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THE IMPORTANCE OF WEB SITE ATMOSPHERICS WITH EMPHASIS ON VISUAL COMPLEXITY IN ONLINE RETAILING BASED ON S-O-R PARADIGM¹

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ABSTRACT

Purpose - Online retailing web sites have become a valuable platform where consumers are exposed to companies' products and services. Online web sites' visual characteristics include text, pictures, graphics, layout, motion have been identified as some of the main factors contributing to repetitive visits and purchases. As visual design and making the right design decisions are critical to effective online retailing, clarifying these visual elements are crucial. Accordingly, the purpose of this study is to provide the main insights highlighted in the literature related to online shopping web site visual cues as well as to propose the adaptation of visual complexity concept to this relatively new environment via S-O-R paradigm discussion.

Methodology - Through a literature review, the importance of web site atmospherics with emphasis on visual complexity and their influence on consumers' decision making process via their cognitive and emotional states based on S-O-R paradigm is discussed.

Findings – Both the online and offline retailing literature survey suggests that visual complexity of an online retailing web site may have a strong effect on marketing outcomes (revisit/repurchase) and S-O-R paradigm is the foundational theory that helps to support this major argument.

Conclusion - As online shopping becomes more competitive, online retailers continuously look for ways to attract more online customers and hence increase their purchase intentions. One way to induce revisit intention is to provide an online retailing environment that features superior atmospherics that are visually less complex. Rather than getting lost in the design decision of each element individually, taking a more holistic approach attempting to understand the interplay between visual cues that define visual complexity is a necessity to generate effective marketing strategies in online retailing.

Keywords: online retailing, web site atmospherics, visual complexity, online shopping, PAD model

JEL Codes: M30, M31, M39

1. INTRODUCTION

The attention of both practitioners and academics to online shopping is constantly increasing due to several benefits it provides over traditional retailing. Along with the technology improvements (i.e. Internet, smart phones) online retailing offers greater convenience and more information, therefore, more retailers are considering online platform as a means of doing business (Eroglu et al., 2001). The prevalence of shopping on the Internet has changed both retailers' marketing

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strategies and consumers' purchasing environments (Varadarajan and Yadav, 2002). Especially, the disappearance of time and space boundaries makes online retailing a desirable commercial medium (Kalakota and Whinston, 1997). Online stores provide cross channel shopping opportunities so that consumers attain time and place convenience, make easier comparisons, and enjoy unconventional experiences (Eroglu et al., 2001). The world statistics indicate that the total e-commerce value was \$837389.6 million in 2014, it is forecasted to be \$2918 billion in 2020 and online retailing constitutes 50% of this value (Kantarci et al., 2017). In parallel to the global trend, e-commerce has gained great attention in Turkey, too. Online retail value for Turkey was \$3096.7 in 2014 and it is expected to be \$5479.8 million in 2019 (Afra, 2014).

The statistics indicate that online retailing industry is growing enormously that leads to fierce competition. Therefore, how to create an online retailing environment that assists to attract and retain consumers stays as a major research question in online retailing as to benefit from this growth (Eroglu et al., 2001). Like in traditional retail stores, physical environment features of online stores affect the various psychological and behavioral shopping outcomes (e.g. satisfaction, time spent in online store) of online shopping (Bitner, 1992; Mallapragada et al., 2016). Eventhough several online retailers have adopted advanced technologies (e.g. computer-aided tools), offering functional features may not be enough for the design of a consumer-oriented online retailing environment. Atmospheric properties of online retailing environment are one of the major variables that help to achieve better shopping experience (Shih, 1998). As the literature indicates, the effect of the online retailing elements on online consumer behavior is a potential area that lacks in-depth investigation (Grewal and Levy, 2007). Despite the increasing attention to online retailing, not much research has given emphasis to the clear categorization of different atmospheric features of online stores (Dailey, 2004; Eroglu et al., 2001), hence their impact on online consumer behavior (Grewal and Levy, 2007). Earlier studies about traditional retailing focus on the specific features of the atmospherics that are music (Hui et al., 1997), lighting (Golden and Zimmerman, 1986), color (Belizzi et al., 1983), and scent (Spangenberg et al., 1996). Similarly, these atmospheric qualities tend to have impact on the psychological and behavioral shopping outcomes (e.g. enjoyment, satisfaction, repatronage, amount purchased, and time spent in the virtual store, basket value) in online store environments (Grewal et al., 2009; Mallapragada et al., 2016). In electronic retailing, web sites are the primary interfaces via which consumers are exposed to products and services so that the effective design of online retailing web site may lead to competitive advantage (e.g. higher trust, engagement, loyalty) (Alba et al., 1997). However, shopping web sites partly lack some of the sensory properties of the offline environment that are scent, touch, and taste. Therefore, visual and audial senses should be emphasized in online shopping settings. This paper will focus on the visual cues of e-retailing web sites and highlight how visuals and their design can enhance online shopping experience.

2. THEORETICAL FOUNDATION OF ONLINE STORE ATMOSPHERICS

Atmospherics are defined as "the conscious designing of space to create certain buyer effects, specifically, the designing of buying environments to produce specific emotional effects in the buyer that enhance purchase probability." (Kotler, 1973–74, p. 50). Research related to the atmospheric cues' generally build upon environmental psychology (Mehrabian and Russell, 1974). The Stimulus–Organism–Response (S–O–R) model of this discipline suggests that stimuli influence consumers' emotional states (organism), whose response result in their retail behaviors (responses) (Mehrabian and Russell, 1974; Russell and Pratt, 1980; Thang and Tan, 2003). When applied in a retail setting, the stimuli are operationalized as the atmospheric cues, organism as emotional and cognitive states of consumers, and response as approach/avoidance behaviors (repatronage, repurchase, longer visit duration) (Donovan and Rossiter, 1982). The S–O–R framework has been extensively tested in the past research of traditional retail environments with promising results (e.g. Baker et al., 1994; Sherman et al., 1997) and can be utilized in studying e-retailing atmospherics, too (Figure 1).

Figure 1: Shopping Web Site Environment and the Adaptation of S-O-R Paradigm

Stimulus	Organism			Response
Online Store Atmospheric Cues	Cognitive and Emotional Assessment			Approach/ Avoidance
	Dominance	Pleasure	Arousal	
Visual Complexity	Perceived Control	Enjoyment		Revisit/Repurchase Intentions

The stimuli in the S–O–R framework are represented by a set of different attributes that affect the perceptions of consumers (Mazursky and Jacoby, 1986). These attributes are cues that enter a consumer’s emotional space and arouse or incite him/her consciously or subconsciously into action (Mehrabian and Russell, 1974; Russell and Pratt, 1980). However, slightly different from the argument of Russel’s (2003) revised S-O-R paradigm, in this study it is argued that in online store settings, consumers’ cognitive mechanism gets activated prior to emotional assessments. At the start of the online shopping experience, some skills’ such as computer literacy, navigation skills, familiarity with online jargon and so on need to be utilized by the shopper so that he/she will feel that they have control over the environment. Accordingly, as the Figure 1 illustrates, Russel’s (2003) pleasure-arousal-dominance sequence occurs as reversed during online retail environment evaluations of consumers and in addition to emotional one includes cognitive assessment too. The attributes entered into a consumer’s mind in a traditional retail environment include social factors such as the people in the store, customers, and employees; design factors such as visual cues of layout, clutter, cleanliness, and color; and ambient factors such as non-visual cues including smells and sounds (Baker et al., 1994). While all these factors except olfactory and touch related ones may be available in online retailing context, the primary attributes that consumers are prevalently exposed to are visual ones which may actually increase the trust, and hence engagement level of consumers (Ganguly, 2010; Sanchez et al., 2010). According to Tan and Guo (2005) the Internet is viewed by customers as a world of chaos and establishing trust in this chaotic online environment is one of the most crucial factors for success (Ganguly et al., 2010). Although some research (e.g. Cyr, 2008; Yoon, 2002) provide empirical evidence on how various design factors build trust in the context of online retailing, the researchers and practitioners have still not reached to a consensus on what constitutes optimal website visual design. In this study, we have carried a review of the literature on website design in order to determine a comprehensive understanding of visual elements in online retailing environment.

3. DEFINITION OF WEB ATMOSPHERICS IN E-RETAILING

Previous studies introduce web atmospherics classification according to their influence on consumers (Dailey, 2004; Eroglu et al., 2003) and they come up with different categorizations that partly overlap. Schenkman and Jonsson (2000) propose a bi-dimensional categorization of visual elements of online retailing web site design that are, aesthetic formality and aesthetic appeal. Aesthetic formality is related to the order, legibility, and simplicity of a website, while aesthetic appeal refers to the overall impressiveness of a web site based on its hedonic quality. Consistent with their categorization Lavie and Tractinsky (2004) put forward two similar dimensions and name them as classical and expressive aesthetics. Classical aesthetics are composed of the organization, clearness, and symmetry of a web site, and resembles to the aesthetic formality dimension. On the other hand, expressive aesthetics refer to the creativeness, fascination, and originality of a website, and correspond to the aesthetic appeal dimension. Their findings indicate that the former dimension of web aesthetics is related to the utilitarian attributes of visual design, while the latter emphasizes the hedonic qualities.

Eroglu et al. (2001) offer another typology that classifies environmental characteristics of the virtual “store” into two groups: high task-relevant and low task-relevant characteristics. According to their grouping high task-relevant cues refer to “all the site descriptors (verbal or pictorial) that appear on the screen which facilitate and enable consumer’s shopping goal attainment, while low task-relevant cues represent site information that is relatively inconsequential to completion of the shopping task” (Eroglu et al., 2001, p.180). They claim that verbal and pictorial content directly related to shopping goals such as descriptions of the merchandise, price, terms of sale, delivery and return policies. Pictures of the merchandise, availability of sampling, and navigation aids are considered as high task-relevant cues. The ones that are unrelated to the shopping goals such as colors, borders and background patterns, typestyles and fonts, animation, music and sounds, entertainment, amount of white space, icons, and pictures other than the merchandise are considered as low task-relevant cues. Eroglu et al. (2001) define visual characteristics as low task-relevant cues and assume no direct relationship between them and shopping outcomes. However, Kaltcheva and Weitz (2006) assert that visual characteristics (i.e. the colors, typestyles and fonts, animation) which are arousal-inducing features of an online retailing store environment have a significant effect on consumer affective responses towards the environment and on the subsequent e-shopping behaviors (e.g. revisit, repurchase, browsing duration). Another approach by McKinney (2004) divide online store atmosphere into five dimensions: external variables (links on internet shopping site home-pages), internal variables (links prepared to access a department and/or brand on the web site), layout and design (all appearances; color scheme, graphics, photos, and texts), point-of-purchase signs (options available at the time of purchase), and customer services (links providing information or offering specific services to). According to McKinney’s research, the last two dimensions are related to the time of the purchase or post-purchase. The first three dimensions (external, internal, and layout and design) are related to initial exposure which is composed of visual design features.

As the main studies above highlight, the visual cues of an online retailing web site have several categorizations based on different perspectives. While some research offers simpler categorizations (Schenkman and Jonsson, 2000; Lavi and Trancinsky, 2004; Donderi, 2006; Guo and Hall, 2009; Hoffmann et al., 2011), others suggest more detailed ones (Pieters et al., 2010; Mai et al., 2014). However, they all acknowledge online shopping store's visual cues' impact on consumers' emotional states (arousal, pleasure). Under the model of PAD pleasure-arousal-dominance (Mehrabian and Russel, 1974) visual cues are investigated as stimuli that affect consumers' emotions (arousal, pleasure) which in turn generate approach/avoidance behaviors (repurchase, revisit). Since human emotions are intrigue and complicated concepts (Plutchik, 2003), more detailed approaches are required to understand the role of visual stimuli in online shopping settings is an interesting area of research. However, due to the multidimensionality of web aesthetics rather than focusing on each visual cue (i.e. color, typology, pattern) individually, it is better to evaluate their effect in a more holistic way which is defined as visual complexity being composed of feature complexity, design complexity, coherence, and novelty. By looking at the entire online shopping environment from visual complexity perspective may provide a broader insight into understanding the emotional and cognitive assessment processes and hence its impact on online shopping outcomes.

4. VISUAL COMPLEXITY IN E-RETAILING

Mai et al. (2014) propose the concept of complexity of the visual characteristics of online retailing web sites and define web site complexity as another arousal-inducing element. In general, complexity is defined as "the amount of variety or diversity in a stimulus pattern" (Berlyne, 1960, p. 38). The literature in human-computer interaction argues that different views contribute to web site complexity, including the amount of information, number of links, number of images, and use of animation (Geissler et al., 2001; Germonprez and Zigurs, 2005). Hence, it is possible to offer sub-types of web site complexity. Three components suggested in the literature are content, structural and visual complexity (Donderi, 2006; Guo and Hall, 2009; Hoffmann et al., 2011). Content complexity refers to the amount of information presented in a web site, while the other two define web site complexity in the scope of design characteristics. Structural complexity means the variation of different elements or the arrangement of a web site's objects (the amount of the elements on a given web site or irregular and asymmetric arrangements of these). Visual complexity refers to how visually cluttered the features of a given web site are (variation and details in the elements of a particular web site or the amount of interactive and dynamic elements) (Cox and Cox, 2002). While the researchers in computer and vision science examine the images that contain more detail and variation in their basic visual features (color, luminance, and edges) under the general labels of "visual complexity" (Donderi, 2006) or "visual clutter" (Rosenholz et al., 2007), it is classified in a different way in advertising literature that is more adaptable to online retailing atmosphere. According to one of the leading studies in advertising by Pieters et al. (2010), visual complexity has two dimensions: feature complexity and design complexity. They define the advertisements that contain more detail and variations in terms of three basic visual features that are, color, luminance, and edges, as having more feature complexity. They assert that the more detail and variation that an advertisement contains in terms of the three basic visual features across an image, the more computer memory is needed to store the image, hence it is considered as visually complex. Pieters et al. (2010) assert that design complexity has more depth than feature complexity. It mainly underlines the variation of the structure of the specific shapes, objects, and their arrangements in the advertisement. Overall, they assert that the more the quantity of objects the higher the irregularity in the shape of the objects (symmetry simplifies object and pattern perception), the dissimilarity in shapes, textures, orientations, and/or colors (similarity in the context simplifies the pattern perception), the details of objects in terms of intricate textures or color variations, the asymmetry of object arrangement and the irregular pattern of object arrangement (random distribution of objects across space), the higher the design complexity. Similar to advertisements, the focal point of online retailing web site is to grab consumers attention and attract them to the stimulus (advertisement/web site), influence organisms (consumers' affect and cognition), and in turn generate positive responses (revisit/repurchase). In both contexts, visual cues act as stimuli that help or hurt to facilitate approach behaviors through cognitive and emotional states. Since, the nature of both contexts overlaps, the concept of visual complexity is adaptable to online shopping web sites.

5. DISCUSSION

Visual stimuli are known to have an influence on affective responses towards the target (web site, brand, company) and in turn, strongly influence judgments and decision-making process (Pham et al., 2001). Due to the complicated nature of human emotions (Plutchik, 2003), more detailed approaches should be utilized to understand the underlying mechanism. Kumar et al. (2013) suggest an approach that emphasizes the interplay of visual elements with each other rather than

separately focusing on them. According to their perspective consumers may perceive an environment in terms of five visual aesthetics stimuli, i.e. legibility, mystery, coherence, complexity, and novelty, through which they assess the environment. Adopting complexity and other holistic variables into online retailing web sites may introduce a deeper understanding of the process and the visual cues' impact on online shopping outcomes. S-O-R paradigm suggests that atmospheric cues influence consumers in altering their cognition and affect (Eroglu et al., 2003) that occur through pleasure-arousal-dominance (PAD) sequence (Russel, 2003). This study acknowledges the underlying value of this paradigm in online retailing but challenges the PAD sequence. In order to understand how this sequence flows in online shopping, web site specific features of this environment should be taken into consideration. The nature of an online retail setting requires individuals to utilize some cognitive skills (e.g. computer literacy, navigation skills, familiarity with online jargon). Therefore, before consumers begin to shop online (as a user of an electronic device), their cognitive mechanism is already activated. For instance, online shopping store with high/less visual complexity (Stimulus) may confuse/comfort consumers (Organism) and decrease/increase their perception of control (Dominance), and then may produce frustration/enjoyment (Pleasure+Arousal) which in turn may cause them to leave the web site without any purchase (Response). Based on these arguments, this study claims that cognitive elaboration takes place before emotional states in online shopping web sites and revises PAD model as DPA (dominance-pleasure-arousal) (Table 2). In other words, visual complexity may impinge on the consumers' perception of their abilities and skills in navigating in the online store environment so that they may lose their sense of being dominant over the environment (perceived control). This feeling then triggers some emotional states which may define revisit/repurchase intentions.

6. CONCLUSION

Statistics indicate that online retailing has undeniably more advantages in Turkey. According to Kantarci et al. (2017), there are 46.2 million Internet users in Turkey and on average Turkish consumers spend 4.9 hours a day using the Internet through their PCs. Furthermore, 1.9 hours a day are spent on the Internet through mobile devices such as tablets and smartphones (Afra, 2014). In order to benefit from the prevailing trends in online retailing in Turkey, online retailers need to invest in dedicated departments to plan and execute internet strategies that follow recent developments in their sector and focus on innovation to remain up-to-date with the latest developments. As online markets become more competitive, online retailers continuously look for a way to attract more online customers and increase their purchase intentions. One way to do so is to provide an online retailing environment that features superior atmospherics and hence induces revisit/repurchase intentions. Each revisit/repurchase has potential to strengthen the bonds with consumers and enhance positive emotions. Visual complexity has potential to help or hurt attention and attitude toward the web site. Stuffing the online shopping web site with detailed patterns, colors, images may prevent consumers from paying attention to the web site due to increased workload. Since when processing resources are limited, attention to the online shopping web site drops when presented in a high complex way. As a result, people do not stay in a web site if they are exposed to high levels of complexity and may leave immediately or may look at it only briefly because complexity distracts them from paying enduring attention. According to the S-O-R paradigm, attention to the stimuli plays a crucial role in generating positive marketing outcomes (revisit, repurchase) (Wedel and Pieters, 2000). Reduced web site attraction can have long-term effects for online retailing web site equity. Drawing on this, reduction of visual complexity is vital in environments with high attention competition, such as in online retailing, print advertising and media contexts. Pracejus et al. (2006) conclude that advertisements with much "white space" lead to more positive brand attitudes. The main reason behind it may be the fact that it helps to regulate the perception of visual complexity. Similar design principle can be applied to online shopping web sites to manage visual complexity. The literature indicates that across many environments the ones without visual complexity engender identifiability and familiarity (Pieters et al., 2010). Measurability of visual complexity may give marketers control over their creative tools by offering ways to lower cost to improve their effectiveness. Similar to advertisements, making visual complexity measurable for online stores may set maximum and/or minimum desirable levels of visual complexity and hence indicate areas for improvement for a better online shopping experience.

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