

Online Consumer Choice: Footwear Design and Visual Presentation

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ABSTRACT

There has been scant empirical research devoted to footwear. The purpose of this study is to gain a better understanding of how female consumers search, select and evaluate footwear. A mixed-research approach was employed for this study. A questionnaire survey and semi-structured interview were conducted with 21 female students, including the five participants who took part in the eye-tracking study. A total of six different pairs of shoes were selected for the investigation of eye-tracking process. According to the results of this study, fit and comfort are the two most important factors for footwear evaluation. This study also indicated that fit, comfort and style are closely related. Many participants did not feel comfortable purchasing shoes online without trying them on. The results of eye-tracking study indicated that majority of the participants spent more time viewing the top, side and toe of the shoes rather than the back and ankle.

Keywords: footwear, visual attribute, eye-tracking, online shopping, mixed methods research

1. Introduction

Global use of the Internet increased by 676.3% from 2000 to 2014 (Internet World Stats, 2014) and in recent years, online shopping has become increasingly popular. Canadian retail e-commerce sales increased 43.5% from C\$836.65 million in June 2016 to C\$1.201 billion in June 2017 (Digital Commerce 360, 2017). Another report published by the Canadian Internet Registration Authority (CIRA, 2016) also confirms that the e-commerce business is growing in Canada. In this CIRA report, many respondents indicated that ‘clothing’ (42%) was the most common online purchase, followed by ‘flights or travel packages’ (40%), and ‘books’ (34%). In

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addition to boosting companies’ sales, the Internet has been widely used to enhance brand image and perceived values (Levenburg, 2005) through different online marketing strategies.

In Canada, more than 50% of Internet-connected households used more than one device for various online shopping activities such as browsing, searching, comparing, evaluating and buying (Sweet et al., 2012). According to many reports and surveys (e.g., Coughlan, 2016; Noble & Noble, 2000), young people spend more time socializing, playing and ‘surfing’ online than watching television programs. The increased use of the Internet for different activities (e.g., entertainment, information search and

purchases) is a phenomenon that suggests the great potential that lies ahead for fashion e-retailing businesses. The overarching objective of this study is to understand how online consumers navigate, select and evaluate footwear.

2. Literature review

2.1 Importance of visual representation – region of interest

When shopping online, consumers often seek visual representations and text descriptions of products. Previous studies (Kim et al., 2007; Shobeiri et al., 2013) suggested that e-retailers should not solely focus on textual information (e.g., product description) but also on the visual presentation (e.g., product image). It has been suggested that visual elements are closely linked to positive affective states of viewers/shoppers (Mano and Oliver, 1993). Several apparel studies (Eckman et al., 1990; Morganosky, 1984; Rahman et al., 2010) have found that the aesthetic pleasure of a product (style, color and texture) can drive consumers' interest in purchasing the product.

According to the theory of visual rhetoric, images can communicate complex messages and ideas faster than textual information (Scott, 1994). For example, previous studies (e.g., Oh et al., 2008; Perez, 2008) have reported that younger consumers, such as those characterized as 'Generation Y' (generally, those born in the 1980s and 1990s) or later, prefer image-based communications over ones that are text-based. Other studies (del Rio et al., 2001; Rahman & Petroff 2014) also reported that a product image and its associative meaning can enhance consumers' long-

term memories as well as increase the likelihood of a purchase when the need for that product arises. In other words, online visual images can greatly influence consumers' purchasing intentions and their perceptions toward a product (Chen-Yu & Kincade, 2001). With such perspective, it is important to understand how the online shoppers view a product on the digital space.

However, few studies have examined the salient impact of the visual presentation of footwear. If fashion designers and e-retailers want to enhance their online consumers' shopping experience and aesthetic responses, it is imperative for them to gain an understanding of how the shoppers navigate, view and evaluate a product in an online environment. With this perspective, the following research question was posed to guide this study:

- Do online shoppers pay more attention to certain areas of a pair of shoes?

In order to understand the viewers' attention on footwear, a number of regions of interest (Ho, 2014 – also referred to as areas of interest by Antúnez et al., 2013) was identified and divided according to the basic structure of athletic or athletic-inspired footwear: top, ankle, back, side and toe, as shown in Figure 1. The selection of these areas was based on Cavanagh's (1980) divisions – hind-/rear-foot (ankle and back) comprises the calcaneus and the talus; mid-foot (side and top) includes the five short bones and the arch; and the fore-foot (toe) includes the toes/phalanges.

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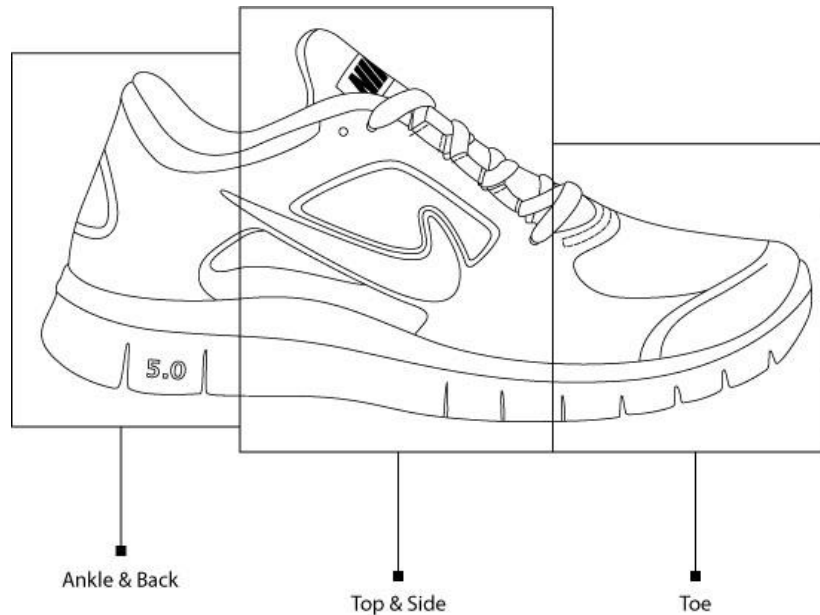


Figure 1. Regions of Interest for Footwear

2.2 Importance of product attributes – intrinsic visual cues

Previous research of cue utilization theory (Rahman, 2011; Rahman et al., 2009; Szybillo & Jacoby, 1974) indicated that consumers often evaluate clothing quality based on a number of product cues. These product cues can be categorized into intrinsic cues (e.g., fit, color and style) and extrinsic cues (e.g., price, brand name and country of origin). Intrinsic cues refer to those attributes directly attached to the physical product, whereas the extrinsic cues are those intangible attributes indirectly attached to the physical product. Intrinsic cues usually provide higher predictive or diagnostic values than do extrinsic cues (Wall et al., 1991). A study conducted by Li (2011) found that Chinese college students paid more attention to intrinsic cues (style, color and fabric) than to extrinsic cues (brand name, certificate and label information). Although brand name can be used to reduce consumers' shopping effort, many buyers do not purchase a pair of shoes merely based on the brand without considering the fit and style to satisfy their physical and psychological needs. In a similar vein, Newcomb (2010) also found that intrinsic cues play a more influential role on product evaluation than do extrinsic cues.

Due to the relative importance of intrinsic cues, the present study focused primarily on visual aspects of a product (style/design, color and fit/silhouette) because these cues can provide quick and detailed information to the shoppers, in contrast to non-visual cues such as product performance, which require consumption experience (Rahman, 2012). Furthermore, some studies (Schifferstein, 2006; Schifferstein & Cleiren, 2005) confirm that vision is the most important sensory system that consumers use for product identification, recognition, categorization and evaluation. For example, a study (Apeagyei, 2008) conducted in the United Kingdom found that more than 50% of female respondents were capable of evaluating and determining the fit of a garment only based on their visual judgment. For these reasons, in this study a questionnaire survey with cue utilization measuring instrument, and eye-tracking study were employed to investigate the significant of visual attributes of footwear.

2.2.1 Style / design

'Style' can be defined as the combination of design features within a garment (Kunz, 1998), or the garment's silhouette and structure (Miller et al., 2005).

According to a study conducted in the U.S. and Korea (Kawabata & Rabolt, 1999), fit and style/design were ranked as the most important evaluative criteria for clothing purchases. Another study, of Chinese and Korean consumers (Forsythe *et al.*, 1999), also found that design was one of the most significant intrinsic cues for product evaluation. In addition, female teens considered fit and style to be the two most important cues for clothing evaluation in a study by Taylor and Cosenza (2002). Although style/design plays an important role in clothing consumption, consumers may perceive and use this product attribute differently on footwear evaluation. Thus, it is of value to investigate style as part of consumers' shopping, evaluating and purchasing behaviours in the case of footwear.

2.2.3 Color

Color information (e.g., hue, light values and bright intensities) can greatly affect consumers' perceptions, their physiological and emotional reactions, and/or the consumer behavioural intentions of a product (Chu & Rahman, 2012; Valdez & Mehrabian 1994). Color cue is the most visible and appealing element of any consumer product, including footwear (Bevlin, 1997; Rasband, 2001). A qualitative exploratory study of women's choice of footwear in the United Kingdom (Naidoo *et al.*, 2011) indicated that six out of seven participants cited color as an important factor for footwear selection. Some prior researchers have pointed out that little research has investigated consumers' shopping motives, selective criteria and (dis)satisfaction with footwear (e.g., Curwen & Park, 2014). Clearly, there is noticeable lack of investigation into the visual cues (style, color and fit) of fashion footwear.

2.2.4 Fit / silhouette

'Fit' can be defined as the way an apparel item conforms to the human body (Workman & Lentz, 2000), or the relationships between an apparel item and body shape (Ashdown & DeLong, 1995).

Well-fitted apparel is important to wearers' physiological comfort, and to their psychological and social well-being (Rahman & Chang, 2018; Smathers & Horridge, 1978-1979). Liechty *et al.* (2000) suggest that a good fit of clothing can be assessed and determined by three factors: balance, ease of movement, and visual appearance. According to a study conducted in Europe (Outsize, 1998), the most important selection criteria for footwear was fit, followed by quality, and then design. Another study (Piller & Müller, 2004) of selective parameters for customized shoes in four European countries (United Kingdom, Germany, Spain and Italy) found that fit and design were the two most important determinants for both male and female consumers. It is not difficult to understand why fit plays a significant role in footwear evaluation; an ill-fitted shoe may cause or exacerbate foot problems such as discomfort, pain, blistering, bunions, black toes, and deformities.

With the preceding discussions, we proposed the following research question to further investigate the importance of visual intrinsic cues.

- Do visual intrinsic cues (style/design, color and silhouette/fit) play a more significant role in footwear (sneakers) evaluation than other product attributes?

2.3 Online shopping and tactile judgment

Although fashion e-retailers can use visual (e.g., pictures and videos) and textual information to reduce consumers' perceived risk and uncertainty, many consumers still prefer touching, interacting, and trying on apparel products such as shoes prior to their purchases. Previous research (Citrin *et al.*, 2003; Peck & Childers, 2003) found that consumers are more willing to make their purchases if they have the opportunity to touch the products, especially for those shoppers who have a higher degree of "Need for Touch" (NFT). Inability to touch the products is one of the most significant

reasons for many of them not purchasing online (Lester et al., 2005). According to a study of denim jeans (Rahman, 2012), both visual and tactile inputs play a significant part on product evaluation. As Rahman (2012: 19) points out in his study, “Most often, visual inputs offer consumers a broader view and impression about a product and tactile inputs can strengthen and re-confirm the visual perceptions.” Although there is considerable amount of studies (Peck & Childers, 2003; Peck & Wiggins, 2006; Rahman, 2012) have examined on the haptic responses or NFT, very little research has focused on footwear. With this perspective, the present study attempted to further investigate the significance of haptic information for judging and selecting a pair of shoes.

- Does haptic information (trying on the product) play a critical role on consumers’ purchasing decisions of footwear?

2.4 Eye-tracking research

Video-based eye-tracking and recording technologies provide an objective assessment of a visual stimulus (Clement, 2007), record viewers’ reactions and focus of attention (Djamasbi et al., 2010), quantify viewers’ overt visual attention (Clement, 2007), and generate precise measurements of eye movements (Duchowski, 2007). Eye-tracking techniques have been widely used in different disciplines and research areas over the last two decades. For example, previous researchers have employed different types of eye-tracking devices to study web design (Cyr et al., 2009; Djamasbi et al., 2010), packaging design (Clement, 2007; Tonkin et al., 2011), gaming design (Alkan & Cagiltay, 2007), marketing (Wedel & Pieters, 2000), and psychology (Wieser et al., 2009).

According to Clement (2007), 90% of consumer selection choices are based on impressions derived from product packaging. Another study conducted by Lundberg (2004) pointed out that 80% of consumers’ decisions are made at the point of sale, in less than ten seconds. In addition, several apparel studies (Damminga et al., 2012; McCormick & Livett, 2012) have reported that viewing a

product may greatly influence consumers’ buying decisions. In other words, the visual image/presentation of a product could play a significant role in the consumer’s evaluation and decision-making processes. Thus, it is critically important to gain a comprehensive understanding of how consumers view and perceive a product.

Despite the growing numbers of studies that make use of eye-tracking, relatively few studies (Ho, 2014; Ju & Johnson, 2010; Park et al., 2012) have employed this technology to investigate the consumers’ viewing and shopping behaviours. One exception was a recent study by Ho (2014) of women’s handbags that used an EyeNTNY-180 eye tracker to capture and record eye movement data, as well as to measure gaze-related variables and the regions of interest – the sequence of e-consumers’ fixations on specific parts of a product. The majority of prior studies have been based on self-reported data or subjective opinions. In order to provide an objective assessment of consumers’ visual attention towards different design components within a product, eye-tracking technology was deemed to be suitable for this study. As Kukkonen (2005: 119) asserted, ‘Since visual evaluation depends directly on the sense of sight, tracking the gaze on the perceived target should provide measurable data for design evaluation.’

3. Research method

The overarching objective of this study is to understand how female consumers select and evaluate a specific fashion product, namely footwear. Footwear was chosen for this study because many reports have indicated that online sales of this clothing item are growing at a much faster rate and play an important part in today’s consumer culture (e.g., CBI, 2010; Zaroban, 2016), and also because very little empirical research has focused on footwear in the past.

In order to gain a comprehensive view of how shoppers view, perceive and evaluate footwear, a mixed-research approach was adopted for this study,

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including eye-tracking study, a questionnaire survey, and semi-structured interviews. This research approach allowed data to be triangulated to strengthen the reliability and validity of the study.

Due to the plethora footwear types/styles offer in the marketplace, it becomes impossible to examine the visual cues and impacts of all types of shoes within one single study. With this limitation in mind, different types of athletic footwear (e.g., sneakers or sneakers-inspired) were chosen as research vehicle for the current study. In order to create a more realistic shopping experience, we kept all the logos and colors exactly the same as the original images without any manipulations and modification.

3.1 Subjects

Female students were recruited through a recruitment poster and referral. The posters were placed on university campuses. Prior to participation, each participant was asked to review and sign an informed consent form. There are several reasons why female students were recruited for this study. First, student subjects have been extensively used for apparel and online research studies (Rahman et al., 2010; Strähle, 2013). Second, the visual stimuli used in this study was gender-specific. Third, younger shoppers are relatively more fashion conscious than are older consumer groups (Stanforth & Lee, 2011). Fourth, many in this demographic sector have experience in searching information and purchasing footwear in both online and offline settings (O’Cass, 2004).

3.2 Questionnaire survey and semi-structured interview

A questionnaire survey and semi-structured interview were conducted with 21 female students, including the five participants who took part in the eye-tracking study. The self-administered questionnaire was comprised of three sections. The first section included 12 product evaluative cues (such as style, color, fit and comfort), all items were

measured on a five-point Likert scale, anchored from 1 (strongly disagree) to 5 (strongly agree). The second section consisted of questions related to shopping behaviour and footwear buying patterns. The final section included sociodemographic questions to ascertain information on age, education, and income. One-on-one semi-structured interviews were conducted subsequent to the questionnaire survey. A series of interview questions was developed that was intended to seek participants’ shopping and consuming experiences in relation to footwear. For example, questions included ‘Do you enjoy shopping online?’, ‘Have you ever purchased footwear online?’, ‘Have you experienced any difficulties or challenges when you shop for footwear?’ and ‘Do you feel comfortable to purchase footwear online? Why or why not?’ Each interview was audio-recorded and transcribed.

3.3 Data Analysis

Each interview lasted approximately between 10 and 17 minutes, with a mean of 14 minutes. Content analysis and holistic interpretation were used for data analysis because this is a systematic technique often employed in consumer research (Rahman & Yu, 2018). The content-analysis procedures described by Zimmer and Golden (1988) was followed for the present current study. Each interview audio recording was transcribed for data analysis. Two apparel researchers read through the transcripts several times, discussed the possibilities of data interpretation, reached a consensus on how data should be organized, and then each judge identified and coded the recurring attributes independently, and placed them into general categories according to their similar characteristics. In the situations of disagreements, encoders would openly discuss the discrepancies and reflect on the coding procedures in order to resolve the issues and make the final decision.

3.4 Visual stimuli and eye-tracking study

Three individuals – including a fashion professor, a fashion professional and a design

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student – selected a total of six different pairs of shoes for eye-tracking study. According to previous research (Rahman, 2012) and a pre-test of this study, participants are able to handle seven or less visual stimuli at the same time. The selective criteria for these shoes were determined on the basis of fashionability – two basic styles ('a' & 'd'), two moderate styles ('b' & 'e'), and two fashionable styles ('c' & 'f') were chosen (as shown in Figure 2). The dimension of the tested visual stimulus was 3300 X 1855 pixels, and the resolution was 300 pixels per inch.

SensoMotoric Instruments (SMI) eye-tracking glasses (optometric measuring instruments) were used to collect data relating to viewers' eye movements, gaze,

fixation and attention (Ju and Johnson 2010). Eye movements consist of two types of motion: saccades and fixation (Tonkin et al., 2011). 'Saccades' refer to speedy movements or sudden jumps of fixation from one location to another (Duchowaky, 2007; Tonkin et al., 2011). 'Fixation' is associated with intense cognitive processing (Pan et al., 2004) which is often viewed as a reliable measure of the extent of a viewer's attention (Chapman, 2005; Vertegaal & Ding, 2002). 'Attention' is measured by the number of durations of fixation (Kuisma et al., 2010).

In total, five female participants were recruited for this pilot eye-tracking study. All of them reported 20/20 or corrected vision without any color vision deficiencies.



Figure 2. Visual stimulus with six different pairs of shoes for eye-tracking experiment

4. Results and discussion

4.1 Demographic profiles of the participants

As shown in Table 1, the vast majority of the participants were students (n=17, 89.9%), and more than half of them earned

less than C\$10,000 per year (n=13, 61.0%). Sixteen participants (76.2%) fell between 18 and 22 years of age, and five participants (23.8%) were over 25 years old.

Table 1. Participants' demographic profile

	Frequency (N = 21)	Percent
<i>Age</i>		
18 years old	1	4.8
19 years old	5	23.8
20 years old	9	42.8
22 years old	1	4.8
Over 25 years old	5	23.8
<i>Employment</i>		
Student	17	89.9
Part-time employed	3	14.3
Unemployed	1	4.8
<i>Annual income</i>		
\$4999 or below	7	33.3
\$5000-\$9999	6	28.6
\$10000-\$14999	4	19.0
\$15000-\$19999	1	4.8
\$20000-\$24999	J 1	4.8
\$25000-\$29999	T 1	4.8
\$30000 or above	T 1	4.8

As indicated in Table 2, ten participants reported that they always shopped for shoes to match their clothing. In other words, they often purchased clothing items first, and then looked for an appropriate type of shoe to match or coordinate with their existing outfit or wardrobe. Over half of the participants

A (n=13, 61.8%) reported that they shopped for footwear at brick-and-mortar stores between one and four times per year. Many of them (n=12, 57.2%) spent two to four hours at the shopping mall each time when they shopped for shoes. In terms of online shopping, eight participants (38.0%) had never shopped for footwear online.

Table 2. Participants' footwear shopping behaviors

	Frequency (N = 21)	Percent
<i>How many times do you shop for footwear at brick-and-mortar stores per year?</i>		
Never	1	4.8
1-2 times	5	23.8
3-4 times	8	38.0
5-6 times	1	4.8
More than 6 times	6	28.6
<i>How many times do you shop for footwear online per year?</i>		
Never	8	38.0
1-2 times	6	28.6
3-4 times	1	4.8
5-6 times	3	14.3
More than 6 times	3	14.3
<i>How much time do you usually spend at the shopping mall each time?</i>		
Less than 2 hours	9	42.8
2-4 hours	12	57.2

<i>How much time do you usually spend on online shopping each time?</i>		
Less than 2 hours	18	85.7
2-4 hours	3	14.3
<i>How much money do you spend on footwear every year?</i>		
Less than \$100	1	4.8
\$100-\$199	4	19.0
\$200-\$299	5	23.8
\$300-\$399	3	14.3
\$400-\$499	1	4.8
\$500-\$599	4	19.0
\$600-\$699	1	4.8
\$700 or above	2	9.5
<i>Buying pattern</i>		
I always shop for clothes to match my shoes	2	9.5
I always shop for shoes to match my clothes	10	47.7
No specific buying pattern	8	38.0
No response	1	4.8

4.2 Survey results – intrinsic visual cues

In regard to significant evaluative criteria for footwear, many participants cited fit as the most important factor, followed by comfort, style, price and color respectively (as shown in Table 3). According to some studies (e.g., Rahman et al., 2018; Gardyn, 2003), consumers are highly concerned about the fit of apparel products because poor fit may cause physical and psychological discomfort, as well as leading to the need to return merchandise.

Relatively, intrinsic visual cues (fit, style and color) played a more significant role than did extrinsic cues (e.g., brand name, country of origin), with the exception of price. It is not difficult to understand why many participants in this study were concerned about product price: the majority were students and many of them earned less than \$10,000 per year.

The results of this study are in line with previous studies: fit was considered the most important determinant for clothing evaluation and purchases (Rahman, 2011; Zhang et al., 2002), and brand name and

country of origin were often viewed as the two least important cues (Rahman et al., 2010). Although color is the most visible and appealing element of any consumer product, the results of this study indicated that color played a relatively less significant role than fit, comfort and style. The importance placed on comfort as a product cue in this study is supported by clinical reports (e.g., Rossi, 1988), poorly fitting shoes may cause foot problems, physical pain and discomfort such as blistering, bunions, and tired feet. Thus, it is reasonable to believe that both physical and psychological comfort are closely related to fit and style.

In order to understand the relationship among these variables, the Pearson's correlation test was performed. The results of the correlation test indicated that fit was strongly related to comfort ($r=0.461$, $p = 0.035$) and style ($r=0.256$, $p = 0.000$). Thus, it is reasonable to suggest that many consumers tend to use these three product attributes simultaneously to judge and choose the footwear products.

Table 3. Importance of footwear evaluative cues

Footwear	N	Mean	S.D.
<i>Product Cue</i>			
Fit	21	4.95	.218
Comfort	21	4.81	.402
Style	21	4.52	.602
Price	21	4.43	.598
Color	21	4.43	.598
Quality – workmanship	21	4.38	.865
Durability	21	4.33	.913
Wardrobe coordination	21	4.19	.680
Fabric	21	4.19	.928
Ease of care	21	3.57	.978
Brand name	21	2.86	1.276
Country of origin	21	2.62	1.117

4.3 Eye-tracking study – region of interest

In the questionnaire survey, participants were also asked to answer two open-ended questions related to footwear brand. Questions include “Which footwear brand you like the most? and “Why?” According to the results, all five participants who participated in the eye-tracking study did not mention athletic brand. These findings indicate that all five participants did not have a strong preference for athletic footwear brand such as Nike, Adidas and Puma as indicated in Figure 2. In addition, two participants even expressed in the interviews that they didn’t (P4) or seldom (P3) wear athletic shoes. Thus, it is reasonable to believe that the results of the eye-tracking study are more likely linked to the visual attributes than on the brand name.

The results of this eye-tracking study showed that most of the participants spent relatively more time viewing the shoes of moderate style (b), and only one participant (P4) was interested in the ‘fashionable’ style (f). This finding implies that participants were more likely to choose the moderate design of footwear over atypical or unconventional footwear such as item (f) with high heels.

As shown in Table 4 and Figure 3 (Heat Map: red spots relatively received more visual attention), it is evident that while inspecting a pair of shoes, the

majority of the participants spent more time viewing the top, side and toe of the shoes rather than the back and ankle. Thus, it is reasonable to suggest that the side, top and toe were considered as important regions of interest when shopping for footwear.

As shown in Figure 3, with the exception of P4, participants did not pay attention to the soles of shoes. It is evident that they were more interested in the visible appearance and aesthetic features (e.g., the side & top) of footwear. This finding supports the results of a previous study (Pieters & Warlop, 1999), where consumers were concerned about the design feature of the product. In a similar vein, consumers usually spend more time and effort when they shop for visible or publicly consumed products, such as jeans and dresses, than when shopping for invisible or privately consumed products such as socks and pyjamas (Rahman *et al.*, 2009). From this perspective, it is not difficult to understand why most of the participants did not pay much attention to the soles and backs/ankles of shoes, because these elements are relatively less visible during use than other parts of the shoe.

According to our findings (Table 5), participants who had larger pupil dilation (P4 & P5) tended to pay more attention to the shoes – as shown in Figure 3; the intensity of gaze is represented in both P4’s

and P5's heat maps. Along with this finding, the fixation count and total tracked points of these two participants seems to be lower than those who had smaller pupil dilation. In other words, the eye movements of both P4 and P5 were relatively less frequent than those of the others. Several

studies (Kafkas & Montaldi, 2011; Papesh et al., 2011) have reported that the size of pupil dilation is linked to observers' memory and the level of arousal the image induces. For example, Papesh et al. (2011) found that high-confidence judgments were accompanied by large pupils.

Table 4. Average time spent on viewing the specific parts of the shoes

	P1	P2	P3	P4	P5	Average
Top	26.3%	7.1%	15.4%	50%	23.1%	24.38%
Ankle	10.5%	14.3%	30.8%	0%	7.7%	12.66%
Back	5.3%	35.7%	23.1%	25%	23.1%	22.44%
Side	26.3%	28.6%	30.8%	12.5%	30.8%	25.80%
Toe	31.6%	14.3%	0%	12.5%	15.4%	14.76%

Table 5. Results of eye-tracking results – fixation and pupil dilation

Measuring item	P1	P2	P3	P4	P5
Total fixation time	98.86%	97.73%	97.30%	96.86%	96.43%
Total non-fixation time	1.14%	2.27%	2.70%	3.14%	3.57%
Total tracked points	4464.0	49698.0	29215.6	28853.8	28492.0
Fixation count	173.0	5020.0	3250.1	3393.0	3535.9
Average fixation time	158.38	119.86	98.14	76.43	54.71
Average base pupil size	3.28	3.44	3.37	3.30	3.22
Average dilation range	1.2 - 4.4	1.8 - 4.1	2.3 - 5.6	2.1 - 4.5	2.1 - 4.5

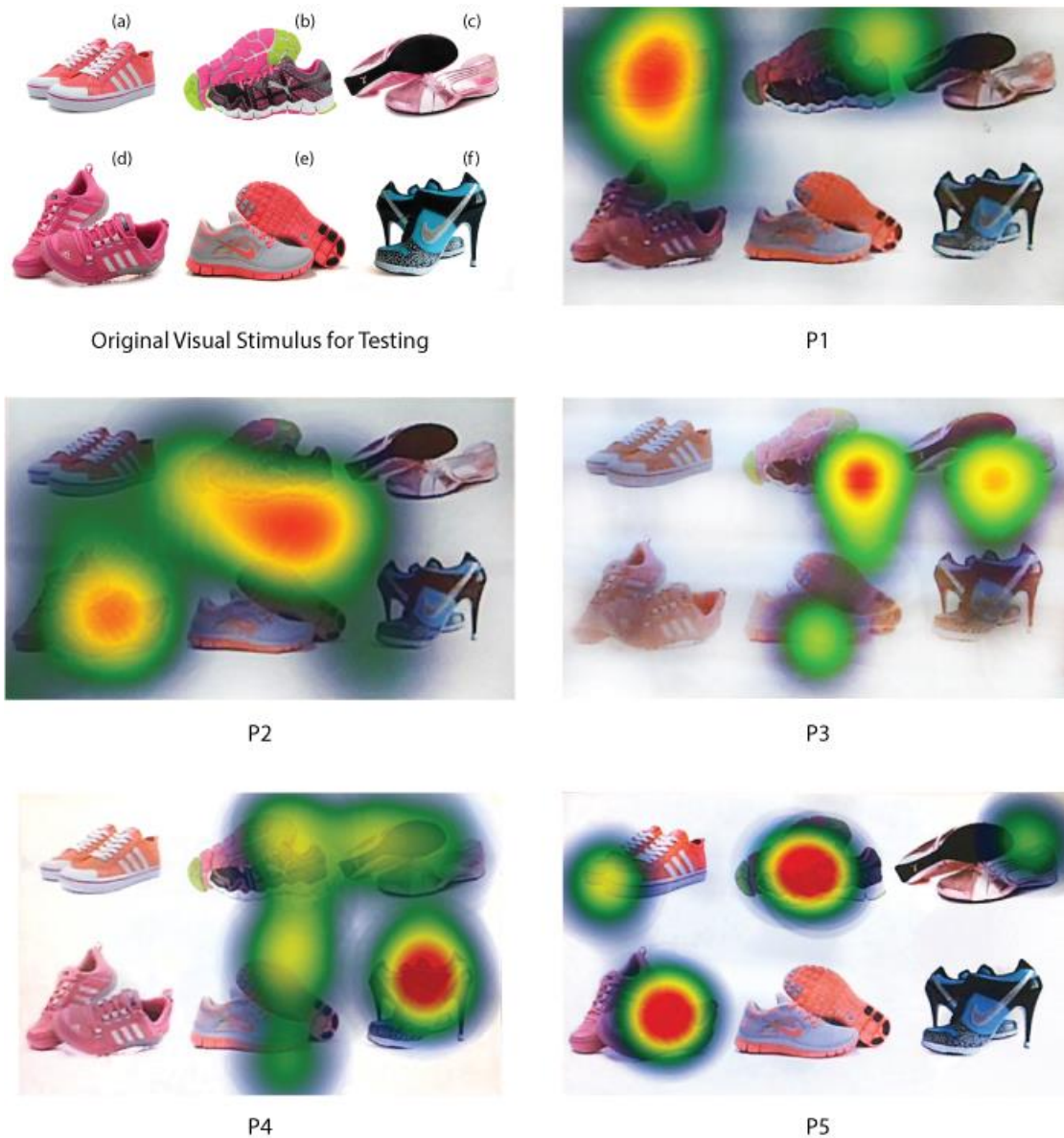


Figure 3. Heat maps showing participants' degree of attention

4.4 Interview results – style, fit and comfort are correlated

In terms of the product evaluative criteria, it is evident that footwear consumers often looked for both aesthetic (style, fit) and functional (comfort, fit) aspects of a product. In many cases, if the footwear purchased didn't fit the consumer's foot size and made the wearer uncomfortable, they might not even wear them regardless of the brand name and price. For example, one of the interviewees admitted:

I have bought shoes that aren't comfortable and they just sit there, and I never wore them again. [P2]

Another said:

There's nothing I hate more than uncomfortable shoes. I chose shoes mostly for comfort. [P12]

Indeed, fit, comfort and style play a significant role in footwear evaluation and consumption. However, people may not always search for the same values among different types of footwear – sandals, high-heels, stilettos, flip flops, wedges, boots and sneakers. As the following informants stated:

If I'm looking for a pair of winter boots, I don't mind spending more money. I would make sure that the boots would keep me warm, and that they're made out of leather or something sturdy. [P2]

I love high heels. I think they look really cute and are pretty feminine, but again they're not super comfortable ... especially thin high heels are not comfortable. Thicker high heels are more comfortable. [P13]

4.5 Interview results - online shopping and tactile judgment

According to the interview transcripts, ten of the 21 informants enjoyed shopping for shoes, while six did not; five were neutral. In terms of online shopping, the majority of the informants reported that they liked to use the Internet to seek product information and compare prices, but they did not like purchasing online. For example, nine informants strongly expressed that they did not want to purchase shoes online. Among all informants, only one person (P1) indicated that she didn't mind purchasing footwear online without trying them on first at a brick-and-mortar store because:

I usually order two pairs and return one ... just to make sure that I'm getting the right size because I'm impatient and I don't want to wait for that process. Although the shipping cost is a little bit higher, it's worth the money. [P1]

However, many informants did not prefer to make footwear purchases online because they wanted to touch and try on the shoes. This finding is consistent with the survey results and numerous research studies (Peck & Childers, 2003; Peck & Wiggins,

2006) that touching and trying on the product can increase confidence in the evaluation processes and ultimate selection. Through touch, consumers may obtain more information about product texture, hardness, temperature, and weight. According to Peck and Wiggins (2006), tactile experience plays a very important role in consumers' evaluation and purchasing decisions, particularly to those who are high in 'Need for Touch.' For example, several participants said,

I don't really shop online. ... I usually prefer to go to the store and try things on, and see how things fit on me. But, if I don't see it at the store then I might order it online, but usually I go to the store to see if they have it first. [P4]

Buying online and you don't have trying it on that is the biggest problem because you don't know if they're comfortable. [P7]

4.6 Interview results - inconsistent sizing system

In addition to tactile or physical judgment, a few informants pointed out that the inconsistent sizing system across footwear brands would aggravate their shopping and buying experience. For example:

If you shop at Payless, my size is like size 7, but if I go to Puma my size is 7.5, 8 or less, so it's really confusing [P10]

I have to try them on. I think size is varied between shoes. [P16]

I'm worry the shoes won't fit if I don't try them on. ... I don't want to buy something, and then realize that it doesn't fit properly later on. [P17]

According to the interviews, it is evident that trying on a pair of shoes is critically important; and many consumers do not want to shop online because the size and fit may vary from brand to brand.

5. Conclusion

According to the quantitative and qualitative results of this study, fit and comfort are the two most important factors for footwear evaluation. The study also showed that fit, comfort and style are closely related. These three product cues are often used for footwear evaluation because ill-fitting shoes may lead to physical pain and discomfort, and inappropriate style may lead to psychological discomfort. Although visual cues such as style, color and fit play a more important role than many other product cues, many consumers are not able to decide on their purchases without touching and trying on the product. Many consumers are not comfortable to purchase footwear online although a few studies reported that consumers are capable and knowledgeable to judge the clothing fit and quality based on its visual representation or physical appearance (Apeagyei, 2008; Rahman, 2012). It could be quite different shopping for a pair of shoes than shopping for clothing. Clearly, consumers do not want to buy any shoes that may lead to physical pain and discomfort, regardless of the attractiveness of the shoes.

The reasons why many shoppers have no confidence in judging the fit of shoes online include: (1) the visual representation and text descriptions do not provide enough information about the fit; (2) the sizing systems of footwear are varied across brand names; and (3) some consumers' feet sizes are beyond the norm (e.g., too small, too wide or too narrow). In order to enhance consumers' online shopping confidence and experience, footwear retailers should address the aforementioned issues. For example, detailed sizing charts to depict the height and width of shoes would be useful, realistic 3D images (with rotating, flipping, zooming and interactive functions) enable detailed examination, and virtual fitting or 'try on' technology (Zolfagharifard, 2015) should be further explored. For example, footwear retailers could develop an affordable handheld scanner for their shoppers to pre-scan their feet at home and upload the data online for product matching and virtual fitting.

The results of this study clearly indicated that many participants did not feel comfortable purchasing shoes online, and most of them only used the Internet for seeking product information. In order to provide useful information to online shoppers, fashion retailers should focus on the following areas: understanding shoppers' navigation styles and patterns, and displaying each visual product alongside reviewers' comments as well as the availability of shoes sizes. Shoppers become frustrated if the size is not available when they attempt to place the item in the shopping cart after a long search. Therefore, they should be informed of size shortages early in the pre-purchase stage.

In terms of product design, footwear designers should pay extra attention to the fit (silhouette and shape) and style (especially the side/top and toe regions). Collazzo (1988) points out that the most common fitting problems in footwear include the width of shoes, narrow toes, arches and sloppy fit. However, the predominant sizing systems of footwear is determined by its length rather than the width dimension. It would be useful if the visual image can be rotated to show the top view and also indicate the measurements of shoe width to accommodate and satisfy diverse consumers' physical needs and aspirations. Other than the footwear design and visual presentation, footwear designers and engineers should work collectively and collaboratively to develop a standard sizing system for the industry in order to reduce or minimize consumers' frustration and confusion.

6. Limitations

Although the findings of this study can provide useful information to footwear manufacturers and vendors, it has several limitations. Firstly, the study was primarily focused on young female consumers. Therefore, future research could be extended to include male consumers and other age groups. Secondly, the sample size was relatively small, and therefore limits the generalizability to a larger population. Thirdly, more research on other apparel products is needed to generate more reliable

results and for comparison purposes, as well as to enrich our understanding of this topic. Fourthly, 3D visual stimuli could be employed for eye-tracking study in the future. Fifthly, a single study should not form the basis for generalizations; thus, more replicated studies are needed to strengthen the data's validity and reliability. In addition, future research may expand to other areas such as consumers' interactivity and engagement with online shopping, and the cognitive, affective and conative responses to e-retailing websites.

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