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**Playing with Music While Shopping Online: The Effects of Interactive
Music on Consumer Engagement and Behavioral Intention**

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**Playing with Music While Shopping Online: The Effects of Interactive
Music on Consumer Engagement and Behavioral Intention**

by

Hsing-Chi Hwang

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Dedication

To my beloved parents, mentors, and friends, thank you for all your support along the way.

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Abstract

Playing with Music While Shopping Online: The Effects of Interactive Music on Consumer Engagement and Behavioral Intention

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The current study investigates the potential of applying interactive music to the design of e-commerce website in order to create more engaging consumer experience. Through a single-factor experiment with three conditions (the control condition without background music, the static background music condition, the interactive background music condition), behavioral and attitudinal data were collected via Google Analytics and a self-report questionnaire (N = 251). We found that consumers in the interactive music condition were more affectively engaged in the shopping task, regarding the website more novel due to its perceived vividness. This enhanced engagement led to more positive brand attitudes and perceptions and increased users' behavioral intention to purchase. Additionally, three moderators were found crucial to predict the target audience profile for

application of interactive music – existing attitudes of users toward online shopping, price and web features as purchase decision-making factors.

Keywords: interactivity, interactive music, user engagement, behavioral intention, e-commerce.

Table of Contents

| | |
|---|----|
| List of Tables | x |
| List of Figures | xi |
| Introduction..... | 1 |
| Literature Review..... | 3 |
| The Effects of Background Music on Online Consumer Perception and Behavior..... | 3 |
| The Effects of Interactivity on Online Consumer Perception and Behavior | 6 |
| The Effects of Interactive Music on Human Perception and Behavior | 10 |
| Moderating Effects of Antecedents on Online Consumer Perception and Behavior..... | 13 |
| Method | 21 |
| Research Design | 21 |
| Stimulus and Manipulation..... | 21 |
| Participants and Procedure..... | 24 |
| Measurements | 24 |
| Results..... | 41 |
| Data Analysis..... | 41 |
| Manipulation Check..... | 41 |
| The Mediating Effects of Vividness and User Engagement..... | 42 |
| The Interaction Effects of Interactive Music and Individual Differences | 45 |
| Summary | 58 |
| Validation of the Theoretical Framework..... | 58 |
| The Moderating Effects of Interactive Music and E-commerce Antecedents..... | 59 |

| | |
|---|----|
| Discussion..... | 62 |
| Theoretical Implications | 62 |
| Practical Implications | 64 |
| Limitations of the Present Study..... | 65 |
| Suggestions for Future Studies | 66 |
| Appendix I: Pre-Stimulus Survey | 68 |
| Appendix II: Post-Stimulus Survey | 71 |
| References..... | 78 |

List of Tables

| | |
|---|----|
| Table 1. Frequency table of respondents' Internet usage purposes | 26 |
| Table 2. Frequency table of respondents' music-listening habits by major music genres | 27 |
| Table 3. Frequency table of respondents' demographics..... | 28 |
| Table 4. Frequency table of respondents' online shopping frequency in the past three months..... | 30 |
| Table 5. Frequency table of respondents' online purchase amount in the past three months..... | 31 |
| Table 6. Frequency table of respondents' online shopping accounts | 32 |
| Table 7. Frequency table of respondents' purchase decision factors..... | 33 |

List of Figures

| | |
|--|----|
| Figure 1. Theoretical framework of the present study | 13 |
| Figure 2. The model of Theory of Reasoned Action by Fishbein and Ajzen (1975) | 14 |
| Figure 3. The function to quantify attitude in the Theory of Reasoned Action (Fishbein & Ajzen, 1975). | 14 |
| Figure 4. A screenshot of the stimulus website, aboutleather.com..... | 23 |
| Figure 5. Respondents' perceived vividness under the three manipulated conditions | 42 |
| Figure 6. Respondents' reported level of novelty under the three manipulated conditions | 44 |
| Figure 7. Interaction effect of existing attitude with the three manipulated conditions | 46 |
| Figure 8. Interaction effect of previous enjoyment toward online shopping with the three manipulated conditions | 46 |
| Figure 9. Interaction effect of the importance of web design as a purchase decision factors with the three manipulated conditions | 47 |
| Figure 10. Interaction effect of previous involvement toward online shopping with the three manipulated conditions | 47 |
| Figure 11. Interaction effect of previous attitude toward online shopping with the three manipulated conditions | 49 |
| Figure 12. Interaction effect of the importance of price as a purchase decision factor with the three manipulated conditions | 49 |
| Figure 13. Interaction effect of the importance of web design as a purchase decision factor with the three manipulated conditions..... | 50 |
| Figure 14. Interaction effect of previous online shopping orientation with the three manipulated conditions | 50 |

| | |
|---|----|
| Figure 15. Interaction effect of existing attitude with the three manipulated conditions .. | 51 |
| Figure 16. Interaction effect of the importance of price as a purchase decision factor with the three manipulated conditions | 52 |
| Figure 17. Interaction effect of existing attitude toward online shopping with the three manipulated conditions | 53 |
| Figure 18. Interaction effect of previous enjoyment in online shopping with the three manipulated conditions | 53 |
| Figure 19. Interaction effect of online purchase amount in the past three months with the three manipulated conditions | 54 |
| Figure 20. Interaction effect of the importance of price as a purchase decision factor with the three manipulated conditions | 55 |
| Figure 21. Interaction effect of the importance of price as a purchase decision factor with the three manipulated conditions | 56 |
| Figure 22. Interaction effect of the importance of price as a purchase decision factor with the three manipulated conditions | 57 |

Introduction

In 2017, global e-commerce sales amounted to 2.3 trillion US dollars and e-retail revenues are projected to double in the next five years (Hall, 2017). At the present, online shopping is without doubt one of the most popular online activities around the world. According to *Nielsen Total Consumer Report of 2017*, in China, the world's largest e-commerce market, 62% of the Chinese population shopped online, accounting to 13% of the total retail purchase in the nation; in the United States, the online merchandising market is as well evolving in an unprecedented pace, with a combined growth rate of 12.2% through 2020. The business becomes ever competitive, and the challenge to create a one-of-a-kind shopping experience has arrived at all online retailers. As a result, an application of modern interface technologies to e-commerce website design has initiated interests of the present research.

Abundant studies have investigated the impact of music on online consumer behavior, as musical arousal not only triggers emotional reactions but also leads to influences on brand perceptions and purchase behavior (Morrison, Gan, Dubelaar, & Oppewal, 2011; Andersson, Kristensson, Wästlund, & Gustafsson, 2012; Xu & Sundar, 2014). Besides the sole presence of background music, the proliferation of on-screen interaction techniques indicates new possibilities for how music can be presented on retailing websites. Considering interactivity is now an essence of web design, the present study experiments the potential of applying interactive music for online retailing purposes. Interactive music refers to a category of audio media where specific actions of a user lead to an alteration in the medium per se (Kaltcheva & Weitz, 2006). As both background music and interactivity were proven to increase the capacity of one's mental representation of information on an interface, a joint use of the two substances would create positive

effects on user engagement (Deweppe et al., 2015). Applying the idea to an e-commerce setting, the current research empirically evaluated the psychological effects of interactive background music on consumer attitudes and brand perceptions of a shopping website.

To begin with, the present study synthesizes former literatures and enumerates theoretical supports to explain how musical arousal and interaction techniques can influence human perception and behavior. The literature review also summarizes previous research findings to verify positive impact of music and interactivity on brand evaluation and product consumption. Furthermore, two critical attributes – user engagement and perceived vividness – are introduced as mediating variables to explain the causal relationship of interactive music and its persuasive outcomes. To take into account individual differences of online consumers, the section also discusses three major categories of antecedents which can moderate the effects of interactive music.

Next, the Method chapter articulates how the empirical research is designed and manipulated. An introduction to participants and measurements of the present experiment is also included in the session. Following, results of data analysis cover manipulation checks and the effects of mediating and moderating variables. In addition, a summary section pin-points primary research finding. Last but not least, theoretical and practical implications as well as limitations of the present research are discussed and suggestions for future studies are also provided at the end.

As a whole, the objective of the present study is to understand whether the application of interactive music can create a unique e-commerce environment to capture consumers, generate positive perceptions, and encourage behavioral intention. In addition, findings of the research can as well contribute existing theories pertaining to the effects of music and interactivity on online consumer psychology and behavior.

Literature Review and Theoretical Support

THE EFFECTS OF BACKGROUND MUSIC ON ONLINE CONSUMER PERCEPTION AND BEHAVIOR

While musical expression is tied to specific cultures, previous literatures have verified that musical perception pertain to biological rather than cultural roots (Foran, 2009; Weinberger, 1998). In other words, human brains are inherently wired to respond to music, and the effects of music on behavior are universal (Yalch & Spangenberg, 2000). Hence, retailers constantly attempt to create a pleasant shopping context with the use of background music, as prior research has repeatedly shown the positive effects of music on consumers' purchase intention and behavior (Yalch & Spangenberg, 2000). In particular, the causal relationship of music and human behavior are commonly explained through the Associative Network Theory, which posits emotional states can powerfully influence cognitive processing, such as free associations, imaginations, and perceptions (Bower, 1981). Based on the theory, scholars have demonstrated that, by eliciting emotional reactions, music can effectively influence the decision-making process and brand evaluation of consumers (Morrison, Gan, Dubelaar, & Oppewal, 2011; Andersson, Kristensson, Wästlund, & Gustafsson, 2012; Xu & Sundar, 2014). From an online user's perspective, background music can produce various emotional arousals and form unique merchandising experiences, which translates into a higher level of engagement with the website (Schwartz, Ayres, & Douglas, 2017).

Music and emotional reactions.

According to the Associative Network Theory, a person's emotional states could enhance cognitive processing of facts associated with those emotions (Bower, 1981). When aroused by musical stimuli, a person produces an emotional reaction and can easily retrieve

information encoded with the same emotional experience (Xu & Sundar, 2014). Scholars have demonstrated that, due to the change in one's cognitive state, music generates effects on consumers' perceptions and behavior. (Morrison, Gan, Dubelaar, & Oppewal, 2011; Andersson, Kristensson, Wästlund, & Gustafsson, 2012; Xu & Sundar, 2014). Specifically, when consumers immerse in a shopping environment with background music, they are found to obtain an increased level pleasure, leading to a heightened sense of customer satisfaction (Andersson, Kristensson, Wästlund, & Gustafsson, 2012). Furthermore, musical arousal is effective in predicting shoppers' approach behavior; accordingly, with a presence of background music, consumers tend to spend more time and purchase with greater amount and value in both online and brick-to-mortar stores (Morrison, Gan, Dubelaar, & Oppewal, 2011; Xu & Sundar, 2014).

Music and user engagement.

User engagement refers to a psychological state where users are either cognitively or emotionally involved in a task at hand (Busselle & Bilandzic, 2008). Particularly, there are two commonly applied indicators of user engagement, absorption and elaboration (Busselle & Bilandzic, 2008). Absorption is defined as the state where an individual is consciously involved in an interaction with a complete attentional focus in the activity (Oh, Bellur, & Sundar, 2010). On the other hand, elaboration is a divergent process in which individuals bring diverse issue-related thoughts and previous experience to evaluate an argument (Green & Brock, 2000; Slater & Rouner, 2002). In sum, users are regarded as being "engaged" when they are completely absorbed in operating and consuming a new media technology (Agarwal & Karahanna, 2000), and/or when they invest their cognitive resources using their previous experience and knowledge to process media messages and make judgements (Ravindran, Greene, & Debacker, 2005).

With application of several well-established theories, scholars pose predictions on how musical arousal affects user engagement. Based on the Theory of Excitation Transfer Effect (Cantor, Bryant, & Zillmann, 1974), Xu and Sundar suggested that musical arousal increases the level of excitation and expands consumers' mental representations of sensory inputs (2014). The Excitation Transfer Effect suggests that external arousal elicits excitation, which "amplifies an individual's physiological response and cognitive appraisal" (Cantor, Bryant, & Zillmann, 1974). In the present discussion, when musical arousal elevates the level of one's excitation, the transfer effect intensifies the consumer's emotional reactions in the online shopping platform. As a result, the mechanism creates a more dynamic user experience, a heightened level of engagement with the media content, and a more positive attitudes and behavioral intention toward the mediated environment (Xu & Sundar, 2014).

Furthermore, scholars elaborate how the variations in pitch, rhythm, tempo, timbre, and organization can assist in focusing one's attention to a task at hand, which leads to a higher extent of absorption (Schwartz, Ayres, & Douglas, 2017). Firstly, by enhancing dynamics and volume, a piece of music can produce higher level of physiological arousals. Adheres to the Excitation Transfer Effect, once consumers get highly engaged with the mediated content, they would generate positive attitudes toward the interface, which subsequently translate into behaviors, such as revisiting and/or spending more time on a website (Fraser & Bradford, 2013). Secondly, atmospheric elements of music move audience into a state of immersion, which not only enhances user engagement by raising one's extent of absorption but also disconnects threats and concerns from reality (Cuny, Fornerino, & Helme-Guizon, 2015). The third, music laying at a regular tempo (90 – 108 beats per minute) results in the greatest increase in engagement level, as a faster tempo (higher than 144 beats per minute) overstimulates participants and thus reduces cognitive

capacity and the degree of message elaboration, whereas a slower tempo (lower than 72 beats per minute) decreased activity levels to a degree which resulted in poor attention, which reduced the degree of user absorption (Schwartz, Ayres, & Douglas, 2017). Despite a variety in application of the above musical elements, the common is that there exist significant effects of musical arousals on user engagement. Therefore, in later experiments, the present study attempts to examine the effect of interactive music on user engagement.

Hypothesis 1: Background music will enhance user engagement, which will positively influence online consumers' behavioral intention and their perception toward the website and its brand.

THE EFFECTS OF INTERACTIVITY ON ONLINE CONSUMER PERCEPTION AND BEHAVIOR

Interactive music is a genre of audio media which reacts to users' activities by generating an alteration in musical components. The media format was first utilized in composing sound effects for video games and has now been widely used in the field of music therapy, as interactive music was proved to improve user engagement by enhancing one's attention at task performance (Haslbeck, 2014). In addition, research by Webster and Weir (2005) confirmed that interacting with a variation of musical elements (e.g. mode, texture, and tempo) has a significant impact on individuals' emotional reactions. Though the media format has yet been widely applied under the scope of online merchandising, the above results outcomes lead to the present study's interest in whether interactive music has additional effects on consumer perception and behavior, compared to the sole use of background music. Given the research substance, we first focus on the concept of interactivity under a human-computer interaction context, then discuss how it influences online consumers.

Interactivity: Definition, Features and Application.

Despite that interactivity serves as an essence of online user experience, due to its multi-dimensional nature, researchers have not agreed with a consensual definition (Janlert & Stolterman, 2017). Given a research interest in the application and effects of interactive music as a new media format, the present study adopts Steuer's (1992) definition where interactivity is "the extent to which an interface allows users to modify a mediated environment in real time." Scholars have posited that possessing different modes of communication on an interactive interface elicits users' sensory responses, expands the scope of mental representation, and leads to greater engagement with content (Oh & Sundar, 2015; Xu & Sundar, 2014). From a communication perspective, when interactive features are perceived to be intuitive, natural, and easy-to-use, interactivity serves as an effective predictor of users' attitude and behavioral intention toward a website and its content; in addition, when a person is experienced user of interaction techniques, interactivity generates a learning curve which enhance one's memory of presented content on the medium (Sundar, Bellur, Oh, Xu, & Jia, 2014). Besides, in the domain of human-computer interaction, interactivity is said to have direct effects on user actions and absorption (O'Brien & Toms, 2008). On one hand, from a behavioral dimension, interactivity triggers deliberate attempts of users to access additional content on an interface; on the other hand, interactivity produces a state of temporal dissociation, heightened attention, enjoyment, and sense of control through individuals' interaction with an interactive medium (Peters, Castellano, & de Freitas, 2009).

In application, studies have verified that interactivity leads to preferable attitudes toward online portals (Kalyanaraman & Sundar, 2006), more positive perception toward digital advertisements (Sundar & Kim, 2005), and a greater degree of satisfaction on an online learning platform (Liaw, Huang, & Chen, 2007). In an e-commerce context, the

above mechanisms have a direct impact on the psychological processes leading to purchase, which is why interactivity has become widely applied in the construction of e-commerce environments (Jiang, Chan, Tan, & Chua, 2010). Furthermore, consumers have displayed more positive attitudinal or behavioral responses toward a highly interactive retailing website, due to heightened user engagement (Van Noort, Voorveld, & Van Reijmersdal, 2012; Jiang, Chan, Tan, & Chua, 2010). Namely, user engagement serves as the key mediator to drive positive effects on online consumer behavior (Mollen & Wilson, 2010).

Interactivity and user engagement.

The process of how interactivity enhances user engagement can take place with three different dimensions of interactivity – modality, message and source. The following provides further elaboration on modality interactivity, which refers to the various methods of interaction offered by the interface, such as clicking scrolling, dragging and hovering (Sundar, Jia, Waddell, & Huang, 2015). Together, these unique activities contribute to enhancing the speed, range, and vividness of one's mental representation of information on an interface (Sundar, Bellur, Oh, Xu, & Jia, 2014). As a result, modality interactivity increases user engagement with content on a medium by expanding one's sensory breadth and depth involved in the interaction process (Sundar, Xu, & Bellur, 2010). On top of that, user engagement serves simultaneously as a product and a mediator of interactivity; through a heightened extent of user engagement, interactivity generates effects on individuals' cognition, attitudes and behavior (Sundar, 2007). Specifically, the Dual-Process Model of Interactivity Effects suggests that the extent to which an individual involves in the performed activity has a critical effect on the pathway of interactivity, user engagement, and their communication outcomes.

To begin with, when a user holds a low level of involvement while performing a task, a mere presence of interactive features can serve as a favorable peripheral cue, leading to positive effects on one's psychology and user experience (Liu & Shrum, 2009). This positively impacts a consumer's brand perception and purchase intention through a higher extent of affective engagement (Jiang, Chan, & Tan, 2010; Liu & Shrum, 2009). However, when a user is highly involved in an activity, one tends to make actual use of available interactive affordances, which can result in either a facilitating or an inhibiting effect. For experienced users, a highly interactive website facilitates systematic elaboration on information, which means individuals can selectively focus on information that is relevant to their needs and decision-making process (Sicilia, Ruiz, & Munuera 2005). From a consumer perspective, the mechanism reduces search costs and expands central bandwidth to process product claims; as a result, the interactivity increases cognitive engagement, contributes to positive brand attitudes, and encourages purchase behavior (Jiang, Chan, & Tan, 2010; Noort, Voorveld, & Van Reijmersdal, 2012). However, interactive features can also present challenges to inexperienced users. As a highly interactive website demands users' cognitive resources, distraction and frustration are commonly reported as users' responses (Liu & Shrum, 2009). Therefore, the inhibiting effects of interactivity can negatively impact consumers' cognitive engagement and result in unfavorable perceptions and behavior towards a brand and its products (Jiang, Chan, & Tan, 2010; Noort, Voorveld, & Van Reijmersdal, 2012). In sum, regardless of the level of involvement, interactivity is convinced to have determining effects on user engagement and its end-sided persuasion outcomes as suggested in the above causal relationship pathway. Therefore, given the cumulative research outcomes on the effects of interactivity, we propose

Hypothesis 2: Interactive music will further enhance user engagement compared to static background music, leading to a more positive impact on online consumers' behavioral intention and their perception toward the website and its brand.

THE EFFECTS OF INTERACTIVE MUSIC ON HUMAN PERCEPTION AND BEHAVIOR

As mentioned above, studies in the domain of music therapy convince the effects of interactive music on human psychology and behavior (Deweppe et al., 2015), such as beneficial outcomes of applying interactive music to enhance attention for individuals with lower concentration capacity (Haslbeck, 2014). Recent experiments also verify that interactive music can improve participants' engagement and task performance by 51 – 91% (Schwartz, Ayres, & Douglas, 2017). In practice, research by Webster and Weir (2005) confirm that individuals' interaction with various combinations of musical factors, such as modes, textures, and tempos, have significant impact on their emotional responses. Additionally, as complex and unexpected stimulus elevates excitement, pleasure, and user engagement of online consumers (Kaltcheva & Weitz, 2006), the present study investigates whether adopting interactive music as a novel technique in the design of an e-commerce channel can similarly produce beneficial impact. Though there is no current consensus on the influences of interactive music on online consumers, by synthesizing previous literatures, the present study raises certain commons shared between the effects of music and of interactivity, and posits potential explanations for the operational mechanism of interactive music.

Vividness as a mediating variable.

Referring the above literature review, both background music and interactivity can improve user engagement by driving emotional arousal and active processing of stimuli

sequentially (Schwartz, Ayres, & Douglas, 2017; Sheng & Joginapelly, 2012). In particular, vividness operates as a shared factor under the operational mechanism (Sheng & Joginapelly, 2012). Vividness refers to the richness of a mediated environment and the way the environment presents and communicates information to the senses of users (Steuer, 1992). Previous literatures confirm that vivid media content contains a greater number of perceptual cues which facilitate individuals to build cognitive and emotional connections through two dimensions: the depth and breadth of vividness (Wickens, Hollands, Banbury, & Parasuraman, 2015), where the depth of vividness refers to the bandwidth of the environment in which information is presented, and the breadth of vividness measures the number of sensory dimensions involved (Fortin & Dholakia, 2005). The first, higher extent of vividness increases the robustness of interaction as media content transmitted by an interface becomes easier to be recognized and memorized by its users for two possible reasons (Sutcliffe, 2009). Vivid interfaces and media content contain a greater number of perceptual cues; as a result, they not only differentiate themselves from other their counterparts but also facilitate individuals to build richer schemas and memory cues (Wickens, Hollands, Banbury, & Parasuraman, 2015). The second, vividness contributes to the attractiveness of interfaces through “increasing levels of arousal that was experienced during perception” (Mollen & Wilson, 2010, p. 921). Worth noting, the increased extent of attractiveness follows an inverted U-shape with increasing levels of experienced arousal, where intermediate levels of vividness yields the highest extent of attractiveness; otherwise, too high a level of vividness results in an avoiding effect and too limited vividness cannot produce significant effects (Wickens, Hollands, Banbury, & Parasuraman, 2015).

Similar to interactivity, vividness is a complex construct and each discipline has recognized a distinct set of major components for the subject (Steuer, 2001). Synthesizing

various literatures, here identifies certain components of vividness which are relevant to the current research topic. On one hand, there are reactive sources of vividness, including perception, aesthetic appeal, and experiential value, which indicate users' reaction to the symmetry, proportion and unity of a tangible object (i.e., the interface and media content of an online shopping website) (Veryzer, 1993). In an e-commerce context, salient visual elements as well as entertaining or even dramatic cues can contribute to the physical attractiveness and beauty inherent in an online retailing setting, which generates a positive emotional state in its audience. Additionally, when consumers perceive a shopping experience to be more than a purchase opportunity, they appreciate the experience for all its nuances and differentiate it from the others (Mathwick, Malhotra, & Rigdon, 2001). On the other hand, there are active sources of vividness, including escapism, playfulness, and enjoyment, which reflect the intrinsic value that comes from engaging in activities to the point of offering an escape from the demands of the day-to-day world (Unger & Kernan, 1983). Together, components of vividness generate a state of psychological immersion, which directly contributes to absorption and elicits heuristics pertaining to the enjoyment aspect of affective engagement. Therefore, scholars posit vividness as an antecedent of user engagement (Mollen & Wilson, 2010). While the joint use of interactivity and musical arousals is expected to generate a heightened level of vividness, the present study pays additional attention to measure the breadth and depth of vividness and posits it as a mediating variable between interactive music and user engagement. Thus, the current research proposes

Hypothesis 3: Vividness will mediate the effect of interactive music on enhancing user engagement.

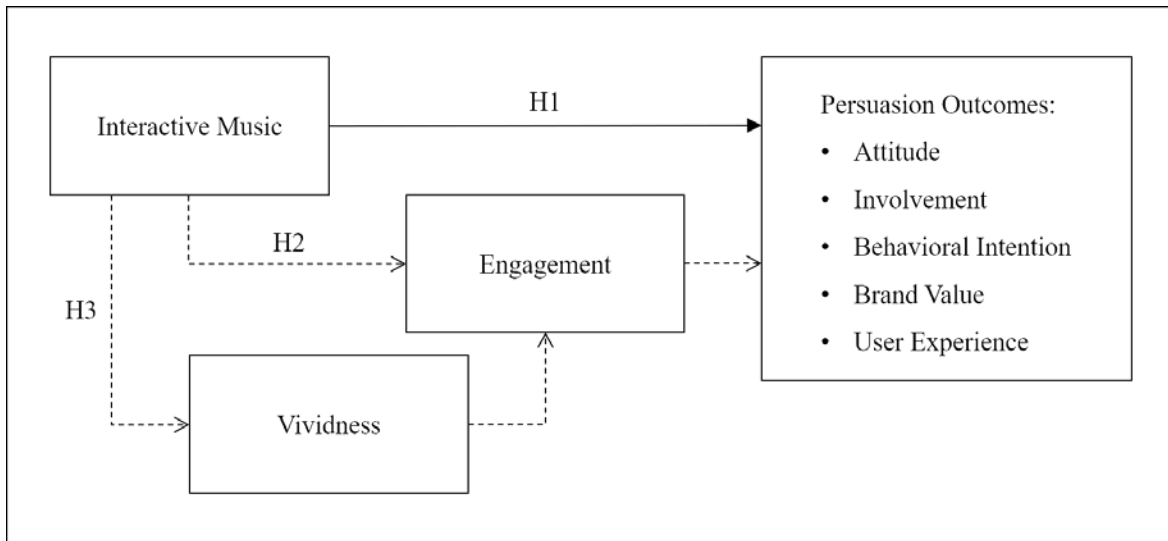


Figure 1. Theoretical framework of the present study

MODERATING EFFECTS OF ANTECEDENTS ON ONLINE CONSUMER PERCEPTION AND BEHAVIOR

Besides the effects that interactivity and musical stimuli can have on consumer behavior, the study also considers several antecedents as moderating variables that can potentially influence research findings. Scholars defined antecedents as “existing characteristics of an individual” which can affect a consumer’s purchase decision and experience (Rose et al., 2012). In general, previous literatures have classified these antecedents into three major categories: (1) existing perception toward online shopping, (2) characteristics of customers, and (3) characteristics of an online shopping website and its products (Chang, Cheung, & Lai, 2005).

Existing perception and evaluation toward online shopping.

Existing attitude.

Consumers’ existing attitude toward online shopping is commonly regarded as the root of all the other psychological variables in customers’ experiences, decisions and

behavior, and it has been proved to have positive impact on purchase intention in numerous studies (Goldsmith, 2002; Zhou et al., 2007; Shobeiri, Laroche, & Mazaheri, 2013). Underlying these research findings, the mechanism of how existing attitudes toward online shopping predicts e-consumer behavior can be explained through the Theory of Reasoned Action, where Fishbein and Ajzen (1975) incorporates attitudes as one of the direct indicators of an individual's behavioral intention and actual behavior (see Figure 2). Specifically, attitude can be quantified as a cross-product of the subjective likelihood that adopting online shopping can lead a specific outcome and consumers' evaluation of the certain outcome (see Figure 3).

$$B \sim BI = A(w_i) + SN(w_2), \text{ where}$$

B = a particular behavior

BI = intention to engage in the particular behavior

A = attitude toward engaging in the behavior

SN = subjective norm pertaining to what others think

Figure 2. The model of Theory of Reasoned Action by Fishbein and Ajzen (1975)

$$A = \sum_{i=1}^n b_i e_i, \text{ where}$$

b_i = subjective likelihood that performing a particular behavior would lead to a specific outcome i

e_i = evaluation of the specific outcome i

Figure 3. The function to quantify attitude in the Theory of Reasoned Action (Fishbein & Ajzen, 1975).

Previous enjoyment.

Enjoyment reflects an individual's intrinsic value when engaging in an activity (Unger & Kernan, 1983). When consumers perceive a shopping experience as fun and enjoying, they tend to develop hedonic motivations and experience-based benefits, which encourage their purchase behavior (Close & Kukar-Kinnery, 2010). Specifically, there are two widely recognized dimensions that construct enjoyment of online shopping: positive affect and fulfillment. The first, positive affect includes feelings such as pleasure, happiness, contentment or similar emotions that were perceived by a consumer when shopping online; the second, fulfillment is a sense of achievement obtained when certain needs or desires are satisfied through an experience (Neuendorf, Xiong, Blake, & Hudzinski, 2014). Jointly, when consumers attained enjoyment through former online shopping experiences, they are proved to possess more positive sentiments and stronger purchase intention in future occurrences as well (Mathwick, Rigdon, & Malhotra, 2001).

Involvement.

Involvement is defined as “a person's perceived relevance of the object based on their inherent needs, values, and interests” (Solomon, Russell-Bennett, & Previte, 2012, p. 105). Based on the Elaboration Likelihood Model, the level of involvement determines whether an individual takes a central or peripheral processing route during a shopping task; to be specific, in the central routes, consumers' decisions are made through extensive, effortful processing to evaluate information that they encounter on an online sale channel; by contrast, in the peripheral routes, consumers rely on simple, easy-to-identify cues to form attitude toward a shopping website, its brand and its products (Shrum et al., 2013). Therefore, to what extent a consumer has been involved in online shopping is commonly

recognized as a decisive moderator that affects online consumer behavior and perception (Dai, Forsythe, & Kwon, 2014).

Perceived risk.

Former studies of consumer behavior frequently discuss the effects of perceived risk, which is considered as the uncertainty about a purchase decision and the unpleasantness of its potential consequences (Murray, 1991; Cox & Rich, 1964). In an e-commerce context, Forsythe and Shi define perceived risk as “the subjectively determined expectation of loss by an Internet shopper in contemplating a particular online purchase” (2003, p. 869). Measuring general risks by asking respondents to assess whether purchasing online were risky, studies suggested controversial findings on whether risk perception has an effect on online consumer behavior (Kimery & Tractinsky, 2002; McKnight, Choudhury, Kacmar, 2002; Ranganathan & Ganapathy, 2002; Vijayasarathy & Jones, 2000). However, specific risks concerned with privacy infringement (Bellman, Lohse, & Johnson, 1999; Miyazaki & Fernandez, 2001), system security (Burroughs, & Sabherwal, 2002), and payment fault (Bhatnagar, Misra, & Rao, 2000) have all been revealed with significant negative impact on intention and actual online purchasing behavior. In particular, uncertainty is believed to be an essence in the construct of perceived risks, as existing literatures posited that concerns on whether products would come in as expected and reliability of delivery, return and refund policies have a negative impact on consumers’ attitude toward online shopping, which inhibits them from adopting the practices (Bhatnagar, Misra, & Rao, 2000; Rose, Clark, Samouel, & Hair, 2012).

Perceived benefits.

Perceived benefit is the construct of a consumer's functional (utilitarian) motives and nonfunctional (hedonic) motives (Forsythe, Liu, Shannon, & Gardner, 2006). Commonly discussed utilitarian functions include convenience, variety, product quality, and price; where as hedonic values pertain to consumers' interests as well as social and emotional needs (Bhatnagar & Ghose, 2004; Chilers, Carr, Peck, & Carson, 2001; Menon & Kahn, 2002). Previous literatures examined perceived benefits of online shopping from the standpoints of perceived consequences and relative advantages compared to shopping in brick-and-mortar stores (Foucault & Scheufele, 2002; Raijas & Tuunainen, 2001). Several common features of perceived benefits were verified with positive impact on online shopping intention and behavior; these advantages include time saving, easy-to-order, decreased transaction cost, and convenience (Sin & Tse, 2002; Goldsmith, R., & Goldsmith, E., 2002; Liang & Huang, 1998).

Previous customer experiences.

A handful of variables regarding customers' previous online shopping experiences are confirmed with significant effects on their behavior and intention. Particularly, under the context of e-commerce, customer experience is highly correlated with user-friendliness and aesthetic elements of a retail website (Rose, Clark, Samouel, & Hair, 2012). Therefore, ease-of-use interactivity, and accessibility are confirmed as deterrents of online customer experiences, which lead to significant effects on online consumer behavior and evaluation (Bilgihan, Okumus, Nusair, & Bujisic, 2014). In addition, scholars have pointed out that, considering the use of modern technology in online sale platforms, attributes, such as novelty and playfulness, are also regarded as strong indicators toward consumers' attitudinal and behavioral reactions (Hwang & Seo, 2016).

Consumer characteristics.

Internet usage.

The attribute refers to one's knowledge in the use of Internet and electronic devices (Chiu, Wang, Fang, & Huang, 2014). From both technical and psychological aspects, being familiar and comfortable to use the Internet has been found to impact positively on consumers' behavioral intention (Rose, Clark, Samouel, & Hair, 2012). Specifically, the amount of computer training, computer experience, and knowledge of online shopping were also found to be positively related to purchase intention on e-retailing channels; by contrast, consumers who are less "tech-savvy" are more likely to avoid online shopping, as low confidence in Internet usage results in an inhibiting effect on the group of audience (Chiu, Wang, Fang, & Huang, 2014).

Shopping Orientation.

Scholars define shopping orientations as "the general predisposition of consumers toward the act of shopping" (Gehrt & Carter, 1992, p. 168). This predisposition can be exhibited through patterns of information search, brand evaluation, and product selection; namely, shopping orientations can be expressed through how a consumer thinks and acts while shopping online (Brown, Pope, & Voges, 2003). Some of the most referred characteristics include functional oriented (convenience oriented, price-oriented, time conscious, etc.), experiential oriented, brand oriented, and impulsiveness (Chang, Cheung, & Lai, 2005). Shopping orientations are commonly studied as moderators of online consumer behavior (Sambargi & Gopal, 2016; Büttner, O., Florack, A., & S. Göritz, 2014); for instance, convenience-oriented customers demonstrate stronger purchase intention online, compared to shopping in physical stores (Scarpi, Pizzi, & Visentin, 2014). Considering the present research interest, the study is particularly concerned with whether

the use of interactive music in web design has an effect on experiential oriented consumers, who are believed to be fond of unique, novel shopping experiences (Sambargi & Gopal, 2016).

Demographics.

Participants' demographics are also commonly investigated as moderators in studies of online consumer behavior and psychology; attributes such as gender, age, education, and income are commonly posited to have interaction effects with or to serve as mediators of other predictor variables (Rose, Clark, Samouel, & Hair, 2012).

Characteristics of an online shopping website and its products.

Website design.

An e-commerce website not only serves as the store front that gives consumers impressions on the brand and its products, but it also determines the flow of a shopping experience and aid users in search for information (Clemes, Gan, & Zhang, 2014). Scholars have identified four key characteristics of business-to-customer (B2C) websites – information, design, security and privacy – to be critical factors for consumers' purchase decision-making process (Ranganathan & Ganapathy, 2002). All four elements have direct effects on consumers' attitude toward a website, which has a positive impact on users' behavioral intention on the site (Shergill & Chen, 2005).

Price.

Previous literatures have supported that a major motivation for consumers to adopt online shopping is due to relatively lower efforts in making price comparison for the same product across different channels (Ahuja et al., 2003). Besides, prices of products have direct effects on consumers' level of involvement in a shopping task. For products with

higher price and lower purchase frequency, consumers tend to rely on the central processing route to form attitude; for products with lower price and higher purchase frequency, involvement levels are generally low, and thus, consumers account for peripheral cues to make purchase decisions (Shrum, 2013). All the above phenomena indicate the importance of price as a decision factor for consumers to make online purchases (Clemes, Gan, & Zhang, 2014).

Product design, quality, and variety.

Characteristics of a product as such are commonly regarded as direct indicators of a consumer's evaluation toward the merchandise (Clemes, Gan, & Zhang, 2014). Products that are good in quality and visually appealing offer consumers a higher sense of guarantee (Koyuncu & Bhattacharya, 2004), while products with wide variety of choices provides customers both functional appeals and a positive emotional state during a shopping experience. Particularly, perceptions of variety are given by the number of distinct products and by repetition frequency; research has found that individuals who prefer online shopping have a more positive evaluation of the product variety available through online shopping (Sin & Tse, 2002). Thus, the three product characteristics are all considered important purchase decision factors for online consumers.

Research Question: How do the selected antecedents moderate the effects of interactive music on consumers' behavioral intention and perception?

Method

RESEARCH DESIGN

The study created an e-commerce website and experimented a common technique of interactive music, soundtrack layering, which refers to layering additional tracks of melody to the original music (Fraser & Bradford, 2013). Particularly, how the variation of musical dynamics influencing on online consumer behavior and intention was examined by a single-factor experiment with three conditions: a control condition without background music, a static background music condition, and an interactive music condition. While participants encountered the same visual content in all three conditions, in the condition with interactive background music, users could initiate or cease various soundtrack layering effects by clicking on different buttons on each product page. In contrast, in the static background music condition, there was no change in the audio regardless of one's click actions. Both the interactive condition and the static condition used the same background music – the only difference was whether consumers could make any change in layering the music. In the control condition, there was no background music for the website.

STIMULUS AND MANIPULATION

Three websites with a fictitious brand name, aboutleather.com, were constructed for this study (Figure 4). All of them shared the same page content and layout, where a menu bar, a shopping cart icon, and a “Check out” button were displayed on the top of each page, and each website was consisted of four tabs (i.e. “Home”, “About us”, “Shop”, and “Contact us”). Particularly, during the study, participants were directly landed at the “Shop” page, which contain eleven fictitious leather products. Given that music stimuli function as peripheral cues, which was stated to be more effective on low involvement

processing, leather accessories ranging from \$20.00 to \$85.00 were presented on the virtual websites (Xu & Sundar, 2014). By clicking on each product images, participants were directed to a corresponding product information page. Layout of all product pages are identical, which included a product image, an interactive panel and a purchase panel. In the interactive panel, when a user clicks on one of the six buttons (i.e. “View more pic”, “Story”, “Product details”, “Shipping info”, “Return & refund”, and “Questions?”), a text-box with certain product information will be displayed. In the interactive and static music conditions, a piece of G-major jazz music with 95 beats per minute was presented, as it not only aligned with the atmosphere of the website but also music with major mode and regular tempo (90 – 102 beats per minute) has been found to yield the greatest effect in promoting users’ involvement (Schwartz, Ayres, & Douglas, 2017).

Considering that interactivity in an interface should provide users with a perception that they are able to modify the mediated content in real time (Steuer, 1992), participants were informed of an ability to make a change in the background music in the interactive music condition. In the interactive music condition, a pop-up text box was displayed when users first entered the website, saying “You can make a change in the background music by clicking on any button on the site”. As they click through web pages, they were able to initiate soundtrack layering effects, which responded to their clicking actions. In the static music condition, participants listened to the same music, but the music did not respond to their clicking.

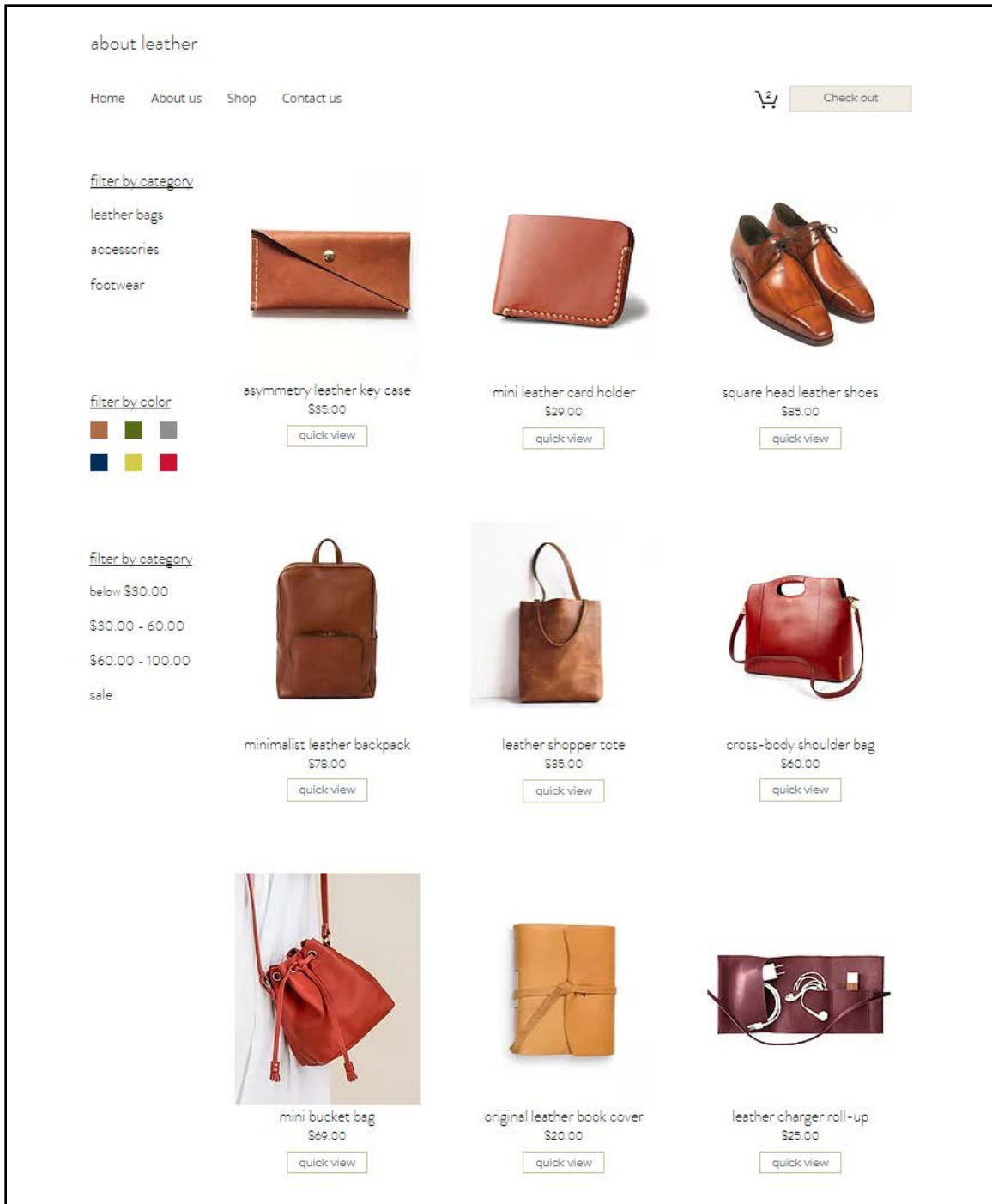


Figure 4. A screenshot of the stimulus website, aboutleather.com

PARTICIPANTS AND PROCEDURE

319 undergraduate students from a large public university were recruited for the online experiment. Prior to encountering an experimental condition, participants conducted a pre-test questionnaire which investigated their Internet usage and general online shopping behavior, including shopping frequency, attitude toward online shopping, monthly purchase amount, general shopping experiences, perceived risks and benefits of online shopping, and critical factors for making purchase decisions. Then, students were instructed to complete a shopping task by placing at least three items in their online shopping carts and spending at least three minutes on an e-commerce website. Next, they were randomly assigned to one of the three conditions, and participants in the interactive and static music conditions were particularly instructed to turn on the volume on their devices. After the experiment, participants were asked to complete a post-test questionnaire which included five sets of manipulation checks and measured users' attitude and involvement towards the brand and behavioral intention towards the products as well as perceived vividness and engagement on the website. After filtering out participants who did not make any click on the shopping website or failed to listen to the background music, 98 participants were recorded under the control condition, 77 under the static music condition, and 76 under the interactive music condition. 52 males and 199 females were included in the study. The average age was 20.4 years old, and the majority were Caucasian (51.1%), followed by Hispanic (26.3%), and Asian (16.3%).

MEASUREMENTS

All self-reported items were measured by a 7-point Likert scale unless specified otherwise. A pre-questionnaire was designed to understand participants' music-listening behavior, including frequency of music appreciation, preference toward music genres, and

practices of instrument performances (Lee & Downie, 2004). Demographics and respondents' general online consumer behavior were also measured to analyze the moderating effects of selected antecedents. Later, a post-test survey included a manipulation check and measurement of mediating and dependent variables. Specifically, the manipulation check was conducted by examining if participants completed the given shopping task and measuring their perceived interactivity and the extent of arousal. Next, vividness and user engagement were investigated as mediating variables. Lastly, dependent variables included participants evaluation on web-related variables and factors pertaining to the brand and its products.

Participants' characteristics.

The questionnaire asked participants about their current Internet usage behavior and their music-listening habits. As for investigating the first attribute, respondents were asked to report *the number of hours of Internet use per day* (M= 8.12, min= 2, max= 24, SD= 3.91) and *purposes of Internet usage* (see Table 1) as well as their *comfortability with navigating on the first visit to a website* (M= 6.01, SD= 1.05, where 1 being “strongly disagree” and 7 being “strongly agree”) (Chen, 2015). Secondly, participants were asked the following four questions from Lee and Downie's form to understand their music-listening behavior (2004): (1) whether they are professionals in the field of music or related areas (M= 0.05, SD= 0.22, where 1 being “Yes” and 0 being “No”), (2) whether they play musical instruments regularly (M= 0.64, SD= 1.45, where 1 being “Everyday” and 7 being “Not at all”), (3) the number of hours they listen to music everyday (M= 4.45, min= 0, max= 24, SD= 3.51), and (4) the frequency they listen to each of the eight major music

genres (see Table 2). Demographic questions, including gender, age, and ethnics, were also presented in the questionnaire (see Table 3).

Table 1. Frequency table of respondents' Internet usage purposes

| Purposes of Internet Usage | Mean | Std. Deviation |
|----------------------------|------|----------------|
| Professional purposes | 5.52 | 1.25 |
| Communication | 5.57 | 1.25 |
| Gaming | 2.03 | 1.41 |
| Online shopping | 4.39 | 1.47 |
| Information seeking | 5.48 | 1.26 |
| Entertainment | 5.41 | 1.33 |

Table 2. Frequency table of respondents' music-listening habits by major music genres

| Music Genre | Mean | Std. Deviation |
|-------------|------|----------------|
| Jazz | 1.86 | 1.16 |
| Blues | 1.71 | 1.12 |
| Hip-hop | 4.26 | 1.65 |
| Rock | 3.30 | 1.68 |
| Pop | 4.66 | 1.46 |
| Classical | 2.08 | 1.31 |
| Country | 2.68 | 1.77 |
| Electronic | 2.90 | 1.73 |

Table 3. Frequency table of respondents' demographics

| Demographics | Mean | Std. Deviation |
|--------------|-------|----------------|
| Gender | 1.79 | 0.41 |
| Age | 20.31 | 1.65 |
| Ethnics | 2.95 | 1.02 |

Manipulation check.

Perceived Interactivity.

The attribute was measured by three items adapted from Kalyanaraman and Sundar (2006) asking participants to indicate “How interactive is the website?” and whether they perceived a sense of control and freedom in actions to access information on the website. Additionally, there were three items added to the section, which specifically asked if a user noticed a difference in the background music when they clicked on buttons in the interactive panel on a product page to initiate changes in the background music (M= 4.87, SD= 1.05, α = 0.95).

Arousal.

Six items developed by Mehrabian and Russell (1974) and Mummalaneni (2005) were used to measure the difference in self-reported arousal after exposed to the stimulus websites (M= 4.30, SD= 1.26, α = 0.90).

Moderating variables: Antecedents of Online Consumer Perception and Behavior.

The section measured participants' present perception toward e-commerce and their online shopping behavior. Respondents were first asked *the frequency* (see Table 4) and *the amount spent on online shopping in the past three months* (see Table 5). They were also asked to report *the total number of subscriptions and/or accounts registered on e-commerce sites* (see Table 6). Following, eight attributes: user experience (M= 5.174, SD= 0.854, α = 0.923), involvement (M= 5.209, SD= 1.120, α = 0.908), decision factors for purchase (see Table 7), attitude (M= 5.767, SD= 0.866, α = 0.866), enjoyment (M= 5.439, SD= 0.916, α = 0.908), perceived benefit (M= 5.538, SD= 0.746, α = 0.738), perceived risk (M= 4.523, SD= 0.833, α = 0.726), and shopping orientation (where 1 being the most functional-oriented and 7 being the most experiential oriented, M= 3.379, SD= 1.192, α = 0.784), were measured respondents' subjective evaluation toward online shopping and their recent online consumer behavior (Chang, Cheung, & Lai, 2005).

Table 4. Frequency table of respondents' online shopping frequency in the past three months

| Online shopping frequency | Frequency | Percentage (%) |
|---------------------------|-----------|----------------|
| More than once every week | 8 | 3.13 |
| Once every week | 27 | 10.66 |
| Once every two weeks | 54 | 21.32 |
| Once a month | 79 | 31.66 |
| Once every two months | 39 | 15.36 |
| Fewer or Never | 45 | 17.87 |
| Total | 251 | 100.00 |

Table 5. Frequency table of respondents' online purchase amount in the past three months

| Online purchase amount | Frequency | Percentage (%) |
|------------------------|-----------|----------------|
| \$0 | 9 | 3.76 |
| Less than \$100 | 80 | 31.97 |
| \$100 - \$200 | 68 | 27.27 |
| \$200 - \$300 | 46 | 18.50 |
| \$300 - \$400 | 17 | 6.58 |
| \$400 - \$500 | 9 | 3.76 |
| More than \$500 | 20 | 8.15 |
| Total | 251 | 100.00 |

Table 6. Frequency table of respondents' online shopping accounts

| Online purchase amount | Frequency | Percentage (%) |
|------------------------|-----------|----------------|
| None | 20 | 8.15 |
| 1 – 3 accounts | 131 | 52.35 |
| 4 – 6 accounts | 67 | 26.65 |
| 7 – 10 accounts | 19 | 7.52 |
| More than 10 accounts | 13 | 5.33 |
| Total | 251 | 100.00 |

Table 7. Frequency table of respondents' purchase decision factors

| Purchase Decision Factors | Mean | Std. Deviation |
|----------------------------|------|----------------|
| Price | 6.34 | 0.858 |
| Product Quality | 6.29 | 0.800 |
| Product Design | 6.15 | 0.847 |
| Web Design | 5.26 | 1.208 |
| Product Options | 6.25 | 0.783 |
| Return and Refund Services | 5.73 | 1.318 |
| Delivery Time and Fee | 6.27 | 0.902 |
| Product Reviews | 5.94 | 1.148 |
| Recommendations | 5.75 | 1.191 |

Respondents' existing *attitude* toward online shopping were measured by five bipolar scales (bad – good, unfavorable – favorable, negative – positive, worthless – valuable, unnecessary – necessary) adopted from Spears and Singh's scale, which included

items developed by Holbrook and Batra (1987) and revised to adapt marketing context ($M= 5.77$, $SD= 0.87$, $\alpha= 0.87$). To measure *online shopping involvement* and *online shopping enjoyment*, the Personal Involvement Scales by Zaichkowsky were adopted for measurements (1985). Online shopping involvement was measured by five bipolar scales (unimportant – important, irrelevant – relevant, means nothing – means a lot, of no concern – of much concern, not needed – needed) ($M= 5.21$, $SD= 1.12$, $\alpha= 0.91$), and online shopping enjoyment were assessed by asking participants whether online shopping sites create a feeling of entertaining, enjoyable, interesting, fun, exciting, and appealing, on a 7-point Likert scale where 1 being “none of this feeling” and 7 being “a lot of this feeling” ($M= 5.44$, $SD= 0.92$, $\alpha= 0.91$). Participants’ general *online shopping orientation* were measured to categorize them either as functional-oriented shoppers or as experiential-oriented shoppers. Selected from Wolfinbarger and Gilly’s scales (2001), six statements indicating functional online shopping orientation read “I go to specific sites,” “I have a purpose in mind,” “I shop online to save time,” “I make repeat purchases,” “I want ease of use,” and “I want to get in-and-out quickly”; whereas the six statements describing experiential shoppers are “I surf for new sites,” “I look for ideas,” “I shop online to kill time,” “I try new things,” “I want a unique experience,” and “I want a welcoming site that draws me in,” ($M= 3.38$, $SD= 1.19$, $\alpha= 0.78$, where 1 being the most functional-oriented and 7 being the most experiential oriented). Finally, *perceived benefits* and *perceived risks* were measured through Foucault and Scheufele’s forms (2001). Six items of measurements for perceived benefits included the following features of online shopping: time-saving, reduced prices, information accessibility, easy-to-view, product comparison, safety ($M= 5.53$, $SD= 0.75$, $\alpha= 0.71$). On the other hand, six statements about the potential risks of online shopping measured respondents’ concerns regarding product representativeness,

payment information, delivery time and services, and information reliability (M= 4.52, SD= 0.83, α = 0.70).

Mediating variables: vividness and user engagement.

Perceived vividness.

Measurement of *perceived vividness* included the following items. To begin with, three items adopted from Sheng and Joginapelly's former study (2012) asked respondents (1) whether the website offered rich media content, (2) whether the website stimulated the respondent's sense, and (3) whether the website was vivid, (M= 4.105, SD= 1.429, α = 0.903). Secondly, to measure participants' perception toward attractiveness and aesthetic appeals of the website, four items pertaining to design and web layout were selected from Kim, Fiore and Lee's scales. (M= 5.060, SD= 1.290, α = 0.878). In addition, the section also measures vividness from the perspectives of *experiential value* and *escapism*. Measurements of from Mathwick, Malhotra and Rigdon's former study and were modified to accommodate the online shopping context (2001). Items pertaining to experiential value reflected the intrinsic enjoyment that came from engaging in the shopping experience, while escapism measured the sense of playfulness that allowed users to temporarily "get away from reality," (M= 4.18, SD= 1.15, α = 0.95).

Absorption.

The extent of absorption measured the "concentration of mental activity" as of whether users were able to concentrate on one stimulus only and ignoring all others (Matlin, 1994). The factor was measured through five items adopted from O'Brien and Toms' model and modified to accommodate the online shopping context (2008). Five items asked participants whether they spent more time than intended and whether they were able

to block out external distractions to measure the level of immersion while they shopped on the stimulus sites (M= 4.681, SD= 1.096, α = 0.915).

Cognitive Engagement.

Five items of *Involvement* were selected to measure the most basic component of cognitive engagement, as it reflects measurable aspects of users' relationship with the study stimulus (Haven, 2007). To measure the factor, the same bipolar scales with five items (unimportant – important, irrelevant – relevant, means nothing – means a lot, of no concern – of much concern, not needed – needed) were adopted (Zaichkowsky, 1985) (M= 3.29, SD= 1.32, α = 0.93). Besides, six items of *evaluation* were also measured to investigate the extent to which respondents engaged in reflective thinking toward information obtained from the stimulus website (Appleton, Christenson, Kim and Reschly, 2006) (M= 4.60, SD= 1.13, α = 0.85). Together, measures from the two aspects assessed the magnitude of respondents' cognitive engagement (M= 4.00, SD= 1.01, α = 0.88).

Affective Engagement.

Affective engagement was measured by five attributes (affect, enjoyment, challenge, novelty, and feedback) selected from O'Brien and Toms' model of engagement (2008). *Affect* measured respondents' "emotional investment made to be immersed in an environment" (Jennings, 2000) through five bipolar scales (sad – happy, bad mood – good mood, irritable – pleased, depressed – cheerful, annoyed – content) selected from Warson, Clark, and Tellegen's Positive and Negative Affect Schedule (1988) (M= 4.681, SD= 1.096, α = 0.915). *Enjoyment* was again measured by the six items (entertaining, enjoyable, interesting, fun, exciting, and appealing) as applied in the pre-stimulus section (Zaichkowsky, 1985) (M= 3.839, SD= 1.500, α = 0.965). *Challenge* measured the amount

of effort experienced by the participants in performing the online task through five items (O'Brien and Toms, 2010) ($M= 2.830$, $SD= 1.305$, $\alpha= 0.894$). *Novelty* evaluated the extent to which “users find unexpected, surprising, new, and unfamiliar experiences” (Huang, 2003) through each of the three online shopping conditions. The attribute was measured by four items adopted from O'Brien and Toms' model and modified to suit the online shopping context, such as “The shopping experience went beyond my expectation,” and “I noticed that the website applied new techniques that I did not see among others” (2010) ($M= 3.717$, $SD= 1.277$, $\alpha= 0.881$). *Feedback* refers to response or reaction that “serves as a basis for users' future action,” (Stone, Jarrett, Woodroffe, & Minocha, 2005) and was measured by four items on seven-point Likert scales, such as “I consider my shopping experience a success,” and “this shopping experience worked out the way I had planned” (O'Brien and Toms, 2010) ($M= 4.048$, $SD= 1.341$, $\alpha= 0.932$). Together, measures from the five aspects assessed the magnitude of respondents' affective engagement ($M= 4.28$, $SD= 1.24$, $\alpha= 0.91$).

Dependent variables: consumer perception and behavioral intention.

Evaluation toward web features.

Per previous literature, particular adjectives were selected from Russell's (1980) and Circumplex Model of Emotion to measure respondents' evaluation web features on the site which they encountered (Boltz, Ebendorf, and Field's, 2017). Participants were asked to evaluate “web features (e.g. background music if any, shopping options, website design, shopping flow, etc.) on the ‘aboutleather.com’ online store” through four positive-active adjectives (exciting, delightful, pleasing, and passionate) and four positive-passive adjectives (calm, relaxing, serene, and comforting) on a seven-point Likert scale, where 1 being extremely negative and 7 being extremely positive ($M= 4.670$, $SD= 1.160$, $\alpha= 0.953$).

Attitude.

Respondents' attitude toward the stimulus website and the brand were measured through three dimensions adopted from former literatures. To begin with, *overall attitude* toward the shopping experience was measured through the same scale as adopted in the pre-stimulus section (M= 4.645, SD= 1.246, α = 0.931) (Spears & Singh, 1987). Additionally, two specific aspects of attitude were measured. Firstly, *attitude toward the site* is an indicator of web site effectiveness, and studies suggest that it is positively related to brand attitude and purchase intention (Bruner & Kumar, 2000). Therefore, four items adopted from Elliot and Speck's scale, which revised Chen and Well's attitude scale to accommodate a context of online retailing website (2005), (M= 4.389, SD= 1.200, α = 0.819). Secondly, four items measuring *perceived values* for shopping on the site (M= 3.953, SD= 1.311, α = 0.801) was adopted from Chen and Well's scale (2005). Together, the three attributes measured respondents' attitude regarding their shopping experience on the stimulus websites (M= 4.35, SD= 1.12, α = 0.93).

Brand Value.

Adopted from Brakus, Schmitt and Zarantonello's Exploratory Factor Analysis on Brand Experience (2009), brand value was assessed through eleven items from affective, behavioral, and intellectual dimensions (M= 3.628, SD= 1.321, α = 0.948). For affective brand value, the survey asked whether the brand could elicit sentimental effects on its customers, such as "the brand induced feelings and sentiments". For intellectual brand value, the measures assessed the extent to which respondents were encourage by the brand to apply critical thinking in his/her shopping experiences, such as "I engaged in a lot of thinking when I encountered this brand". For behavioral brand value, participated were

recoded with their actual actions triggered by the brand and its online store, such as “I engaged in physical actions and behaviors when shopping on the website”.

Behavioral Intention.

In total, five aspects of behavioral intention (desire to stay on the website, intention to return, recommendation, purchase intention, and willingness to pay more) were taken into concern in the study. To assess respondents’ *desire to stay on the website*, they were asked if they were to visit the stimulus website without time constraint through three itmes from Kim, Fiore and Lee’s form (2007) (M= 3.77, SD= 1.41, α = 0.88). Respondents’ *intention to return* to the online shopping sites (M= 4.13, SD= 1.56, α = 0.87) and *intention to recommend* the websites, the brand and its products to acquaintances (M= 3.73, SD= 1.62, α = 0.91) were measured by items from selected from Coyle and Thorson’s scale (2001). While purchase intention was proved to indicate higher commitment than the former intentional attributes, the factor was measured by Putrevu and Lord’s scales and revised to suit the online shopping context (1994). Specifically, the form included questions asking respondents’ intention in purchases on both needed and voluntary basis, trial purchases, and purchases to learn more about a new brand (M= 3.80, SD= 1.52, α = 0.93). Finally, items adopted from Baker and Crompton’s form were utilized to investigate participants’ *willingness to pay more* (2000). The persuasive outcome is considered as a robust indicator toward both behavioral intention and customer loyalty, as those who reported high willingness agreed that they would continue to visit the brand’s online store even if the product prices increase and that they were willing to pay a higher price for products of the brand than for those of others’ (M= 2.86, SD= 1.45, α = 0.89). Inclusively, behavioral intention was measured through the five dimensions (M= 3.81, SD= 1.45, α = 0.95).

Customer share.

Questions pertaining to customer share were adopted from former literature to capture the extent of temporal and economic resources participants were willing to spend proportionally at the stimulus websites. Four items asked participants to fill in blanks indicating (1) the proportion of times he/she shopped for the brand's main product category that he/she would shop on the stimulus online store, (2) the amount out of every \$100 spent on online shopping that he/she would spend at the stimulus online store, (3) the amount out of every \$100 spent on the brand's main product category that he/she would spend at the stimulus online store, and (4) considering the total amount he/she spent on the brand's main product category per year, the percentage that he/she would spend on the stimulus online store (Babin & Attaway, 2000) ($M= 25.30$, $\min= 0$, $\max= 100$, $SD= 23.79$, $\alpha= 0.91$).

Retail preference.

The attribute measures whether respondents considered the brand with excellence and whether they posited relative positive attitude toward the stimulus brand and its products, in comparison to that of other options he/she had when shopping online. Per previous literature, four items (e.g. "When it comes to shopping for leather goods, the brand is among my top choices,") were measured on a seven-point Likert scale (Mathwick, Rigdon & Malhotra, 2001). Four items were measured on seven-point Likert scales ($M= 3.87$, $SD= 1.37$, $\alpha= 0.91$).

Results

DATA ANALYSIS

One-way analysis of variance (ANOVAs) were used to check whether the manipulations of interactive music were effective and whether interactive music has a significant total effect on the proposed persuasive outcomes. Model 4 of the PROCESS macro developed by Hayes was used (2013) and Bootstrapped 95% confidence intervals were calculated to identify indirect effects of the mediators on participants' behavior and perception. Univariate analyses were used to explore interaction effects of interactive music with proposed moderating variables.

MANIPULATION CHECK

Perceived interactivity.

One-way ANOVA showed that the manipulated conditions with interactive music differed significantly from each other in their levels of perceived interactivity, $F(2, 248)=29.07$, $p =0.00$. Post hoc tests using Tukey-Kramer HSD (honestly significant difference) indicated that the condition with interactive music ($M= 4.33$, $SE= 0.14$) led to the higher level of interactivity, followed by the condition with static background music ($M= 3.41$, $SE= 0.13$) and the control condition ($M= 2.85$, $SE= 0.14$).

Arousal.

The result of one-way ANOVA test showed that the manipulation of audio arousal was successful, $F(2, 248)= 9.81$, $p =0.00$. Post hoc tests using Tukey-Kramer HSD (honestly significant difference) indicated that the condition with interactive music ($M= 4.68$, $SE= 0.14$) led to the higher level of interactivity, followed by the condition with static background music ($M= 4.43$, $SE= 0.15$) and the control condition ($M= 3.89$, $SE= 0.11$).

THE MEDIATING EFFECTS OF VIVIDNESS AND USER ENGAGEMENT

Vividness.

One-way ANOVA tests revealed significant main effects of interactive music on measures of *perceived vividness* ($F(2, 248) = 6.533, p = 0.00$). In addition, Post hoc tests by Tukey-Kramer HSD showed that the interactive music condition led to the highest level of perceived vividness ($M = 4.57, SE = 0.14$) followed by the static music condition ($M = 4.02, SE = 0.16$) and the control condition ($M = 3.81, SE = 0.15$) (see Figure 5).

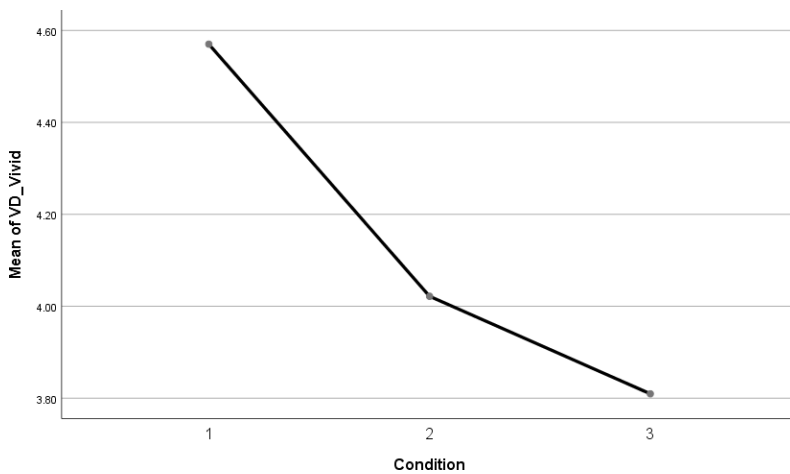


Figure 5. Respondents' perceived vividness under the three manipulated conditions¹

The next, Model 4 of the PROCESS macro was employed to examine whether vividness explains the indirect effects of interactive music on user engagement. Compared to condition with static background music, interactive music significantly enhanced cognitive engagement, and perceived vividness was found with significant indirect effects on *involvement* ($B = 0.38, SE = 0.12, 95\% \text{ C.I. from } 0.17 \text{ to } 0.63$) and on *evaluation* ($B = 0.20, SE = 0.07, 95\% \text{ C.I. from } 0.08 \text{ to } 0.34$). Besides, interactive music also elevated the

¹ 1: Interaction music condition, 2: Static background music condition, 3: Control condition

extent of affective engagement, and perceived vividness revealed significant indirect effects on the aspects of *affect* (B= 0.30, SE= 0.09, 95% C.I. from 0.14 to 0.48), *enjoyment* (B= 0.54, SE= 0.15, 95% C.I. from 0.25 to 0.83), *challenge* (B= -0.13, SE= 0.06, 95% C.I. from -0.27 to -0.02), *novelty* (B= 0.45, SE= 0.13, 95% C.I. from 0.21 to 0.70), and *feedback* (B= 0.44, SE= 0.13, 95% C.I. from 0.21 to 0.69). Following, the mediating effects of aesthetic value was investigated. Similarly, when compared to the condition with static background music, interactive music improved user engagement, and aesthetic value has significant indirect effects on the following attributes: *involvement* (B= 0.21, SE= 0.11, 95% C.I. from 0.01 to 0.43), *evaluation* (B= 0.12, SE= 0.06, 95% C.I. from 0.01 to 0.26), *affect* (B= 0.18, SE= 0.09, 95% C.I. from 0.01 to 0.35), *enjoyment* (B= 0.29, SE= 0.15, 95% C.I. from 0.02 to 0.59), *challenge* (B= -0.11, SE= 0.06, 95% C.I. from -0.25 to -0.01), and *feedback* (B= 0.23, SE= 0.12, 95% C.I. from 0.01 to 0.46).

User engagement.

To begin with, results of one-way ANOVA test showed that the interactive music condition differed significantly from each other in terms of the *novelty* aspect of respondents' affective engagement, ($F(2, 248)= 3.95, p= 0.02$). According to Post hoc tests using Tukey-Kramer HSD, the condition with interactive music resulted in the highest level of novelty (M= 4.03, SE= 0.15), followed by the condition with static background music (M= 3.71, SE= 0.15) and the control condition (M= 3.49, SE= 0.12) (see Figure 6).

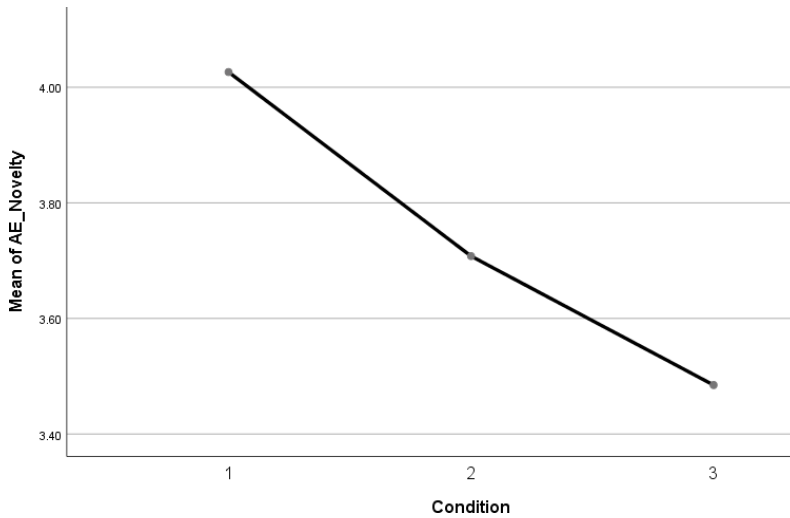


Figure 6. Respondents' reported level of novelty under the three manipulated conditions²

Next, the indirect effects of novelty were assessed by using Model 4 of the PROCESS macro. Compared to the condition with static background music, interactive music has significantly increased the level of respondents' perception and behavioral intention in terms of the following measures: *evaluation toward web features* (B= 0.23, SE= 0.09, 95% C.I. from 0.07 to 0.41), *customer experiences* (B= 0.26, SE= 0.10, 95% C.I. from 0.07 to 0.46), *attitude toward the site* (B= 0.30, SE= 0.11, 95% C.I. from 0.09 to 0.53), *brand value* (B= 0.38, SE= 0.14, 95% C.I. from 0.12 to 0.66), *behavioral intention* (B= 0.37, SE= 0.14, 95% C.I. from 0.11 to 0.65), *customer share* (B= 0.25, SE= 0.94, 95% C.I. from 0.07 to 0.45), and *retail preference* (B= 0.35, SE= 0.13, 95% C.I. from 0.11 to 0.60).

² 1: Interaction music condition, 2: Static background music condition, 3: Control condition

THE INTERACTION EFFECTS OF INTERACTIVE MUSIC AND INDIVIDUAL DIFFERENCES

Website-related measures.

One-way ANOVA tests did not show a significant main effect of interactive music on any of the web-related measures. However, through univariate analysis, interactive music was identified with a number of interaction effects with various antecedent variables which moderate consumers' online shopping behavior and decision-making processes.

Evaluation of web features.

Interactive music was found with similar interaction effects with respondents' existing *attitude* ($F(2, 245) = 6.90, p = 0.00$) and levels of previous *enjoyment* ($F(2, 245) = 5.00, p = 0.01$) for online shopping. With positive attitude or a higher level of enjoyment, interactive music led to more positive evaluation of the web features, compared to the use of static background music (see Figure 7 and Figure 8). By contrast, given that there is a significant interaction effect between interactive music and the importance of *web design* as a purchase decision factor ($F(2, 245) = 7.64, p = 0.00$), when the importance of web design increased, interactive music led to inferior evaluation toward web features, compared to static background music (see Figure 9). Lastly, when mediated by respondents' previous *involvement* in online shopping ($F(2, 245) = 7.62, p = 0.00$), consumers with low involvement reflected more positive evaluation toward web features on the online store under the static music condition; but, with increasing level of involvement, little difference was found between the two conditions (see Figure 10).

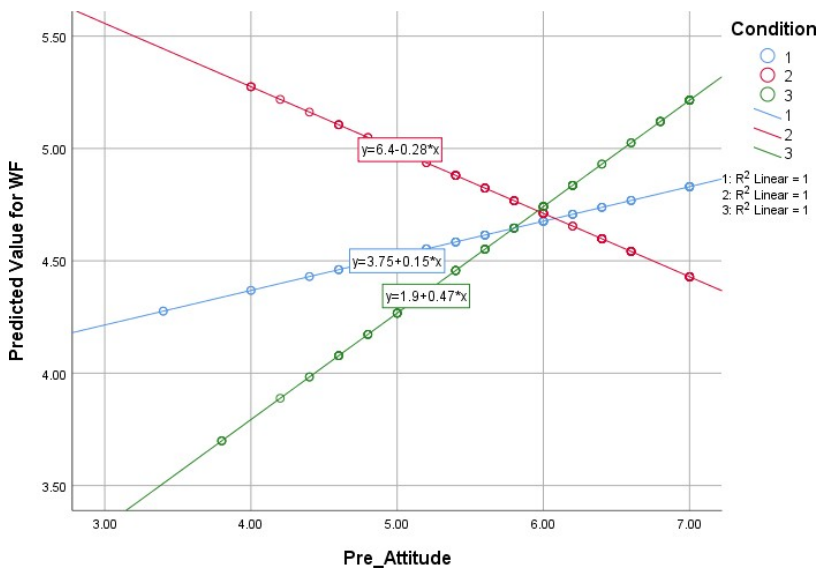


Figure 7. Interaction effect of existing attitude with the three manipulated conditions³

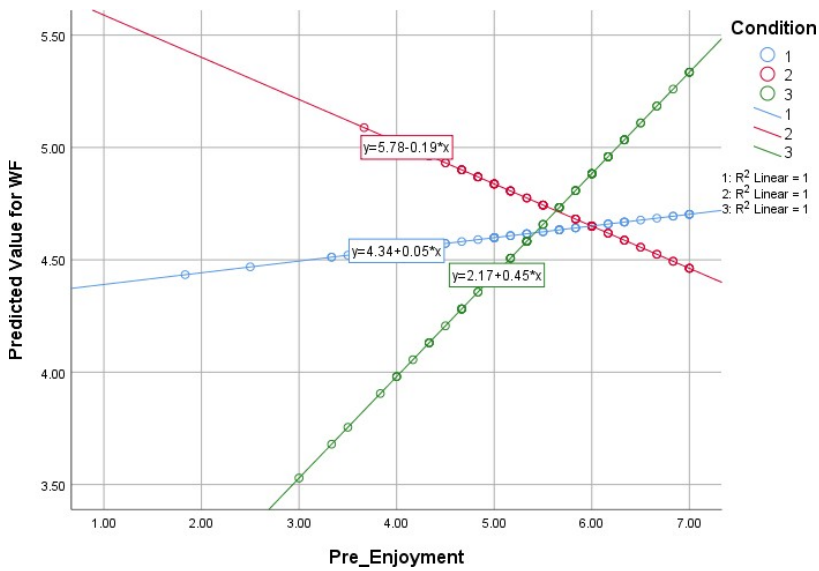


Figure 8. Interaction effect of previous enjoyment toward online shopping with the three manipulated conditions⁴

³ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

⁴ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

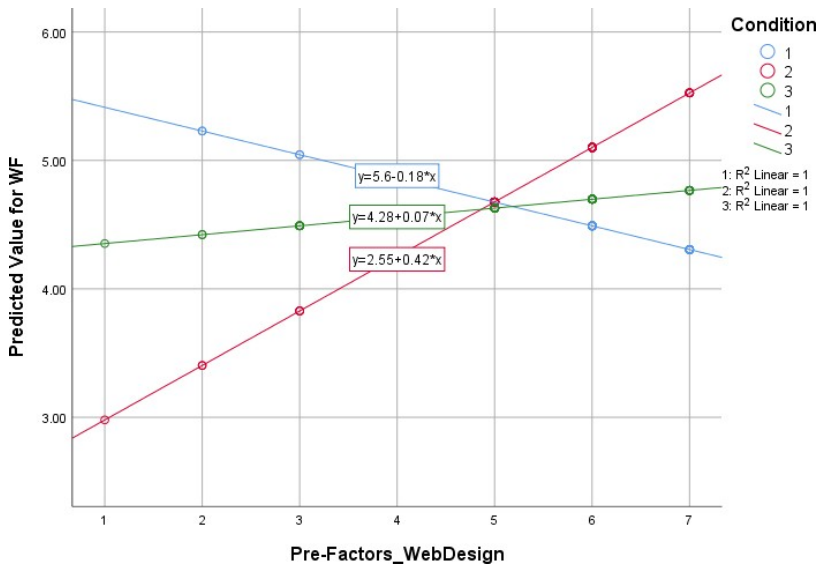


Figure 9. Interaction effect of the importance of web design as a purchase decision factors with the three manipulated conditions⁵

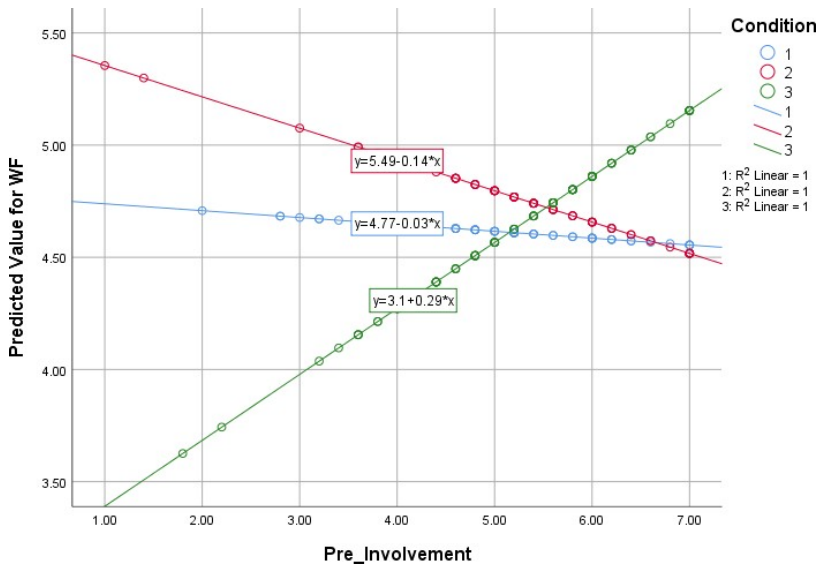


Figure 10. Interaction effect of previous involvement toward online shopping with the three manipulated conditions⁶

⁵ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

⁶ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

User experience.

The first, interactive music has a significant interaction effect with users' existing *attitude* toward online shopping ($F(2, 245)= 5.11, p= 0.01$). For respondents who held more positive attitude toward online shopping, the presence of interactive music led to preferable user experience; for respondents who held more negative attitude, the use of static background music alone resulted in the best customer experience (see Figure 11). Secondly, interactive music also has a significant interaction effect with the importance of both *price* ($F(2, 245)= 4.14, p= 0.02$) and *web design* ($F(2, 245)= 3.52, p= 0.03$) as purchase decision factors. When price serves as an unimportant factor, interactive music led to less favorable shopping experience; when price plays a key role in purchase decisions, user experiences under each the three conditions did not differ (see Figure 12). When web design is considered as a more important factor, interactive music resulted in less favorable customer experience (see Figure 13). Similarly, given a significant interaction effect between interactive music and *shopping orientation* ($F(2, 245)= 3.30, p= 0.04$), when respondents who strong tendency as experiential oriented shoppers, interactive music created the least favored customer experience (see Figure 14).

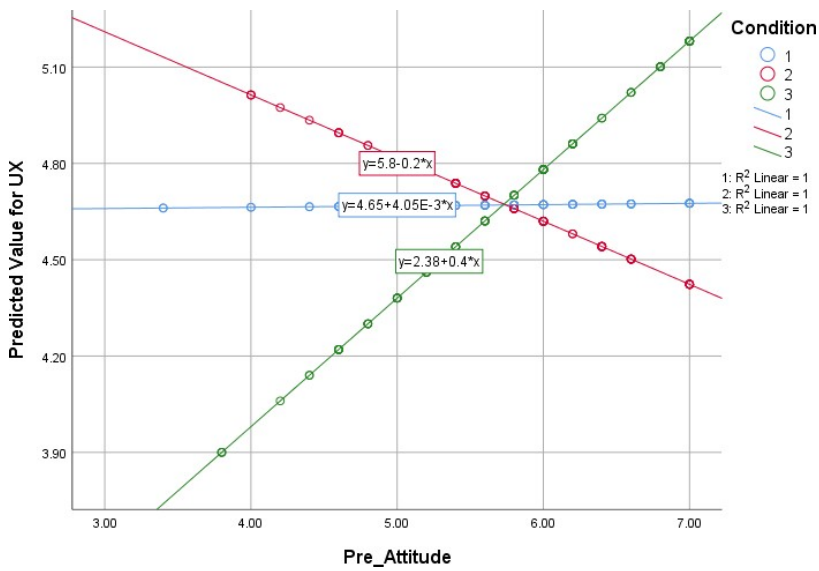


Figure 11. Interaction effect of previous attitude toward online shopping with the three manipulated conditions⁷

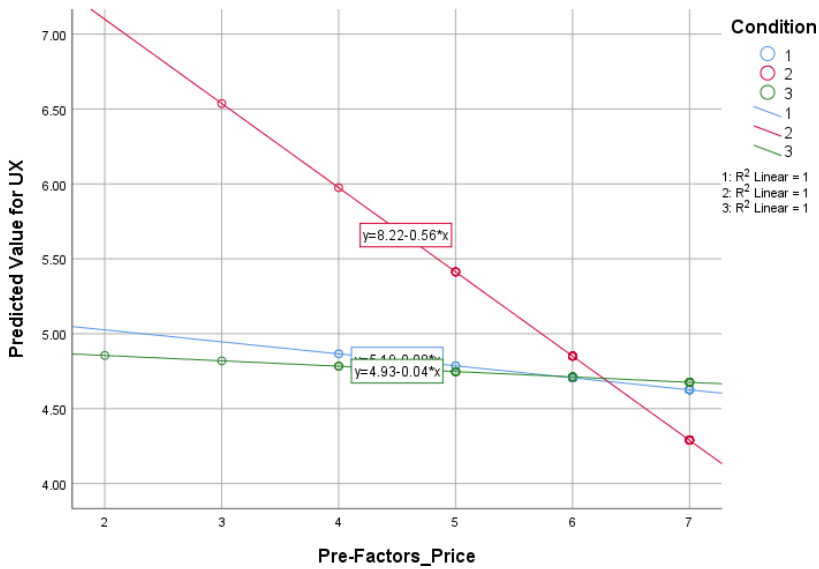


Figure 12. Interaction effect of the importance of price as a purchase decision factor with the three manipulated conditions⁸

⁷ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

⁸ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

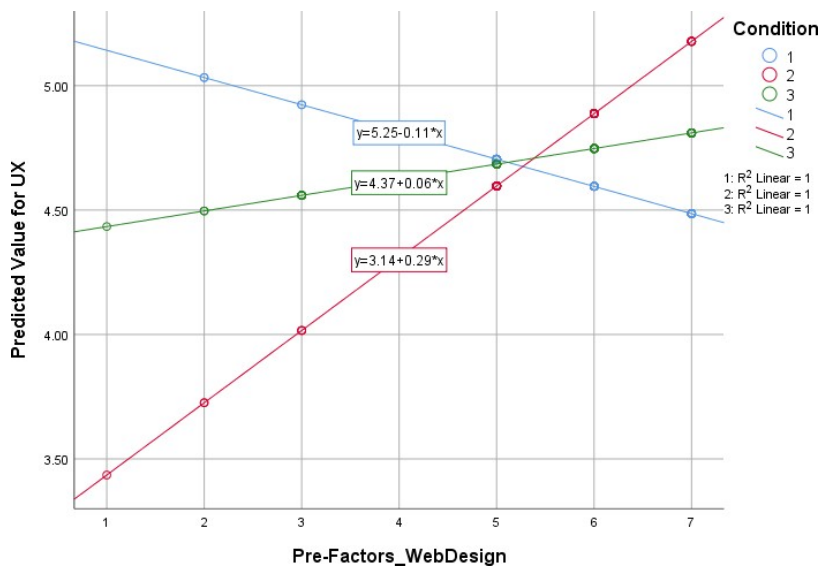


Figure 13. Interaction effect of the importance of web design as a purchase decision factor with the three manipulated conditions⁹

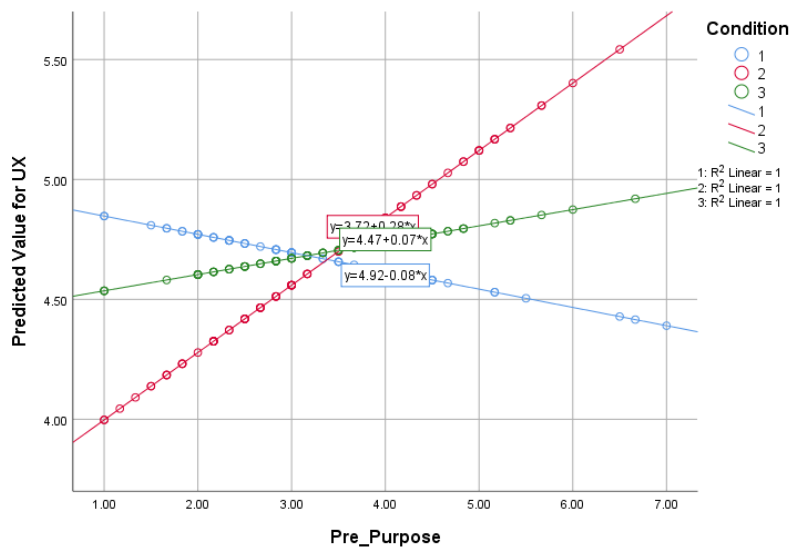


Figure 14. Interaction effect of previous online shopping orientation with the three manipulated conditions¹⁰

⁹ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

¹⁰ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

Attitude toward the site.

Interactive music has significant interaction effects with both respondents' existing *attitude* toward online shopping ($F(2, 245)= 3.60, p= 0.03$) and with the importance of *price* as a purchase decision factor ($F(2, 245)= 3.79, p= 0.02$). Consistently, when either price or existing attitude serves as weak factors, interactive music led to a more positive attitude toward the site, but when levels of the two moderators increase, the three conditions did not show significant differences (see Figure 15 and Figure 16).

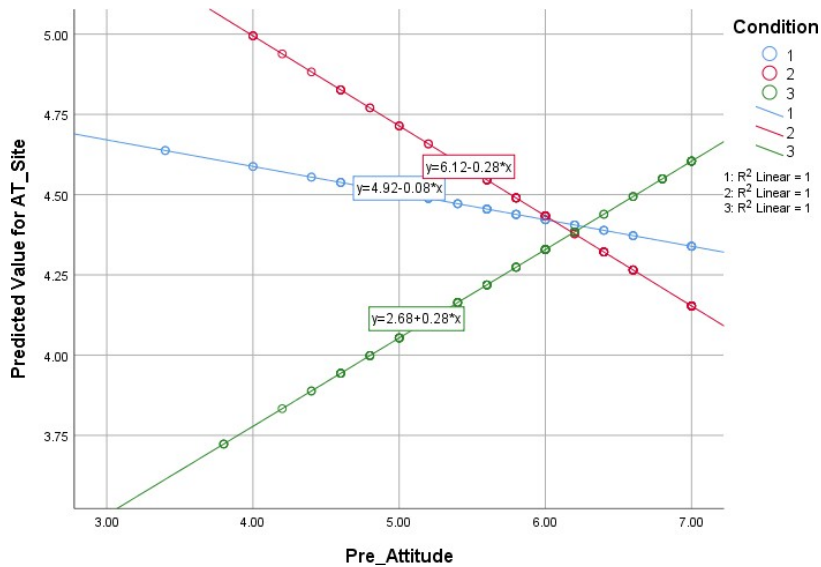


Figure 15. Interaction effect of existing attitude with the three manipulated conditions¹¹

¹¹ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

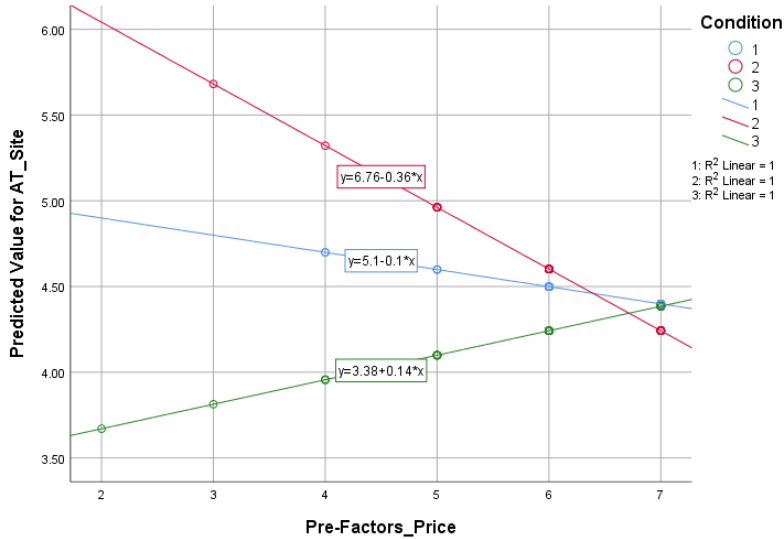


Figure 16. Interaction effect of the importance of price as a purchase decision factor with the three manipulated conditions¹²

Brand-and-product-related measures

Brand value.

Interactive music was found with similar interaction effects on brand value with respondents' existing *attitude* ($F(2, 245) = 4.25, p = 0.02$) and levels of previous *enjoyment* ($F(2, 245) = 5.35, p = 0.01$) for online shopping. With positive attitude or a higher level of enjoyment, interactive music led to higher, compared to static background music (see Figure 17 and Figure 18). Conversely, while interactive music also has an interaction effect with recent online *purchase amount* ($F(2, 245) = 4.06, p = 0.03$), the independent variable led to lower brand values in comparison with static background music (see Figure 19).

¹² Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

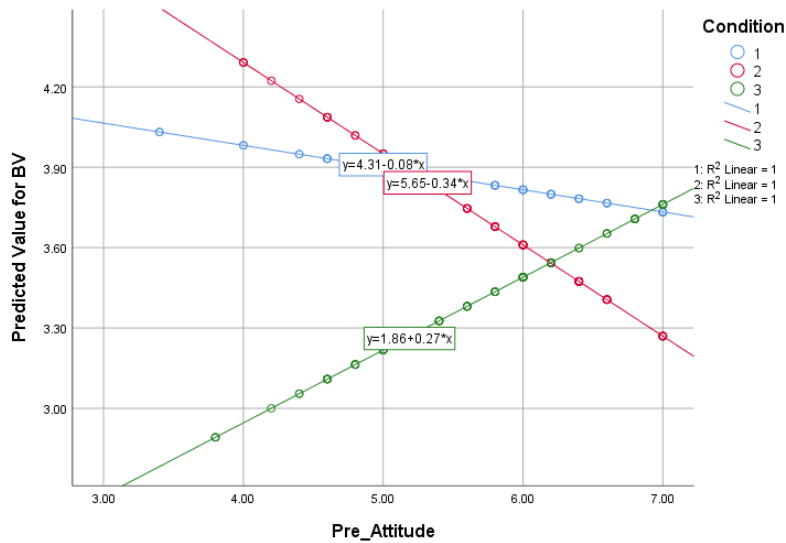


Figure 17. Interaction effect of existing attitude toward online shopping with the three manipulated conditions¹³

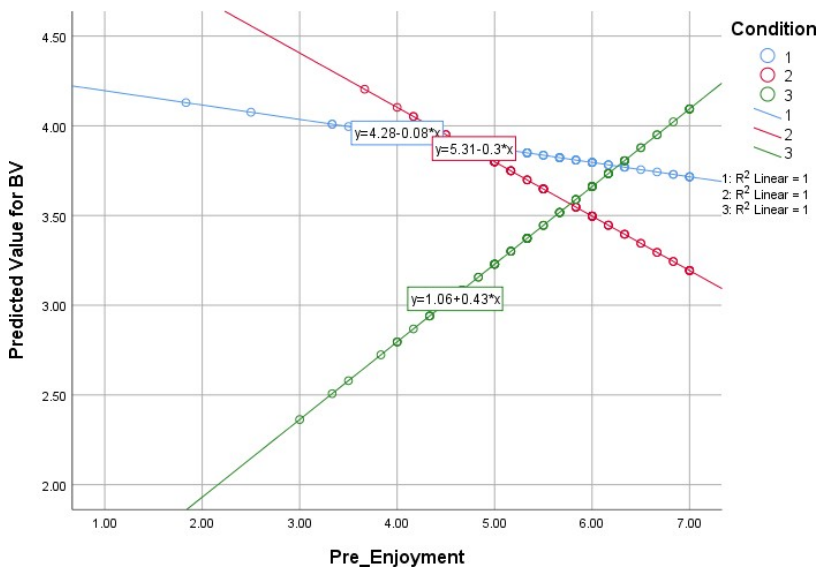


Figure 18. Interaction effect of previous enjoyment in online shopping with the three manipulated conditions¹⁴

¹³ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

¹⁴ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

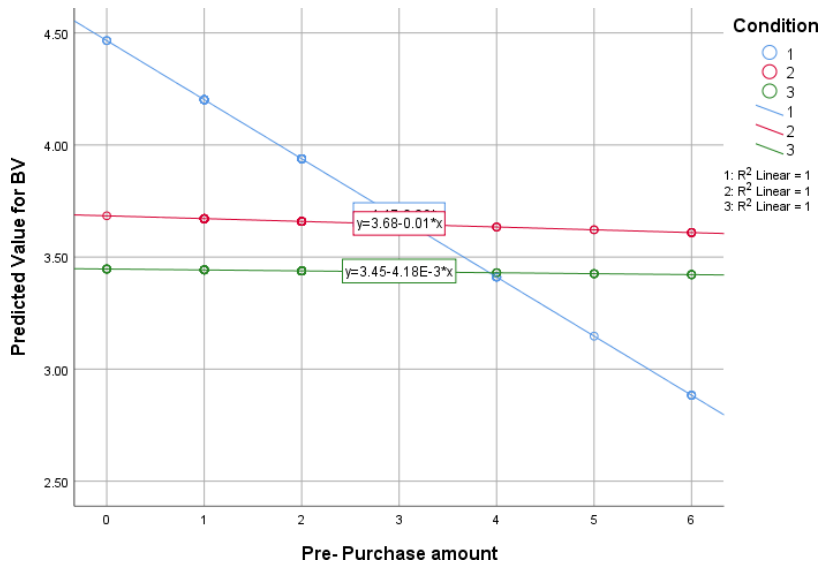


Figure 19. Interaction effect of online purchase amount in the past three months with the three manipulated conditions¹⁵

Behavioral intention.

Interactive music again demonstrates a significant interaction effect with the importance of *price* as purchase decision factor ($F(2, 245) = 4.25, p = 0.01$). Similar with former findings, interactive music led to lower behavioral intention when prices are less salient a factor; however, when the importance of price factor increased, the three conditions did not result with a significant difference (see Figure 20).

¹⁵ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

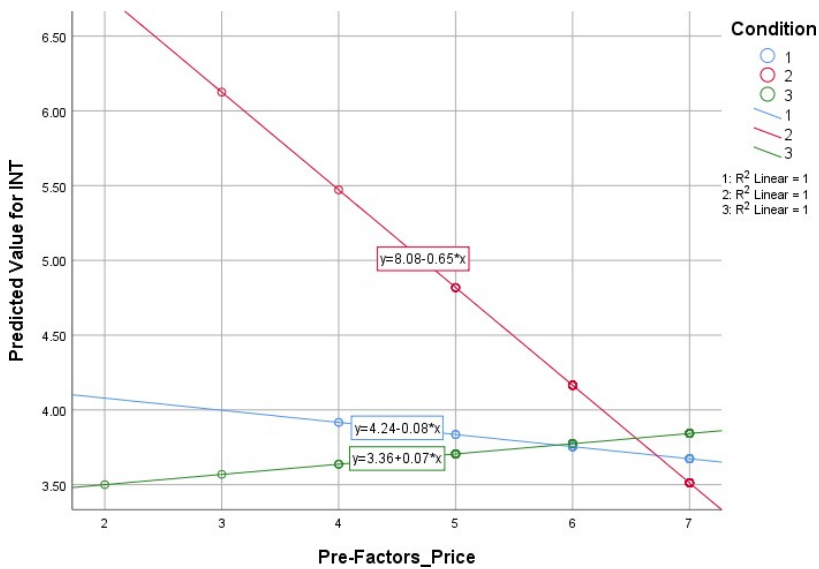


Figure 20. Interaction effect of the importance of price as a purchase decision factor with the three manipulated conditions¹⁶

Customer share.

Interactive music has a significant interaction effect with the importance of *price* factor on customer share measures ($F(2, 245) = 3.91, p = 0.02$). Once again, when prices are considered as an unimportant factor toward purchase decisions, interactive music led to a lower level of customer share; nonetheless, when the importance of price factor increased, the three conditions yielded similar outcomes (see Figure 21).

¹⁶ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

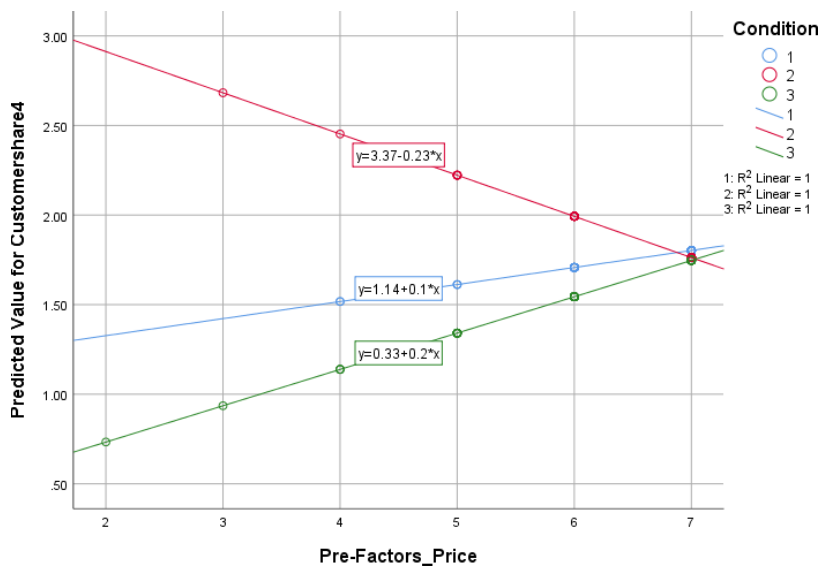


Figure 21. Interaction effect of the importance of price as a purchase decision factor with the three manipulated conditions¹⁷

Retail preference.

Once again, interactive music has a significant interaction effect with *price* as a purchase decision factor ($F(2, 245) = 3.51, p = 0.03$). When prices are considered as an unimportant factor toward purchase decisions, interactive music led to a lower level of retail preference; on the other hand, when price serves as a critical factor, the three conditions did not differ in results (see Figure 22).

¹⁷ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

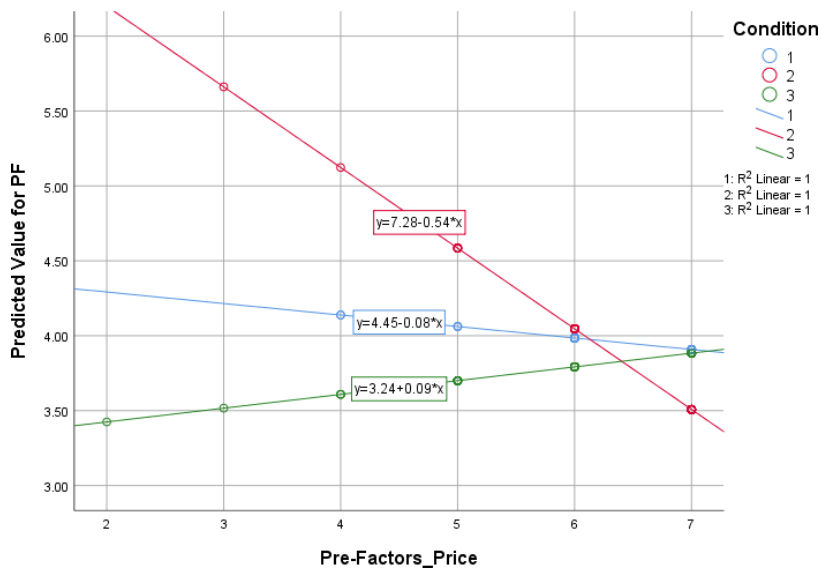


Figure 22. Interaction effect of the importance of price as a purchase decision factor with the three manipulated conditions¹⁸

¹⁸ Blue line 1: Interaction music condition, Red line 2: Static background music condition, Green line 3: Control condition

Summary

According to data analysis of the experiment, Interactive music significantly enhanced perceived vividness of the shopping website and affective engagement, particularly in the aspect of novelty. Whereas vividness explained why interactive music led to more affective engagement, the attribute heightened by interactive music successfully predicted participants' brand perceptions and attitudes. Interactive music also influenced online consumers through interaction effects in three unique pathways. The more positive attitude consumers held toward online shopping, the more positive outcomes interactive music produced on their perception and behavioral intention. The positive response toward interactive music also increased as the importance of price factor raised, and as the importance of web design factor decreased.

VALIDATION OF THE THEORETICAL FRAMEWORK

Empirical outcomes of the present study verified all three hypotheses in the proposed theoretical framework. To begin with, one-way ANOVA demonstrated the highest level of affective engagement under the interactive music condition, followed by the static background music condition and the control condition. Therefore, Hypothesis 1 is verified. On top of the findings, a heightened level of novelty perceived by participants in the interactive music condition contributes to the greatest extent of affective engagement. In addition, the use of Model 4 of the PROCESS Macro reported significant mediating effects of user engagement under the interactive music condition, which had a positive impact on evaluation toward web features, customer experiences, attitudes toward the site, brand value, behavioral intention, customer share, and retail preference. Hence, Hypothesis 2 is also verified, and the research findings indicated that interactive music not only

enhances online user engagement but is also effective in improving online consumer perception and behavioral intention.

On the other hand, one-way ANOVA likewise revealed the highest level of perceived vividness under the interactive music condition, followed by the condition with static background music, then the control condition. Furthermore, under the interactive music condition, perceived vividness was found with significant mediating effects on enhancing affective engagement through positive influences on the affect, enjoyment, novelty, and feedback of online participants as well as a reduction on the degree of challenge throughout their user experience. Synthesizing the above findings, Hypothesis 3 is also verified, and interactive music is proved to directly increase the degree of perceived vividness, which generates a greater extent of user engagement to positively influence online shoppers.

THE MODERATING EFFECTS OF INTERACTIVE MUSIC AND E-COMMERCE ANTECEDENTS

Though interactive music did not directly influence participants' perception and behavioral intention, it was effective when certain e-commerce antecedents were taken into concern. In particular, interactive music generated indirect impact on participants through interactions with existing attitudes toward e-commerce, previous enjoyment and the level of involvement in online shopping, and whether they consider price or website design as a critical purchase decision-making factor.

Existing attitude and previous enjoyment.

Per literature review, both existing attitude and previous enjoyment of online shopping are classified as existing perception toward online shopping among the three categories of antecedents which influence purchase decision-making processes (Chang,

Cheung, & Lai, 2005). Interestingly, the present study saw similar effects of the two antecedents on web-related variables and brand-and-product-related variables. Specifically, when a participant possessed a more positive attitude or more favorable former experiences toward online shopping, the interactive music condition tended to have greater impact on the individual's behavioral intention and evaluation towards the brand and its website. Conversely, when a participant held a low level of positivity in one's attitude or enjoyment toward online shopping, the effects of interactive music on consumer perception and behavioral intention diminished.

The price factor and involvement in online shopping.

Present research findings also saw similar effects moderated by the price factor and levels of involvement in online shopping. When the more a consumer viewed price as a critical factor for purchase decision, the more interactive music generated positive impact on the individual. By contrast, when the price factor is less important, interactive music became less effective on enhancing online consumer's behavioral intention. Likewise, when a consumer regarded online shopping as a low involvement task, interactive music demonstrated greater impact on the person's attitudinal and intentional responses toward the brand and its website. However, when a participant had been actively involved in online shopping, the use of interactive music can influence the individual from neither psychological nor behavioral aspects.

Website design and experiential values.

Last but not least, data analysis suggested similar interaction effects of interactive music with two variables pertaining to interface design. The first, when website design was reported to affect one's online purchase decision, the use of interactive music had limited

effects on the person's evaluation toward the e-commerce platform, the brand and its products. However, while a participant had little concern towards presentation of the website, the interactive music condition led to more positive persuasion outcomes. Similarly, though interactive music had limited impact on experiential oriented consumers, it positively influenced users who paid less attention to the aesthetic values of an shopping experience.

Discussion

THEORETICAL IMPLICATIONS

Results validated the mediating effect of vividness on user engagement and suggested that interactive music created more vivid interface than static background music did. Per literature reviews, a heightened extent of vividness can encourage behavioral intention toward the interface (Sutcliffe, 2009). Especially, interacting with background music was essential to produce greater perception of novelty, which creates a higher degree of attractiveness for the communication platform (Mollen & Wilson, 2010). Therefore, the shopping website that allowed consumers to change its background music was perceived to be more novel, unexpected, and original, which led to more positive brand attitudes and higher behavioral intention to purchase. In addition, the joint effect of interactivity and musical arousal not only further expanded the scope of ones' cognitive processing to elevate user engagement, but consumers were also provided with a sense of control over the aesthetic aspect of the online shopping experience. Therefore, the use of interactive music resulted in more positive evaluations toward the brand and its products. These findings contribute to revealing the key mechanism by which interactivity of e-commerce websites can be more engaging to consumers. Interacting with the background music while shopping online is perceived to be fresh, unique and pleasant, and the positive experience enhances consumers' brand attitudes and even behavioral intentions, even when all the other aspects of the website remained the same across three conditions.

Regarding significant moderating effects identified in the present study, findings on the major antecedents each contribute to existing literatures in a unique way. The first, consistent findings in the effects of consumers' existing attitudes and enjoyment of online shopping support the established Theory of Reasoned Action (Fishbein & Ajzen, 1975).

The present study reaffirms existing attitude and former experience as critical factors affecting individuals' perception and behavior. Additionally, current research findings suggest that, given the context of e-commerce and the presence of interactive music, positive prior attitude and enjoyment result in more favorable evaluations toward the brand and its products, and thus predict a stronger behavioral intention on the online shopping website.

The moderating effect of price and web features as purchase decision-making factors provided additional insights to the function of interactive music as a heuristic cue (Petty & Cacioppo, 1986) and resonated with the Dual-Process Model of Interactivity Effects that interactivity can influence its audience through different pathways (Liu & Shrum, 2009). On one hand, the experiment manipulated a low-involvement condition for price-oriented consumers; hence, the mere presence of interactive music created a pleasant merchandising environment and elicited positive emotional and attitudinal reactions of its users. On the other hand, participants who are attentive to design of an interface were more likely to apply the central route to process perceived website features, including the background music per se. Thus, interactive music served as an additional factor for these consumers to evaluate, which did not necessarily result in positive outcomes since interacting with the background music did not significantly change the usability of the website or the efficiency of their online shopping. Similar implications apply to findings regarding the moderating effects of individual involvement in online shopping. The presentation of interactive music attracted less involved shoppers by creating a novel and playful experience. However, the new media format created additional information for serious online consumers to digest. In addition, interactive music has yet to be widely adopted on e-commerce platforms, the unexpected condition resulted in an inhibiting effect on inexperienced users.

PRACTICAL IMPLICATIONS

Practical wise, the present study not only revealed potential of employing interactive music to the design of online retail platforms but also provided various marketing implications. To begin with, findings in respect to interactive music's positive impact on enhancing perceived novelty are meaningful under the context of new media, website interactivity and their application in digital marketing communication (Hwang & Seo, 2016). The first, given that interactive music is particularly impactful on eliciting perceived novelty, marketers should strategize to approach consumers who are early adopters of innovations, according to the Social Technology Adopt Theory (Hall & Khan, 2003).

Secondly, given that interactive music is effective in enhancing affective engagement through vividness, the use of interactive music on online stores with product presentation that comes alongside rich and creative visuals are more likely to see a positive impact of the media format. Thirdly, consumers' current perception toward e-commerce, digital purchase amount, and frequencies of online shopping over brick-and-mortar stores can be a guideline for market research, as existing attitude is a strong predictor of consumers' positive responses to interactive music.

On the other hand, the present research results also suggest the Dual-Process Model of Interactivity Effects provides major guides for the application of interaction music (Liu & Shrum, 2009). In terms of product selection, findings prefer commodities which come with a low-to-medium price range and require little efforts in purchase decisions. That is, marketers are suggested to avoid functional products and present social or affective goods with the application of interactive music. As the latter two product types generally demand a lower level of involvement, the presence of interactive music can serve more effectively as a peripheral cue. Last but not least, the extent of arousal should be carefully examined

with focus groups before the launch of an e-commerce website with the use of interactive music. As the present research findings also suggested that when there is an excessive amount of interface components to process, an inhibiting effect can result from the online shopping experience.

LIMITATIONS OF THE PRESENT STUDY

Despite the efforts placed in creating the stimulus websites, there are several limitations regarding the design of the experimental conditions. As the piece of interactive music and the websites used in the present study were not made by professional composers and web developers, some participants may regard the components and presentation of the stimuli being less fluent and intuitive. Besides, as interactive music is not a technique commonly used in the design of an online sale channel, such unfamiliarity may cause users to consider the website as unnatural. In addition, given a time constraint on the research project, the present study only selected one interactive music technique and performed the same stimulus repeatedly on the online shopping website. As a result, such repetition can cause boredom and exhaustion on the test participants.

Originally, the experiment aimed to investigate if there is a difference in terms of the amount purchased and the time spent on each stimulus website. However, no significant result was revealed, which was very likely to result from participants' high awareness of the test scenario. That is, as they were conscious that they were participating in a study rather than in a real shopping situation, their main goal may have shifted to completing the given shopping task and their decision-making processes can be affected. For instance, prices of the products may play a less critical role in their consumption on the stimulus websites, as they were informed that they would not be charged for any purchase during the study. On the other hands, while the experiment asked participants to stay on the

stimulus websites for at least three minutes, tracking data showed that the majority of them spent just about three minutes to browse the website, which is another sign indicating that respondents may have focused on completing the given task rather than considering the experience in reality. Finally, there are limitations due to the demographics of the study's participants. While they are all recruited through the Advertising Participants Pool at the Stan Richards School of Advertising and Public Relations, not only that their age range is considerably limited, but there is a skewness in the gender of the test sample, where the majority of respondents are female. Also, while various literature suggested that Internet usage and knowledge of users play a key role in the effects of interactive features on websites, as the participants are mostly digital native, the study results were not able to provide insightful information from this perspective. Additionally, respondents mostly reported rich experiences in online shopping, and thus, the study was not able to conduct further analysis on how familiarity with the use of e-commerce influence consumers' perception under the presence of interactive music.

SUGGESTIONS FOR FUTURE STUDIES

On top of all, future studies are encouraged to experiment with other types of interactive music techniques, such as applying the interactive feature of tempo acceleration to examine whether providing users with a control over the pace of a background music has an effect on their online consumer behavior (Ding & Lin, 2012). Furthermore, under the use of interactive music, it is critical to ask how the effects of interactivity and of music can be differentiated and also to understand each of their roles in the causal framework – does either one of the two components of the stimulus contribute more to the persuasive outcomes? Besides, a number of recommendations made for practical implications in the previous section can be further verified in future studies. For instance, to investigate the

effects of interactive music on online shopping environment for different product types or to discuss whether consumers of different personality traits will respond differently to the presence of interactive music can all be interesting and practical topics to study in the future. Finally, considering a wide range of emerging new media, it is always meaningful to make comparisons or to examine a joint use of interactive music with other techniques. After all, with regard the nature of interactive music as an innovative technology, there is a preceding way to explore the full potential of the new media format.

Appendix I: Pre-Stimulus Survey

1. Have you visited an online store at least once in the past month?
2. What kind of Web browser are you using now?
3. Please indicate your agreement to the following statement: "Generally speaking, I have no problem navigating myself on my first visit to a website."
4. How often do you use the Internet for the following purposes? (1) Professional (work or study purposes); (2) Communication; interact on social websites; (3) Gaming; (4) Online shopping; (5) Seek for information; (6) Entertainment.
5. Do you currently study or work in the field of music or related areas (e.g. music management, music therapy)?
6. Do you play any musical instrument (including vocal) on a regular basis?
7. In average, how many hours do you listen to music every day?
8. How often do you listen to the following types of music? (1) Jazz; (2) Blues; (3) Hip- hop; (4) Rock; (5) Pop; (6) Classical; (7) Country; (8) Electronic.
9. Please indicate your level of agreement with the following statements: (a) I like online shopping. (b) I prefer shopping online over shopping in-store.
10. How often do you shop online in the past three months?
11. Do you subscribe to or have a registered account on any online shopping site?
12. How often do you visit these sites with subscriptions/registered accounts?
13. In the past three months, how much did you approximately spend on online shopping?
14. How would you describe your online shopping experience(s) in the past three months? (1) Good; (2) happy; (3) exciting; (4) satisfying; (5) pleasurable; (6) engaging; (7) relaxing; (8) delightful; (9) wonderful; (10) unique; (11) memorable.

15. For you, online shopping is: (1) unimportant – important; (2) irrelevant – relevant; (3) means nothing to me – means a lot to me; (4) of no concern to me – of concern to me; (5) not needed – needed.
16. Please rate the relative importance of the following factors when you shop online. (1) Price; (2) quality and product features; (3) design of products; (4) design of the online shopping site; (5) available product options (e.g. color, size); (6) return, refunds and other customer services; (7) delivery fees and time.
17. In general, shopping online is: (1) bad – good; (2) unfavorable – favorable; (3) negative – positive; (4) worthless – valuable; (5) unnecessary – necessary.
18. In general, online shopping sites create a feeling of: (1) entertaining; (2) enjoyable; (3) interesting; (4) fun; (5) exciting; (6) appealing.
19. Please indicate your level of agreement with the following statements about online shopping. (1) Shopping online saves time. (2) Products sold online are less expensive than those sold in-store. (3) I have access to more information about products. (4) I can view more products at the same time. (5) Product options can be compared more easily. (6) Online shopping is safe.
20. Please indicate your level of agreement with the following statements about online shopping. (1) There is a risk for me not to see a product in real. (2) It is not safe for me to give personal and payment information online. (3) A product may come different from the website. (4) Delivery time is not reliable. (5) Delivery fees are high. (6) I don't have enough information about online shopping.
21. In general, how would you describe your online shopping behavior? (1) I surf for new sites. (2) I look for ideas. (3) I shop online to kill time. (4) I try new things. (5) I want a unique experience. (6) I want a welcoming site that draws me in.
22. What is your gender?

23. What is your age?

24. What ethnic group do you belong to?

Appendix II: Post-Stimulus Survey

1. Have you put at least three items in your shopping cart?
2. Select all pages you have visited while you were shopping at the online store.
3. Did you click the filter function on the product catalogue?
4. Did you click to "quick view" a product before you enter a product info page?
5. How many products did you put in your shopping cart?
6. Was there any background music on the "*about leather*" online store?
7. Please select all the buttons you clicked in the interactive panel on the product page.
8. Did you notice that there was a change in the background music when you clicked on different buttons on the "about leather" online store?
9. When clicking on different buttons in the interactive panel: (1) I could interact with the background music. (2) I could make a change in the background music. (3) I could initiate a change in the background music when I clicked to open a pop-up box like below. (4) I heard additional MELODY on the original background music when I clicked the buttons. (5) I heard additional BEATS on the original background music when I clicked the buttons. (6) I could cease a change in the background music when I clicked the buttons. (7) The background music responded to my clicking actions.
10. While I was browsing the online shopping site: (1) I felt that I had a lot of control over my visiting experiences on this website. (2) While I was on the website, I could choose freely what I wanted to see. (3) While surfing the website, I had control over what I can do on the site. (4) While surfing the website, my actions decided the kind of experiences I get.

11. Considering your shopping experience on the site, indicate whether you agree with the following statements. (1) The website was interactive. (2) The website was engaging. (3) The website was easy to navigate. (4) I could find my way through the website easily. (5) The website provided immediate feedback. (6) The website provided information I was looking for quickly.
12. Considering your shopping experience on the site, indicate whether you agree with the following statements. (1) I felt that the website features were well connected to my actions. (2) The website was aware of the actions I performed. (3) I felt like I was engaged in an active dialogue with the website. (4) My interactions with the site felt like a back and forth conversation.
13. How would you describe your online shopping experience at the "*about leather*" online store? (1) Good; (2) happy; (3) exciting; (4) satisfying; (5) pleasurable; (6) engaging; (7) relaxing; (8) delightful; (9) wonderful; (10) unique; (11) memorable.
14. If I were to visit the online store without time constraint, (1) I would like to stay at this site as long as possible. (2) I enjoyed spending time on this site. (3) I would probably spend more time shopping on this site than I planned.
15. After browsing the site, (1) I would recommend shopping on this site to my friends and family. (2) It is very likely that I will return to this site. (3) I will return to this site the next time when I need a product. (4) It is very likely that I will buy products from the brand. (5) I will purchase products from the brand next time when I need one. (6) I will definitely try products from the brand. (7) I would like to learn more about the brand and its products.
16. Please indicate your agreement with the following statements. (1) This brand made a strong impression to me. (2) I find the brand interesting in a sensory way. (3) This brand appeal to my senses. (4) This brand induces feelings and sentiments. (5) I

- have strong emotions for this brand after visiting its website. (6) This brand is an emotional brand. (7) I engaged in physical actions and behaviors when shopping on the site. (8) This brand resulted in bodily experiences. (9) I engaged in a lot of thinking when I encounter this brand. (10) This brand stimulated my curiosity. (11) This brand influenced my decision-making process.
17. Please fill in the blanks so that the statements describe you accurately: "out of every five times I shop for leather goods, I would like to shop at this online store."
18. Please fill in the blanks so that the statements describe you accurately. "Out of every \$100 I spend for online shopping, I would like to spend at the online store."
19. Please fill in the blanks so that the statements describe you accurately. "Out of every \$100 I spend on leather goods, I would like to spend at the online store."
20. Considering the amount I spent on leather goods per year, I would like to spend % on this online store.
21. Through your shopping experience on the "*about leather*" online shopping site: (1) When I think of the brand, I think of excellence. (2) I think of the brand as an expert in the product type it offers. (3) The brand's online store is one of the best places to shop. (4) When it comes to shopping for leather goods, the brand is among my top choices.
22. Consider your future visit to the "about leather" online shopping site: (1) I will continue to visit the brand's online store even if the product prices increase. (2) I am willing to pay a higher price for products of the brand than for those of other brands.

23. The website features (e.g., background music if any, shopping options, website design, shopping flow, etc.) on the "about leather" online store are: (1) exciting; (2) delightful; (3) pleasing; (4) passionate; (5) calm; (6) relaxing; (7) serene; (8) comforting.
24. The background music on the "about leather" online store is: (1) exciting; (2) delightful; (3) pleasing; (4) passionate; (5) calm; (6) relaxing; (7) serene; (8) comforting.
25. Interacting with the background music (i.e. making changes to the background music when clicking on different buttons) on the "about leather" online store is: (1) exciting; (2) delightful; (3) pleasing; (4) passionate; (5) calm; (6) relaxing; (7) serene; (8) comforting.
26. Please indicate your agreement with the following statements about "*about leather*" online shopping site. (1) This site has fun, interactive features. (2) This site contains entertaining audio media. (3) This site is designed in a fun and entertaining manner. (4) The site makes good use of the audio capability of the web. (5) This site creates a favorable shopping environment and atmosphere.
27. While browsing the "*about leather*" online shopping site, (1) Time appeared to go by very quickly when I was browsing the product page. (2) I spent more time on the product page than I had intended. (3) While browsing the website, I was able to block out most other external distractions. (4) While browsing the website, I felt absorbed/immersed in what I was doing. (5) I continued to shop on the site out of curiosity.
28. For you, the "*about leather*" online shopping site is: (1) unimportant – important; (2) irrelevant – relevant; (3) means nothing to me – means a lot to me; (4) of no concern to me – of concern to me; (4) not needed – needed.

29. While browsing the "*about leather*" online shopping site, (1) I evaluated products with its features and factors. (2) I thought about what actions I might take based on what I consumed from the website. (3) I found myself making connections between the product information and my common sense/knowledge. (4) I made comparisons among multiple products on the site. (5) I compared the brand and its products with those of other brands. (6) I tried to relate the brand's products to my own user experiences.
30. How would you describe your mood when you were shopping at the "*about leather*" online store? (1) Sad – happy; (2) bad mood – good mood; (3) irritable – pleased; (4) annoyed – content.
31. When you were shopping at the "*about leather*" online store, the site created a feeling of: (1) entertaining; (2) enjoyable; (3) interesting; (4) fun; (5) exciting; (6) appealing.
32. Please indicate your agreement with the following statements. (1) I felt frustrated while visiting this site. (2) I found this shopping site confusing to use. (3) I felt annoyed while visiting this shopping site. (4) Using the shopping site was mentally taxing. (5) This shopping experience was demanding.
33. Please indicate your agreement with the following statements. (1) The shopping experience went beyond my expectation. (2) The website was able to excite my imagination. (3) The shopping site offered novel experiences. (4) I noticed that the website applied new techniques that I did not see among others.
34. Considering your shopping experience at the "*about leather*" online store, indicate your agreement with the following statements. (1) Shopping on the site was worthwhile. (2) I consider my shopping experience a success. (3) This shopping

- experience worked out the way I had planned. (4) My shopping experience was rewarding.
35. Overall, the "about leather" shopping site is: (1) bad – good; (2) unfavorable – favorable; (3) negative – positive; (4) worthless – valuable; (5) unnecessary – necessary.
36. Please indicate your attitude when you were shopping at the "*about leather*" online store. (1) The website made it easy for me to build a relationship with this brand. (2) I was satisfied with the functions provided by the site. (3) I felt comfortable surfing the website. (4) Compared to other websites, I would rate this one as one of the best.
37. Considering your shopping experience at the "*about leather*" online store, please indicate your agreement with the following statements. (1) I would only shop at this online store when I need to buy something. (2) I enjoyed the shopping trip on this site, not just for items I may have purchased. (3) While shopping at this online store, I was able to forget my problems. (4) Compared to other things I could have done, the time spent at this online store was truly enjoyable.
38. Please indicate your agreement with the following statements. (1) The website offered rich media content. (2) The website stimulated my senses. (3) The website was vivid.
39. Considering the design of the "*about leather*" online shopping site: (1) the online store has an attractive character. (2) The overall design of this online store is interesting. (3) The layout of this online store makes it easy to browse for the product I am looking for. (4) Overall, the layout of this online store makes it easy to navigate on the site.

40. Consider the aesthetic aspect of the *"about leather"* online shopping site: (1) The website is aesthetically appealing. (2) I liked the graphics and images used on this shopping site. (3) The color schemes of the online store design are attractive. (4) This shopping site appealed to my visual senses. (5) The layout of the website is visually pleasing.
41. Consider your shopping experience on the *"about leather"* online shopping site: (1) The site came to me and created a "new world" for me. (2) When I left the website, I felt like I came back to the "real world" after a journey. (3) While I was on the site, I sometimes forgot I was in the middle of a study. (4) While I was shopping, the world generated by the site seemed to be more real.
42. While you were shopping on the *"about leather"* online store: (1) The enthusiasm of the site was catching; it picked me up. (2) The site didn't just sell products. It entertained me. (3) Shopping on the site "got me away from it all." (4) I shopped on the site for the pure enjoyment of it.

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