Online Store Atmospherics: Development of a Gender-Neutral Measure

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ABSTRACT

The study was designed to explore store atmospheric cues currently employed by online retailers. The specific research goals were to establish a comprehensive taxonomy of online store atmospheric cues; and to develop a gender-neutral measurement of online store atmospheric cues identified through qualitative and quantitative approaches.

The study generated an initial item pool via literature review and a focus group interview, and personal interviews were conducted to identify possible online store atmospheric cues and classify items into the identified online store atmospheric cues. A pretest (n = 192) was conducted to initially purify items, and the main study (n = 1751) was conducted for measurement purification and validation. To generate a gender-neutral measurement, the differential item functioning test was conducted for every identified atmospheric cue to eliminate items showing biased responses between males and females. As a result, the study established a gender-neutral measurement consisting 52 items that measure 16 online store atmospheric cues: customization, font, layout, visual, rich media, content, CSR, order fulfillment, company information, merchandise, navigation, promotion, security, support, personalization, and social cues. The study provided implications to future researchers and online retailers based on the findings.

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CHAPTER 1

INTRODUCTION AND GENERAL INFORMATION

Background of the Study

U.S. online retailers have enjoyed rapid growth since the early 1990s. Although still growing, retailers are beginning to realize that the U.S. online market has entered an early stage of maturity. In 2013, U.S. online sales were recorded at $419.53 billion, about 12% growth from the previous year ($373.03 billion) ("B2C ecommerce climbs," 2013). This growth, though huge, was lower than the average worldwide growth rate of 17% ("B2C ecommerce climbs," 2013). This indicates that U.S. online retail is becoming more competitive.

Brick-and-mortar retailers, on the other hand, experienced strong competition much earlier than online retailers, and they are already in the post-maturity stage recording only 5% growth in 2013 ("The future of stores," 2013). As a result, these retailers have made significant efforts to establish favorable store environments to strengthen their competitiveness (Johnson, Kim, Mun, & Lee, 2014). For example, consumers shopping in an Abercrombie and Fitch store enjoy loud, up-tempo music, cool fragrance, sleek, exuberant sales people, dark light, and well organized apparel browsing. Consumers in Apple stores, instead of just finding an electronic product, are prompted by environmental cues, including placid music, bright lighting, courteous, helpful sales people in blue Apple shirts, and a predictable, consistent store layout. In 2009, while average U.S. retail sales declined two percent, retail sales in Apple stores rose seven

percent. Most market analysts attributed this success to superb store environment (Denning, 2011).

A number of academic studies corroborate this analysis, indicating that renovation of store environment can lead to positive consumer behavior (Baker, Levy, & Grewal, 1992; Chebat, Filiatrault, Gélinas-Chebat, & Vaninsky, 1995; Donovan & Rossiter, 1982; Donovan, Rossiter, Marcoolyn, & Nesdale, 1994; Mattila & Wirtz, 2001). Specifically, consumers gain positive emotions from diverse environmental cues, and this leads to purchase and revisit intentions (Baker et al., 1992; Baker, Parasuraman, Grewal, & Voss, 2002; Mehrabian & Russell, 1974).

These findings allude that renovating the online store environment would improve survival and competitive edge in the online retail market. However, academics and business practitioners are skeptical, considering it is impossible to fully transfer actual store feeling to the computer screen (Eroglu, Machleit, & Davis, 2001). They argue that a shopping environment delivered through a computer screen does not have enough power to generate positive emotion from consumers (Eroglu et al., 2001).

The media richness theory, however, contends that computer mediated multimedia such as high quality images, vivid colors, and video clips can deliver positive emotional responses to viewers (Rice, 1992). In the past, roadband's speed was not fast enough to hold online shoppers who could easily move to other online stores just by typing and clicking. According to Nah (2004), Web users will only wait two seconds for a webpage to load.

Because high speed broadband speed has become so readily available, online stores have been able to use extensive multimedia easily, without impeding consumers' browsing ability. Online retailers are, therefore, now able to provide superb online store environments with unrestricted multimedia content, through which they hope to generate positive consumer emotion and ultimately increase consumers' revisit intention (Dailey, 2004; Eroglu, Machleit, & Davis, 2003; Manganari, Siomkos, & Vrechopoulos, 2009).

With the removal of limitations previously imposed by broadband speed, online retailers have been freed to concentrate on improving their online store environments. Thus this study will focus on how online stores should attempt such improvement. This study will identify specific categories of online environment available in current online store websites, and provide practical guidance for online retailers on how to enhance their websites as needed.

Statement of the Problem

Kotler (1973) initially suggested the term "atmospherics" to represent retailers' control of designing the store environment, and all elements in the store environment, which can be recognized by the human senses as atmospheric cues. Kotler (1973) also proposed that providing refined atmospheric cues throughout the store environment can generate positive emotional customer responses, thus increasing the probability of purchase. This approach was theorized by Mehrabian and Russell (1974) in a framework, which was called the Mehrabian and Russell (M-R) model. The M-R model proposes that multiple environmental cues generate positive emotional states (pleasure, arousal, and dominance) that ultimately determine consumers' approach-avoidance behavior.

Based on the M-R model, a number of researchers have demonstrated the effects of various atmospheric cues on consumer behavior (Baker et al., 2002; Chang & Chen, 2008; Demangeot & Broderick, 2010; Eroglu et al., 2001; Grewal & Baker, 1994; Turley & Milliman, 2000). These studies, conducted in diverse research settings such as apparel stores, furniture stores, and grocery stores (Crowley, 1993; Ha & Lennon, 2010; Milliman & Fugate, 1993), have identified diverse atmospheric cues in specific shopping environments.

The identification of atmospheric cues in brick-and-mortar store settings began with the original proposer of atmospherics, Kotler (1973). Kotler suggested multiple atmospheric cues in brick-and-mortar stores appealing to all of the five human senses except taste: visual (color, brightness, size, and shape), aural (volume and pitch), olfactory (scent and freshness), and tactile (softness, smoothness, and temperature). Following Kotler's lead, a number of studies that have identified and measured possible atmospheric cues for brick-and-mortar stores have reached some agreement upon the following categories: design cues (e.g., layouts, colors, and equipment), ambient cues (e.g., scants, music, and temperature), and social cues (e.g., number, attire, and kindness of sales people) (Baker, Grewal, & Parasuraman, 1994; Baker et al., 2002; Grewal & Baker, 1994; Turley & Chebat, 2002; Turley & Milliman, 2000).

Unlike in brick-and-mortar stores (Kotler, 1973), consumers shopping in online stores can perceive environment cues—mediated through their computer screen and speakers—only with their visual and aural senses. Therefore, defining, identifying, and classifying environment cues in online stores should differ significantly from those in

brick-and-mortar stores. That is to say, it is not appropriate to fully adopt environment cues identified in the brick-and-mortar store context for the online store context.

To present, a great number of studies have identified atmospheric cues in diverse online store settings. However, there exist three major problems in identifying online store atmospheric cues.

First, the methods of identifying and classifying online store environmental cues are fairly inconsistent, when compared with the methods used in analyzing environmental cues in the brick-and-mortar store context. Eroglu et al. (2001), in their pioneer study identifying online store atmospheric cues, classified these cues into two types: high-task online store atmospheric cues (i.e., cues, such as information of product and policies, associated with shopping tasks) and low-task online store atmospheric cues (i.e., cues, such as design and colors, not directly related to shopping tasks). The authors also empirically demonstrated their typology. Hsin and Chen (2008), based on the observation that the quality of online store atmospheric cues is constitutive of or identical to website quality, measured online store atmospheric cues using only four categories (i.e., technology, content quality, special content, and appearance). The content quality and special content identified by Chang and Chen (2008) are clearly associated with high-task online store atmospheric cues in Eroglu et al.'s (2001) classification.

Using the high-task and low-task categories of online store atmospheric cues originally identified by Eroglu et al. (2001), Richard's (2005) study added items such as "confusing site" and "irritating site" to the category of high-task cues. These items, however, do not appear to comply with Eroglu et al.'s definition of high-task cues (i.e.,

specific elements associated with shopping tasks, which can be perceived by visual and aural senses). Rather, Richard's items seem to be associated with overall attitudes toward an online store.

The different classification schemes used in these studies result from different definitions of online store atmospheric cues. Therefore, in order to establish some measurement consistency for future studies, it is necessary to set up a clear definition of online store atmospheric cues for identification purposes.

Second, classifications of online store atmospheric cues seem too highly simplified. Specifically, studies have not considered cues that have become remarkably common nowadays in online stores such as rich media (i.e., high quality animation and images) and social cues. Because high speed Internet connections are available in the United States ("A report on consumer wireline," 2013), a number of online retailers operationalize high quality rich media in their online stores. For example, Louis Vuitton, a luxury apparel retailer, maintains an online store fully employing Adobe Flash (i.e., a software authoring interactive Web design with text, animation, audio, and video) ("Flash professional CC," 2013). Similarly, AT&T, a mobile service provider in the United States, recently provided an interactive feature, by which consumers can virtually experience a newly released smartphone. This increasingly ubiquitous use of rich media in online stores should be addressed.

Classifications of online store atmospheric cues should also be expanded to include the Web 2.0 phenomenon (e.g., real-time interaction and user generated contents), well known among online shoppers. In Web 2.0 online stores serve diverse social

functions by providing in-store blogs, forums, instant chatting, and connectivity to social networking sites (e.g., Facebook, Twitter, MySpace, etc.) (Riegner, 2007).

It is important, therefore, to identify possible online store atmospheric cues currently employed by a number of online retailers in order to fill the gap in simplified categorizations of online store atmospheric cues employed by previous studies. This more inclusive categorization of online store atmospheric cues will be useful to online retailers and researchers alike. Online retailers, by understanding all possible online store atmospheric cues, can greatly improve their online store environment by utilizing previously overlooked cues. Researchers may be able to discover a number of not previously analyzed online consumer behavioral responses simply by broadening their analytical categories to include previously nonexistent or unidentified online store atmospheric cues. Specifically, by employing selective online store atmospheric cues in their research frameworks, researchers can provide much more detailed and practical implications for business practitioners.

Third, so far, none of the studies that have developed measurements of online store atmospheric cues have checked measurement equivalence (Vandenberg & Lance, 2000). Researchers cannot guarantee that the measurement items they use measure latent constructs, because these items can function and be interpreted differently by various groups having distinctive traits. Differential item functioning (DIF) is the statistical term used to indicate that a measurement item shows significantly biased responses among different groups (Teresi & Fleishman, 2007). Evaluation of DIF on measurement items at the item purification level is considered an essential process in establishing the

psychological validity of the measurement (Millsap & Everson, 1993; Teresi & Fleishman, 2007).

This study employs DIF to gender-biased measurement items. It is important, in terms of representativeness, to control biased interpretation of measurement items between males and females (Vandenberg & Lance, 2000). In general, females' verbal abilities (e.g., vocabulary, receptive language, productive language, and analogies) are generally better than males (Fletcher & Hattie, 2005; Maccoby & Jacklin, 1980). Males and females also have different familiarity, inborn interests, and emotional reactions to a certain topic (Stricker & Emmerich, 1999). For instance, females favor measurement items regarding aesthetics, social science, or human relationship, while males prefer items with technical or science content (O'Neill & McPeek, 1993). In addition, Mehrabian and Epstein (1972) demonstrated that females are born with much stronger empathy (i.e., vicarious emotional reaction toward others' emotional experience) than males; thus, females make more extreme response to items containing emotional terms such as fear, anger, and pleasure (Stricker & Emmerich, 1999). These arguments make it difficult to ensure the validity of previous measurements of online store atmospheric cues that did not control for gender-biased items among samples containing both genders.

If customers in online stores are dominantly males or just females, the control of gender-biased items may not be a significant problem. However, as of 2013, the ratio of males to females in Internet environment was 1.15, indicating that the numbers of Internet users between males and females are close to equal ("Male Internet users," 2013).

This makes it more critical to control gender-biased items when researchers develop a measurement of online store atmospheric cues.

Purpose of the Study

There are two major goals of the study. First, the study establishes a comprehensive taxonomy of online store atmospheric cues. Second, the study attempts to develop a gender-neutral measurement of online store atmospheric cues through qualitative and quantitative approaches. To accomplish the latter, the study initially identifies underlying atmospheric cues that are currently employed by online retailers. Since the identification of these cues varies based on conceptualization of them, the study will thoroughly conduct a literature review to identify the theories and existing definitions of atmospheric cues. An initial item pool will be built based on extensive literature review and focus group interviews. In addition, personal interviews will be conducted to identify all possible online store atmospheric cues.

Next, the measurement of online store atmospheric cues will be validated with quantitative approaches. To maximize validity and generalizability of the measurement, the study will employ diverse online store settings (e.g., apparel, electronics, furniture, and shopping goods) with a large sample size. Furthermore, in the item purification stage the study will identify and eliminate items showing DIF to ultimately establish a gender-neutral measurement of online store atmospheric cues.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a thorough literature review of research on atmospherics, starting with atmospheric cues from brick-and-mortar store contexts to online store contexts. The purpose of the study is to develop a taxonomy of online store atmospheric cues and a gender-neutral measurement that corresponds to the taxonomy. To establish gender-neutral measurement, the differential item functioning (DIF) test should be conducted to control for gender-biased measurement items. Thus, this chapter also provides detailed explanations of the DIF test and a rationale for its use in measure development especially for the online store context.

Atmospherics

Environment psychologists have studied human behavior based on the environment for about 50 years. Going back to studies in 1960s and early 1970s, environment psychologists focused on human behavior in non-retail institutions such as schools and hospitals (Craik, 1973). The studies investigating the role of store environment on consumer behavior started with Kotler (1973), who conceptualized store atmospherics. Kotler proposed that the environment where products are displayed and sold is the most critical factor in determining consumers' purchase decision. Based on this proposition, Kotler (1973) defined atmospherics as the effort, taken by all retailers, to design consumers' buying environment so as to generate positive emotional responses, and thereby increase the probability of a decision to purchase.

Kotler's (1973) innovative proposition was systemically conceptualized by Mehrabian and Russell (1974) in their Mehrabian and Russell (M-R) model. The M-R model follows the stimulus-organism-response (S-O-R) paradigm. The M-R model drew researchers' attention to the effect of store environment on consumer behavior. The M-R model demonstrates that atmospheric cues perceived by store (S) generate consumers' emotional states of pleasure (i.e., the degree to which a person feels good, joyful or happy), arousal (i.e., the degree to which a person feels excited, stimulated, alert or active), and dominance (i.e., the degree to which the person feels unrestricted or in control of the situation) (PAD), which, in turn, affect consumers' approach-avoidance behavior toward the store.

Although the M-R model was originally conceptualized as an analysis of atmospherics in traditional brick-and-mortar stores, it has been adopted to apply to diverse service settings—wherever consumers can feel the physical environment, for example, restaurants (Jang & Namkung, 2009; Kim & Moon, 2009), hotels (Countryman & Jang, 2006; Park, Pae, & Meneely, 2010), and sports events (Pham, 1992; Uhrich & Koenigstorfer, 2009). The majority of studies, however, have been conducted in the brick-and-mortar store context.

Atmospheric Cues

Research regarding atmospherics has also been applied to the relatively recent phenomenon of the online store; the World-Wide Web, enabling people to connect to websites with browsers (e.g., Internet Explorer, Firefox, Chrome, Safari, etc.) via Internet connections appeared as late as mid-1990s.

The next sections will first examine brick-and-mortar store atmospheric cues, and then discuss online store atmospheric cues. Last, the study will address gaps in defining and identifying online store atmospheric cues.

Atmospheric Cues in Brick-and-Mortar Stores

Kotler (1973) defined atmospherics as "the effort to design buying environments to produce specific emotional effects in the buyer that enhance his purchase probability" (p. 50), and defined atmospheric cues as all elements in the buying environment that can stimulate consumers' senses (Kotler, 1973). Milliman and Fugate (1993) define atmospheric cues as "any component within an individual's perceptual field which stimulates one's senses and thus affects the total experience of being in a given place at a given time" (p. 68). Milliman and Fugate's definition, based on a thorough review of literature regarding atmospherics, reflected Kotler's (1973) original definition in that (1) the scope of cues was limited to the store environment, and (2) that both studies assumed that atmospheric cues are perceived by human senses.

Since Milliman and Fugate's (1993) redefinition of atmospheric cues, very few or perhaps no studies have tried to re-define or expand Kotler's (1973) atmospheric cues, and studies regarding atmospherics have adopted the Kotler's definition (Baker et al., 2002; Koo & Kim, 2013; Turley & Milliman, 2000).

Kotler's (1973) atmospheric cues, in brick-and-mortar stores, correspond to the five human senses except taste: visual (color, brightness, size, & shape), aural (volume & pitch), olfactory (scent & freshness), and tactile (softness, smoothness, temperature).

In the early stage of atmospheric research, studies demonstrated the effect of a single environment cue on consumer responses. For example, Crowley (1993) demonstrated the effect of color in a furniture store on consumer responses; specifically, retail stores with high wavelength colors (e.g., red and blue) generated pleasant emotions, which in turn improved their perception of merchandise quality. Bellizzi and Hite (1992) also found that the blue color generated affection, which positively influenced approach-avoidance behavior, while the red color generated arousal, which negatively influenced approach-avoidance behavior. Music is another atmospheric cue that has been employed by researchers. Milliman (1982) demonstrated that the tempo of music in a grocery retail store influenced consumers' shopping pace. Milliman (1982) also found that, in the restaurant setting, slow music tempo increased retention time of consumers at tables. Furthermore, Yalch and Spangenberg (2000) found that consumers in apparel stores increased their shopping time if they were listening to familiar music. In addition, Areni and Kim (1994) and Summers and Hebert (2001) demonstrated that supplemental lighting increased shoppers' numbers and browsing duration. Mattila and Wirtz (2001) observed that scent generated positive emotion, which in turn increased approach and impulse buying behavior in a brick-and-mortar store.

Later research considered multiple environment cues in brick-and-mortar stores. The systemization of atmospheric cues started with Baker, Levy, and Grewal's (1992) study. The authors showed videotapes of stores with high and low ambient and social cues, and demonstrated the effects of the ambient and social cues (e.g., number, attire, and kindness of sales people) on two emotional states (i.e., pleasure and arousal) and in

turn the willingness to buy. A decade later, Baker, Parasuraman, Grewal, and Voss's (2002) study considering design cues in a brick-and-mortar store operationalized three cues: design cues (i.e., store attributes highly visual in nature such as layouts, colors, and equipment), ambient cues (i.e., peripheral store attributes which cannot be perceived by the visual sense such as scants, music, and temperature), and social cues (i.e., store attributes associated with sales personnel such as number, attire, and kindness of sales people). The analysis of social cues by Baker et al. (2002) was limited to considering store employees; other researchers considered additional social cues, such as crowding factor (Machleit, Kellaris, and Eroglu,1994). Design, ambient, and social cues have been thoroughly operationalized in a number of studies of atmospheric cues of brick-and-mortar stores (Grewal & Baker, 1994; Turley & Chebat, 2002; Turley & Milliman, 2000). Some recent studies have attended to merchandise cues (e.g., assortment of merchandise and merchandise itself) (Koo & Kim, 2013; Kumar, 2010; Thang & Tan, 2003). To conclude, researchers have come to a consensus that there are representatively four atmospheric cues (i.e., design, ambient, social, and merchandise) in the brick-and-mortar store environment.

Atmospheric Cues in Online Stores

With the rapid growth of online stores since early 2000s (Bakos, 2001) and advanced development of web design technologies (Hopkins & Alford, 2005), many researchers started to focus on consumer behavior associated with online store atmospherics (Chang & Chen, 2008; Davis, Wang, & Lindridge, 2008; Demangeot & Broderick, 2010; Eroglu et al., 2001, 2003; Fiore, Jin, & Kim, 2005; Ha & Lennon, 2010;

Harris & Goode, 2010; Manganari et al., 2009; Porat & Tractinsky, 2011; Richard, 2005; Wang, Minor, & Wei, 2011).

The Eroglu et al.'s (2001) study can be considered the pioneering study of atmospheric cues in the online store context. The study defined online store atmospheric cues as all possible cues perceivable with visual and aural senses in an online store. Therefore, their study closely follows Kotler's (1973) widely adopted original definition, which stipulated that cues should exist within the store environment, and that cues should be perceivable by human senses. The only difference was that Eroglu et al.'s (2001) definition of online store atmospheric cues indicated only two functional human senses in the online environment: visual and aural. While in brick-and-mortar stores retailers can appeal to four human senses (i.e., visual, aural, olfactory, and tactile) with countless combinations of cues, online stores can only appeal to visual and aural human senses through the screen and speaker regardless of platform (e.g., personal computers, laptops, tablets, and smartphones).

Recognizing that brick-and-mortar stores and online stores possess different environmental features, Eroglu et al. (2001) suggested an alternative taxonomy for online store atmospheric cues based on a taxonomy from media richness theory (Daft & Lengel, 1986; Walther, 1992). Lean media have clear and apparent characteristics, whereas rich media possess all decorative features (Eroglu et al., 2001; Walther, 1992). In line with this taxonomy, Eroglu et al. (2001) classified online store atmospheric cues into two categories: high-task and low-task cues. High-task cues refer to online store attributes related to consumers' actual fulfillment upon purchasing a product, such as product

descriptions, prices, delivery options, and policies. Low-task cues are online store attributes not directly related to consumers' purchase-related fulfillment, such as colors, layouts, fonts, music, and animation.

The conceptualization of online store atmospheric cues developed by Eroglu et al (2001) has been adopted by others (Davis et al., 2008; Ha & Lennon, 2010; Richard, 2005). Davis et al. (2008) created two online stores selling music compact discs: one with both high-task and low-task cues and the other with low-task cues only. They investigated the effect of presence/absence of low task cues on consumer behavior. High-task cues were descriptions of company and products, order policies, customer testimonials, and explanations of links. Low-task cues were colors of texts, background colors, product images, logos of third-party approval, and animated icons.

Ha and Lennon (2010) designed four mock apparel online stores with high-task atmospheric cues (medium amount of high-task cues vs. high amount of high-task cues) and low-task atmospheric cues (presence vs. absence) to investigate the effects of high-task and low-task atmospheric cues on two emotional states, pleasure and arousal. In their mock apparel online stores, they employed product-related information pieces (e.g., fit, price, size, style, fabric, and product care information) for high-task atmospheric cues, while they used vivid colors for texts, brand logos, icons, and background for low-task atmospheric cues.

Richard (2005) also adopted the classification of high-task and low-task online store atmospheric cues. The study criticized that the online store atmospheric cues suggested by Eroglu et al. (2001) overlooked other possible cues. Richard (2005)

conducted a literature review, finding additional high-task and low-task online atmospheric cues. High-task online store atmospheric cues were explained by navigational characteristics (e.g., easy to use, good search agents, and non-problematic navigation), the structure of webpages (well-organized, great overview of structure, and straightforward structure), informativeness (e.g., informative and useful), information content effectiveness (e.g., accurate information and up-to-date information), and organization (e.g., clear and non-irritating). Low-task online atmospheric cues were explained byentertainment (e.g., exciting, imaginative, and entertaining).

However, Richard's (2005) classification included some online store atmospheric cues that diverged from those contained in the original definition of store atmospheric cues. Richard measured the organization cue (high-task) through two items: "confusing site" and "irritating site," and the entertainment cue (low-task) via three items: "exciting site," "imaginative site," and "entertaining site." According to the original definition of Kotler (1973), atmospheric cues should be specific attributes in a store environment that can stimulate human senses. The organization and entertainment cues are associated not with specific atmospheric cues but overall attitudes toward an online store.

Studies adopting Eroglu et al.'s (2001) high-task vs. low-task online store atmospheric cues (Davis et al., 2008; Ha & Lennon, 2010; Richard, 2005) oversimplified and overlooked other possible atmospheric cues in online stores. Recognizing this problem, some studies have tried to provide different classifications of online store environment cues.

For instance, Demangeot and Broderick (2010), in their systemic literature review, found more possible categories of online atmospheric cues. The authors conceptualized a gestalt model made up of six cues: page clarity (i.e., the amount of text in a webpage), site architecture (i.e., navigation and organization of information), visual impact (i.e., design and aesthetic quality), marketer informativeness (i.e., amount of information), non-marketer informativeness (i.e., information provided by other users), and experiential intensity (i.e., degree to which an online store generates an engaging shopping experience). Although the study classified atmospheric cues in a different way, the authors suggested only two new cues: non-marketer informativeness and experiential intensity. Although customer reviews are remarkably common in online store nowadays, former studies have overlooked non-marketer information, and this was a novel and useful contribution of Demangeot and Broderick's (2010) study. However, it is hard to consider the experiential intensity cue as an atmospheric cue because it is associated with overall experience in an online store, rather than a specific element within store environment, based on the original definition (Eroglu et al., 2001; Kotler, 1973). When Demangeot and Broderick (2010) set a definition of online store atmospheric cues based on their literature review, they included experiential intensity in atmospheric cues. Therefore, Demangeot and Broderick's (2010) inclusion of experiential intensity does not support the definition of atmospheric cues.

Wang et al. (2011) included aesthetic formality and aesthetic appeal in their classification of online store atmospheric cues. Aesthetic formality was measured in terms of navigation and legibility (e.g., clear text), and aesthetic appeal was measured in

terms of overall impression and creativeness. However, since the aesthetic appeal category cannot be considered as an atmospheric cue, but as an overall attitude, no additional cues were discovered by this study. Rather, the study categorized existing navigation and text cues under the new superordinate category, aesthetic formality.

Unlike the taxonomies of Demangeot and Broderick (2010) and Wang et al. (2011), which did not progress far in finding additional cues, Harris and Goode's (2010) study did make substantial progress in classification and identification of atmospheric cues. The authors defined nine atmospheric cues: visual appeal, originality of design, entertainment value, usability (i.e., navigation features), relevance of information, customization, interactivity (i.e., interactive technologies such as multiple view options and search tools), perceived security, and ease of payment. Besides entertainment value, which is not a specific cue but an overall value perception, the authors' new categories—including customization, interactivity, payment, and security—reflect online store atmospheric cues based on the original definition.

Numerous other studies have also defined online store atmospheric cues in their own ways (Bart, Shankar, Sultan, & Urban, 2005; Fiore et al., 2005; Lorenzo-Romero, Constantinides, & Alarcón-del-Amo, 2013; Manganari et al., 2009; Porat & Tractinsky, 2011). However, two major problems persist through all these taxonomies of online store atmospheric cues.

First, there is no consensus on classifications and terminology. A number of online store atmospheric cue scale items appear in different studies but those items are differently classified. For instance, the scale item, layout, was classified as virtual layout

by Manganari et al. (2009); however, it was classified as design aesthetics by Lorenzo-Romero et al. (2013). This divergence in definition and classification of online store atmospheric cues results from authors not focusing on developing a comprehensive measurement for online store atmospheric cues. The varying definitions and classifications of online store atmospheric cues are summarized in Table 1.

Second, social interaction features in online stores have been overlooked by studies to date. Because of the ubiquity of fast broadband speed throughout the United States ("A report on consumer wireline," 2013), individuals can interact with other users in real-time via Internet. For instance, consumers can interact with retailers via a free board or instant chatting service in online stores. In addition, consumers can also interact with other consumers via a blog or consumer review board in an online store.

Furthermore, social media (i.e., community websites mainly constituted by user generated contents, such as cooperative projects, content communities, blogs, virtual games, and social networking sites) have skyrocketed in popularity (Kaplan & Haenlein, 2010). Among diverse types of social media, social networking sites (i.e., websites like Facebook, Twitter, Linkedln, Myspace, and Google Plus+, where people interact with others mainly for the purpose of establishing or maintaining their relationships) have experienced the greatest increase in popularity. By end of 2011, there were over 1.2 billion users of social media worldwide; among social media sites, Facebook has firmly remained in the top position in terms of its marketing power and number of users (Sorkin, 2012). Facebook retains about 845 million users in globally, and more than 57 percent of them are daily active users (Sorkin, 2012). The marketing value created from Facebook

for business practitioners is as high as $100 billion (Oreskovic & Barr, 2012). To maximize possible profits derived from social interaction, the majority of online stores provide social networking connectivity via icons linked to retailers' brand pages in social networking sites or by providing a "share" button in each product page. This enables consumers to easily share the product information and their opinions with their personal social networking pages by simply clicking a button.

Table 1. Definitions and Identified Online Store Atmospheric Cues

Sources	**Definition**	**Settings**	**Cues**
(Chang & Chen, 2008)	Elements of website quality.	B2C websites that respondents were currently visited	Technology (easy to navigate, valid links, & interactive features), content quality (useful content, clear content, & accurate content), special content (contact information & general company information), and appearance (attractive, organized, & proper color)
(Davis et al., 2008)	Design elements	Online stores selling music compact discs	High-task cues (third-party approval, price information, and payment information) and low-task cues (background colors, animated icons)
(Demangeot & Broderick, 2010)	Overall attributes	Respondents' browsing experience in any website	Page clarity (the amount of text), site architecture (navigation & organization), visual impact (design & aesthetic quality), marketer informativeness (helpful & useful information), non-marketer informativeness (customer reviews), and experiential intensity (overall involving shopping experience)
(Eroglu et al., 2001)	Attributes stimulate visual and aural senses	N/A (The study made propositions.)	High-task cues (product descriptions, price information, delivery information, and return policies) and low-task cues (color, background patterns, fonts, and typestyles)
(Fiore et al., 2005)	Design elements	Apparel online stores	Image interactive features (i.e., image viewer allowing users to change product design features)
(Ha & Lennon, 2010)	Attributes stimulate visual and aural senses	Mock apparel online stores	High-task cues (fit, size, style, price, & product information) and low-task cues (color, logos, icons, & background design)

Table 1. Continued

Sources	**Definition**	**Settings**	**Cues**
(Harris & Goode, 2010)	Factors associated with service delivery in online store environment	Respondents' online shopping experience	Aesthetic appeal (originality of design, visual appeal, & entertainment value), layout & functionality (usability, relevance of information, customization, & interactivity), and financial security (perceived security & ease of payment)
(Manganari et al., 2009)	Overall attributes	N/A (The study proposed a framework.)	Virtual layout & design (different types of layout), virtual atmospherics (color, background music, fonts, scent appeal, & touch appeal), Virtual theatrics (animation techniques, images, vividness, & interactivity), and virtual social presence (web counter, user comments, & crowding)
(Porat & Tractinsky, 2011)	Overall design	Apparel and book online stores	Classical aesthetics (clean, pleasant, symmetrical, & aesthetic design), expressive aesthetics (original, sophisticated, spectacular, & creative design), and usability (buying process & navigation)
(Richard, 2005)	Interface components stimulating human senses	Pharmaceutical online store	High-task cues (navigation, informativeness, structure, & organization) and low-task cues (entertainment)
(Wang et al., 2011)	Overall attributes	Furniture online stores	Aesthetic formality (navigation & legibility) and aesthetic appeal (impression & creativeness)

In sum, studies identifying and classifying atmospheric cues in brick-and-mortar store contexts have achieved a large degree of consensus. Specifically, there are four representative atmospheric cues: design cues (e.g., layouts, colors, and equipment), ambient cues (e.g., scants, music, and temperature), and social cues (e.g., number, attire, and kindness of sales people) (Baker et al., 1994; Baker et al., 2002; Grewal & Baker, 1994; Turley & Chebat, 2002; Turley & Milliman, 2000). However, studies regarding online store atmospherics cues have identified these cues quite differently (Bart et al., 2005; Eroglu et al., 2001; Fiore et al., 2005; Lorenzo-Romero et al., 2013; Manganari et al., 2009; Porat & Tractinsky, 2011), mainly because they have employed their own ad-hoc definitions of online store atmospheric cues. In addition, studies have oversimplified classifications of these cues, and have overlooked important features in online stores such as social features (e.g., real-time interaction with retailers or other customers and social networking). The present study will address these issues by comprehensively identifying and classifying online store atmospheric cues currently available and widespread in online stores. This study conducts a thorough literature review, a focus group interview, and personal interviews to identify a comprehensive list of possible online store atmospheric cues currently employed by online retailers. These cues will be validated by developing a measurement of online store atmospheric cues and statistically testing the measurement model that corresponds with the identified cues.

Differential Item Functioning

When researchers develop a measurement tool, they often assume that their respondents are identically capable of understanding measurement items. In fact, some items are differently interpreted by groups with different traits. This phenomenon is captured by the statistical term, differential item functioning (DIF) (Teresi & Fleishman, 2007). If items function differently for respondent groups, it is difficult to assure that findings of a measurement tool are valid for all respondent groups. By testing DIF, researchers can detect and eliminate items showing biased responses across groups. DIF testing is, therefore, highly recommended at the item purification level when studies develop a measurement tool (Neil et al., 2010).

DIF testing investigates whether a significant relationship exists between responses to measurement items of a latent construct and a grouping variable (e.g., gender or race), after controlling respondents' performance in relation to the latent construct to be equal across groups (Teresi & Fleishman, 2007). For example, assume that a measurement item assessing ability to float on water is one of a number of items used to measure swimming ability, and there are two groups: respondents from tropical regions and respondents from cold regions. If swimming abilities of respondents from both tropical and cold regions are not equal, the possibility of answering "yes or no" to the item (i.e., ability to float on water) should be different. However, if respondents from both tropical and cold regions have an equal swimming ability, the possibility of answering "yes or no" to the item (i.e., ability to float on water) will be same between two groups. The DIF test forcibly makes the swimming ability equal between two groups,

and concludes DIF exists in the item if the possibility of answering “yes or no” to the item is different. If the item is measured with a Likert type scale, researchers conclude that a DIF is present when the probability of giving a certain answer is consistently different between two groups at all levels of the item.

Testing DIF is totally different from testing mean scores among groups which can be tested with analysis of variance (ANOVA). Basically, ANOVA simply tests difference of average mean scores of measurement items among groups to establish variance. Thus, ANOVA measures significance of difference in performance of a latent construct among groups. The DIF test, on the other hand, assesses whether an item in a latent construct has an equal chance of being responded to in a certain way across groups after controlling for performance in relation to the latent construct (i.e., assuming that summed scores or mean scores of all items of the latent construct do not significantly differ across groups) (Teresi & Fleishman, 2007). In short, ANOVA focuses on comparing overall performance of the latent construct across groups, while the DIF test focuses on testing equal likelihood of responses to a certain item of the latent construct.

Gender DIF Test

When researchers conduct paper-based or online surveys, respondents answer to diverse questions (i.e., measurement items) based on their reading, interpretation, and understanding of measurement items. If different groups have equal capacity in relation to certain latent construct, the groups will have equal chances of giving a certain answer to an item of that latent construct. However, if different groups possess different capacities to read, interpret, or understand sentences, groups may show different response

patterns to a certain item of the latent construct. This usually happens when a measurement item contains ambiguous wording, difficult sentence structure, inappropriate use of vocabulary, and so on (Vandenberg & Lance, 2000).

It is commonly asserted that males and females have different in-born capabilities. Females outperform males in overall verbal abilities such as vocabulary, receptive language, productive language, and analogies (Fletcher & Hattie, 2005; Hyde & Linn, 1988; Maccoby & Jacklin, 1980). On scholastic assessment test (SAT) scores for verbal reasoning between 2006 and 2010, the number of females scoring in the high range, between 600 and 800, considerably exceeded males (Wai, Cacchio, Putallaz, & Makel, 2010). Because of differences in verbal abilities between males and females, some measurement items are differently interpreted, and this produces biased responses. In addition, different familiarity, inborn interests, and emotional reactions to a certain measurement item between males and females can cause biased responses (Stricker & Emmerich, 1999).Therefore, it is necessary to conduct the DIF test on gender (“gender DIF”) to ensure measurement validity (Teresi & Fleishman, 2007).

When a sample consists mainly of males (or females), items that differ by gender would not be significantly problematic as results will represent performance of the predominant gender. However, when a sample consists evenly of both genders, performance results on gender DIF items cannot represent the true performance of the sample evenly mixed with males and females. In fact, as of 2013, among 2.8 billion Internet users, there are 1.5 billion males and 1.3 billion females; the number of male and female Internet users are not that different ("Male Internet users," 2013). Therefore,

controlling gender DIF items is significantly important for measurements associated with online shopping. However, so far, no study regarding online store atmospheric cues has implemented such a control. Therefore, the current study attempts to develop a measurement of online store atmospheric cues employing the gender DIF test.

CHAPTER 3

METHODS

This chapter develops a taxonomy of online store atmospheric cues and a gender neutral measurement that corresponds to the taxonomy. The chapter is divided into four major sections. The first section indicates the overall research process. The second section includes information on a list of initial measurement items generated based on literature review and a focus group interview, and classification of the items based on personal interviews. The third section discusses instrument development, including stimuli selection, survey design, data collection, and statistical analyses. The fourth section deals with the overall process of the main study, including data collection procedures and sample characteristics.

The Research Process

The research process for developing a measurement of online store atmospheric cues followed the guidelines of Churchill (1979). The study first established an initial pool of items via literature review. Next, the study employed both qualitative and quantitative approaches to refine and validate the pool of items. In the qualitative part, this study conducted a focus group interview and in-depth personal interviews. The purpose of a focus group interview was to find additional measurement items of online store atmospheric cues beyond the items found through the literature review. The personal interviews were used to identify possible categories of online store atmospheric cues and classify items into the identified categories. Next, a pretest was conducted to purify items for a main study. The main study mainly focused on developing a gender-

neutral measurement of identified online store atmospheric cues. For this purpose, the study conducted a survey including a large pool of purified items. Using this collected data, first, measurement items were again purified via confirmatory factor analysis (CFA). Next, DIF tests were conducted to eliminate items showing gender-biased responses and thereby establish a gender-neutral measurement. The gender-neutral measurement was assessed via CFA and multiple validity tests. After finalizing a measurement of identified online store atmospheric cues, the study tested multiple posited measurement models to provide some alternative ways of using the measurement. The entire research process is demonstrated in Figure 1.

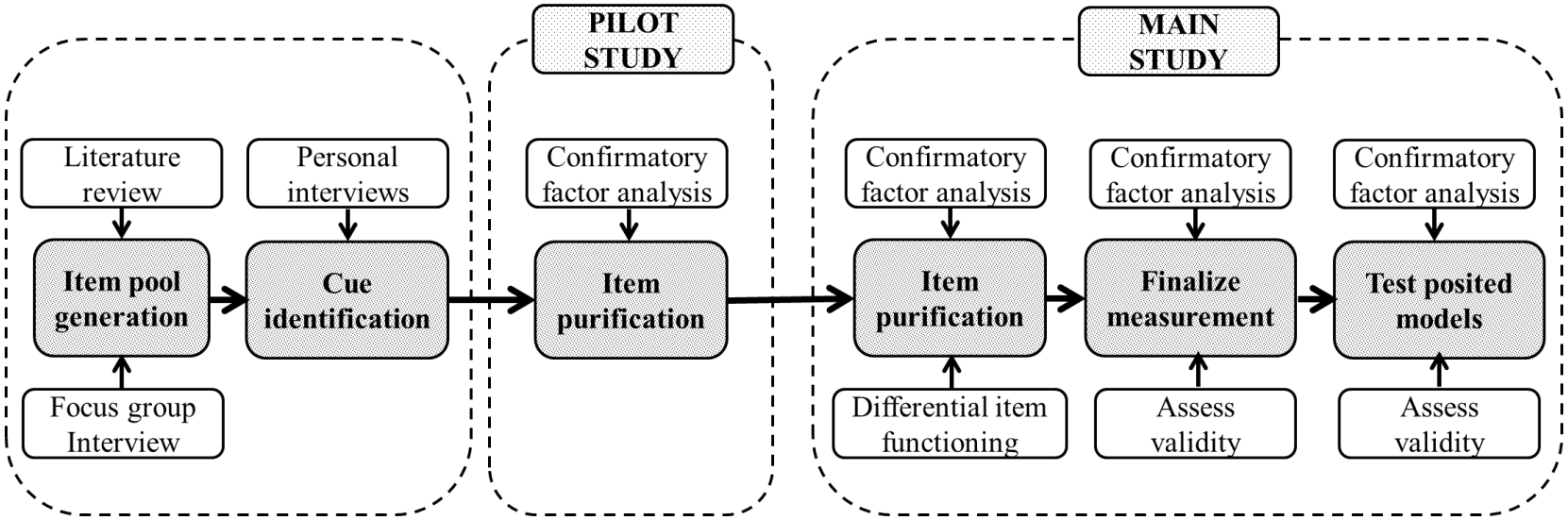

Figure 1. The Research Process

Generating an Initial Measurement through Interview Processes

Initial Item Pool Generation

Following Eroglu et al. (2001), the present study defined online store atmospheric cues as: all cues in an online site that are perceivable by consumers' visual and aural senses. Using this definition, the study conducted an extensive literature review to generate an initial pool of measurement items corresponding to online store atmospheric cues. The study searched from peer reviewed (refereed) journals using several keywords: online store environment, web environment, online store atmospherics, and web atmospherics. Additionally, studies on interactivity and communities in online stores were searched in order to consider cues relevant to social interaction.

Items reflecting the definition of online store atmospheric cues were included in the initial item pool. As a result, the study generated an initial item pool consisting of 191 items from previous studies (Bart et al., 2005; Chang & Chen, 2008; Cyr, Hassanein, Head, & Ivanov, 2007; Dash & Saji, 2008; Davis et al., 2008; Demangeot & Broderick, 2010; Fiore et al., 2005; Ha & Lennon, 2010; Harris & Goode, 2010; Lorenzo-Romero et al., 2013; Manganari et al., 2009; Porat & Tractinsky, 2011; Richard, 2005; Wang, Baker, Wagner, & Wakefield, 2007; Wang et al., 2011).

Focus Group Interview

A focus group interview was conducted to find cues not included in the initial item pool but perceivable in online stores. The focus group interview is an effective way of gathering a wide range of consumer perceptions regarding a topic within a short period of time (Krueger, 1994).

In order to find online store atmospheric cues that can be perceived by general consumers, it was important to have interviewees who were not professionals in online store retailing. In addition, Fern (2001) demonstrated that the ideal size of a focus group is six to twelve participants.

To establish a convenient sample for the focus group interview, an invitation email was sent to graduate students not specialized in online retailing and in the Retail, Hospitality, and Tourism Management program at a major southeastern university. As a result, nine graduate students participated in the focus group interview. Interviewees' ages ranged from 29 to 40, and consisted of two males and seven females.

According to Krueger (1994), it is important to create a natural, comfortable, and familiar atmosphere, preferably with food, for a focus group interview in order to encourage interviewees to participate actively in the conversation. The study therefore selected a conference room the graduate students were familiar with, and the focus group interview was intentionally held during lunch time on April 24th, 2014. Food was provided during the interview.

The interviewer began interviews by welcoming participants, and announcing contents in a consent form approved by the University Institutional Review Board (IRB). The interviewer verbally demonstrated that no personal information would be collected or reported, and that all information they provided during the interview would remain strictly confidential. The participants were also informed that their participation in the focus group interview was completely voluntary, and that they could terminate the interview at any time without penalty. The interviewees were also informed that the focus

group interview would take about than 60 minutes, and that their responses would be recorded by note-taking. In addition, participants were assured that their names would not be recorded.

After announcing basic interview processes, the researcher briefly explained the concept of online store atmospheric cues to interviewees, and asked following questions: “What elements in online stores do you consider while you are doing shopping?”; “What elements in online stores stimulate your senses (e.g., sight and hearing) while you are doing shopping?”; “Can you list some elements in online stores that you consider them as special or uncommon?” The questions were provided at the same time, and participants were asked to answer freely, and reminded that there was no right and wrong answer. The researchers also asked probing questions of participants only when they provided ambiguous answers. Examples of probing questions were: “Could you tell me about the element that you mentioned more in detail?” and “Could you give me more examples of the element that you just mentioned?”

After collecting the data, the study analyzed the data with QDA Miner 4.0 (Peledeau, 2004). The entire script was imported into the program, and every word representing a specific atmospheric cue was highlighted and sorted. As a result, the study found 35 additional items from analysis of focus group interviews. The 35 items were added into the initial item pool containing 191 items, so that the second item pool contained 226 items. Table 2 demonstrates original sources, names of constructs, and all items in the item pool.

Table 2. Initial Item Pool

Sources	Constructs	Scale Item
(Bart et al., 2005)	Advice	The site provides me with sufficient information to make a purchase decision on all products.
		The site has useful shopping support tools (such as a calculator or planner)
		The site provides an explanation of services and products being offered.
		The site set up can be personalized to my needs.
		The site can recommend products based on previous purchase.
		The site allows me to create products or services to exactly fit my needs.
		Products can easily be compared.
		Comparisons of all competing brands are presented.
		Good shopping tips are provided.
		The site provides options asking my preferences to recommend products for me.
		Useful shopping recommendations are made based on my personal information and preferences.
		The site presents both benefits and drawbacks of products and services.
		A toll free number is easily found for live help.
		The site asks questions to determine needs and preferences.
	Community	Testimonial/endorsement by past users is present.
		Informative magazine articles or editorial content are present.
		It is possible to interact on the screen with a shopping advisor.
		It is possible to communicate via live chat to an expert advisor.
		It is easy to interact with other users of this site who may have bought things at the site before or who use the site frequently.
		I found gifts on the site.
		I found photos of people/family/kids on the site.
		I found bios of executives on the site.
		The site provides areas where users can provide their opinions.
		The site informs retailer's participation in philanthropy/charity.
		A chat room is available where consumers can discuss their experience with the site and/or its products.

Table 2. Continued

Sources	Constructs	Scale Item
(Bart et al., 2005)	Navigation	The site is easy to use.
		Overall layout of the site is clear.
		The site layout is consistent across all pages.
		The site uses simple language.
		The site uses a layout that is familiar.
		There is readily available site map (a summary of site links), which allows you to figure out where to go and what you can do at the site.
		There are useful links to other sites that aid the primary purpose of coming to this site.
		The site content is easy for me to understand.
		I can quickly find information that I want.
		The content appears to be up-to-date.
		The site provides accurate information.
		The site provides relevant information.
		The explanations for the products and services at the site are helpful.
		I enjoyed the overall experience of the site.
		This site features are state-of-the-art, better than most sites in this industry.
		The site feels warm and comforting.
	Order fulfillment	There is a search tool to help find information on the site.
		It is possible to contact a shopping assistant through e-mail.
		The site accepts a variety of payment methods.
		Easy ordering and payment mechanisms exist.
		Service and product guarantees are clearly explained.
		Shipping and handling costs are listed up front.
		The site tells me immediately if something is out of stock, so time is not wasted going through the checkout process and finding this out later.
		Delivery options are available.
		Return policies or other measures of accountability are present.
		Once an order is placed, it can be tracked to see where it is in the shipping process.

Table 2. Continued

Sources	Constructs	Scale Item
(Chang & Chen, 2008)	Appearance	X's web site looks organized.
		X's web site uses fonts properly.
		X's web site uses colors properly.
		X's web site uses multimedia features properly.
	Content quality	The content of X's web site is useful.
		The content of X's web site is complete.
		The content of X's web site is clear.
		The content of X's web site is current.
		The content of X's web site is concise.
		The content of X's web site is accurate.
	Special content	In X's web site, one can find contact information (e.g. email addresses, phone numbers, etc.)
		In X's web site, one can find the firm's general information (e.g. goals, owners).
		In X's web site, one can find information related to customers' policies (e.g. privacy and dispute details).
		In X's web site, one can find information related to customer service.
	Technology	X's web site looks easy to navigate through.
		X's web site has adequate search facilities
		X's web site is always up and available.
		X's web site has valid links (hyperlinks).
		X's web site has many interactive features.
		X's web site is easy to access.
(Cyr et al., 2007)	Perceived social presence	There is a sense of human contact in the website.
		There is a sense of personalness in the website.
		There is a sense of sociability in the website.
		There is a sense of human warmth in the website.
		There is a sense of human sensitivity in the website.

Table 2. Continued

Sources	Constructs	Scale Item
(Dash & Saji, 2008)	Social presence	There is always a sense of human touch whenever I do interact through my online store.
		There is always a possibility of social networking through the interaction with my online store.
		There is always a sense of friendliness whenever I do interact through my online store.
		There is always a feeling of belongingness whenever I do interact through my online store.
(Davis et al., 2008)	Low task cues	The site uses animated icons.
		The site uses background colors.
(Demangeot & Broderick, 2010)	Page clarity	There was too much text on the screen. (Reverse coded)
		There was an awful lot of things on every page. (Reverse coded)
		The pages on this Web site were too crowded. (Reverse coded)
	Site architecture	My interaction with this Web site was clear and understandable.
		The Web pages were easy to read.
		The content on this site was clear.
		The organization of the information presented on the screen was confusing. (Reverse coded)
	Visual	The Web site had a visually pleasing design.
	Marketer informative-ness	There was enough information on this Web site to assess the products.
		I could learn a lot about the products.
		The information on this Web site was helpful.
		The information on this Web site was useful.
		This Web site adequately met my information needs.
	Non-marketer informative-ness	This site had customer reviews of products.
		From this site it was impossible to see what other users thought of the products. (Reverse coded)
		This Web site only gave me its own product information, and not other users' impressions. (Reverse coded)
(Fiore et al., 2005)	Image interactivity	I can zoom in pictures of products.

Table 2. Continued

Sources	Constructs	Scale Item
(Ha & Lennon, 2010)	High task relevant cues	The Web site you browsed today contained very much information.
		The Web site was very informative.
		After browsing the Web site, I know enough to make an informed purchase decision.
	Low task relevant cues	The Web site looks organized.
		The Web site uses fonts properly.
		The Web site uses colors properly.
		The Web site uses multimedia features properly.
(Harris & Goode, 2010)	Customization	This web site is tailored toward me.
		If I wanted to, I could customize this web site to what I like.
		I feel that this web site is designed for me.
		The services of this web site are often personalized to me.
		That this web site treats me as an individual.
		When communicating with this web site, I am rarely addressed using my correct name. (Reverse coded)
		This web site makes purchase recommendations that match my needs.
	Ease of payment	It has efficient payment procedures.
		Payment procedures seem to take a long time. (Reverse coded)
		The payment facilities of this web site are easy to use.
		Paying for goods is straightforward.
		Paying for goods involves entering a lot of details. (Reverse coded)
	Entertainment value	I think that this web site is very entertaining.
		The enthusiasm of this web site is catching, it picks me up.
		This web site doesn’t just sell products-it entertains me.
		I enjoy shopping from this web site for its own sake, not just for the items I may have purchased.
		I shop from this web site for the pure enjoyment of it.

Table 2. Continued

Sources	Constructs	Scale Item
(Harris & Goode, 2010)	Interactivity	This web site enables me to view the merchandise in different ways.
		This web site has a search tool which helps me find what I want.
		This web site helps me to compare products and prices.
	Perceived security	It seems very secure.
		I have no concerns about buying things from this web site.
		The security systems of this web site seem rigorous.
		When buying from this web site, I am not reassured by the
		When buying from this web site, I am not reassured by the security procedures.
		Overall, this web site seems security conscious.
	Relevance of information	Each page clearly indicates what one can expect to find or do.
		Visual information about products is easily accessed.
		All relevant information is easily available.
		There is a great deal of irrelevant information. (Reverse coded)
		Technical details about products can be easily accessed.
	Usability	There are useful navigational aids.
		The links are obvious in their intent and destination.
		It is not easily navigated. (Reverse coded)
		There are convenient ways to maneuver among related pages and between different sections.
		Navigation through this web site is intuitively logical.
		I use this web site because it has a good keyword search facility.
		The functions on this web site are easy to operate.
		This web site is user-friendly.
	Visual appeal	It does not use visually appealing graphics. (Reverse coded)
		The way it displays its products is attractive.
		I like the way this web site looks.

Table 2. Continued

Sources	Constructs	Scale Item
(Lorenzo-Romero et al., 2013)	Classic aesthetics	The site uses balanced layout.
	Design aesthetics	The site uses attractive colors.
		The site uses the attractive layout.
		The site uses attractive images.
		Product presentation in the site is good.
		The site uses clear headers.
		The text is readable.
(Manganari et al., 2009)	Virtual atmospherics	The site uses appropriate background color.
		The site provides a good-looking color scheme.
		The site provides music nice to hear.
		The site uses appropriate fonts.
	Virtual layout	The site provides clear layout.
	Virtual social presence	The site indicates the number of visitors.
		The site seems to be crowding.
	Virtual theatrics	The site provides exciting animation techniques.
		The site provides high-quality images.
		The site provides vivid images and animations.
		The site provides interactive icons.
(Porat & Tractinsky, 2011)	Usability	It was convenient navigating in this store site.
		The buying process in this site is simple
		One can find information easily in this site
(Richard, 2005)	Information content effectiveness	Information is accurate.
		Information is up-to-date
		Product information is complete.

Table 2. Continued

Sources	Constructs	Scale Item
(Richard, 2005)	Informativeness	The site is informative.
		The site contains useful information.
		The site is resourceful.
	Navigational cues	It is easy to use.
		Navigational problems are limited.
		There are good search agents to find information,
		Easy keywords to find information are used.
	Organization	The site is clear to use.
		The site is comfortable to use.
	Structure	The structure is well-organized.
		It allows a great overview of its structure.
		The structure is straightforward.
(Wang et al., 2007)	Socialness perceptions	Customer service is helpful.
		Customer service is intelligent..
		Customer service is polite.
		Customer service is informative.
(Wang et al., 2011)	Aesthetic formality	The site is well organized.
		The order of the site is good.
		The text is legible.
Focus group		The site well provides a 360 rotation option.
		The site appropriately opens a live chat window for helping shoppers.
		The site well provides in-store blogs.
		The site well provides consumer reviews under products pages.
		The site well provides certification symbols.
		The site well provides corporate social responsibility information.
		The site well provides external payment options.
		The site well provides a store locator function.
		The site well remembers my personal information.

Table 2. Continued

Sources	Constructs	Scale Item
Focus group		The site is informative.
		The site contains useful information.
		The site is resourceful.
		The site is easy to use.
		The site well suggests products.
		Shoppers can easily chat with employees.
		The site well provides free shipping.
		The site well provides free gifts with purchases
		Shoppers can easily use promotional codes.
		The site well provides partnership information.
		The site well provides exclusive sales for online stores only.
		The site well provides virtual model or virtual try on.
		Virtual employees appropriately appear when shoppers need helps.
		The site well suggests relevant products.
		The site well remembers browsed products.
		The site well provides awards information.
		The site well provides sponsorship information.
		The site clearly demonstrates a slogan.
		The site well explains how to use products.
		The site well provides company history.
		Participations in charity events are well explained in the site.
		The site well provides video explanations.
		The site well provides bidding options.
		Shoppers can easily compare products.
		The site well provides customization functions.
		Shoppers can well personalize product design.

Personal Interviews

After finalizing the item pool in the focus group interview, the researchers conducted personal interviews to discover categories of online store atmospheric cues. The personal interview is a great method for gathering in-depth opinions from participants based on their experience (Morrison, Haley, Sheehan, & Taylor, 2002). To maximize the advantage of the personal interview, two experts in online retailing were recruited from the United States and South Korea respectively. The first interviewee from the United States ran a small online store in Denton, Texas, and the second interviewee from South Korea was a CEO of a medium-sized website design enterprise in South Korea. Due to distance, personal interviews were conducted via Skype, software supporting video chatting, instant messaging, and screen sharing.

The interview was initiated by greetings and expression of gratitude for participation. Interviewees were informed contents in a consent form approved by the University IRB. The interviewer verbally demonstrated that that participation was voluntary, and that information obtained from the interview would be kept confidential. The researcher announced that the interview would take about 40 minutes to complete, and that their responses would be recorded by note-taking.

Interviewees were first informed of the definition of online store atmospheric cues so that interviewees could provide answers mainly relevant to online store atmospheric cues. First, researchers asked two questions: “what are elements that you consider when you design online stores?”; “Can you list specific examples of cues for the elements?” As a result of the personal interviews, 17 categories were suggested. Interviewees were also

asked to classify 226 measurement items into dimensions. Table 3 demonstrates the online store atmospheric cues found as a result of the personal interviews, summaries of interviewees' description of each category, and examples of specific cues proposed by interviewees.

Table 3. Categories of Online Store Atmospheric Cues

Cues	**Description**	**Attributes**
Customization	The customization cue is related to software allowing consumers to change product options.	A section in a product page where consumers can change product options
Font	The font cue stands for not only styles of characters but also includes size and quality of the text.	Font styles, size, and quality
Layout	The layout cue is associated with arrangements of all types of contents in a single web page.	Overall arrangements of the text, images, menus, and blank space
Visual	The visual cue is associated with the aesthetic quality of every web page in an online store.	Color choice, design of web pages, and attractive images
Rich media	The rich media cue refers to high quality animation techniques and images. Previously, web developers avoided using Rich Media because Rich Media was developed with the Flash program, and loading time was enormously increased by the Flash program. However, new Hypertext Markup Language (HTML) 5 allows web developers to present Rich Media without the heavy Flash program.	High quality images, video, and animated menus or icons
Content	The content cue is related to overall information quality in an online store.	The amount, depth, and usefulness information
Corporate social responsibility (CSR)	The CSR cue refers to a set of web pages announcing retailers' contributions to society.	Information regarding charity activities and environmentally conscious business

Table 3. Continued

Cues	Description	Attributes
Order fulfillment	The order fulfillment cue stands for information or functions helping successful transactions.	Payment options, delivery options, and return information
Product information	The product information cue refers to information regarding products. Online stores put extra work into product information because the accuracy and quality of information is significantly important.	Product specifications and instructions
Company information	The company information refers to information associated with the company.	Goals, slogan, and history
Merchandise	Merchandise cue is related to product assortment and inventory control.	Product availability and a wide selection of products
Navigation	Navigation cue refers to all features helping consumers find information.	Navigation bars and search tools
Promotion	The promotion cue refers to all promotional activities in an online store.	Free shipping and special offers
Security	The security cue is associated with attributes that can differentiate the consumers' perception of the security level.	Rewards and certifications
Support	The support cue refers to all options that consumers can receive support from an online store.	Live chat help and contact information for questions
Personalization	The personalization cue refers to features that make consumers perceive they receive personalized service.	Product recommendation
Social	The social cue is associated with features that allow consumers to interact with other users.	Social media connectivity, user reviews, and blogs

Item Classification and Generation of Measurement Items

Face validation was conducted with five experts (one graduate student and four professors) for initial item purification. The experts thoroughly evaluated the total of 226 items collected by the literature review and focus group interview to (1) eliminate duplicated or unacceptable items, (2) evaluate a classification of items, and (3) revise

ambiguous wording. As a result, 80 items measuring 17 online store atmospheric cues were generated. All 80 measurement items are indicated in Table 4.

In addition to the items measuring online store atmospheric cues, the study adopted items measuring the three emotional states of the M-R (Mehrabian & Russell, 1974) model—pleasure (5 items), arousal (5 items), dominance (3 items), and approach-avoidance behavior (4 items) —for the purpose of checking predictive validity and demonstrating application of the measurement (See Table 4 and Table 5).

Table 4. Measurement Items of Online Store Atmospheric Cues

Constructs	Label	Scale Item
Customization	Cus1	The X online store provides a lot of customization options.
	Cus2	I can well customize products in the X online store.
	Cus3	The X online store allows me to create products or services to exactly fit my needs.
Font	Font1	The X online store is easy to read.
	Font2	The X online store uses readable text.
	Font3	The X online store uses clear headers.
	Font4	The X online store uses fonts properly.
Layout	Layout1	The X online store provides clear layout.
	Layout2	The X online store uses consistent layout across all pages.
	Layout3	The X online store uses a balanced layout.
	Layout4	The X online store uses an attractive layout.
	Layout5	The pages on the X online store are not crowded.
	Layout6	The X online store looks organized.
Visual	Visual1	The X online store uses colors properly.
	Visual2	The X online store uses attractive colors.
	Visual3	The X online store has a visually pleasing design.
	Visual4	The way the X online store displays its products is attractive.
	Visual5	The X online store uses attractive images.
Rich media	Media1	The X online store well provides interactive effects on menus or icons.
	Media2	The X online store provides attractive zoom on features for pictures of products.
	Media3	The X online store enables me to view the merchandise in different ways.
	Media4	The X online store provides exciting animation techniques.
	Media5	The X online store provides high-quality images.
	Media6	The X online store provides various video clips.
	Media7	The X online store provides various technologies that help shopping tasks.

Table 4. Continued

Constructs	Label	Scale Item
Content	Content1	The content of the X online store is easy for me to understand.
	Content2	The content of the X online store appears to be up-to-date.
	Content3	The X online store provides accurate information.
	Content4	The content of the X online store is useful.
	Content5	The information on the X online store is helpful.
	Content6	The information on the X online store is relevant to me.
	Content7	The X online store is informative.
CSR	Csr1	The X online store well provides evidence of the retailer's participation in charity.
	Csr2	The X online store well provides corporate social responsibility information.
	Csr3	The X online store well provides the retailer's sustainability activities.
	Csr4	The X online store well provides the retailer's activities for promoting the well-being of the society.
Order fulfillment	Order1	Service and product guarantees are clearly explained in the X online store.
	Order2	Shipping and handling costs are clearly listed in the X online store.
	Order3	Return policies or other measures of accountability are well presented in the X online store.
	Order4	The X online store accepts a variety of payment methods.
	Order5	The payment procedure of the X online store is easy to use.
	Order6	Various delivery options are available in the X online store.
Product information	Product1	Details about products can be easily accessed in the X online store.
	Product2	There is enough information on the X online store to assess the products.
	Product3	The X online store provides up-to-date information of products.
	Product4	Explanations of the products are helpful in making a purchase decision in the X online store.
Company information	Company1	The X online store well provides information related to customer policies (e.g., privacy and dispute details).
	Company2	The X online store well provides the retailer's general information (e.g., goals, owners, history, slogan, etc.).

Table 4. Continued

Constructs	Label	Scale Item
Merchandise	Merch1	The X online store well tells one immediately if something is out of stock.
	Merch2	The X online store carries a wide selection of merchandise.
	Merch3	The X online store is fully stocked.
Navigation	Navi1	The X online store looks easy to navigate through.
	Navi2	The organization of the information presented on the screen is clear in the X online store.
	Navi3	The X online store has valid links (hyperlinks).
	Navi4	The X online store has useful navigational aids.
	Navi5	There are convenient ways to maneuver among related pages in the X online store.
	Navi6	Navigation through the X online store is logical.
	Navi7	The X online store is user-friendly.
	Navi8	One can find information easily in the X online store.
	Navi9	The X online store has a search tool which helps one find what s/he want.
Promotion	Promo1	The X online store offers a various promotions.
	Promo2	The X online store well provides special offers.
	Promo3	One can see promotions easily in the X online store.
Security	Security1	The X online store seems secure.
	Security2	The security systems of the X online store seem rigorous.
	Security3	Overall, the X online store seems security conscious.
Support	Support1	The X online store provides various ways to receive shopping help.
	Support2	It is easy to contact a support staff in the X online store.
	Support3	The X online store well provides contact information for questions.
Personalization	Person1	The X online store can well recommend products for individuals.
	Person2	One can easily change product options in the X online store.
	Person3	Useful shopping recommendations are made for individuals in the X online store.
	Person4	The X online store well helps one to compare products.

Table 4. Continued

Social	Social1	Informative magazine articles or editorial content are well present in the X online store.
	Social2	It is easy to interact with other users of the X online store.
	Social3	The X online store provides a lot of areas where users can provide their opinions.
	Social4	The X online store offers various links to connect to social networking sites (e.g., Facebook, Twitter, Pinterest, etc.).
	Social5	The X online store well provides customer reviews of products.
	Social6	One can easily see what other users think of the products in the X online store.
	Social7	The X online store well indicates the number of reviews or ratings.

Table 5. Measurement Items of Constructs of the M-R Model

Constructs	**Label**	**Scale Item**
Pleasure	Pleasure1	My shopping experience was contented.
	Pleasure2	My shopping experience was happy.
	Pleasure3	My shopping experience was satisfying.
	Pleasure4	My shopping experience was pleasing.
	Pleasure5	My shopping experience was relaxing.
Arousal	Arousal1	My shopping experience was stimulating.
	Arousal2	My shopping experience was exciting.
	Arousal3	My shopping experience was arousing.
	Arousal4	My shopping experience was frenzied.
	Arousal5	My shopping experience was wide awake.
Dominance	Domi1	My shopping experience was controlling.
	Domi2	My shopping experience was dominant.
	Domi3	My shopping experience was influential.
Approach-avoidance behavior	Aab1	I liked the X online store.
	Aab2	I enjoyed shopping in the X online store.
	Aab3	I was active in browsing and exploring the X online store.
	Aab4	I will return to the X online store in the future.

Pretest

Instrument Development

Stimuli selection

First, only online stores containing all 17 online store atmospheric cues identified by personal interviews were selected for inclusion (See Table 3). In addition, in order to increase generalizability of the measurement, the study strove to diversify selection of product categories of online stores. Furthermore, online stores that contain most of the identified atmospheric cues were selected. As a result, a total of 18 stores were selected, as indicated in Table 6.

Table 6. Selected Stores

Stores	Selling Products	Web Addresses
Amazon	Apparel, book, and electronics	www.amazon.com.
ASOS	Apparel	www.asos.com
Best Buy	Electronics	www.bestbuy.com
Dell	Computers	www.dell.com/us/en
Home Depot	Home improvement products	www.homedepot.com
IKEA	Furniture	www.ikea.com/us/en
JCPenney	Apparel	www.jcpenney.com
Kohl's	Apparel and home décor	www.kohls.com
Marks & Spencer	Apparel and home décor	www.marksandspencer.com
Nike	Apparel	www.nike.com
Nordstrom	Apparel	www.shop.nordstrom.com
Office Depot	Electronics and office supplies	www.officedepot.com
Pottery Barn	Furniture	www.potterybarn.com
QVC	Apparel and home décor	www.qvc.com
Target	Apparel, drugs, electronics, groceries, home décor, and toys	www.target.com
Toys "R" Us	Toys	www.toysrus.com
Walmart	Apparel, drugs, electronics, groceries, home décor, and toys	www.walmart.com
Wayfair	Furniture, luggage, and toys	www.wayfair.com

Survey design

An online survey was designed with the online survey platform Qualtrics (www.qualtrics.com). In Section 1, respondents were made aware contents in a consent form approved by the University IRB: their participation was voluntary, their responses would remain confidential, they could terminate the survey at any time, and they could skip questions without being penalized.

In Section 2, qualifications were checked. First, the survey asked respondents' age, and was designed to terminate the survey if respondents were less than 18 years old. Second, from a list of stores, respondents were asked to select one online store that they had most recently visited. The survey was designed to terminate if respondents had not visited any of the online stores.

In Section 3, respondents were asked to thoroughly browse the online store they selected for at least 5 minutes, and were also asked to experience as many menus within the site as possible so as to maximize their exposure to online store atmospheric cues. This section provided a hyperlink to an online store selected by the participant in Section 2 for ease of access. At the end of the Section 3, respondents were asked to answer questions based on their experience in a selected online store.

Section 4 contained measurement items for 18 online store atmospheric cues (customization, font, layout, visual, rich media, content, CSR, order fulfillment, product information, company information, merchandise, navigation, promotion, security, support, personalization, and social). Section 5 contained measurement items for key constructs (pleasure, arousal, dominance, and approach-avoidance behavior). Sections 4 and 5 were

designed to display the hyperlinked name of an online store selected by the recipient in Section 2, for ease of re-visit access. For example, if a respondent selected Amazon, the item, Layout 1, displayed as follows: “The Amazon online store uses an attractive layout.” Last, Section 6 asked respondents for basic demographic information. All items in Section 4, Section 5, and Section 6 were measured with a 7-point Likert scale labeled: 1 = strongly disagree; 2 = disagree; 3 = somewhat disagree; 4 = neither agree nor disagree; 5 = somewhat agree: 6 = agree: and 7 = strongly agree, randomly ordered.

Data Collection

A pretest was conducted to purify measurement items. The data were collected via Mechanical Turk (www.mturk.com), an online crowdsourcing platform where one can assign a project to a great number of workers, and workers get paid for job completion (Ross, Irani, Silberman, Zaldivar, & Tomlinson, 2010). Mechanical Turk retains about more than 500,000 workers in over 190 countries.

The study created a Mechanical Turk project asking workers to finish the online survey designed with Qualtrics. On the project page, the study provided a hyperlink to the online survey, and asked workers to enter a code that they would receive at the end of the online survey. Workers were paid $0.50 for entering the correct code. The study collected 200 responses, of which 8 were eliminated due to relatively short response time (less than 10 minutes). As a result, a total of 192 usable surveys were collected. Respondents were of median age 29 years and a median income of $20,000-39,999. Asian (47.9%) was the majority ethnic group, followed by White-American (34.9%), African-American (4.7%), Hispanic (3.6%), and Native American (3.6%).

Statistical Analyses

The study used Mplus Version 6.1 (Muthén & Muthén, 2010) to test measurement models of online store atmospheric cues with the CFA. The study specified robust maximum likelihood (MLM) estimation for parameters of a measurement model because MLM estimates the parameters with standard errors and a mean-adjusted chi-square test statistic that are distribution-free (Satorra & Bentler, 2010).

The comparative fit index (CFI), Tucker Lewis index (TLI), root mean square error of approximation (RMSEA), and the chi-square (χ^2) tests were used to evaluate model fits of confirmatory factor analysis. For the pretest, the study used moderate model fit criteria, and CFI and TLI values over .80. RMSEA values less than or equal to .08 were considered satisfactory goodness-of-fit indices (Hair, Black, Babin & Anderson, 2009).

An initial measurement model including measurement items for 17 online store atmospheric cues (See Table 3) was initially tested. The measurement model showed satisfactory model fit indices: CFI = .942; TLI = .934; RMSEA = .057; $\chi^2(2944) = 4754.27$. Factor loadings of all items and composite reliabilities of all constructs are demonstrated in Table 7.

Table 7. The Initial Measurement Model

Constructs	Label	S.L.[a]	C.R.[b]
Customization	Cus1	0.813	0.852
	Cus2	0.872	
	Cus3	0.743	
Font	Font1	0.756	0.834
	Font2	0.730	
	Font3	0.748	
	Font4	0.750	
Layout	Layout1	0.767	0.857
	Layout2	0.689	
	Layout3	0.707	
	Layout4	0.750	
	Layout5	0.495	
	Layout6	0.811	
Visual	Visual1	0.794	0.886
	Visual2	0.764	
	Visual3	0.760	
	Visual4	0.790	
	Visual5	0.795	
Rich media	Media1	0.545	0.767
	Media2	0.650	
	Media3	0.594	
	Media4	0.501	
	Media5	0.616	
	Media6	0.291	
	Media7	0.732	
Content	Content1	0.763	0.903
	Content2	0.768	
	Content3	0.687	
	Content4	0.777	
	Content5	0.806	
	Content6	0.676	
	Content7	0.810	

Note: [a]Standardized loading;
[b]Composite reliability score.

Table 7. Continued

Constructs	**Label**	**S.L.**[a]	**C.R.**[b]
CSR	Csr1	0.784	0.882
	Csr2	0.773	
	Csr3	0.848	
	Csr4	0.822	
Order fulfillment	Order1	0.749	0.856
	Order2	0.679	
	Order3	0.641	
	Order4	0.673	
	Order5	0.767	
	Order6	0.717	
Product information	Product1	0.777	0.883
	Product2	0.820	
	Product3	0.824	
	Product4	0.810	
Company information	Company1	0.679	0.629
	Company2	0.676	
Merchandise	Merch1	0.706	0.711
	Merch2	0.794	
	Merch3	0.497	

Note: [a]Standardized loading;
[b]Composite reliability score.

Table 7. Continued

Constructs	Label	S.L.[a]	C.R.[b]
Navigation	Navi1	0.794	0.923
	Navi2	0.746	
	Navi3	0.658	
	Navi4	0.692	
	Navi5	0.797	
	Navi6	0.762	
	Navi7	0.770	
	Navi8	0.804	
	Navi9	0.767	
Promotion	Promo1	0.815	0.833
	Promo2	0.778	
	Promo3	0.776	
Security	Security1	0.751	0.744
	Security2	0.554	
	Security3	0.789	
Support	Support1	0.801	0.761
	Support2	0.596	
	Support3	0.747	
Personalization	Person1	0.597	0.733
	Person2	0.663	
	Person3	0.710	
	Person4	0.578	
Social	Social1	0.238	0.770
	Social2	0.276	
	Social3	0.761	
	Social4	0.281	
	Social5	0.787	
	Social6	0.769	
	Social7	0.745	

Note: [a]Standardized loading;
[b]Composite reliability score.

Every item was evaluated based on values of factor loading and composite reliability. In general, factor loadings below the threshold of 0.40 are eliminated (Hair et al., 1995), and composite reliabilities below the threshold of 0.60 are considered as poor reliability (Fornell & Larcker, 1981). However, instead of strictly eliminating items based on minimum criteria, the current study purified items mainly based on researchers' intuition. Two experts (one graduate student and professor) conducted face validation to purify items.

Frist, the study tried to eliminate items having factor loadings below .40; four items complied with this condition: Media6 (0.291), Social1 (0.238), Social 2 (0.276), and Social4 (0.281). Of these four, three items (Media6, Socail1, and Social2) were deleted. Social4 was preserved because social networking connectivity was suggested as a key feature of the social cue by two experts in online retailing during focus group interviews.

Second, composite reliability (0.629) and factor loadings were acceptable (i.e., Company1 = 0.679; Company2 = 0.676) but amounted to only two measures of company information cue and therefore were discussed by the experts. The study attempted to conduct DIF tests to purify gender DIF items; one more item ("The X online store provides company information in detail.") was added to avoid only one item surviving after item purification.

Last, the study found that the correlation between the content cue and product information cue was noticeably high: 0.976. The study concluded that all items of the product information cue overlapped with items of the content cue except Product2. Since

the content cue stands for overall information quality in an online store, and the product information cue was specifically limited to products, the study decided to eliminate the product information cue. All items except Product2 were eliminated; Product2 was re-assigned to the content cue after minor revision in wording. After the item purification in the pretest, the study finalized measurement items for the main study (see Table 8).

Table 8. Measurement Items of Online Store Atmospheric Cues for the Main Study

Constructs	**Label**	**Scale Item**
Customization	Cus1	The X online store provides a lot of customization options.
	Cus2	I can well customize products in the X online store.
	Cus3	The X online store allows me to create products or services to exactly fit my needs.
Font	Font1	The X online store is easy to read.
	Font2	The X online store uses readable text.
	Font3	The X online store uses clear headers.
	Font4	The X online store uses fonts properly.
Layout	Layout1	The X online store provides clear layout.
	Layout2	The X online store uses consistent layout across all pages.
	Layout3	The X online store uses a balanced layout.
	Layout4	The X online store uses an attractive layout.
	Layout5	The pages on the X online store are not crowded.
	Layout6	The X online store looks organized.
Visual	Visual1	The X online store uses colors properly.
	Visual2	The X online store uses attractive colors.
	Visual3	The X online store has a visually pleasing design.
	Visual4	The way the X online store displays its products is attractive.
	Visual5	The X online store uses attractive images.
Rich media	Media1	The X online store well provides interactive effects on menus or icons.
	Media2	The X online store provides attractive zoom on features for pictures of products.
	Media3	The X online store enables me to view the merchandise in different ways.
	Media4	The X online store provides exciting animation techniques.
	Media5	The X online store provides high-quality images.
	Media6	The X online store provides various technologies that help shopping tasks.

Table 8. Continued

Constructs	Label	Scale Item
Content	Content1	The content of the X online store is easy for me to understand.
	Content2	The content of the X online store appears to be up-to-date.
	Content3	The X online store provides accurate information.
	Content4	The content of the X online store is useful.
	Content5	The information on the X online store is helpful.
	Content6	The information on the X online store is relevant to me.
	Content7	The X online store is informative.
	Content8	There is enough information on the X online store.
CSR	Csr1	The X online store well provides evidence of the retailer's participation in charity.
	Csr2	The X online store well provides corporate social responsibility information.
	Csr3	The X online store well provides the retailer's sustainability activities.
	Csr4	The X online store well provides the retailer's activities for promoting the well-being of the society.
Order fulfillment	Order1	Service and product guarantees are clearly explained in the X online store.
	Order2	Shipping and handling costs are clearly listed in the X online store.
	Order3	Return policies or other measures of accountability are well presented in the X online store.
	Order4	The X online store accepts a variety of payment methods.
	Order5	The payment procedure of the X online store is easy to use.
	Order6	Various delivery options are available in the X online store.
Company information	Company1	The X online store well provides information related to customer policies (e.g., privacy and dispute details).
	Company2	The X online store well provides the retailer's general information (e.g., goals, owners, history, slogan, etc.).
	Company3	The X online store provides company information in detail.
Merchandise	Merch1	The X online store well tells one immediately if something is out of stock.
	Merch2	The X online store carries a wide selection of merchandise.
	Merch3	The X online store is fully stocked.

Table 8. Continued

Constructs	Label	Scale Item
Navigation	Navi1	The X online store looks easy to navigate through.
	Navi2	The organization of the information presented on the screen is clear in the X online store.
	Navi3	The X online store has valid links (hyperlinks).
	Navi4	The X online store has useful navigational aids.
	Navi5	There are convenient ways to maneuver among related pages in the X online store.
	Navi6	Navigation through the X online store is logical.
	Navi7	The X online store is user-friendly.
	Navi8	One can find information easily in the X online store.
	Navi9	The X online store has a search tool which helps one find what s/he want.
Promotion	Promo1	The X online store offers a various promotions.
	Promo2	The X online store well provides special offers.
	Promo3	One can see promotions easily in the X online store.
Security	Security1	The X online store seems secure.
	Security2	The security systems of the X online store seem rigorous.
	Security3	Overall, the X online store seems security conscious.
Support	Support1	The X online store provides various ways to receive shopping help.
	Support2	It is easy to contact a support staff in the X online store.
	Support3	The X online store well provides contact information for questions.
Personalization	Person1	The X online store can well recommend products for individuals.
	Person2	One can easily change product options in the X online store.
	Person3	Useful shopping recommendations are made for individuals in the X online store.
	Person4	The X online store well helps one to compare products.
Social	Social1	The X online store provides a lot of areas where users can provide their opinions.
	Social2	The X online store offers various links to connect to social networking sites (e.g., Facebook, Twitter, Pinterest, etc.).
	Social3	The X online store well provides customer reviews of products.
	Social4	One can easily see what other users think of the products in the X online store.
	Social5	The X online store well indicates the number of reviews or ratings.

Main Study

Data Collection

The exact same stimuli and survey design as used in the pretest were used for the main study, and the main study collected the data through Mechanical Turk (www.mturk.com) again. The data collection was conducted for a week, and incentives were changed several times to adjust speed of data collection. The study offered $1.00 for 400 respondents, $0.75 for 970 respondents, and $0.50 for 455 respondents. 1825 responses were collected, and 1751 usable responses were collected after eliminating 74 responses due to relatively short response time (less than 10 minutes).

Sample Characteristics

It is important to have even gender distribution in order to purify gender DIF items. Among 1751 respondents, gender was fairly evenly distributed between males (n = 943, 53.9%) and females (n = 808, 46.1%). In fact, the sex ratio of males to females (1.17) closely approximates the actual sex ratio of Internet users (1.15) ("Male Internet users," 2013). Respondents' ages ranged from 18 to 78 with a median age of 29. 896 (51.2%) were married or doing domestic partnership. 847 respondents (48.4%) were Asian or Pacific Islander, followed by Caucasian (n = 614, 35.1%), African-American (n = 103, 5.9%), Native American (n = 58, 3.3%), and Hispanic (n = 55, 3.1%).

About 60% of respondents' income was less than $40,000 (n of less than $20,000 = 535, 30.6%; n of $20,000 to $39,999 = 516, 29.5%) followed by $40,000 to $59,999 (n = 282, 16.1%), $60,000 to $79,999 (n = 206, 11.8%), $80,000 to $99,999 (n = 100, 5.7%), $100,000 to $119,999 (n = 51, 2.9%), $120,000 to $139,999 (n = 28, 1.6%), and

$140,000 or more (n = 33, 1.9%). The majority of respondents' education level was college/university graduate (n = 845, 48.3%) followed by post-graduate (n = 415, 23.7%), some college (n = 368, 21.0%), and pre-high school or high school (n = 113, 6.5%). Amazon was the most recently visited online store (n = 1374, 78.5%) followed by Walmart (n = 117, 6.7%), and Dell (n = 46, 2.6%). Detailed demographic characteristics are indicated in Table 9.

Table 9. Demographic Characteristics

Demographics		**Frequencies (n = 1751)**	**Percentage (%)**
Gender	Male	943	53.9
	Female	808	46.1
Age	18-25	496	28.3
	26-35	780	44.5
	36-45	236	13.5
	46-55	145	8.3
	Over 55	94	5.4
Ethnicity	African-American	103	5.9
	Caucasian	614	35.1
	Native American	58	3.3
	Asian or Pacific Islander	847	48.4
	Hispanic	55	3.1
	Other	74	4.2
Income	Less than $20,000	535	30.6
	$20,000-39,999	516	29.5
	$40,000-59,999	282	16.1
	$60,000-79,999	206	11.8
	$80, 000-99,999	100	5.7
	$100,000-119,999	51	2.9
	$120,000-139,999	28	1.6
	$140,000 or more	33	1.9
Marital Status	Single, never married	855	48.8
	Married or domestic partnership	896	51.2
Education	Pre-High School or High School	113	6.5
	Some College (2 Years)	368	21.0
	College/Univ. Graduate	845	48.3
	Post-Graduate	415	23.7
	Other	10	0.6

Table 9. Continued

Demographics		**Frequencies (n = 1751)**	**Percentage (%)**
Number of times shopped at online stores in past 3 months	1	102	5.8
	2	165	9.4
	3	185	10.6
	4	226	12.9
	5	217	12.4
	6	190	10.9
	7	175	10.0
	8	103	5.9
	9, or more	388	22.2
An online store that respondents had most recently visited	Amazon	1374	78.5
	ASOS	5	0.3
	Best Buy	44	2.5
	Dell	46	2.6
	Home Depot	19	1.1
	IKEA	14	0.8
	JCPenney	12	0.7
	Kohl's	12	0.7
	Marks & Spencer	9	0.5
	Nike	37	2.1
	Nordstrom	6	0.3
	Office Depot	4	0.2
	Pottery Barn	4	0.2
	QVC	6	0.3
	Target	36	2.1
	Toys “R” Us	4	0.2
	Walmart	117	6.7
	Wayfair	2	0.1

CHAPTER 4

RESULTS AND DISCUSSION

This chapter discusses data analyses of the main study. Measurement items were initially purified with confirmatory factor analysis (CFA), and gender differential item functioning (DIF) items were further purified to establish a gender neutral measurement. Next, measurement items were finalized by CFA and multiple validity tests (convergent validity, discriminant validity, and predictive validity). Last, the study tested multiple models to arrive at the best taxonomy of online store atmospheric cues.

Statistical Analyses

Mplus Version 6.1 (Muthén & Muthén, 2010) was also used to test measurement models and DIF. MLM estimation was also specified to control for multivariate normality issues. The study established a model comprised of purified measurements after the pretest (See Table 8). This measurement model representing 16 online store atmospheric cues was tested with CFA. The measurement model demonstrated excellent model fit indices: CFI = .926; TLI = .920; RMSEA = .029; $\chi^2(2580) = 6440.37$.

All factor loading values exceeded the threshold of 0.40 (Hair et al., 1995), except Social2, which was eliminated from further analyses. Next, the study tested the measurement model without Social2, and the model showed noticeably improved great model fit indices: CFI = .933; TLI = .927; RMSEA = .028; $\chi^2(2507) = 5970.53$, and all factor loadings were over the threshold of 0.40 (Hair et al., 1995).

Testing Gender DIF with MIMIC Analyses

The gender DIF items were tested by the multiple indicators multiple causes (MIMIC) model approach (Woods, 2009). The MIMIC model has been widely used for detecting DIF (Finch, 2005), The MIMIC model was assessed by Mplus. The MIMIC model DIF test basically estimates both the effect of a grouping variable (i.e., gender) on a latent construct and effects of the grouping variable on items measuring the latent construct. The MIMIC model specifies that different groups (males vs. females) have equal capacity in relation to the latent construct (i.e., accounting for group difference on the latent construct), and investigate whether the likelihood of responses to items are consistently different between the two groups at all levels of the items.

The study conducted multiple gender DIF tests on constructs. The null hypothesis for the gender DIF test is that there is no gender DIF item in a latent construct. The study rejected the null hypothesis if chi-square values exceeded the threshold of 3.84 (p = 0.05). The gender DIF tests were conducted with a stepwise approach as follows: an initial DIF test was conducted with all items of a latent construct, and found the highest DIF item. The next DIF test was conducted without the highest DIF item, and found the next highest DIF item. The study continuously conducted DIF tests until no DIF item was found.

Testing Gender DIF on Customization

The customization cue was measured by three items: Cus1, Cus2, and Cus3. On the first step, Cus3 turned out to be a gender DIF item ($\chi^2(1) = 4.426$), and Cus3 was eliminated. Next, the customization cue contained the measurement items Cus1 and Cus2, and conducted another DIF test. On the second stage, there was no gender DIF item (See Table 10).

Table 10. Testing Gender DIF on the Customization Cue

Steps	**Constructs**	**Label**	**Chi-square values**
1	Customization	Cus1	0.034
		Cus2	0.057
		Cus3	**4.426**
2	Customization	Cus1	0.740
		Cus2	1.827

Testing Gender DIF on Font

The font cue contained four items: Font1, Font2, Font3, and Font4. The DIF test revealed that there was no DIF item in the font cue. See Table 11.

Table 11. Testing Gender DIF on the Font Cue

Steps	**Constructs**	**Label**	**Chi-square values**
1	Font	Font1	0.473
		Font2	0.109
		Font3	3.774
		Font4	0.112

Testing Gender DIF on Layout

The layout cue was measured by six items: Layout1, Layout2, Layout3, Layout4, Layout5, and Layout 6. Layout 2 was identified as a gender DIF item ($\chi^2(1) = 4.021$). After eliminating Layout2, there was no gender DIF item on the second step. See Table 12.

Table 12. Testing Gender DIF on the Layout Cue

Steps	**Constructs**	**Label**	**Chi-square values**
1	Layout	Layout1	0.049
		Layout2	**4.021**
		Layout3	0.211
		Layout4	1.894
		Layout5	2.087
		Layout6	0.124
2	Layout	Layout1	0.425
		Layout3	0.958
		Layout4	1.467
		Layout5	2.312
		Layout6	0.002

Testing Gender DIF on Visual

The visual cue contained five items: Visual1, Visual2, Visual3, Visual4, and Visual5. Visual1 ($\chi^2(1) = 5.035$) was identified as a DIF item. When the visual cue was measured without Visual1, there was no DIF item. See Table 13.

Table 13. Testing Gender DIF on the Visual Cue

Steps	Constructs	Label	Chi-square values
1	Visual	Visual1	**5.035**
		Visual2	0.061
		Visual3	0.006
		Visual4	0.653
		Visual5	0.040
2	Visual	Visual2	0.497
		Visual3	0.011
		Visual4	0.128
		Visual5	0.452

Testing Gender DIF on Rich Media

The rich media cue was initially measured by six items: Media1, Media2, Media3, Media4, Media5, and Media6. Chi-square values of three items (i.e., Media3, Media4, and Media5) were higher than the critical value of 3.84, and Media4 showed the highest chi-square value of 12.027. Thus, Media4 was eliminated in the first stage. On the second stage, Media1 and Media5 ($\chi^2(1) = 5.280$) were gender DIF items, and the chi-square value of Media5 was higher than the value of Media1. Thus, Media5 was eliminated on the second step. Next, the rich media cue was measured by four items (i.e., Media1, Media2, Media3, and Media6). Only Media3 ($\chi^2(1) = 4.459$) was identified as a gender DIF item. Thus, Media3 was deleted on the third stage, and there was no gender DIF item on the fourth stage. See Table 14.

Table 14. Testing Gender DIF on the Rich Media Cue

Steps	Constructs	Label	Chi-square values
1	Rich media	Media1	0.680
		Media2	0.001
		Media3	4.406
		Media4	**12.027**
		Media5	4.657
		Media6	0.100
2	Rich media	Media1	4.691
		Media2	0.049
		Media3	2.991
		Media5	**5.280**
		Media6	0.410
3	Rich media	Media1	3.603
		Media2	0.142
		Media3	**4.459**
		Media6	0.056
4	Rich media	Media1	2.101
		Media2	0.767
		Media6	0.157

Testing Gender DIF on Content

The content cue was initially measured by eight items: Content1, Content2, Content3, Content4, Content5, Content6, Content7, and Content8. The chi-square values of Content1 ($\chi^2(1) = 5.125$), Content2 ($\chi^2(1) = 5.212$), and Content8 ($\chi^2(1) = 8.020$) exceeded the critical value of 3.84, and the value of Content8 was higher than other two items. Therefore, Content8 was deleted on the first step. On the second step, Content1 ($\chi^2(1) = 4.306$) and Content2 ($\chi^2(1) = 4.163$) were found to be gender DIF items, and since the chi-square value of Content1 was slightly higher than Content2, Content1 was eliminated on the second step. In the third step, only Content1 ($\chi^2(1) = 5.683$) turned out to be a gender DIF item, and therefore excluded. In the fourth step, no gender DIF item was found. See Table 15.

Table 15. Testing Gender DIF on the Content Cue

Steps	Constructs	Label	Chi-square values
1	Content	Content1	5.125
		Content2	5.212
		Content3	0.882
		Content4	0.738
		Content5	0.006
		Content6	1.617
		Content7	0.001
		Content8	**8.020**
2	Content	Content1	**4.306**
		Content2	4.163
		Content3	2.000
		Content4	0.255
		Content5	0.138
		Content6	1.544
		Content7	0.281
3	Content	Content2	**5.683**
		Content3	1.510
		Content4	1.157
		Content5	0.009
		Content6	2.356
		Content7	0.159
4	Content	Content3	0.366
		Content4	2.048
		Content5	0.021
		Content6	3.641
		Content7	0.003

Testing Gender DIF on corporate social responsibility (CSR)

The CSR cue was initially measured by four items: Csr1, Csr2, Csr3, and Csr4. Among four items, only Csr3 ($\chi^2(1) = 7.324$) was identified as a gender DIF item, and it was eliminated in the second step. The CSR cue as measured by three items (i.e., Csr1, Csr2, and Csr4) in the second step revealed no gender DIF item. See Table 16.

Table 16. Testing Gender DIF on the CSR Cue

Steps	**Constructs**	**Label**	**Chi-square values**
1	CSR	Csr1	0.803
		Csr2	0.599
		Csr3	**7.324**
		Csr4	0.211
2	CSR	Csr1	2.140
		Csr2	0.011
		Csr4	1.449

Testing Gender DIF on Order Fulfillment

The order fulfillment cue was measured by six items (Order1, Order2, Order3, Order4, Order5, and Order6) in the first step. Order5 ($\chi^2(1) = 11.528$) was the only gender DIF item, and therefore eliminated. In the second step, Order4 ($\chi^2(1) = 4.070$) and Order6 ($\chi^2(1) = 7.670$) turned out to be gender DIF items. Since the chi-square value of Order6 was higher than the value of Order4, Order6 was eliminated in the second step. In the third step, only Order4 ($\chi^2(1) = 9.842$) was found to be a DIF item. After eliminating Order4, there was no gender DIF item in the fourth step. See Table 17.

Table 17. Testing Gender DIF on the order fulfillment Cue

Steps	Constructs	Label	Chi-square values
1	Order fulfillment	Order1	0.666
		Order2	2.498
		Order3	2.090
		Order4	1.108
		Order5	**11.528**
		Order6	3.361
2	Order fulfillment	Order1	0.655
		Order2	1.015
		Order3	1.204
		Order4	4.070
		Order6	**7.670**
3	Order fulfillment	Order1	0.329
		Order2	0.179
		Order3	0.700
		Order4	**9.842**
3	Order fulfillment	Order1	0.020
		Order2	0.093
		Order3	0.099

Testing Gender DIF on Company Information

The company information cue was measured by three items (Company1, Company2, and Company3). Company2 was identified as a gender DIF item, and therefore removed before the second step. When the study conducted the DIF test with two items (i.e., Company1 and Company3), the chi-square value of Company3 ($\chi^2(1) = 3.883$) was slightly higher than the critical value of 3.84. However, it was decided that Company3 should be kept because its chi-square value was almost equal to the critical value. This decision should be valid because Company3 would have survived if the study used the critical value of 6.64 ($p = 0.01$). See Table 18.

Table 18. Testing Gender DIF on the order fulfillment Cue

Steps	Constructs	Label	Chi-square values
1	Company information	Company1	1.665
		Company2	**6.925**
		Company3	0.812
2	Company information	Company1	0.156
		Company3	**3.883**

Testing Gender DIF on Merchandise

The merchandise cue was measured by Merch1, Merch2, and Merch3. Merch2 ($\chi^2(1) = 25.986$) turned out to be a gender DIF item. After eliminating Merch2, there was no gender DIF item in the second step. See Table 19.

Table 19. Testing Gender DIF on the Merchandise Cue

Steps	Constructs	Label	Chi-square values
1	Merchandise	Merch1	0.014
		Merch2	**25.986**
		Merch3	0.772
2	Merchandise	Merch1	1.740
		Merch3	0.822

Testing Gender DIF on Navigation

The navigation cue initially contained nine items: Navi1, Navi2, Navi3, Navi4, Navi5, Navi6, Navi7, Navi8, and Navi9, and only Navi7 ($\chi^2(1) = 5.871$) exceeded the critical value of 3.84. Next, when the navigation cue was measured without Navi7, Navi9 ($\chi^2(1) = 6.108$) was identified as a gender DIF item. Thus, Navi9 was eliminated on the second step. There was no gender DIF item on the third step. See Table 20.

Table 20. Testing Gender DIF on the Navigation Cue

Steps	Constructs	Label	Chi-square values
1	Navigation	Navi1	0.180
		Navi2	0.001
		Navi3	0.120
		Navi4	0.217
		Navi5	1.853
		Navi6	0.267
		Navi7	**5.871**
		Navi8	0.224
		Navi9	4.815
2	Navigation	Navi1	0.849
		Navi2	0.070
		Navi3	0.042
		Navi4	0.430
		Navi5	1.398
		Navi6	0.005
		Navi8	0.000
		Navi9	**6.108**
3	Navigation	Navi1	1.227
		Navi2	0.179
		Navi3	0.029
		Navi4	0.737
		Navi5	0.945
		Navi6	0.163
		Navi8	0.151

Testing Gender DIF on Promotion

The promotion cue was measured by three items: Promo1, Promo2, and Promo3. No gender DIF item was found in the first stage. See Table 21.

Table 21. Testing Gender DIF on the Promotion Cue

Steps	Constructs	Label	Chi-square values
1	Promotion	Promo1	1.771
		Promo2	0.017
		Promo3	0.797

Testing Gender DIF on Security

The security cue was measured by three items: Security1, Security2, and Security3. Security2 ($\chi^2(1) = 10.659$) was the only gender DIF item. When the security cue was measured without Security2, there was no gender DIF item. See Table 22.

Table 22. Testing Gender DIF on the Security Cue

Steps	Constructs	Label	Chi-square values
1	Security	Security1	1.243
		Security2	**10.659**
		Security3	0.076
2	Security	Security1	0.526
		Security3	0.622

Testing Gender DIF on Support

The support cue was measured by three items (i.e., Support1, Support2, and Support3). Support2 ($\chi^2(1) = 6.946$) and Support3 ($\chi^2(1) = 10.144$) were identified as gender DIF items. Since the chi-square value of Support3 was higher than Support2, Support3 was deleted in the first step. After that, no gender DIF item was found. See Table 23.

Table 23. Testing Gender DIF on the Support Cue

Steps	Constructs	Label	Chi-square values
1	Support	Support1	2.893
		Support2	6.946
		Support3	**10.144**
2	Support	Support1	0.448
		Support2	1.972

Testing Gender DIF on Personalization

The personalization cue was measured by four items (i.e., Person1, Person2, Person3, and Person 4). Person2 ($\chi^2(1) = 4.556$) was the only gender DIF item. After removing Person2, the DIF test was conducted with Person1 and Person3, and no gender DIF was found in the second step. See Table 24.

Table 24. Testing Gender DIF on the Personalization Cue

Steps	Constructs	Label	Chi-square values
1	Personalization	Person1	0.180
		Person2	**4.556**
		Person3	0.269
		Person4	0.559
2	Personalization	Person1	0.697
		Person3	0.016
		Person4	0.077

Testing Gender DIF on Social

Social2 was previously eliminated due to low factor loading score, therefore the social cue was measured by four items: Social1, Social3, Social4, and Social5. Social1 ($\chi^2(1) = 9.515$), Social3 ($\chi^2(1) = 10.326$), and Social4 ($\chi^2(1) = 7.958$) were gender DIF items, and Social3 was removed for having highest chi-square value. In the second step, the social cue was measured by Social1, Social4, and Social5, and the chi-square values of Social1 ($\chi^2(1) = 6.462$) and Social4 ($\chi^2(1) = 15.865$) were higher than the critical value of 3.84. Since the chi-square value of Social4 was higher than Social1, Social4 was eliminated in the second step, and there was no gender DIF item in the third step. See Table 25.

Table 25. Testing Gender DIF on the Social Cue

Steps	Constructs	Label	Chi-square values
1	Social	Social1	9.515
		Social3	**10.326**
		Social4	7.958
		Social5	2.537
2	Social	Social1	6.462
		Social4	**15.865**
		Social5	0.270
3	Social	Social1	1.878
		Social5	2.872

Testing Validity

After purifying gender DIF items, the study tested convergent and discriminant validity. First of all, the study tested the measurement model with 16 online store atmospheric cues measured by items surviving purification of gender DIF items. Model fit indices of the measurement model were greatly improved over model fit indices of the previous measurement model before conducting gender DIF tests: CFI = .968; TLI = .963; RMSEA = .023; $\chi^2(1154) = 2230.64$.

Convergent Validity

Convergent validity was evaluated by factor loadings of items in each construct, composite reliability, and average variance extracted (AVE). All factor loadings of measurement items were over the threshold of 0.40. In addition, composite reliabilities of all constructs exceeded the threshold of 0.60 (Fornell & Larcker, 1981). AVE greater than 0.40 is acceptable when composite reliability is over 0.60 (Fornell & Larcker, 1981). Thus, the study set the threshold of AVE as 0.40 because all composite reliabilities were over 0.60. The results demonstrated that AVE values for all constructs exceeded the

threshold of 0.40. Therefore, the convergent validity of the measurement of online store atmospheric cues was deemed to be supported. See Table 26.

Discriminant Validity

Discriminant validity was evaluated by correlations across all latent variables. As Table 27 demonstrates, all correlations were below the threshold of 0.85 (Kenny, 2011). Therefore, discriminant validity was supported. To rigorously evaluate discriminant validity, the study also compared AVE values for all latent variables with shared variances. When AVE values for all constructs exceed shared variances of all possible pairs of latent variables, discriminant validity is deemed to be acceptable (Fornell & Larcker, 1981). As Table 28 demonstrates, AVE values exceeded 116 pairs among 120 pairs of latent variables. Four pairs (layout-font, layout-visual, navigation-layout, & content-navigation) failed to exceed AVE values. Each of these pairs was, however, found to be internally conceptually intertwined: layout-font, in that both font and layout have design aspects; layout-visual cues, in that proper or fancy layout of a webpage can be considered as visually appealing; navigation-layout, in that the locations of navigation bars and menus vary layout, and navigation-content cues, in that the content cue is associated with information quality, and the navigation cue is related to functions that assist in finding information. Because of this internal conceptual intertwining, and the fact that the respective correlations of the two pairs were below threshold of 0.85 (Kenny, 2011), discriminant validity was deemed moderately supported.

Table 26. The Initial Measurement Model

Constructs	Label	S.L.[a]	C.R.[b]	AVE
Customization	Cus1	0.786	0.767	0.622
	Cus2	0.791		
Font	Font1	0.786	0.838	0.564
	Font2	0.738		
	Font3	0.752		
	Font4	0.726		
Layout	Layout1	0.724	0.830	0.498
	Layout3	0.717		
	Layout4	0.771		
	Layout5	0.514		
	Layout6	0.770		
Visual	Visual2	0.755	0.866	0.617
	Visual3	0.812		
	Visual4	0.815		
	Visual5	0.759		
Rich media	Media1	0.649	0.713	0.454
	Media2	0.649		
	Media6	0.720		
Content	Content3	0.723	0.855	0.541
	Content4	0.780		
	Content5	0.757		
	Content6	0.726		
	Content7	0.688		
CSR	Csr1	0.799	0.870	0.690
	Csr2	0.851		
	Csr4	0.841		
Order fulfillment	Order1	0.779	0.774	0.534
	Order2	0.682		
	Order3	0.728		
Company information	Company1	0.788	0.782	0.642
	Company3	0.814		
Merchandise	Merch1	0.639	0.614	0.444
	Merch3	0.692		

Note: [a]Standardized loading;
[b]Composite reliability score.

Table 26. Continued

Constructs	Label	S.L.[a]	C.R.[b]	AVE
Navigation	Navi1	0.762	0.884	0.522
	Navi2	0.705		
	Navi3	0.606		
	Navi4	0.734		
	Navi5	0.711		
	Navi6	0.759		
	Navi8	0.768		
Promotion	Promo1	0.823	0.859	0.670
	Promo2	0.817		
	Promo3	0.816		
Security	Security1	0.820	0.751	0.602
	Security3	0.729		
Support	Support1	0.780	0.729	0.574
	Support2	0.734		
Personalization	Person1	0.721	0.736	0.483
	Person3	0.738		
	Person4	0.620		
Social	Social1	0.731	0.669	0.502
	Social5	0.686		

Note: [a]Standardized loading;
[b]Composite reliability score.

Table 27. Correlation Matrix

Variable	*CU*	*FO*	*LA*	*VI*	*RI*	*CO*	*CS*	*OF*	*CI*	*ME*	*NA*	*PR*	*SE*	*SU*	*PE*	*SO*
CU	**1**															
FO	.295	**1**														
LA	.385	.723	**1**													
VI	.372	.643	.763	**1**												
RI	.472	.554	.654	.658	**1**											
CO	.325	.720	.690	.717	.613	**1**										
CS	.472	.184	.353	.362	.437	.272	**1**									
OF	.354	.539	.550	.527	.523	.640	.438	**1**								
CI	.407	.343	.455	.438	.479	.417	.652	.503	**1**							
ME	.227	.537	.498	.485	.477	.638	.201	.518	.374	**1**						
NA	.317	.703	.730	.704	.613	.765	.296	.626	.483	.643	**1**					
PR	.334	.465	.463	.503	.506	.538	.361	.473	.409	.476	.563	**1**				
SE	.300	.551	.512	.525	.487	.606	.268	.545	.408	.557	.660	.466	**1**			
SU	.398	.402	.482	.463	.496	.468	.483	.538	.560	.398	.530	.494	.465	**1**		
PE	.390	.507	.522	.539	.556	.603	.371	.571	.469	.536	.642	.565	.562	.566	**1**	
SO	.266	.513	.472	.474	.491	.600	.237	.508	.372	.522	.606	.531	.547	.461	.611	**1**

1. Full factor names: CU (customization), FO (font), LA (layout), VI (visual), RI (rich media), CO (content), CS (CSR), OF (order fulfillment), CI (company information), ME (merchandise), NA (navigation), PR (promotion), SE (security), SU (support), PE (personalization), SO (social)

Table 28. Discriminant Validity: AVE and Shared Variance

Variable	*CU*	*FO*	*LA*	*VI*	*RI*	*CO*	*CS*	*OF*	*CI*	*ME*	*NA*	*PR*	*SE*	*SU*	*PE*	*SO*
CU	**.622**															
FO	.087	**.564**														
LA	.148	.523	**.498**													
VI	.138	.413	.582	**.617**												
RI	.223	.307	.428	.433	**.454**											
CO	.106	.518	.476	.514	.376	**.541**										
CS	.223	.034	.125	.131	.191	.074	**.690**									
OF	.125	.291	.303	.278	.274	.410	.192	**.534**								
CI	.166	.118	.207	.192	.229	.174	.425	.253	**.642**							
ME	.052	.288	.248	.235	.228	.407	.040	.268	.140	**.444**						
NA	.100	.494	.533	.496	.376	.585	.088	.392	.233.	.413	**.522**					
PR	.112	.216	.214	.253	.256	.289	.130	.224	.167	.227	.317	**.670**				
SE	.090	.304	.262	.276	.237	.367	.072	.297	.166	.310	.436	.217	**.602**			
SU	.158	.162	.232	.214	.246	.219	.233	.289	.314	.158	.281	.244	.216	**.574**		
PE	.152	.257	.272	.291	.309	.364	.138	.326	.220	.287	.412	.319	.316	.320	**.483**	
SO	.071	.263	.223	.225	.241	.360	.056	.258	.138	.272	.367	.282	.299	.213	.373	**.502**

1. Diagonal entries show the average variance extracted by the construct and off-diagonal entries represent the variance shared (squared correlation) between constructs. 1.
2. Underlined entries indicate the variance shared higher than the average variance extracted
3. Full factor names: CU (customization), FO (font), LA (layout), VI (visual), RI (rich media), CO (content), CS (CSR), OF (order fulfillment), CI (company information),

ME (merchandise), NA (navigation), PR (promotion), SE (security), SU (support), PE (personalization), SO (social)

Predictive Validity

Lastly, predictive validity of the finalized measurement model was evaluated. predictive validity can be assessed by investigating whether identified online store atmospheric cues were correlated with theoretically related constructs (Campbell, 1960). Statistically significant positive correlations between online store atmospheric cues and theoretically related construct confirm the predictive validity.

Mehrabian and Russell (1974) demonstrated that atmospheric cues can control three emotional states (pleasure, arousal, and dominance). Thus, the study posited that all online store atmospheric cues have significant positive correlations with pleasure, arousal, and dominance. The results indicated that all correlations were significant, and all online store atmospheric cues were positively related to the emotional states (See Table 29). Therefore, predictive validity was supported. The finalized measurement of online store atmospheric cues is presented in Table 30. In addition, Figure 2 illustrates the measurement model of online store atmospheric cues.

Table 29. Correlations between Atmospheric Cues and Emotional States

	CU	*FO*	*LA*	*VI*	*RI*	*CO*	*CS*	*OF*	*CI*	*ME*	*NA*	*PR*	*SE*	*SU*	*PE*	*SO*
PL	.342***	.617***	.626***	.616***	.568***	.690***	.323***	.570***	.436***	.560***	.723***	.515***	.595***	.479***	.611***	.586***
AR	.452***	.191***	.357***	.394***	.430***	.279***	.525***	.389***	.477***	.230***	.347***	.349***	.328***	.475***	.396***	.293***
DO	.386***	.060*	.229***	.217***	.308***	.126***	.520***	.255***	.401***	.094***	.165***	.222***	.175***	.367***	.246***	.136***

1. * p -value is significant at 0.05 level; ** p -value is significant at 0.01 level; *** p -value is significant at 0.001 level
2.Full factor names: CU (customization), FO (font), LA (layout), VI (visual), RI (rich media), CO (content), CS (CSR), OF (order fulfillment), CI (company information), ME (merchandise), NA (navigation), PR (promotion), SE (security), SU (support), PE (personalization), SO (social), PL (pleasure), AR (Arousal), DO (dominance)

Table 30. The Finalized Measurement of Online Store Atmospheric Cues

Constructs	Label	Scale Item
Customization	Cus1	The X online store provides a lot of customization options.
	Cus2	I can well customize products in the X online store.
Font	Font1	The X online store is easy to read.
	Font2	The X online store uses readable text.
	Font3	The X online store uses clear headers.
	Font4	The X online store uses fonts properly.
Layout	Layout1	The X online store provides clear layout.
	Layout3	The X online store uses a balanced layout.
	Layout4	The X online store uses an attractive layout.
	Layout5	The pages on the X online store are not crowded.
	Layout6	The X online store looks organized.
Visual	Visual2	The X online store uses attractive colors.
	Visual3	The X online store has a visually pleasing design.
	Visual4	The way the X online store displays its products is attractive.
	Visual5	The X online store uses attractive images.
Rich media	Media1	The X online store well provides interactive effects on menus or icons.
	Media2	The X online store provides attractive zoom on features for pictures of products.
	Media6	The X online store provides various technologies that help shopping tasks.
Content	Content3	The X online store provides accurate information.
	Content4	The content of the X online store is useful.
	Content5	The information on the X online store is helpful.
	Content6	The information on the X online store is relevant to me.
	Content7	The X online store is informative.
CSR	Csr1	The X online store well provides evidence of the retailer's participation in charity.
	Csr2	The X online store well provides corporate social responsibility information.
	Csr4	The X online store well provides the retailer's activities for promoting the well-being of the society.

Table 30. Continued

Constructs	Label	Scale Item
Order fulfillment	Order1	Service and product guarantees are clearly explained in the X online store.
	Order2	Shipping and handling costs are clearly listed in the X online store.
	Order3	Return policies or other measures of accountability are well presented in the X online store.
Company information	Company1	The X online store well provides information related to customer policies (e.g., privacy and dispute details).
	Company3	The X online store provides company information in detail.
Merchandise	Merch1	The X online store well tells one immediately if something is out of stock.
	Merch3	The X online store is fully stocked.
Navigation	Navi1	The X online store looks easy to navigate through.
	Navi2	The organization of the information presented on the screen is clear in the X online store.
	Navi3	The X online store has valid links (hyperlinks).
	Navi4	The X online store has useful navigational aids.
	Navi5	There are convenient ways to maneuver among related pages in the X online store.
	Navi6	Navigation through the X online store is logical.
	Navi8	One can find information easily in the X online store.
Promotion	Promo1	The X online store offers a various promotions.
	Promo2	The X online store well provides special offers.
	Promo3	One can see promotions easily in the X online store.
Security	Security1	The X online store seems secure.
	Security3	Overall, the X online store seems security conscious.
Support	Support1	The X online store provides various ways to receive shopping help.
	Support2	It is easy to contact a support staff in the X online store.
Personalization	Person1	The X online store can well recommend products for individuals.
	Person3	Useful shopping recommendations are made for individuals in the X online store.
	Person4	The X online store well helps one to compare products.
Social	Social1	The X online store provides a lot of areas where users can provide their opinions.
	Social5	The X online store well indicates the number of reviews or ratings.

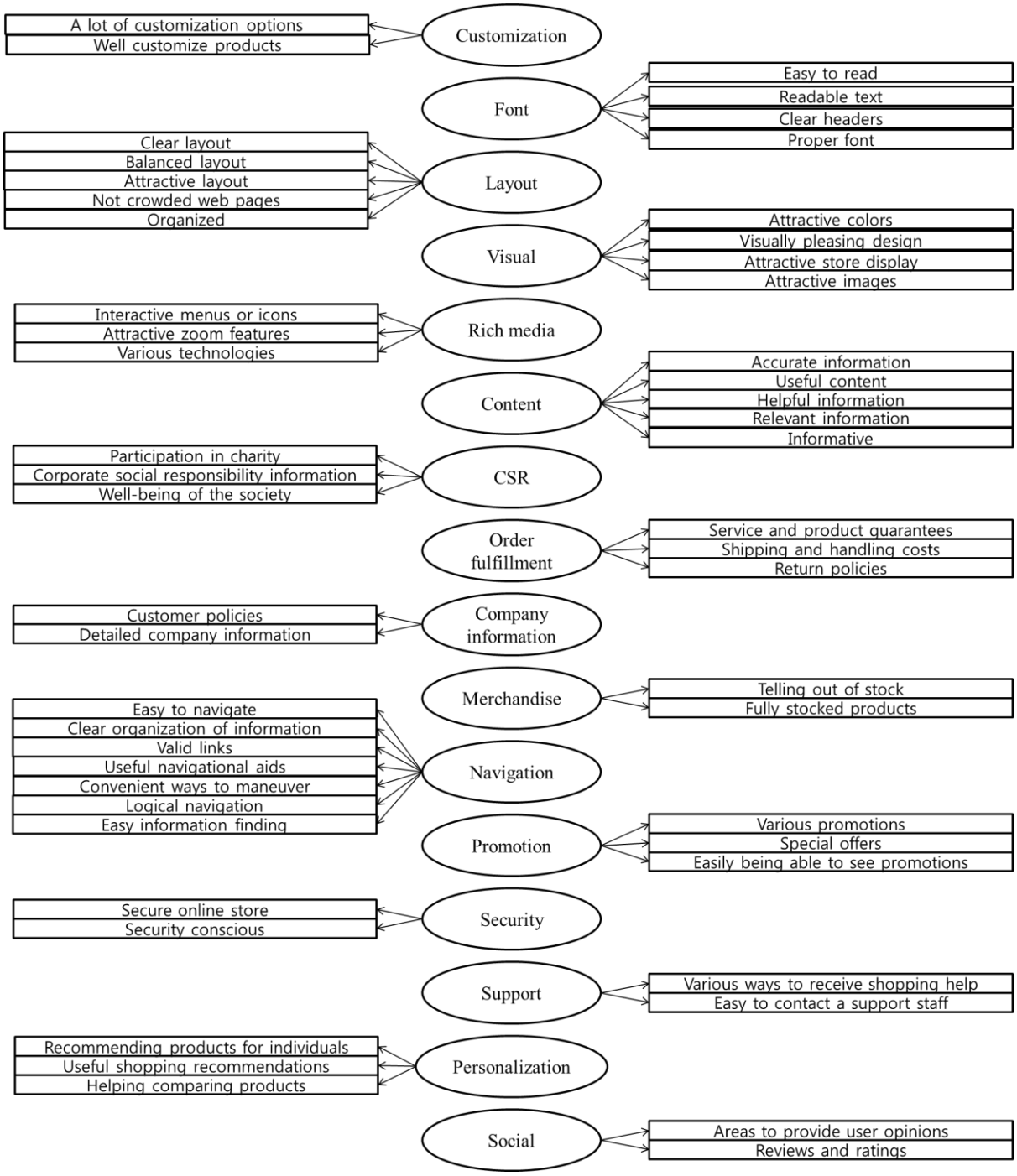

Figure 2. The Measurement Model

1. Covariances and errors are omitted in the measurement model.
2. Measurement items are summarized with key pharases.

Testing Posited Measurement Models

Last, the study evaluated the various posited models in relation to the finalized measurement of online store atmospheric cues, in order to identify other possible taxonomies of online store atmospheric cues. Following Eroglu, Machleit, and Davis's (2001) approach, the current study classified online store atmospheric cues based on relevancy of the shopping task (i.e., product purchase). Online store atmospheric cues relevant to the shopping task such as product descriptions, prices, delivery options, and policies were classified as high-task cues. Online store atmospheric cues not relevant to the shopping task such as colors, layouts, and fonts were categorized as low-task cues.

Among 16 online store atmospheric cues identified in the study (i.e., customization, font, layout, visual, rich media, content, CSR, order fulfillment, company information, merchandise, navigation, promotion, security, support, personalization, and social), customization, content, order fulfillment, merchandise, promotion, personalization, support, navigation, security cues were deemed to be relevant to the shopping task. Font, layout, visual, rich media, CSR, company information, and social cues were considered to be irrelevant to the shopping task. The study tested a measurement model that had two second-order factors of high-task cues containing nine first-order factors (i.e., customization, content, order fulfillment, merchandise, promotion, personalization, support, navigation, security cues) and low-task cues containing seven first-order factors (i.e., font, layout, visual, rich media, CSR, company information, and social cues). The measurement model showed acceptable model fit scores: CFI = .913; TLI = .909; RMSEA = .036; $\chi^2(1257) = 4129.08$. See Figure 3.

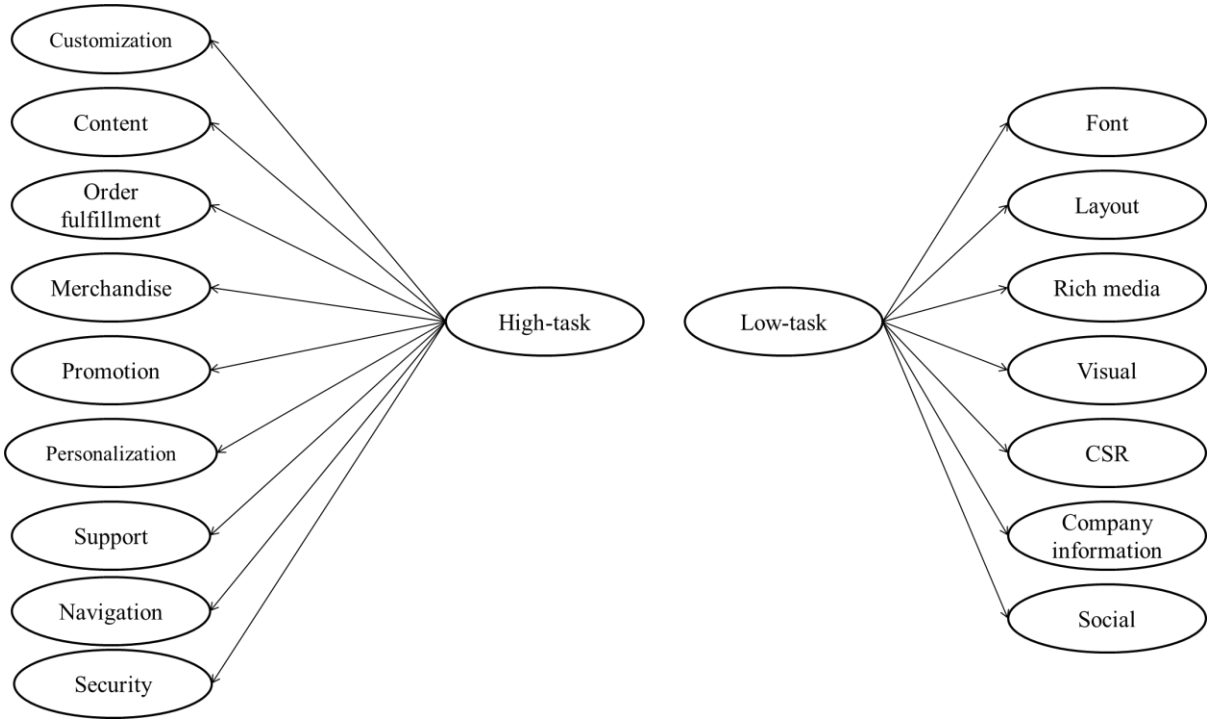

Figure 3. Two Second-Order Factors

Measurement items, covariances, errors are omitted in the measurement model.

Next, the study attempted to group online store atmospheric cues having somewhat apparent commonalities. Four cues were related to information: content, order fulfillment, CSR, and company information cues. Font, layout, visual, and multimedia cues were associated with design of online stores. Thus, content, order fulfillment, CSR, and company information cues were grouped under a second order factor—information cues, while font, layout, visual, and multimedia cues were grouped under a second-order factor—design cues. The measurement model therefore consisted of two second-order factors: 1) information cues containing four first-order factors (i.e., content, order fulfillment, CSR, and company information cues); and 2) design cues containing four first-order factors (i.e., font, layout, visual, and multimedia cues) and eight first-order

factors of customization, merchandise, navigation, promotion, security, support, personalization, and social cues. The model showed acceptable model fit indices: CFI = .931; TLI = .926; RMSEA = .033; $\chi^2(1221) = 3493.12$, and fit scores were noticeably better than the model with high-task cues and low-task cues. See Figure 4.

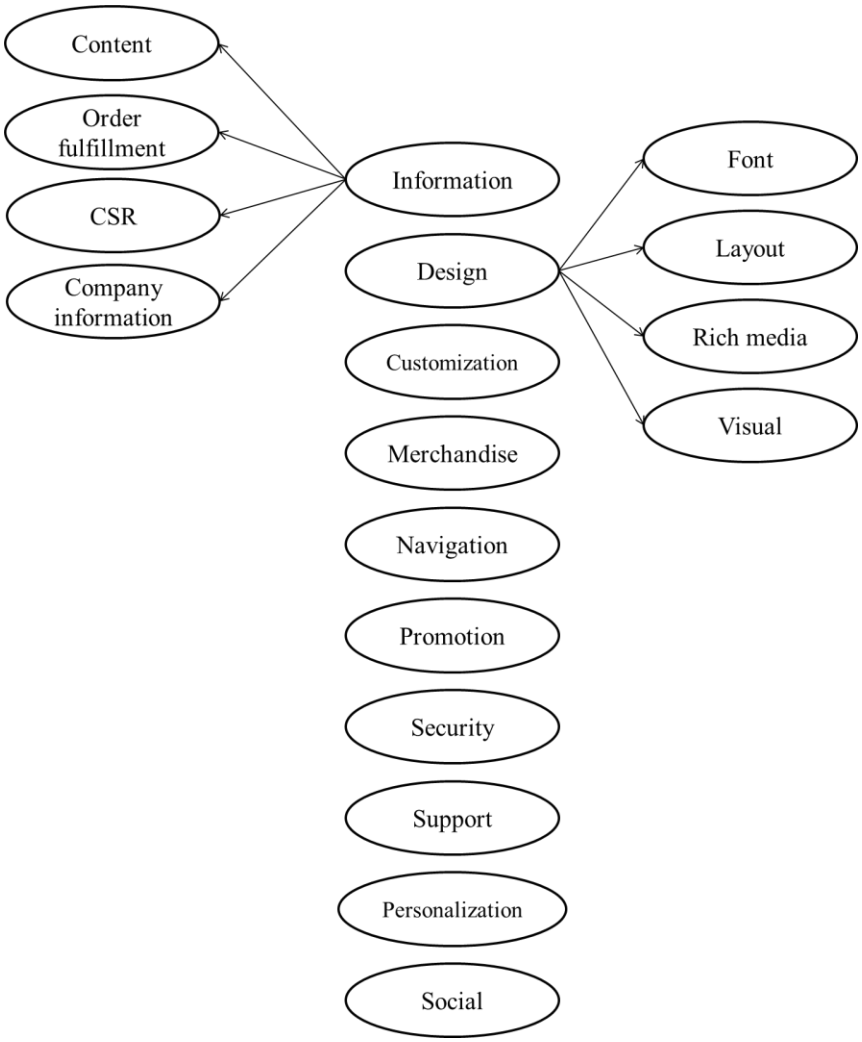

Figure 4. Two Second Order Factors and Eight First Order Factors
Measurement items, covariances, errors are omitted in the measurement model.

Summary

In sum, the original measurement model containing 16 online store atmospheric cues showed outstanding model fit indices: CFI = .968; TLI = .963; RMSEA = .023; $\chi^2(1154) = 2230.64$. When the study divided the online store atmospheric cues into high-task and low-task cues, the model fit was significantly worse than the original measurement model (MLM $\Delta\chi^2 = 1874.02$, $\Delta df = 103$, $p < .001$) although model fit indices were acceptable: CFI = .913; TLI = .909; RMSEA = .036; $\chi^2(1257) = 4129.08$. Thus, when studies consider all possible online store atmospheric cues, it is not necessarily appropriate to forcibly classify cues into two categories based on task relevancy; cues such as social, customization, personalization, CSR, company information cues may be found not to be highly associated with task relevancy itself.

Although the study demonstrated convergent and discriminant validities of the finalized measurement model, it should be observed that some online store atmospheric cues have commonalities in some degree. There were two representative commonalities: content, order fulfillment, CSR, and company information cues were all to some degree information cues; and font, layout, rich media, and visual cues were all to some degree design cues. The measurement model demonstrated noticeably improved model fit indices (CFI = .931; TLI = .926; RMSEA = .033; $\chi^2(1221) = 3493.12$) than the previous classification. However, the measurement model was significantly worse than the original measurement model (MLM $\Delta\chi^2 = 1262.48$, $\Delta df = 67$, $p < .001$).

Overall, this investigation of posited measurement models demonstrated that although considering 16 online store atmospheric cues separately achieved the best model

fit, researchers or online retailers might possibly consider content, order fulfillment, CSR, and company information cues as sub-categories of information cues and font, layout, rich media, and visual cues as sub-categories of design cues. See Table 31.

Table 31. Model Fit Indices of Posited Models

Measurement model	**CFI**	**TLI**	**RMSEA**	**χ^2(df)**
16 first-order factors (original model)	.968	.963	.023	2230.64(1154)
Two second-order factors (high-task & low-task cues)	.913	.909	.036	4129.08(1257)
Two second-order factors (information & design cues) & eight first-order factors	.931	.926	.033	3493.12(1221)

Application of the Measurement

To exemplify an application of the measurement to a specific online retailer setting, based on the stimulus-organism-response (S-O-R) paradigm, the study simply tested whether and which online store atmospheric cues (S) can generate pleasure emotion (O) and whether the pleasure emotion can affect online shoppers' approach avoidance behavior (R) in Amazon.com (i.e., An online retailer selling a wide range of products such as books, digital downloads/streaming, electronics, apparel, food, toys, furniture, and so on at a discounted price). The measurement model was tested by the confirmatory factor analysis, and the measurement model containing 18 constructs (i.e., 16 online store atmospheric cues, pleasure, and approach avoidance behavior) showed acceptable model fit scores (CFI = .959; TLI = .954; RMSEA = .024; χ^2(1616) = 2933.87). All factor loadings of measurement items were over the threshold of 0.40, and composite reliabilities ranged from 0.611 to 0.883, exceeding the threshold of 0.60 (Fornell & Larcker, 1981).

The structural model delineating effects of 16 atmospheric cues on pleasure and pleasure on approach avoidance behavior (Figure 5) showed also acceptable model fit indices: CFI = .910; TLI = .905; RMSEA = .065; $\chi^2(1632) = 3081.07$. Content (β=.203, p <.01), navigation (β = .382, $p < .001$), security (β = .162, $p < .001$), personalization (β = .164, $p < .01$), and social cues (β = .153, $p < .01$) provoked pleasure emotion, and pleasure emotion positively affected approach avoidance behavior (β = .857, $p < .001$).

The navigation cue turned out to be the most significant positive predictor of pleasure emotion followed by the content cue. The results imply that accurate, useful, and helpful information provided in Amazon.com and strong navigation aids that help consumers conveniently find the information increase consumers' pleasure emotion. It seems to be logical because Amazon.com contains a wide range of products, and that consumers mainly visit Amazon.com to learn and compare a variety of products.

However, since Amazon.com consumers search specific products for themselves, they want to know other shoppers' objective evaluations of the products. Thus, Amazon's suggestions of products for online shoppers (i.e., the personalization cue) and attributes allowing consumers to provide their opinions (i.e., the social cue) could generate pleasure emotion.

Online shoppers are required to provide their private information to Amazon.com to purchase a product, which could cause stress to them because their information can possibly be stolen or hacked. Thus, recognizing Amazon's efforts to enhance security (i.e., the security cue) allows online shoppers to do pleasure shopping.

Interestingly, although the predictive power was not strong, the rich media (β = -.123, p <. 05) and support cues (β = -.074, p <. 05) rather negatively affected pleasure emotion, implying that interactive graphic effects and diverse shopping help options decreased pleasure emotion. As mentioned above, Amazon shoppers mainly visit the online store to browse and learn a wide range of products. Thus, interactive effects and diverse help options provided could disturb online shoppers in focusing on browsing and learning about products.

Lastly, the rest of cues (i.e., customization, font, layout, visual, CSR, order fulfillment, company information, merchandise, promotion) did not predict pleasure emotion in Amazon.com. That is to say, although Amazon shoppers can distinctively perceive the cues, the cues do not have sufficient power to generate pleasure emotion in Amazon.com. It seems to be also caused by the Amazon shoppers' major purpose: browsing and learning variety of products ("2013 Annual Report," 2014) because the cues do not help them learn about products.

The results would be different if the model were tested in other online stores. This model is simply an example of Amazon.com and future researchers can develop a different model with different sets of atmospheric cues for a specific setting.

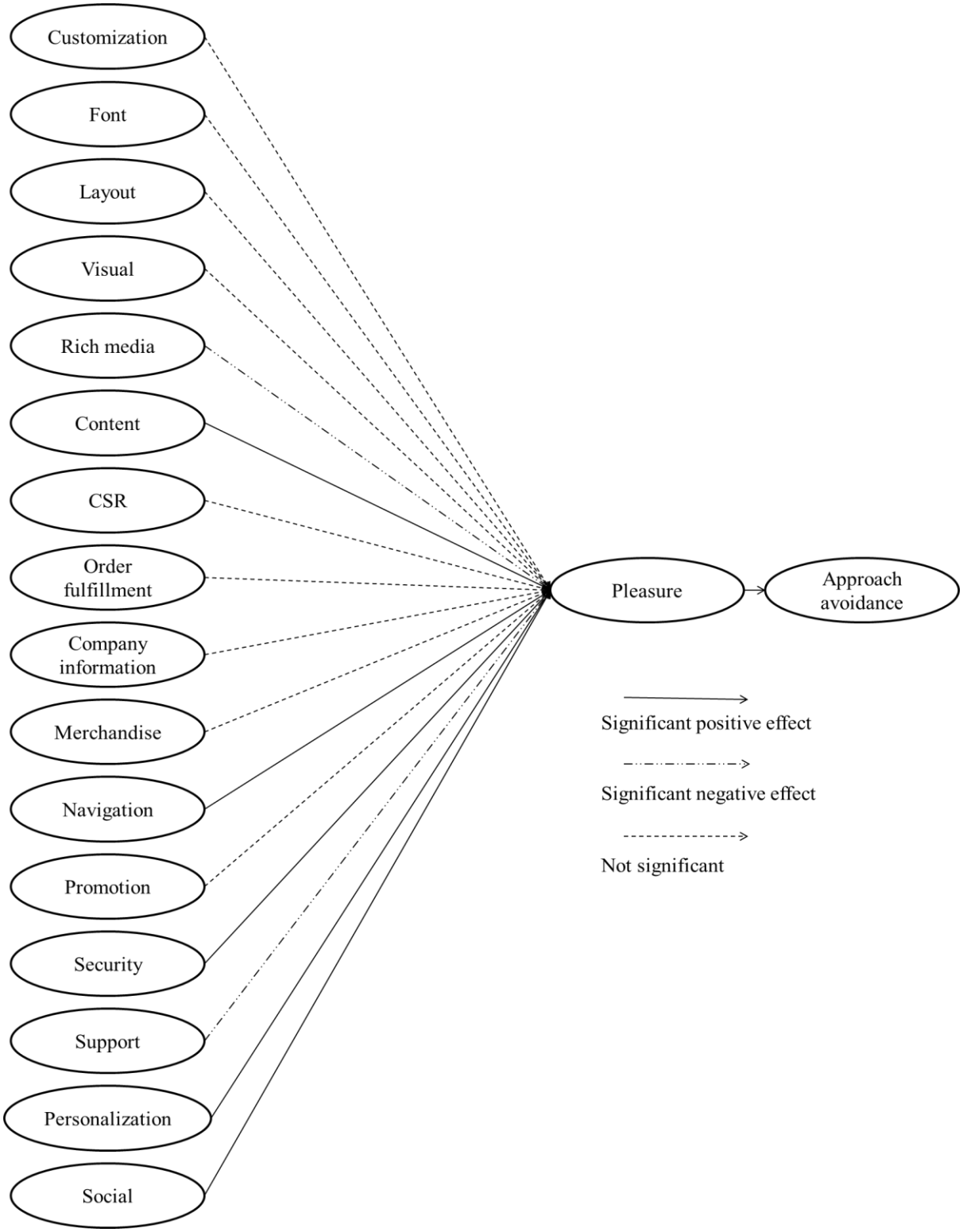

Figure 5. Structural Model

Measurement items, covariances, errors are omitted in the structural model

CHAPTER 5

CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

The study was conducted to establish a comprehensive taxonomy and the corresponding gender-neutral measurement of online store atmospheric cues. This chapter discusses findings of the study, and implications, including online store atmospherics managerial strategies for online retailers and possible uses of online store atmospheric cue measurement for future studies. Lastly, limitations and future research directions are discussed.

Conclusions and Managerial Implications

There have been three major gaps in identification of online store atmospheric cues. First, atmospheric cues such as customization, social, and company information, though commonly employed in recent online stores have been overlooked. Second, studies have oversimplified classifications of online store atmospheric cues (e.g., high-task vs. low-task cues). Third, there is no consensus across classifications. Previous to the current study, no effort has been made to establish a comprehensive taxonomy of online store atmospheric cues based on a solid and concrete definition.

To solve these gaps, first, this study defined online store atmospheric cues as all possible cues perceivable with visual and aural senses in an online store (Eroglu, Machleit, & Davis, 2001). The definition indicates that online store atmospheric cues are relevant not to overall value perceptions (e.g., entertaining and creative) but to specific attributes. Based on this definition, this study identified all possible atmospheric cues currently employed by online stores. Focus group and personal interviews identified new

online store atmospheric cues not addressed by former studies. The study provided a comprehensive taxonomy of online store atmospheric cues, which contains 16 distinctive cues (i.e., customization, font, layout, visual, rich media, content, CSR, order fulfillment, company information, merchandise, navigation, promotion, security, support, personalization, and social), and a measurement corresponding to the taxonomy.

16 Distinctive Online Store Atmospheric Cues

The taxonomy of identified online store atmospheric cues was validated by numerous statistical analyses. The study tested some posited measurement models delineating alternative viable taxonomies of online store atmospheric cues.

In previous studies, a majority of online store atmospheric cues were classified based on the shopping task relevancy (Chang & Chen, 2008; Eroglu et al., 2001; Richard, 2005). The present study subcategorized 16 cues under two second-order factor headings (i.e., high-task and low-task cues), and the model showed acceptable fit indices, although fit scores were considerably lower than the original model. The implication of this finding is that second-order factors as well as first-order factors can be used; however, it is not necessary to classify cues into two categories based on task relevancy when considering all 16 cues.

The analyses of posited models revealed that content, order fulfillment, CSR, and company information cues were clearly related to information, while font, layout, rich media, and visual cues were also clearly relevant to design. Thus, the study grouped the four cues (i.e., content, order fulfillment, CSR, and company information) under a second-order factor called the information cue and the four cues (font, layout, rich media,

and visual) under a second-order factor called the design cue. This model, employing these subcategories, showed acceptable model fit scores, and much better scores than the high-task, low-task (based on the shopping task relevancy) categorization model. However, the original measurement model delineating 16 online store atmospheric cues showed the best fit scores. Thus, although some cues have viable commonalities, all 16 cues should be considered separately because online shoppers distinctively recognize these cues.

The study's identification of 16 distinctive online store atmospheric cues serves future researchers, who can employ these online store atmospheric cues in their research frameworks. By employing previously unidentified online store atmospheric cues, researchers can discover the cues that must be created or redesigned to enhance behavioral responses. In this way, researchers should be able to provide much more detailed guidance to online retailers. In addition, by conducting studies in diverse online store settings, future researchers can observe which among the 16 cues are especially critical in a specific setting. For instance, this study investigated the effects of 16 cues on consumer behavior based on the stimulus-organism-response model in Amazon.com. Content, navigation, security, personalization, and social cues generated positive pleasure emotion, which in turn led to approach avoidance behavior. The results may change when different settings are employed.

Gender-Neutral Measurement of Online Store Atmospheric Cues

The study eliminated gender DIF items to ensure that all measurement items were similarly interpreted by males and females. Because a number of items are interpreted differently interpreted by males and females due to different natures and verbal abilities (Fletcher & Hattie, 2005; Maccoby & Jacklin, 1980), and because there is equal distribution of males and females among Internet users, a measurement that does not control gender DIF items cannot ensure validity. No previous studies measuring online store atmospheric cues controlled gender DIF items.

The study found satisfactory model fit scores for a measurement model containing 74 items prior to conducting the gender DIF test (CFI = .933; TLI = .927; RMSEA = .028; $\chi^2(2507) = 5970.53$). However, after testing DIF, 22 items out of 74, or approximately 30 percent of items were revealed to be gender DIF items. A measurement based on a model containing 30 percent gender DIF items can hardly be considered valid.

In fact, gender DIF items seemed to be legitimate based on the acknowledged understanding of gender difference. For instance, the CSR cue originally contained four items (See Table 8): “The X online store well provides evidence of the retailer's participation in charity (Csr1).”; “The X online store well provides corporate social responsibility information (Csr2).”; “The X online store well provides the retailer's sustainability activities (Csr3).”; and “The X online store well provides the retailer's activities for promoting the well-being of the society (Csr4).” Of these four items, only Csr3 was revealed as a gender DIF item, and seemed to be caused by the relatively difficult term, “sustainability.” The rest of the items, charity (Csr1), social responsibility

(Csr2), and well-being (Csr4), did not seem to be hard to understand. In addition, the merchandise cue was measured by three items (See Table 8): “The X online store well tells one immediately if something is out of stock (Merch1).”; “The X online store carries a wide selection of merchandise (Merch2).”; and “The X online store is fully stocked (Merch3).” Among these three, Merch2 functioned significantly differently between males and females. This could be caused by different standards employed by males and females when interpreting the phrase “a wide selection of merchandise.”

Since this study’s measurement of online store atmospheric cues controlled for gender DIF items, researchers can use this valid measure in future studies. In particular, researchers studying gender differences in online store atmospheric cues will be able to increase validity of results because differences result from both genders’ unbiased responses to measurement items.

Lastly, future studies should selectively use these 16 online store atmospheric cues according to study settings or stimuli in a particular online environment; not many online retailers actually utilize all the possible cues identified in our taxonomy in their online stores.

Managerial Implications for Online Retailers

Information Cues: Content, Order Fulfillment, CSR, and Company Information

The study identified four cues relevant to information: content, order fulfillment, CSR, and company information cues. The content cue refers to information quality in terms of accuracy, practicality, and usefulness of information. The order fulfillment cue provides information specifically relevant to buying products such as service and product

guarantees, shipping costs, and return policies. Both content and order fulfillment cues are associated with shopping tasks, and these cues have already been used by previous studies (Bart et al., 2005; Chang & Chen, 2008; Demangeot & Broderick, 2010).

Recently, there is increasing evidence of socially responsible consumption (Marin, Ruiz, & Rubio, 2009). Many consumers' purchase decisions are affected not only by price competitiveness and quality of products but also by retailers' character traits. Thus, online retailers provide company information cues, such as webpages explaining general company information (e.g., goals, history, and customer policies), and CSR cues, indicating how they meet social responsibilities (e.g., participation in charity and well-being of the society).

Tests of posited measurement models revealed that the four cues (i.e., content, order fulfillment, company information, and CSR cues) can overlap with a commonality of information. However, as explained above, content and order fulfillment cues are specifically associated with information related to shopping task, and company information and CSR cues are relevant to a company itself. Testing a posited measurement model that distinguishes content and order fulfillment cues from company information and CSR cues indicated how much model fit scores were improved. However, the original measurement model containing 16 online store atmospheric cues showed outstanding model fit indices and results of validity tests. Overall, online retailers should understand that there are four informational atmospheric cues (i.e., content, order fulfillment, company information, and CSR cues) relevant to shopping task and company itself, and these four cues are distinctively recognized by online shoppers.

Design Cues: Font, Layout, Visual, Rich Media

Some previous studies considered font, layout, and visual cues as all relevant to overall store aesthetics (Chang & Chen, 2008; Ha & Lennon, 2010; Manganari et al., 2009). In addition to these three cues, this study identified the rich media cue (i.e., high-quality animation and images), which has become widely available due to fast broadband speed, as another contributor to the aesthetic quality of an online store. Multiple models categorizing these four cues under a second-order factor proved to be valid in testing. However, the original model with 16 distinctive cues showed much better model fit scores than the models grouping font, layout, visual, and rich media cues. Although these four cues, taken together, may overlap with common aesthetic features, it isimportant to consider each cue separately because online shoppers recognize each of the four cues in a distinctive manner. The following sections will discuss distinctive features of the respective four cues.

Font cue

The font cue includes the style, size, and quality of text. Text designed to be more fancy, of appropriate size, and clear should be more aesthetically pleasing than text possessing boring style, tiny size, and rough, hard to read, features. In addition to having this aesthetic characteristic, the font cue also has functional characteristics because online stores deliver almost all information via text. Proper use of font cue can not only increase the aesthetic quality of webpages but also their readability and information delivery. Therefore, online stores should pay special attention to the design of the text, ensuring the use of clear and readable text and proper font.

Layout cue

The layout cue specifically refers to an arrangement of all kinds of contents (e.g., text, images, video clips, menus, navigation bars, and blank space) within an individual webpage. The layout cue's key distinction from other cues (i.e., font, visual, and rich media cues) is that it focuses not on design of contents but rather on their organization. Online retailers can improve the layout cue by employing an attractive and balanced layout. In addition, online retailers should avoid putting too many contents on a webpage; crowded contents decrease the quality of the layout cue.

Visual cue

The visual cue is the most relevant cue to the overall aesthetic quality of online stores, and elements of design such as line, color, shape, size, and texture can be considered as attributes of the visual cue. Maintaining consistent design throughout the online store is important to establish a pleasant online store atmosphere (Lohse & Spiller, 1999).

Measurement items of the visual cue also demonstrate the importance of product display. Therefore, online retailers should give attention to providing pleasing visual display of products. Visual merchandising is already being emphasized in not only brick-and-mortar stores but also in the online store environment (Khakimdjanova & Park, 2005).

Rich media cue

The rich media cue involves advanced visual technology, enabling high-quality website image and video and interactive animation. Online stores consistently place

navigation bars or menus in every webpage, and are able to include interactive animation features on the navigations bars. For example, online retailers can use Flash (i.e., a program enabling interactive multimedia content) to realize animated drop down menus and icons. Also, because visual merchandising is especially important in online stores (Khakimdjanova & Park, 2005), providing 3D rotation or zoom features for products is a great way to improve the rich media cue.

Customization Cue

Millennials (ages 18-33) are major consumers and spend more than $600 billion annually in the United States (Donnelly & Scaff, 2013). As they are tech-savvy, they prefer shopping in online stores over brick-and-mortar stores. Thus, online retailers focus closely on Millennials' online shopping preferences. One popular shopping trend in this population is that they are eager to have unique and customizable products. Due to the availability of quick response manufacturing, retailers are able to realize the importance of product customization in their online stores. For instance, Pottery Barn, a furniture retailer, offers a simple customization option, by which consumers have their names carved on products. Apparel retailers employ advanced customization technologies enabling shoppers to change the design of products. For example, Nike iD, a service offered by Nike, allows shoppers to change the colors, prints, design, and even the performance of Nike products.

Customization services can be designed by experts in writing scripts (i.e., scripters), and online retailers should invest in development of their websites to provide such services. Nike iD technology, for instance, was purchased from a scripting company

called RJ iD. To secure price competitiveness, online retailers must consider whether employing customization technology is worthwhile. If online retailers' main target consumer segment is Millennials, and if they have the production and transportation systems requisite to product customization, investing in customization technology for their online stores may be logical.

Merchandise Cue

The merchandising cue refers to attributes that online shoppers use to assess quality of product assortment and inventory control. This study demonstrated that the merchandise cue can be detected in online stores. Online retailers have almost unlimited space to display products, and this is a major advantage of online retailing. As a result, consumers also have higher expectations of product assortment from online stores than from brick-and-mortar stores. To meet these expectations, online retailers must sell a wide range of products. Product availability is also associated with the merchandising cue. Online retailers are encouraged to continue to indicate product availability with a message showing how many products are left in stock.

Navigation Cue

The navigation cue includes all features helping online shoppers find desired information while they are navigating online. Since online shoppers find information by continuously browsing a number of online store webpages via navigation bars, online retailers should place navigation bars in suitable and visible sections throughout their online stores. In addition, online shoppers seeking information navigate webpages

without a specific goal in mind. Therefore, it is important to provide a logical navigational hierarchy. Employing a search engine permitting keyword searches within an online store also can improve the navigation cue.

Promotion Cue

Price competitiveness is a significantly important factor influencing shoppers' purchase decisions, especially in online stores as the Internet environment permits easy price comparisons (Swinyard & Smith, 2003). Online retailers are therefore prompted to offer diverse promotions. All promotional activities in an online store are related to the promotion cue.

In addition to offering diverse promotions, increasing visibility of on-going promotions is also crucial to enhancing the promotion cue; promotions are useless unless consumers are aware of them. In order to grab online shoppers' attention, online retailers usually display promotions in the main webpage (i.e., the initial webpage a person sees when navigating to a web address). Unlike in brick-and-mortar stores, online shoppers can easily move out to see other retailers in just a few clicks. Therefore, these cues are important to retaining existing customers as well as recruiting new customers.

Promotions that apply to all products in an online store (e.g., free shipping and discount on a volume purchase) can be displayed on the top or sides throughout all pages of the store. In addition, discounts offered on specific products can be indicated by putting a visible sign or mark on those products.

Security Cue

All attributes that determine online shoppers' perception of the security level are relevant to the security cue. Online retailers typically provide a separate menu explaining security on the site. However, since the menus are not visible, and consumers usually do not take time to read all security statements, a great number of online retailers purchase security seals from trust mark companies such as TRUSTe and VeraSafe. Retailers can acquire security seals if their privacy statements and security levels meet the standards of a trust mark company. Since a security seal is highly visible and implies that the online retailer takes security considerations seriously, employing a security seal in online stores should significantly enhance the security cue.

Support Cue

The support cue includes all options by which online shoppers can receive support from an online store. Online retailers commonly provide diverse contact options such as toll free phone numbers and email addresses. Some online retailers establish a frequently asked questions (FAQ) menu where online shoppers can quickly find answers to common questions. A live chat option is also employed by some online stores.

Usually, these support options are provided under a support menu. However, some online retailers make the support options immediately visible by placing the contact information or live chat option in a visible space throughout their online stores. The live chat option may also be provided in each product page. Moreover, some online stores provide a pop-up menu for the live chat, which is randomly opened while online shoppers are browsing products.

Personalization Cue

All features making consumers feel that they are receiving personalized service in an online store contribute to the personalization cue. The product recommendation feature is a representative example of the personalization cue. Some online retailers, using the online shoppers' browsing history, show products previously viewed when they next browse to that store's page. In addition, some online retailers recommend products for online shoppers. There are two methods for product recommendation: collaborative filtering and web usage mining (Sohail, Siddiqui, & Ali, 2012). The collaborative filtering method retrieves browsing and/or purchase history from online shoppers showing similar shopping patterns or interests to the online shopper in question, and recommends products on that basis. In addition, web usage mining is a system that identifies online shoppers' shopping patterns from a large data set, and recommends products based on the identified shopping patterns. To enhance the personalization cue, it is important to provide correct and useful product recommendation based on accurate identification of shopping patterns.

Social Cue

The social cue refers to all features enabling online shoppers to interact with other online shoppers. A product review section placed in a product page allows users to interact with each other in real time. However, discussion topics in the product review section are limited to issues relating to products. Therefore, some online retailers run blogs or free boards in their online stores so that users can freely communicate with each

other without limitations on discussion topics. Online retailers can employ diverse areas like the above where users can interact with each other to enhance the social cue.

Summary

The discussion has explained all 16 online store atmospheric cues, and also suggested how online retailers can enhance these cues. In practice, however, expensive starting up and maintenance costs make it difficult to employ all cues. For instance, online retailers can include animated navigation bars or icons, interactive features, and even games in their online stores (Sheehan & Morrison, 2009). These features employ scripts (i.e., code enabling web browsers to perform some work or action instead of just merely displaying static contents), such as Java, Flash, and Active X supported by web browsers (e.g., Explorer, Chrome, Firefox, Safari, etc.), but employing scripters (individuals having specialized knowledge on script applications) is costly.

Online retailers, therefore, should selectively employ the 16 online store atmospheric cues. In addition, they can prioritize cues in accordance with their market and target consumers. For example, if an online retailer selling hearing aids to the elderly, the retailer may not have to invest money in the rich media cue such as virtual try on or interactive icons because it may be sufficient to use standard media or pictures to illustrate the products and the resulting appearance. On the other hand, in the case of an apparel online retailer targeting Millennials, employing the virtual fitting technology that enables online shoppers to virtually dress an avatar in diverse clothes should be a worthwhile investment because appearance is a critical element when wearing apparel and because Millennials are tech-savvy to enjoy the virtual fitting technology (Donnelly

& Scaff, 2013). When consumers shop for computers online, they may need diverse support options, with which they can conveniently ask questions and get beneficial ideas regarding products while they browse computers. In this case, computer retailers should make financial investment on enhancing social cues such as a live chat option. In fact, top online computer sellers such as Dell and Hewlett-Packard provide great live chat options although they use fairly plain website design.

Limitations and Future Research

Several limitations should be addressed as considerations for future research. First, although the study attempted to identify all possible online atmospheric cues, the study may have overlooked some online store atmospheric cues. In this market where Internet technology is growing daily, online retailers keep trying to employ new technologies in their online stores. Therefore, it is necessary periodically to refine and expand the taxonomy.

Second, this study endeavored to maximize generalizability of the measurement of online store atmospheric cues by randomly collecting a large number of data, using multiple stimuli (e.g., 18 online stores selling apparel, electronics, furniture, and shopping goods), and employing robust estimators for analyses. There was a limitation of distribution of stimuli because a majority of respondents selected Amazon.com (about 78%). This limitation appears to have resulted from the study's choice of data collection agency, Mechanical Turk, which is in fact a part of Amazon.com. Thus, future studies controlling stimuli distribution can improve the generalizability of the measurement.

Third, the distribution of ethnic groups cannot represent U.S. Internet users. In 2011, about 70 Internet users were Caucasian, followed by African-American (13%), and Asian (5%) (File, 2013). However, in the sample of the study, Asian (47.9%) was the majority ethnic group, followed by White-American (34.9%), African-American (4.7%). Thus, the results cannot necessarily be generalized to U.S. online shoppers.

Lastly, the study conducted gender DIF tests to eliminate items showing gender-biased responses. However, DIF may also occur across ages, ethnicities, and educational levels. Future studies conducting multiple DIF tests will be able to increase the validity of the measurement.

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APPENDIX

APPENDIX A - The Online Survey Instrument

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Dear participants,

Welcome to the survey! I appreciate your participation in this survey in advance. We do this survey to identify possible online store environment cues and categorize the online store environment cues. The survey will take about 20 minutes to complete. First of all, I would like to announce that all the information you provide in the survey will remain completely confidential. Only the authors of this study will access to the data obtained in the survey.
Your participation in this survey is completely voluntary. In addition, you can terminate the survey at any time, and can skip questions without penalty. Return of completed survey will constitute your consent to participate. In addition, you can contact the author at any time if you have any questions about the study or the procedures. We can be reached at 940-300-8616 or 1215 W Cumberland Avenue, JHB 244A, University of Tennessee. If you have any questions about your rights as a participant, please feel free to contact the research Compliance Service section of the Office of Research at (865) 974-3466.

Thanking You.

Respectfully,

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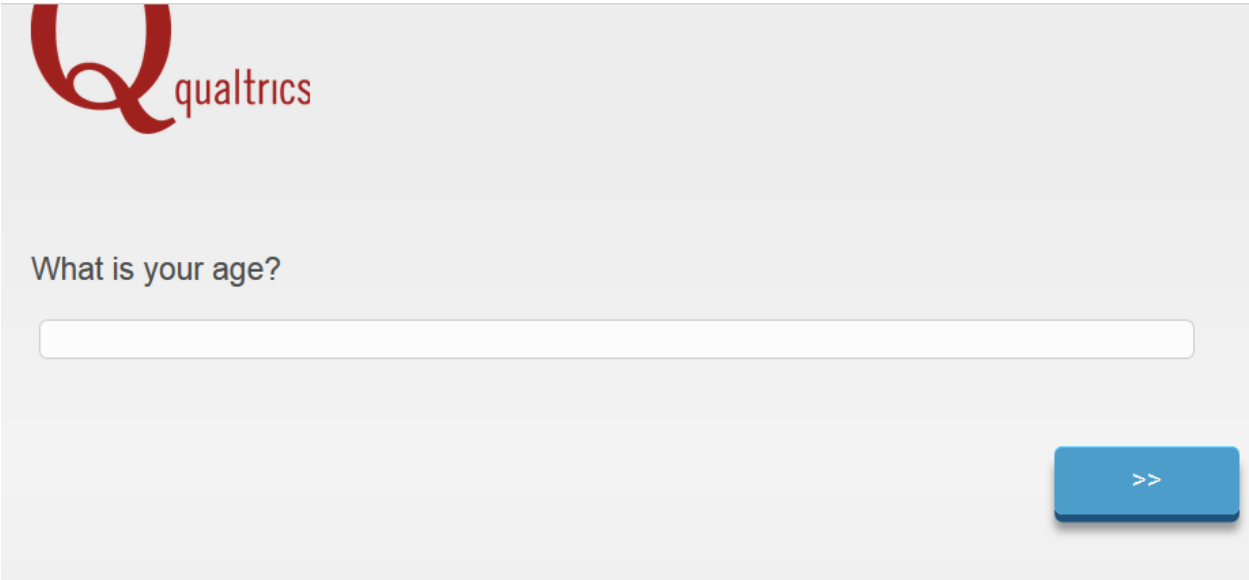
qualtrics
What is your age?
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Qualtrics

Please select one online store that you most recently visited from the following list.

- ○ Amazon
- ○ ASOS
- ○ Best Buy
- ○ Dell
- ○ Home Depot
- ○ IKEA
- ○ JCPenney
- ○ Kohl's
- ○ Marks & Spencer
- ○ Nike
- ○ Nordstrom
- ○ Office Depot
- ○ Pottery Barn
- ○ QVC
- ○ Target
- ○ Toys"R"Us
- ○ Walmart
- ○ Wayfair
- ○ None of above

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INSTRUCTIONS

Please **thoroughly** explore the Nike online store for at least 5 minutes. You can easily move to the Nike online store by clicking "Nike." While you are exploring the Nike online store, PLEASE TRY TO EXPERIENCE **ALL POSSIBLE MENUS** EVEN INCLUDING MENUS NOT RELATED TO SHOPPING. Next, answer questions based on your experience in the Nike online store.

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ONLINE STORE ENVIRONMENT

Recall the Nike online store you explored. Please indicate the extent to which you agree or disagree with the following statements on your experience with the Nike online store.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The Nike online store uses consistent layout across all pages.	○	○	○	○	○	○	○
The Nike online store uses fonts properly.	○	○	○	○	○	○	○
The Nike online store provides a lot of customization options.	○	○	○	○	○	○	○
The Nike online store uses clear headers.	○	○	○	○	○	○	○
The Nike online store provides clear layout.	○	○	○	○	○	○	○
The Nike online store is easy to read.	○	○	○	○	○	○	○
I can well customize products in the Nike online store.	○	○	○	○	○	○	○
The Nike online store uses readable text.	○	○	○	○	○	○	○
The Nike online store uses a balanced layout.	○	○	○	○	○	○	○
The Nike online store allows me to create products or services to exactly fit my needs.	○	○	○	○	○	○	○

ONLINE STORE ENVIRONMENT

Recall the Nike online store you explored. Please indicate the extent to which you agree or disagree with the following statements on your experience with the Nike online store.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The Nike online store looks organized.	○	○	○	○	○	○	○
The Nike online store enables me to view the merchandise in different ways.	○	○	○	○	○	○	○
The Nike online store well provides interactive effects on menus or icons.	○	○	○	○	○	○	○
The Nike online store uses an attractive layout.	○	○	○	○	○	○	○
The Nike online store provides various technologies that help shopping tasks.	○	○	○	○	○	○	○
The pages on the Nike online store are not crowded.	○	○	○	○	○	○	○
The Nike online store provides high-quality images.	○	○	○	○	○	○	○
The Nike online store provides exciting animation techniques.	○	○	○	○	○	○	○
The Nike online store uses colors properly.	○	○	○	○	○	○	○
The Nike online store provides attractive zoom on features for pictures of products.	○	○	○	○	○	○	○

ONLINE STORE ENVIRONMENT

Recall the Nike online store you explored. Please indicate the extent to which you agree or disagree with the following statements on your experience with the Nike online store.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The content of the Nike online store is useful.	○	○	○	○	○	○	○
The content of the Nike online store is easy for me to understand.	○	○	○	○	○	○	○
The Nike online store has a visually pleasing design.	○	○	○	○	○	○	○
The information on the Nike online store is helpful.	○	○	○	○	○	○	○
The way the Nike online store displays its products is attractive.	○	○	○	○	○	○	○
The Nike online store uses attractive colors.	○	○	○	○	○	○	○
The content of the Nike online store appears to be up-to-date.	○	○	○	○	○	○	○
The Nike online store uses attractive images.	○	○	○	○	○	○	○
The information on the Nike online store is relevant to me.	○	○	○	○	○	○	○
The Nike online store provides accurate information.	○	○	○	○	○	○	○

ONLINE STORE ENVIRONMENT

Recall the Nike online store you explored. Please indicate the extent to which you agree or disagree with the following statements on your experience with the Nike online store.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The Nike online store well provides the retailer's activities for promoting the well-being of the society.	○	○	○	○	○	○	○
The Nike online store well provides corporate social responsibility information.	○	○	○	○	○	○	○
The Nike online store well provides the retailer's sustainability activities.	○	○	○	○	○	○	○
Return policies or other measures of accountability are well presented in the Nike online store.	○	○	○	○	○	○	○
Shipping and handling costs are clearly listed in the Nike online store.	○	○	○	○	○	○	○
The Nike online store well provides evidence of the retailer's participation in charity.	○	○	○	○	○	○	○
Service and product guarantees are clearly explained in the Nike online store.	○	○	○	○	○	○	○
The Nike online store accepts a variety of payment methods.	○	○	○	○	○	○	○
There is enough information on the Nike online store.	○	○	○	○	○	○	○
The Nike online store is informative.	○	○	○	○	○	○	○

ONLINE STORE ENVIRONMENT

Recall the Nike online store you explored. Please indicate the extent to which you agree or disagree with the following statements on your experience with the Nike online store.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The Nike online store well provides the retailer's general information (e.g., goals, owners, history, slogan, etc.).	○	○	○	○	○	○	○
The Nike online store well tells one immediately if something is out of stock.	○	○	○	○	○	○	○
The Nike online store carries dependable products.	○	○	○	○	○	○	○
The Nike online store provides company information in detail.	○	○	○	○	○	○	○
Various delivery options are available in the Nike online store.	○	○	○	○	○	○	○
The Nike online store carries a wide selection of merchandise.	○	○	○	○	○	○	○
The Nike online store looks easy to navigate through.	○	○	○	○	○	○	○
The organization of the information presented on the screen is clear in the Nike online store.	○	○	○	○	○	○	○
The payment procedure of the Nike online store is easy to use.	○	○	○	○	○	○	○
One can well learn about the company from the Nike online store.	○	○	○	○	○	○	○

ONLINE STORE ENVIRONMENT

Recall the Nike online store you explored. Please indicate the extent to which you agree or disagree with the following statements on your experience with the Nike online store.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The Nike online store has valid links (hyperlinks).	○	○	○	○	○	○	○
The Nike online store has useful navigational aids.	○	○	○	○	○	○	○
Navigation through the Nike online store is logical.	○	○	○	○	○	○	○
The Nike online store seems secure.	○	○	○	○	○	○	○
The security systems of the Nike online store seem rigorous.	○	○	○	○	○	○	○
The Nike online store has a search tool which helps one find what s/he want.	○	○	○	○	○	○	○
There are convenient ways to maneuver among related pages in the Nike online store.	○	○	○	○	○	○	○
One can find information easily in the Nike online store.	○	○	○	○	○	○	○
The Nike online store is user-friendly.	○	○	○	○	○	○	○
Overall, the Nike online store seems security conscious.	○	○	○	○	○	○	○

ONLINE STORE ENVIRONMENT

Recall the Nike online store you explored. Please indicate the extent to which you agree or disagree with the following statements on your experience with the Nike online store.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The Nike online store well provides customer reviews of products.	○	○	○	○	○	○	○
The Nike online store provides a lot of areas where users can provide their opinions.	○	○	○	○	○	○	○
Useful shopping recommendations are made for individuals in the Nike online store.	○	○	○	○	○	○	○
One can easily change product options in the Nike online store.	○	○	○	○	○	○	○
The Nike online store offers various links to connect to social networking sites (e.g., Facebook, Twitter, Pinterest, etc.).	○	○	○	○	○	○	○
It is easy to contact a support staff in the Nike online store.	○	○	○	○	○	○	○
The Nike online store provides various ways to receive shopping help.	○	○	○	○	○	○	○
The Nike online store well helps one to compare products.	○	○	○	○	○	○	○
The Nike online store well provides contact information for questions.	○	○	○	○	○	○	○
The Nike online store can well recommend products for individuals.	○	○	○	○	○	○	○

ONLINE STORE ENVIRONMENT

Recall the Nike online store you explored. Please indicate the extent to which you agree or disagree with the following statements on your experience with the Nike online store.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The Nike online store well provides special offers.	○	○	○	○	○	○	○
One can see promotions easily in the Nike online store.	○	○	○	○	○	○	○
The Nike online store offers a various promotions.	○	○	○	○	○	○	○
One can easily see what other users think of the products in the Nike online store.	○	○	○	○	○	○	○
The Nike online store well indicates the number of reviews or ratings.	○	○	○	○	○	○	○

ONLINE STORE EXPERIENCE

Please indicate the extent to which you agree or disagree with the following statements on your experience with the Nike online store.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
My shopping experience was contented.	○	○	○	○	○	○	○
My shopping experience was happy	○	○	○	○	○	○	○
My shopping experience was satisfying.	○	○	○	○	○	○	○
My shopping experience was pleasing.	○	○	○	○	○	○	○
My shopping experience was relaxing.	○	○	○	○	○	○	○
My shopping experience was stimulating.	○	○	○	○	○	○	○
My shopping experience was exciting.	○	○	○	○	○	○	○
My shopping experience was arousing.	○	○	○	○	○	○	○
My shopping experience was frenzied.	○	○	○	○	○	○	○
My shopping experience was wide awake.	○	○	○	○	○	○	○
My shopping experience was controlling.	○	○	○	○	○	○	○
My shopping experience was dominant.	○	○	○	○	○	○	○

My shopping experience was influential.	○	○	○	○	○	○	○
I liked the Nike online store.	○	○	○	○	○	○	○
I enjoyed shopping in the Nike online store.	○	○	○	○	○	○	○
I was active in browsing and exploring the Nike online store.	○	○	○	○	○	○	○
I will return to the Nike online store in the future.	○	○	○	○	○	○	○

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What is your gender?

○ Male

○ Female

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Which of the following best describes your racial or ethnic identifications?

- ○ African-American
- ○ Caucasian
- ○ Native American
- ○ Asian or Pacific Islander
- ○ Hispanic
- ○ Other (please specify below)

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What was your approximated TOTAL HOUSEHOLD INCOME last year (before tax)?

- ○ Less than $20,000
- ○ $20,000-39,999
- ○ $40,000-59,999
- ○ $60,000-79,999
- ○ $80,000-99,999
- ○ $100,000-119,999
- ○ $120,000-139,999
- ○ $140,000 or more

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qualtrics

What is the highest degree or level of education you have completed?

- ○ Pre-High School or High School
- ○ Some College (2 Years)
- ○ College/Univ. Graduate
- ○ Post-Graduate
- ○ Other

>>

What is your marital status?

- ○ Single, never married
- ○ Married or domestic partnership

>>

How many times have you shopped at online stores in the past 3 months?

	1	2	3	4	5	6	7	8	9, or more
	○	○	○	○	○	○	○	○	○

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qualtrics

Thank you very much for your participation.
Please record the survey code below and submit through Mturk.

4989

VITA

Wanmo Koo completed his Ph.D. in Retail and Consumer Sciences with a minor in Statistics at the University of Tennessee, Knoxville (2014). He holds a Master of Science in Merchandising from University of North Texas (2010), a Bachelor of Science in Fashion Design Information from Chungbuk National University, South Korea (2008), and a Bachelor of Arts in English Language and Literature from Chungbuk National University, South Korea (2008).

His research interests encompass apparel consumer behavior related to self-image and store environment and cross-cultural studies on mobile advertising. During his doctoral program, he has published four studies in refereed journals, and his journal publications are as follows:

Koo, W., Cho, E., & Kim, Y-K. (2014). Actual and ideal self-congruity affecting consumers' emotional and behavioral responses toward an online store. *Computers in Human Behavior*, *36*, 147-153.

Fu, W., Koo, W., & Kim, Y-K. (2014). Chinese-inspired products: Value-attitude-behavior. *International Journal of Marketing Studies*, *6*(3), 76-86.

Koo, W., & Kim, Y-K. (2013). Impacts of store environmental cues on store love and loyalty: Single-brand apparel retailers. *Journal of International Consumer Marketing*, *25*(2), 94-106.

Koo, W., Knight, D. K., Yang, K., & Xiang, Z. (2012). Generation Y consumers' value perceptions toward apparel mobile advertising: Functions of modality and culture. *International Journal of Marketing Studies*, *4*(2), 56-66.

He will start his academic career as an Assistant Professor in the Fashion Merchandising program in the Department of Dietetics, Fashion Merchandising and Hospitality at Western Illinois University.