | 1 | 7 |
| Frenzied    | 1     | 102 | 3.66 | 1.156 | .114 | 3.43 | 3.88 | 1 | 7 |
|             | 2     | 110 | 4.21 | 1.212 | .116 | 3.98 | 4.44 | 1 | 7 |
|             | 3     | 83  | 3.73 | 1.289 | .141 | 3.45 | 4.02 | 1 | 7 |
|             | Total | 295 | 3.88 | 1.237 | .072 | 3.74 | 4.03 | 1 | 7 |
| Jittery     | 1     | 101 | 3.94 | 1.182 | .118 | 3.71 | 4.17 | 1 | 7 |
|             | 2     | 111 | 4.42 | 1.187 | .113 | 4.20 | 4.65 | 2 | 7 |
|             | 3     | 84  | 4.10 | 1.385 | .151 | 3.79 | 4.40 | 1 | 7 |
|             | Total | 296 | 4.17 | 1.258 | .073 | 4.02 | 4.31 | 1 | 7 |
| Wideawake   | 1     | 102 | 3.68 | 1.422 | .141 | 3.40 | 3.96 | 1 | 7 |
|             | 2     | 111 | 4.12 | 1.360 | .129 | 3.86 | 4.37 | 1 | 7 |
|             | 3     | 84  | 3.62 | 1.605 | .175 | 3.27 | 3.97 | 1 | 7 |
|             | Total | 297 | 3.82 | 1.467 | .085 | 3.66 | 3.99 | 1 | 7 |
| Aroused     | 1     | 102 | 4.09 | 1.636 | .162 | 3.77 | 4.41 | 1 | 7 |
|             | 2     | 111 | 4.47 | 1.407 | .134 | 4.20 | 4.73 | 1 | 7 |
|             | 3     | 84  | 4.17 | 1.642 | .179 | 3.81 | 4.52 | 1 | 7 |
|             | Total | 297 | 4.25 | 1.560 | .091 | 4.07 | 4.43 | 1 | 7 |
| Controlling | 1     | 102 | 4.01 | 1.680 | .166 | 3.68 | 4.34 | 1 | 7 |
|             | 2     | 110 | 3.97 | 1.260 | .120 | 3.73 | 4.21 | 1 | 7 |
|             | 3     | 84  | 4.20 | 1.315 | .143 | 3.92 | 4.49 | 1 | 7 |
|             | Total | 296 | 4.05 | 1.431 | .083 | 3.89 | 4.21 | 1 | 7 |
| Influential | 1     | 102 | 3.77 | 1.598 | .158 | 3.46 | 4.09 | 1 | 7 |
|             | 2     | 111 | 4.07 | 1.226 | .116 | 3.84 | 4.30 | 1 | 7 |
|             | 3     | 84  | 4.01 | 1.697 | .185 | 3.64 | 4.38 | 1 | 7 |
|             | Total | 297 | 3.95 | 1.502 | .087 | 3.78 | 4.12 | 1 | 7 |
| Incontrol   | 1     | 102 | 3.46 | 1.645 | .163 | 3.14 | 3.78 | 1 | 7 |

|             |       |     |      |       |      |      |      |   |   |
|-------------|-------|-----|------|-------|------|------|------|---|---|
|             | 2     | 111 | 4.05 | 1.476 | .140 | 3.78 | 4.33 | 1 | 7 |
|             | 3     | 84  | 3.57 | 1.539 | .168 | 3.24 | 3.91 | 1 | 7 |
|             | Total | 297 | 3.71 | 1.571 | .091 | 3.53 | 3.89 | 1 | 7 |
| Important   | 1     | 102 | 3.70 | 1.850 | .183 | 3.33 | 4.06 | 1 | 7 |
|             | 2     | 111 | 3.69 | 1.530 | .145 | 3.41 | 3.98 | 1 | 7 |
|             | 3     | 84  | 3.82 | 1.785 | .195 | 3.43 | 4.21 | 1 | 7 |
|             | Total | 297 | 3.73 | 1.713 | .099 | 3.54 | 3.93 | 1 | 7 |
| Dominant    | 1     | 102 | 3.53 | 1.384 | .137 | 3.26 | 3.80 | 1 | 7 |
|             | 2     | 111 | 4.00 | 1.321 | .125 | 3.75 | 4.25 | 1 | 7 |
|             | 3     | 84  | 3.94 | 1.476 | .161 | 3.62 | 4.26 | 1 | 7 |
|             | Total | 297 | 3.82 | 1.399 | .081 | 3.66 | 3.98 | 1 | 7 |
| Independent | 1     | 102 | 3.54 | 1.928 | .191 | 3.16 | 3.92 | 1 | 7 |
|             | 2     | 111 | 3.71 | 1.569 | .149 | 3.42 | 4.01 | 1 | 7 |
|             | 3     | 84  | 3.85 | 1.746 | .190 | 3.47 | 4.22 | 1 | 7 |
|             | Total | 297 | 3.69 | 1.747 | .101 | 3.49 | 3.89 | 1 | 7 |
| Stimulated  | 1     | 102 | 3.43 | 1.570 | .155 | 3.12 | 3.74 | 1 | 7 |
|             | 2     | 110 | 3.90 | 1.433 | .137 | 3.63 | 4.17 | 1 | 7 |
|             | 3     | 84  | 3.35 | 1.556 | .170 | 3.01 | 3.68 | 1 | 7 |
|             | Total | 296 | 3.58 | 1.532 | .089 | 3.41 | 3.76 | 1 | 7 |

**Hypothesis 1a: One-way T-test Findings and Tukey's HSD Test Findings for Stimulated**



| Simulated                |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 3         | 84  | 3.35                    |      |
|                          | 1         | 102 | 3.43                    | 3.43 |
|                          | 2         | 110 |                         | 3.90 |
|                          | Sig.      |     | .917                    | .081 |
| Tukey B <sup>a,b</sup>   | 3         | 84  | 3.35                    |      |
|                          | 1         | 102 | 3.43                    | 3.43 |
|                          | 2         | 110 |                         | 3.90 |

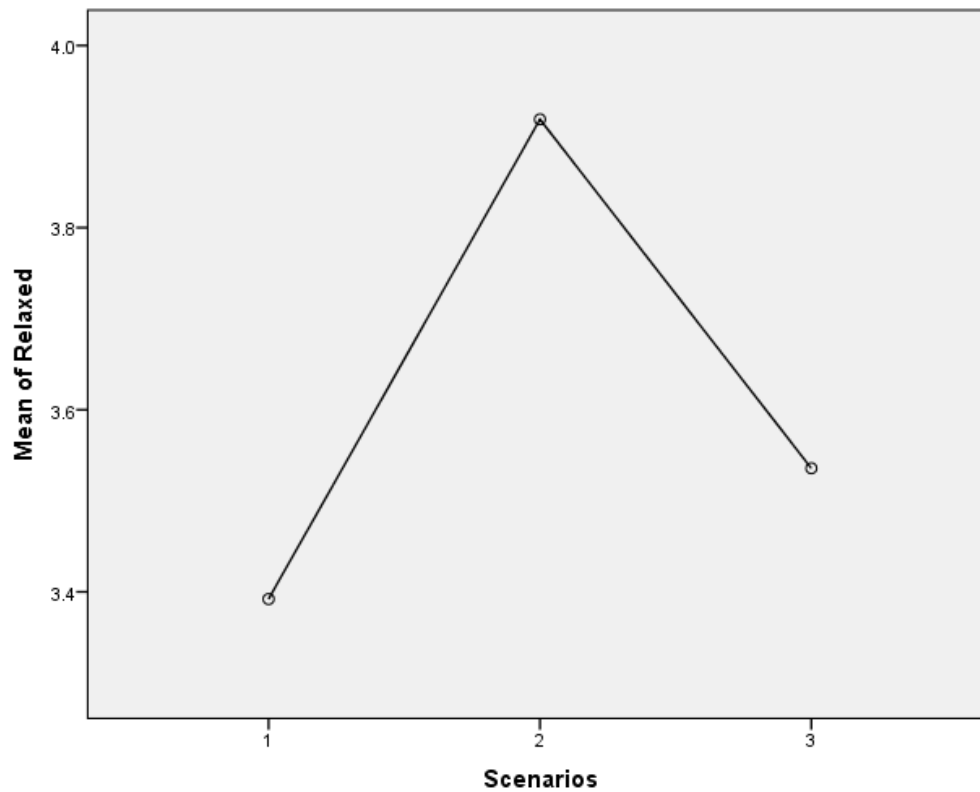
Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 97.404.

b. The group sizes are unequal. The harmonic mean of the group sizes is used.

Type I error levels are not guaranteed.

### Hypothesis 1a: One-way T-test Findings and Tukey's HSD Test Findings for Relaxed



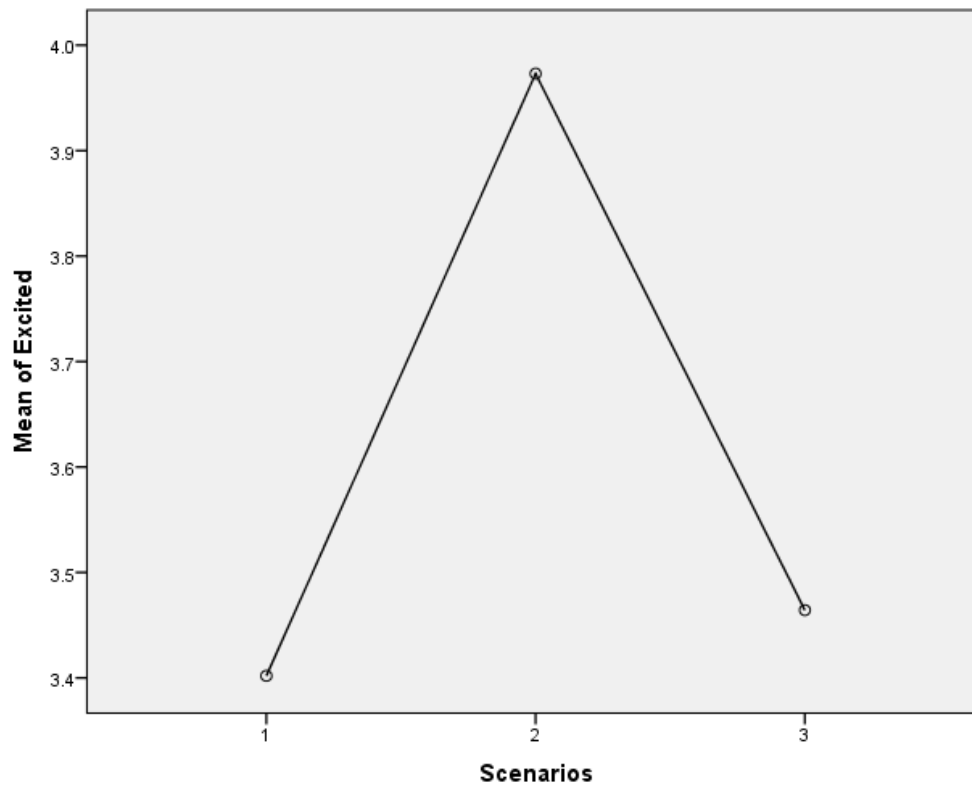
| Relaxed                  |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1         | 102 | 3.39                    |      |
|                          | 3         | 84  | 3.54                    | 3.54 |
|                          | 2         | 111 |                         | 3.92 |
|                          | Sig.      |     | .797                    | .202 |
| Tukey B <sup>a,b</sup>   | 1         | 102 | 3.39                    |      |
|                          | 3         | 84  | 3.54                    | 3.54 |
|                          | 2         | 111 |                         | 3.92 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 97.664.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

### Hypothesis 1a: One-way T-test Findings and Tukey's HSD Test Findings for Excited



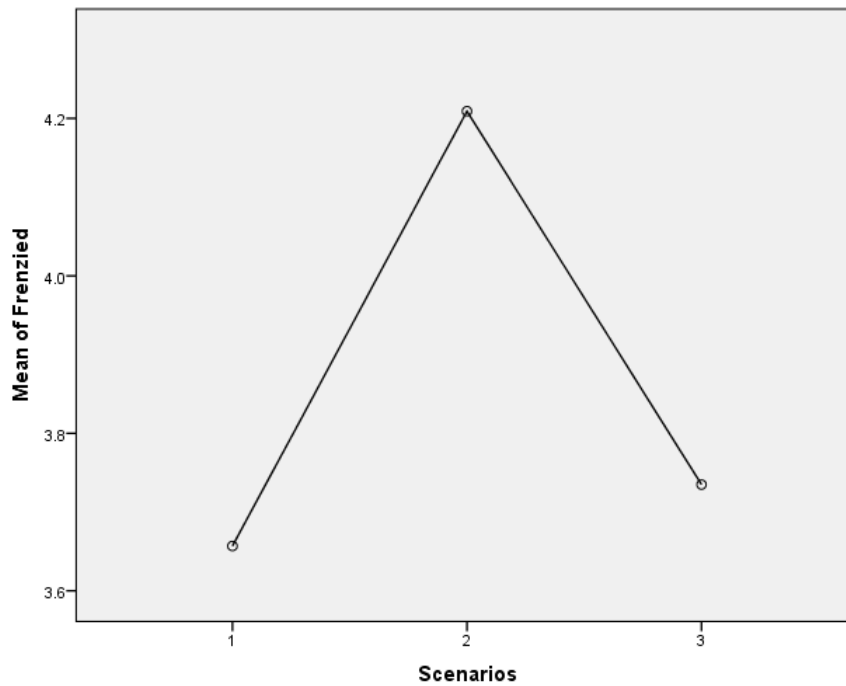
| Excited                  |           |     |                            |
|--------------------------|-----------|-----|----------------------------|
|                          | Scenarios | N   | Subset for alpha =<br>0.05 |
|                          |           |     | 1                          |
| Tukey HSD <sup>a,b</sup> | 1         | 102 | 3.40                       |
|                          | 3         | 84  | 3.46                       |
|                          | 2         | 111 | 3.97                       |
|                          | Sig.      |     | .058                       |
| Tukey B <sup>a,b</sup>   | 1         | 102 | 3.40                       |
|                          | 3         | 84  | 3.46                       |
|                          | 2         | 111 | 3.97                       |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 97.664.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

### Hypothesis 1a: One-way T-test Findings and Tukey's HSD Test Findings for Frenzied



| Frenzied                 |           |     |                         |       |
|--------------------------|-----------|-----|-------------------------|-------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |       |
|                          |           |     | 1                       | 2     |
| Tukey HSD <sup>a,b</sup> | 1         | 102 | 3.66                    |       |
|                          | 3         | 83  | 3.73                    |       |
|                          | 2         | 110 |                         | 4.21  |
|                          | Sig.      |     | .896                    | 1.000 |
| Tukey B <sup>a,b</sup>   | 1         | 102 | 3.66                    |       |
|                          | 3         | 83  | 3.73                    |       |
|                          | 2         | 110 |                         | 4.21  |

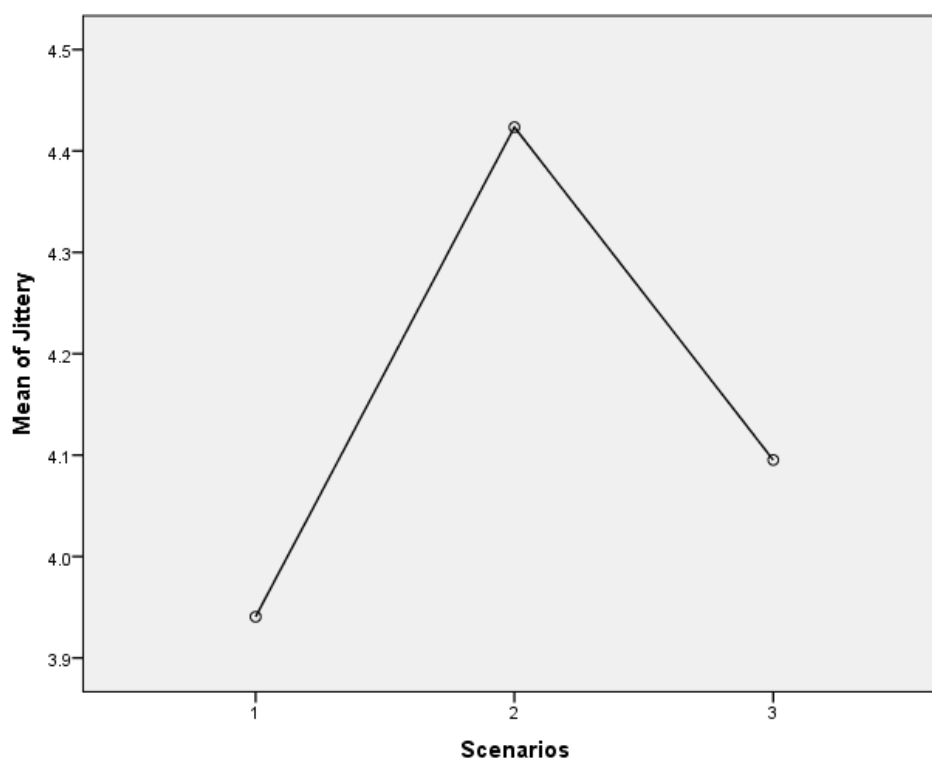
Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 96.952.

b. The group sizes are unequal. The harmonic mean of the group sizes is used.

Type I error levels are not guaranteed.

### Hypothesis 1a: One-way T-test Findings and Tukey's HSD Test Findings for Jittery



| Jittery                  |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1         | 101 | 3.94                    |      |
|                          | 3         | 84  | 4.10                    | 4.10 |
|                          | 2         | 111 |                         | 4.42 |
|                          | Sig.      |     | .662                    | .159 |
| Tukey B <sup>a,b</sup>   | 1         | 101 | 3.94                    |      |
|                          | 3         | 84  | 4.10                    | 4.10 |
|                          | 2         | 111 |                         | 4.42 |

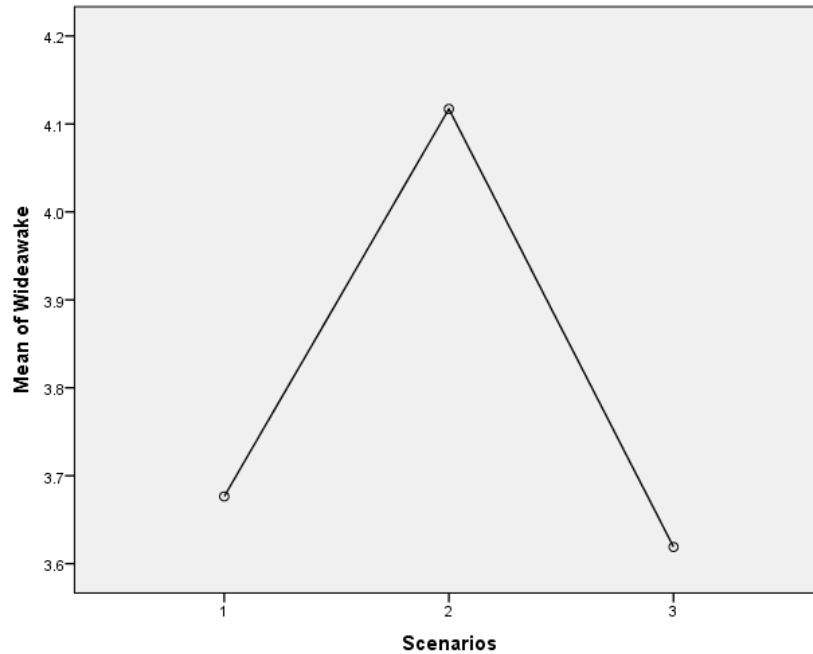
Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 97.356.

b. The group sizes are unequal. The harmonic mean of the group sizes is used.

Type I error levels are not guaranteed.

**Hypothesis 1a: One-way T-test Findings and Tukey's HSD Test Findings for Wide Awake**



| Wideawake                |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 3         | 84  | 3.62                    |      |
|                          | 1         | 102 | 3.68                    | 3.68 |
|                          | 2         | 111 |                         | 4.12 |
|                          | Sig.      |     | .959                    | .088 |
| Tukey B <sup>a,b</sup>   | 3         | 84  | 3.62                    |      |
|                          | 1         | 102 | 3.68                    | 3.68 |
|                          | 2         | 111 |                         | 4.12 |

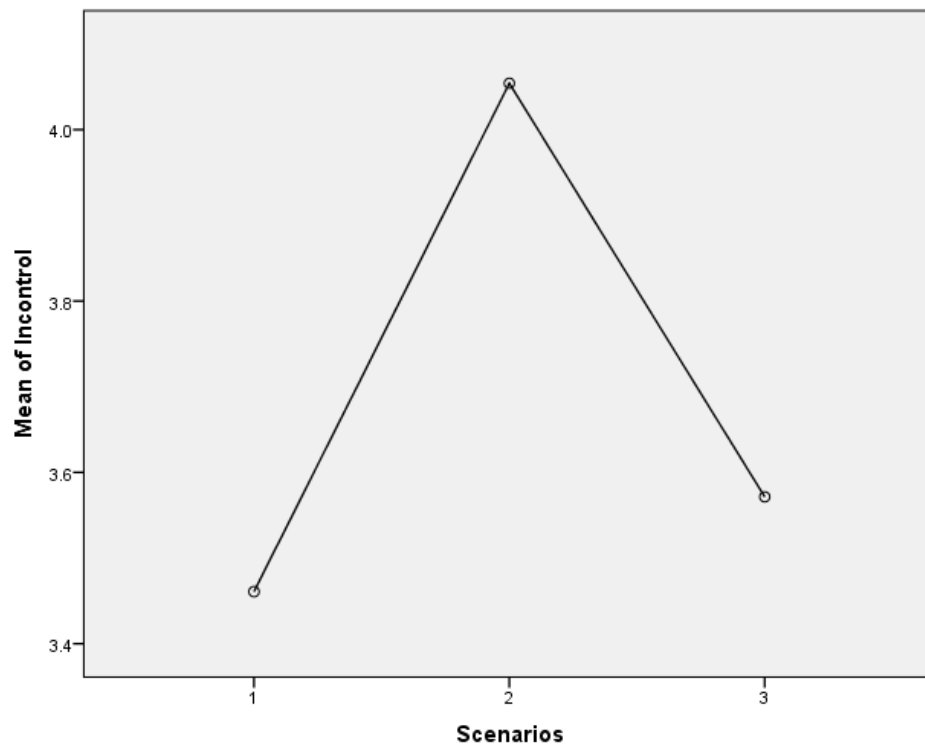
Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 97.664.

b. The group sizes are unequal. The harmonic mean of the group sizes is used.

Type I error levels are not guaranteed.

### Hypothesis 1a: One-way T-test Findings and Tukey's HSD Test Findings for In Control



| Incontrol                |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1         | 102 | 3.46                    |      |
|                          | 3         | 84  | 3.57                    | 3.57 |
|                          | 2         | 111 |                         | 4.05 |
|                          | Sig.      |     | .872                    | .078 |
| Tukey B <sup>a,b</sup>   | 1         | 102 | 3.46                    |      |
|                          | 3         | 84  | 3.57                    |      |
|                          | 2         | 111 |                         | 4.05 |

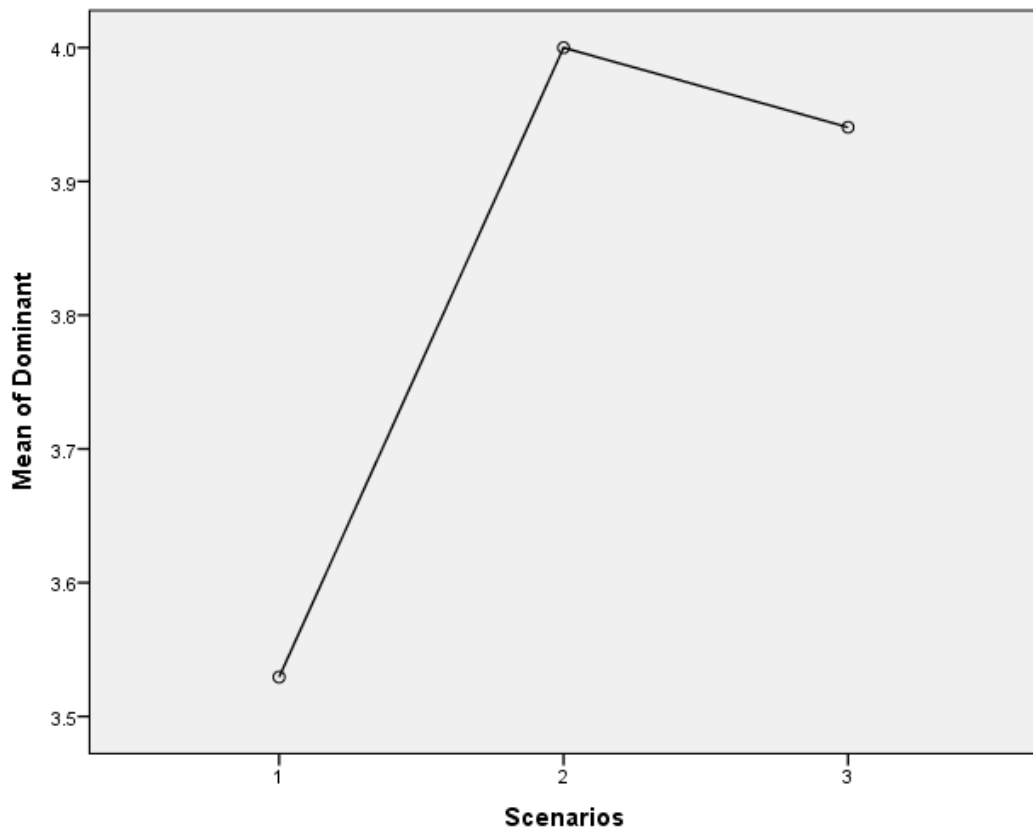
Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 97.664.

b. The group sizes are unequal. The harmonic mean of the group sizes is used.

Type I error levels are not guaranteed.

### Hypothesis 1a: One-way T-test Findings and Tukey's HSD Test Findings for Dominant



| Dominant                 |           |     |                         |      |
|--------------------------|-----------|-----|-------------------------|------|
|                          | Scenarios | N   | Subset for alpha = 0.05 |      |
|                          |           |     | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1         | 102 | 3.53                    |      |
|                          | 3         | 84  | 3.94                    | 3.94 |
|                          | 2         | 111 |                         | 4.00 |
|                          | Sig.      |     | .098                    | .952 |
| Tukey B <sup>a,b</sup>   | 1         | 102 | 3.53                    |      |
|                          | 3         | 84  | 3.94                    | 3.94 |
|                          | 2         | 111 |                         | 4.00 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 97.664.

b. The group sizes are unequal. The harmonic mean of the group sizes is used.

Type I error levels are not guaranteed.

### Hypothesis 1b: ANOVA Findings (Involvement)

| ANOVA              |                |                |    |             |       |      |
|--------------------|----------------|----------------|----|-------------|-------|------|
|                    |                | Sum of Squares | df | Mean Square | F     | Sig. |
| Important4         | Between Groups | 1.772          | 2  | .886        | .492  | .613 |
|                    | Within Groups  | 172.854        | 96 | 1.801       |       |      |
|                    | Total          | 174.626        | 98 |             |       |      |
| Noconcern4         | Between Groups | 1.390          | 2  | .695        | .417  | .660 |
|                    | Within Groups  | 160.024        | 96 | 1.667       |       |      |
|                    | Total          | 161.414        | 98 |             |       |      |
| Irrelevant4        | Between Groups | .776           | 2  | .388        | .301  | .741 |
|                    | Within Groups  | 123.769        | 96 | 1.289       |       |      |
|                    | Total          | 124.545        | 98 |             |       |      |
| Meaningful4        | Between Groups | 6.791          | 2  | 3.395       | 1.412 | .249 |
|                    | Within Groups  | 230.846        | 96 | 2.405       |       |      |
|                    | Total          | 237.636        | 98 |             |       |      |
| Useless4           | Between Groups | 5.993          | 2  | 2.997       | 2.867 | .062 |
|                    | Within Groups  | 100.330        | 96 | 1.045       |       |      |
|                    | Total          | 106.323        | 98 |             |       |      |
| Valuable4          | Between Groups | 4.281          | 2  | 2.141       | .840  | .435 |
|                    | Within Groups  | 244.709        | 96 | 2.549       |       |      |
|                    | Total          | 248.990        | 98 |             |       |      |
| Trivial4           | Between Groups | .353           | 2  | .177        | .115  | .891 |
|                    | Within Groups  | 147.061        | 96 | 1.532       |       |      |
|                    | Total          | 147.414        | 98 |             |       |      |
| Beneficial4        | Between Groups | 3.926          | 2  | 1.963       | 1.023 | .363 |
|                    | Within Groups  | 184.154        | 96 | 1.918       |       |      |
|                    | Total          | 188.081        | 98 |             |       |      |
| Matters4           | Between Groups | .042           | 2  | .021        | .013  | .987 |
|                    | Within Groups  | 148.282        | 96 | 1.545       |       |      |
|                    | Total          | 148.323        | 98 |             |       |      |
| Uninteresting<br>4 | Between Groups | .179           | 2  | .090        | .056  | .945 |
|                    | Within Groups  | 152.730        | 96 | 1.591       |       |      |
|                    | Total          | 152.909        | 98 |             |       |      |
| Significant4       | Between Groups | 1.263          | 2  | .631        | .416  | .661 |
|                    | Within Groups  | 145.848        | 96 | 1.519       |       |      |
|                    | Total          | 147.111        | 98 |             |       |      |
| Vital4             | Between Groups | .258           | 2  | .129        | .102  | .903 |
|                    | Within Groups  | 121.035        | 96 | 1.261       |       |      |
|                    | Total          | 121.293        | 98 |             |       |      |
| Boring4            | Between Groups | 2.576          | 2  | 1.288       | .961  | .386 |

|              |                |         |    |       |       |      |
|--------------|----------------|---------|----|-------|-------|------|
|              | Within Groups  | 128.717 | 96 | 1.341 |       |      |
|              | Total          | 131.293 | 98 |       |       |      |
| Unexciting4  | Between Groups | 3.558   | 2  | 1.779 | 1.060 | .351 |
|              | Within Groups  | 161.169 | 96 | 1.679 |       |      |
|              | Total          | 164.727 | 98 |       |       |      |
| Appealing4   | Between Groups | 4.836   | 2  | 2.418 | 1.141 | .324 |
|              | Within Groups  | 203.346 | 96 | 2.118 |       |      |
|              | Total          | 208.182 | 98 |       |       |      |
| Mundane4     | Between Groups | .559    | 2  | .279  | .190  | .827 |
|              | Within Groups  | 141.078 | 96 | 1.470 |       |      |
|              | Total          | 141.636 | 98 |       |       |      |
| Essential4   | Between Groups | 1.471   | 2  | .736  | .510  | .602 |
|              | Within Groups  | 138.488 | 96 | 1.443 |       |      |
|              | Total          | 139.960 | 98 |       |       |      |
| Undesirable4 | Between Groups | .069    | 2  | .035  | .028  | .973 |
|              | Within Groups  | 120.678 | 96 | 1.257 |       |      |
|              | Total          | 120.747 | 98 |       |       |      |
| Wanted4      | Between Groups | 3.461   | 2  | 1.731 | .907  | .407 |
|              | Within Groups  | 183.226 | 96 | 1.909 |       |      |
|              | Total          | 186.687 | 98 |       |       |      |
| Notneeded4   | Between Groups | 6.281   | 2  | 3.140 | 2.569 | .082 |
|              | Within Groups  | 117.376 | 96 | 1.223 |       |      |
|              | Total          | 123.657 | 98 |       |       |      |

### Hypothesis 1c: ANOVA Findings (Engagement)

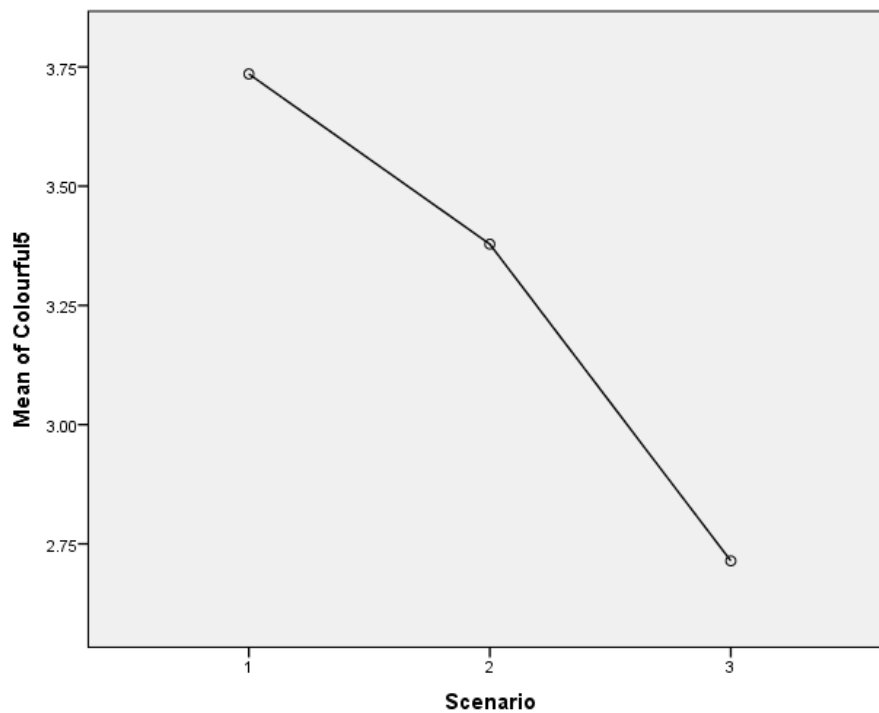
|                   |                | ANOVA          |    |             |       |      |
|-------------------|----------------|----------------|----|-------------|-------|------|
|                   |                | Sum of Squares | df | Mean Square | F     | Sig. |
| Colourful5        | Between Groups | 16.258         | 2  | 8.129       | 4.172 | .018 |
|                   | Within Groups  | 187.035        | 96 | 1.948       |       |      |
|                   | Total          | 203.293        | 98 |             |       |      |
| Negative5         | Between Groups | 3.650          | 2  | 1.825       | 1.466 | .236 |
|                   | Within Groups  | 119.522        | 96 | 1.245       |       |      |
|                   | Total          | 123.172        | 98 |             |       |      |
| Stimulating5      | Between Groups | 2.644          | 2  | 1.322       | .668  | .515 |
|                   | Within Groups  | 190.083        | 96 | 1.980       |       |      |
|                   | Total          | 192.727        | 98 |             |       |      |
| Attractive5       | Between Groups | 4.730          | 2  | 2.365       | 1.399 | .252 |
|                   | Within Groups  | 162.260        | 96 | 1.690       |       |      |
|                   | Total          | 166.990        | 98 |             |       |      |
| Tense5            | Between Groups | 1.865          | 2  | .933        | .681  | .509 |
|                   | Within Groups  | 131.489        | 96 | 1.370       |       |      |
|                   | Total          | 133.354        | 98 |             |       |      |
| Comfortable5      | Between Groups | 2.305          | 2  | 1.152       | .658  | .520 |
|                   | Within Groups  | 168.241        | 96 | 1.753       |       |      |
|                   | Total          | 170.545        | 98 |             |       |      |
| Depressing5       | Between Groups | 13.431         | 2  | 6.715       | 4.796 | .010 |
|                   | Within Groups  | 134.408        | 96 | 1.400       |       |      |
|                   | Total          | 147.838        | 98 |             |       |      |
| Good5             | Between Groups | 1.926          | 2  | .963        | .657  | .520 |
|                   | Within Groups  | 140.619        | 96 | 1.465       |       |      |
|                   | Total          | 142.545        | 98 |             |       |      |
| Unlively5         | Between Groups | 16.812         | 2  | 8.406       | 4.705 | .011 |
|                   | Within Groups  | 171.512        | 96 | 1.787       |       |      |
|                   | Total          | 188.323        | 98 |             |       |      |
| Bright5           | Between Groups | .996           | 2  | .498        | .259  | .772 |
|                   | Within Groups  | 184.640        | 96 | 1.923       |       |      |
|                   | Total          | 185.636        | 98 |             |       |      |
| Unmotivating<br>5 | Between Groups | 2.062          | 2  | 1.031       | .605  | .548 |
|                   | Within Groups  | 163.575        | 96 | 1.704       |       |      |
|                   | Total          | 165.636        | 98 |             |       |      |
| Pleasant5         | Between Groups | 2.228          | 2  | 1.114       | .854  | .429 |
|                   | Within Groups  | 125.186        | 96 | 1.304       |       |      |
|                   | Total          | 127.414        | 98 |             |       |      |
| Interesting5      | Between Groups | 6.964          | 2  | 3.482       | 1.971 | .145 |

|               |         |    |       |  |  |
|---------------|---------|----|-------|--|--|
| Within Groups | 169.581 | 96 | 1.766 |  |  |
| Total         | 176.545 | 98 |       |  |  |

### Hypothesis 1c: ANOVA Findings (Engagement) Descriptive Statistics

| Descriptives |       |    |      |                   |               |                                     |                |         |         |
|--------------|-------|----|------|-------------------|---------------|-------------------------------------|----------------|---------|---------|
|              |       | N  | Mean | Std.<br>Deviation | Std.<br>Error | 95% Confidence<br>Interval for Mean |                | Minimum | Maximum |
|              |       |    |      |                   |               | Lower<br>Bound                      | Upper<br>Bound |         |         |
| Colourful5   | 1     | 34 | 3.74 | 1.504             | .258          | 3.21                                | 4.26           | 1       | 7       |
|              | 2     | 37 | 3.38 | 1.320             | .217          | 2.94                                | 3.82           | 1       | 7       |
|              | 3     | 28 | 2.71 | 1.357             | .256          | 2.19                                | 3.24           | 1       | 7       |
|              | Total | 99 | 3.31 | 1.440             | .145          | 3.03                                | 3.60           | 1       | 7       |
| Depressing5  | 1     | 34 | 4.53 | 1.237             | .212          | 4.10                                | 4.96           | 2       | 7       |
|              | 2     | 37 | 4.97 | 1.067             | .175          | 4.62                                | 5.33           | 2       | 7       |
|              | 3     | 28 | 5.46 | 1.261             | .238          | 4.98                                | 5.95           | 2       | 7       |
|              | Total | 99 | 4.96 | 1.228             | .123          | 4.71                                | 5.20           | 2       | 7       |
| Unlively5    | 1     | 34 | 4.21 | 1.431             | .245          | 3.71                                | 4.71           | 1       | 6       |
|              | 2     | 37 | 4.62 | 1.233             | .203          | 4.21                                | 5.03           | 2       | 7       |
|              | 3     | 28 | 5.25 | 1.351             | .255          | 4.73                                | 5.77           | 1       | 7       |
|              | Total | 99 | 4.66 | 1.386             | .139          | 4.38                                | 4.93           | 1       | 7       |

### Hypothesis 1c: One-way T-test and Tukey's HSD Test Findings for Colourful



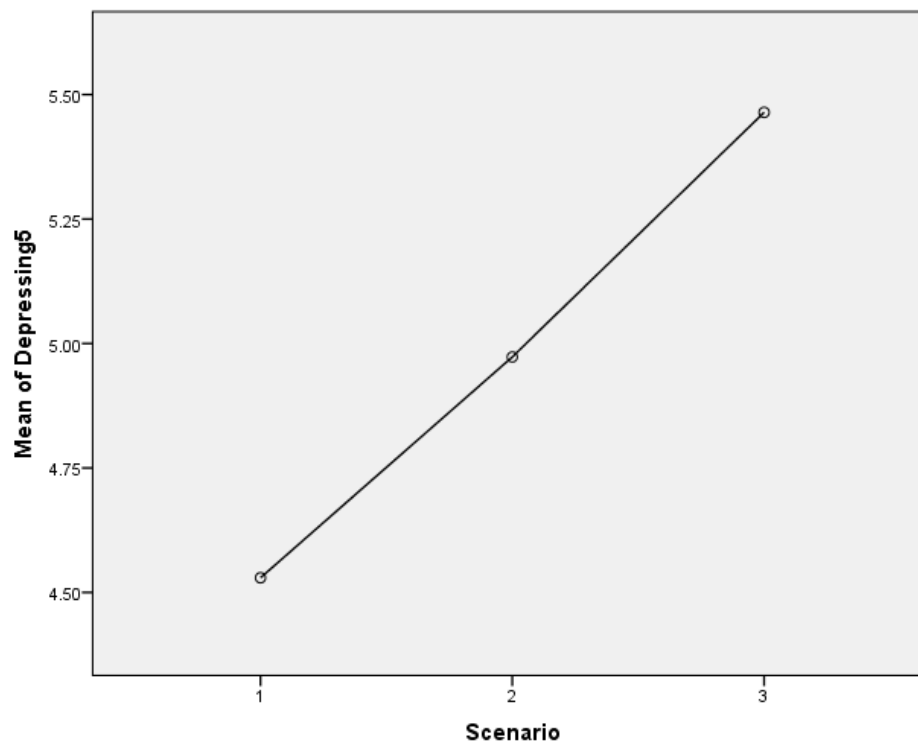
| Colourful5               |          |    |                         |      |
|--------------------------|----------|----|-------------------------|------|
|                          | Scenario | N  | Subset for alpha = 0.05 |      |
|                          |          |    | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 3        | 28 | 2.71                    |      |
|                          | 2        | 37 | 3.38                    | 3.38 |
|                          | 1        | 34 |                         | 3.74 |
|                          | Sig.     |    | .139                    | .559 |
| Tukey B <sup>a,b</sup>   | 3        | 28 | 2.71                    |      |
|                          | 2        | 37 | 3.38                    | 3.38 |
|                          | 1        | 34 |                         | 3.74 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 32.555.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

### Hypothesis 1c: One-way T-test and Tukey's HSD Test Findings for Depressing



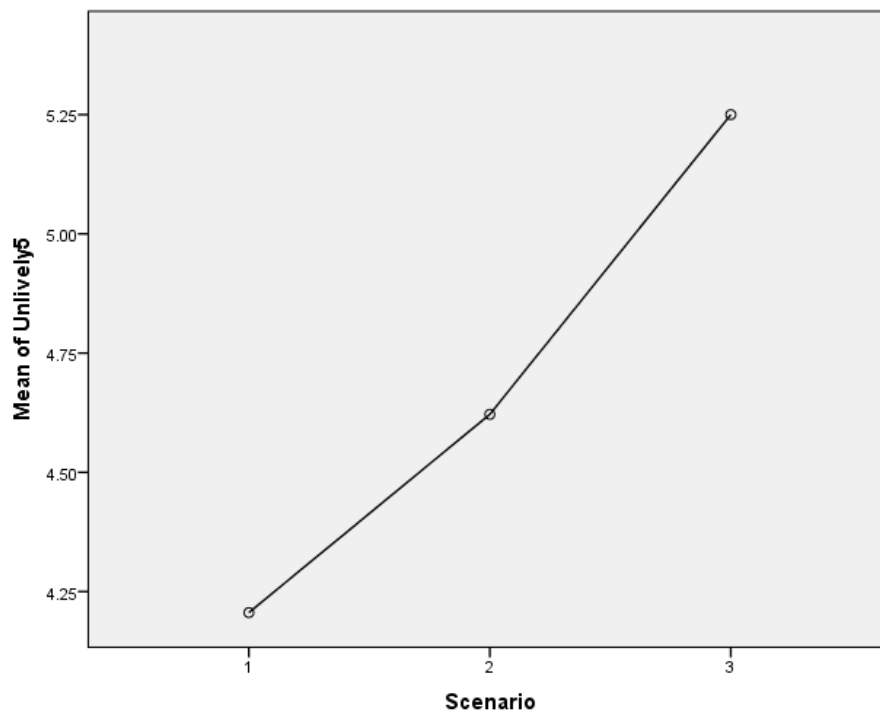
| Depressing5              |          |    |                         |      |
|--------------------------|----------|----|-------------------------|------|
|                          | Scenario | N  | Subset for alpha = 0.05 |      |
|                          |          |    | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1        | 34 | 4.53                    |      |
|                          | 2        | 37 | 4.97                    | 4.97 |
|                          | 3        | 28 |                         | 5.46 |
|                          | Sig.     |    | .290                    | .220 |
| Tukey B <sup>a,b</sup>   | 1        | 34 | 4.53                    |      |
|                          | 2        | 37 | 4.97                    | 4.97 |
|                          | 3        | 28 |                         | 5.46 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 32.555.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

### Hypothesis 1c: One-way T-test and Tukey's HSD Test Findings for Unlively



| Unlively5                |          |    |                         |      |
|--------------------------|----------|----|-------------------------|------|
|                          | Scenario | N  | Subset for alpha = 0.05 |      |
|                          |          |    | 1                       | 2    |
| Tukey HSD <sup>a,b</sup> | 1        | 34 | 4.21                    |      |
|                          | 2        | 37 | 4.62                    | 4.62 |
|                          | 3        | 28 |                         | 5.25 |
|                          | Sig.     |    | .424                    | .145 |
| Tukey B <sup>a,b</sup>   | 1        | 34 | 4.21                    |      |
|                          | 2        | 37 | 4.62                    | 4.62 |
|                          | 3        | 28 |                         | 5.25 |

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 32.555.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.