

Modeling the Effect of Web Advertising Visual Design on Online Purchase Intention: An Examination across Genders

Abstract

With web advertising growing to be a huge industry, it is important to understand the effectiveness of web advertisement. In this study we investigate the effects of web advertising visual design (WAVD) purchasing intention within the framework of an integrated model. Nine hypotheses were developed and tested on a dataset of 316 observations collected via a questionnaire survey. The results of structural equation modeling (SEM) indicate that while web advertising visual cues influence consumers' purchasing intention through advertising attitudes and brand attitudes, they do not have direct effects on purchasing intention. Further results on the moderating role of gender suggest that web advertising visual cues have direct effect on consumers' purchasing intention for male groups but not for female groups. This study contributes to the understanding the role of visual dimensions in forming online purchase intentions.

Keywords: Web advertising, visual design, advertising attitudes, brand attitudes, purchase intention, and gender.

1. Introduction

The use of web advertisements began in 1994, when the first banner advertising was displayed on Hotwired.com for AT&T (Holis, 2005), and since then the internet has become an important medium through which companies advertise their products and services. According to a recent report released by the Interactive Advertising Bureau (IAB, 2014), web advertising revenue surpassed \$23 billion in the first half of 2014, up 15% on the same period in 2013. In the coming years, web advertising expenditure is projected to overtake all advertising media, including TV advertising. Advertising is often considered as the main marketing tool in terms of influencing consumer purchase decisions (Kiang, Raghu, & Shang, 2000). In an internet context, most scholars agree that more careful consideration needs to be given to web advertising visual design (WAVD) in order to achieve its goals (Cho, 1999; Duffett, 2015; Méndez & Leiva, 2015; Pieters, Wedel, & Batra, 2010). This may be because of the sheer numbers of site stimuli competing for consumers' visual attention. Online users have been found to spend on average only 6.4 seconds on each search engine results page (Hotchkiss, 2006), and they usually decide to stay or leave the website within the first two minutes (Dahal, 2011). Thus, it is increasingly essential to measure the efficiency of web advertising and its design because the beauty of advertising is in the eye of the beholder.

Against this backdrop, web advertising has gained a great deal of attention in recent years due to its potential effect on online shoppers' responses (Almendros & García, 2014; Ching, Tong, Chen, & Chen, 2013; Flores, Chen, & Ross, 2014; Goodrich, 2011; Kuisma, Simola, Uusitalo, & Öörni, 2010; Saadeghvaziri, Dehdashti, & Askarabad, 2013; Sajjacholapunt & Ball, 2014; Sokolik, Magee, & Ivory, 2014). While previous studies have identified the impacts of web advertising on basic consumer reactions such as click-through rates and consumer recall, a significant gap remains in the theoretical understanding of how WAVD influences online purchase intention (Cyr, Head, Larios, & Pan, 2009; Goodrich, 2011). This study sets out to fill in the gap by investigating effects of WAVD on consumers' purchase intention. In addition to the potential direct impact of WAVD on purchase intention (Goodrich, 2011), this study also establishes the role of attitudinal effect as an important mediator in the relationship between WAVD and purchasing intentions (Ha & Janda, 2014; Pavlou & Fygenson, 2006).

Moreover, we examine the moderating role of gender in the relationships between WAVD, consumers' attitude and purchasing. Gender is considered a key segmentation variable in the field of marketing (Darley & Smith, 1995), and plays a key role in moderating consumers' evaluative judgments (Holbrook, 1986). Based on gender-based research, differences between the sexes have been uncovered related to attitudes toward web

advertising, attitudes toward online shopping (Hasan, 2010; Rodgers & Sheldon, 1999), information searching and processing styles (Krugman, 1996; Richard, Chebat, Yang, & Putrevu, 2010), visual design preferences (Cyr & Head, 2013; Mahzari & Ahmadzadeh, 2013), attention to web advertising (Goodrich, 2014; Park, 2015), satisfaction with online shopping (Rodgers & Harris, 2003), online communication strategies (Holmberg & Hellsten 2015), and purchase intention (Davis, Lang, & Diego, 2014). These differences between men and women may moderate the effects of web advertisements (Goodrich, 2014). Although some studies focus on the importance of gender in the online shopping context, empirical evidence regarding the moderating role of this variable remains scarce. According to Goodrich (2013), such investigation may be beneficial with regard to providing a link between web advertising design elements and marketing goals. Thus, this investigation also attempts to fill this gap and to help marketers better understand the impact of WAVD on online shoppers across genders.

This study contributes to the advertising literature in two ways. First, the study advances our understanding of the role of WAVD in online purchase intention formation by integrating the direct and indirect effects of WAVD on online purchase intention into a single model. Second, unlike previous research that proposes that gender only moderates the effect of site stimuli on attitudes (Goodrich, 2014; Richard et al., 2010; Tsihla, Hatzithomas, & Boutsouki, 2014), our study discovers that gender plays a significant moderating role with behavioral intentions as well. This study therefore is the first of its kind to provide such empirical evidence in a web advertising context.

The remainder of the paper is organized as follows. First, we provide a theoretical background of the variables in our model. Next, we develop the hypotheses proposed in our model. After that, we discuss the method used for data collection and analysis. Then, we conclude the paper with a discussion and some directions for future research.

2. Theoretical background

2.1. Web advertising visual design (WAVD)

Visual design is considered as one of the essential elements of web advertising success (Cho, 1999). Recognizing its importance in the field of the internet, Singh and Dalal (1999, p.92) profess that “designing effective messages (ads or web sites) is a key ingredient in creating an ideal customer”. Moreover, Duffett (2015, p.520) declares that “advertisements should be carefully created to be interactive and stimulating”. In an internet context, visual appeal has been shown to influence the quality of interaction between online stimuli and the

internet users (Chou, Chen, & Lin, 2015; Lee, Ahn, & Park, 2015). The importance of WAVD may derive from the fact that websites become more competitive with hundreds, if not thousands, of advertisements competing for consumers' visual attention (Pieters et al., 2010). Therefore, employing a variety of attention-grabbing tools in web advertisements, such as large size, vivid colors, and animation, may play a vital role in making a strong first impression on visitors. Dreze and Zufryden (1997) argue that visual design in web advertising deals with elements that include color, shapes, images, font type, font size, and dynamic techniques, etc. As long as these factors are congruent with customers' attitudes, beliefs and values, the effectiveness of advertising will be enhanced (Braun-Latour & Zaltman, 2006).

Among many theories that aim to explain the effect of visual design factors, the theory of Visual Rhetoric (Scott, 1994) is a widely accepted one. According to this theory, visual elements, such as images and color, can easily convey commercial meaning in marketing messages, reduce the role of cognitive efforts, and in turn influence a target audience. Since its appearance 21 years ago (Scott, 1994), the theory of Visual Rhetoric has become one of the most frequently referenced and powerful theories for the prediction of online consumer behavior (Cyr et al., 2009; Flores et al., 2014). In this light, we attempt to explore whether visual cues in web advertising (e.g., background color, images, and flash design) influence advertising outcomes as measured by advertising attitude, brand attitude, and online purchase intention. In an internet context, much research has shown that attractive and pleasurable site stimuli can enhance positive consumer responses (Chen et al., 2010; Ching et al., 2013; Cho & Kim, 2012; Day, Shyi, & Wang, 2006; Flores et al., 2014; Kim, Kim, & Park, 2010; Liu, Chou, & Liao, 2015; Moore, Stammerjohan, & Coulter, 2005; Richard, 2005; Sokolik et al., 2014). Hence, the responses of online consumers may be influenced by visual attractiveness in web advertising as well.

2.2. Attitudinal responses: attitudes toward advertising (ATA) and attitudes toward brand (ATB)

Attitude is considered to be one of the key determinants of advertising efficiency. It is viewed as an overall feeling or evaluation about an individual, idea or object (Fishbein & Ajzen, 1975). This definition suggests that attitudes change over time as individuals gain new knowledge about the idea or object from different sources. In this study, we consider attitude toward advertising (ATA) as an overall feeling toward advertising on the internet in general, whereas attitude toward brand (ATB) is described as the overall feeling about a

particular brand. In this regard, Cho (1999, p.40) suggested that “People who have a more favorable attitude toward web advertising overall have a more favorable attitude toward a banner ad.” A person’s attitudes play a vital role in determining his/her behavioral intentions, as suggested by the theory of reasoned action (Fishbein & Ajzen, 1975). In addition, previous research has shown that the impacts of advertising messages on purchase intention are theoretically mediated by advertising attitudes and brand attitude (MacKenzie & Lutz, 1989; Mitchell & Olson, 1981; Shimp, 1981). In an online setting, various studies have established the mediating role of attitude in the relationship between site stimuli and online purchase intention (e.g. Korgaonkar & Wolin, 2002; Rasty, Chou, & Feiz, 2013; Stevenson, Bruner, & Kumar, 2000; Wu et al., 2008).

2.3. Online purchase intention (OPI)

Online purchase intention has been defined as a consumer’s desire to buy a product or service from a web site (Cyr, 2008). In this context, online purchase intention is considered as “the final consequence of a number of cues for the e-commerce customer” (Ganguly, Dash, & Cyr, 2009, p. 27). Research in which online purchase intention has been examined shows a significant relationship between purchase intention and actual purchasing (Morwitz, Steckel, & Gupta, 2007; Pavlou & Fygenson, 2006). In other words, online purchase rates of a product or service will be higher among consumers who state positive intentions to buy the product than among those with weaker intentions. This view is consistent with many theoretical models of consumer behavior. For instance, Fishbein and Ajzen (1975, p. 368) state, "if one wants to know whether or not an individual will perform a given behavior, the simplest and probably most efficient thing one can do is to ask the individual whether he intends to perform that behavior". As a result, online purchase intention becomes a crucial factor that can predict the effectiveness of online stimuli (Amaro & Duarte, 2015; Elwalda et al., 2016; Lu, Fan, & Zhou, 2016; Wu et al., 2008).

While attitude plays an important role in determining an individual’s behavioral choices and intentions (Fishbein & Ajzen, 1975), visual elements of marketing messages may have the potential to influence behavioral intentions without the mediating effect of attitude (Goodrich, 2011; Smith, Mackenzie, Yang, Buchholz, & Darley, 2007; Sundar & Noseworthy, 2014). Thus, the challenge for online advertisers and marketers is to comprehend such differences and adjust their online communication strategies accordingly. In this study, therefore, we attempt to clarify these differences by investigating how the

characteristics of WAVD affect online purchase intention with and without attitudinal effects.

2.4. Gender differences

The term “gender” refers to whether an individual is genetically and biologically male or female (Wilson, 2002). For decades, gender has been considered to be an important research topic in different fields, such as psychology, marketing, and behavioral studies (Bem, 1981; Meyers- Levy & Maheswaran, 1991; Putrevu, 2004; Richard et al., 2010). It is also deemed to be an important demographic factor of segmentation used by marketers (Darley & Smith, 1995). In recent times, however, the necessity of gender-related research has increased in the context of the internet due to the dissemination of the internet among males and females alike (Cyr, 2014). Official figures have shown that 37% of all women worldwide use the internet, and around 40% of all men (Internet World Stats, 2014). Thus, advertisers need to understand as much as possible about gender differences in order to employ optimal advertising design features. Recognizing the importance of this investigation, recently, Tsihla et al. (2014, p.2) have insisted that “a thorough understanding of gender-specific evaluations and desires pertaining to web design is paramount”.

For advertisers, the most important aspect of gender issues may be how males and females respond differently to advertising stimuli. Particularly, there is considerable evidence to suggest that males tend to have more positive attitudes toward advertising than females (Kempf, Palan, & Lacznik, 1997; Shavitt, 1998; Wolin & Korgaonkar, 2003). Moreover, male users stated more favorable attitudes toward online shopping than female users (Rodgers & Sheldon, 1999). In research examining gender-related purchase intentions, Davis et al. (2014) suggest that online purchase intention for male shoppers is higher than for females. Interestingly, women were found to have different preferences from men regarding web site design features such as shapes, colors, and images (Mahzari & Ahmadzadeh, 2013; Moss, Gunn, & Heller, 2006). These differences between men and women may moderate the relationships between site stimuli and shopping outcomes such as online purchase intentions.

Table 1 shows an overview of recent gender-related research that investigated the moderating role of gender in this context. The summary in Table 1 shows that there are very few studies focusing on the moderating effect of gender in the online shopping context. The recent study of Cyr and Head (2013) also emphasizes this research gap, and the authors encouraged future research in this particular area. Table 1 also shows that the relationship

between WAVD and advertising attitude, brand attitude, and online purchase intention has never been examined across gender. Thus, this study attempts to gain a fuller understanding of how gender works in this context by investigating the moderating effect of gender on the relationships between WAVD, attitudinal effects, and behavioral intentions. It is widely believed that investigating gender differences in the process of decision making will provide better insights than examining their effects on outcomes (Sun et al., 2010; Venkatesh & Morris, 2000).

Table 1 about here

3. **Research model and hypotheses development**

3.1 Research model

In this section, we develop a conceptual model to better understand the impact of the elements of WAVD, such as background colors, pictures, and flash design, on consumers' purchase intentions. Moreover, we attempt to discover whether or not gender moderates the relationships in our model. Based on the research gaps identified in our literature review, it can be seen that the proposed model is of great importance. It will help marketers and researchers to understand how visual cues in advertising affect shopper behaviors and outcomes in an online environment where attention to web advertising is very low. According to MediaMind (2010), click-through rates are only 0.09%. It has been proven that most purchase decisions are taken based on peripheral cues such as color, animation, music, entertainment, pictures, and summary content rather than text-heavy content (Park & Srinivasan, 1994). Compared with physical stores, however, the visual appeal of online stores may be more important because visitors usually make their judgments about the store based on their initial impressions (Chen & Dhillon, 2002). Moreover, they usually make their decisions to stay or leave the website within the first few minutes (Dahal, 2011). As previously mentioned, shoppers' intention to purchase is considered a strong predictor of their actual behavior (Pavlou & Fygenon, 2006). As such, it is vital for web advertisers and marketers to understand how visual appeal affects purchase intentions for online shoppers.

Among the models explaining the determinants of behavioral intentions, the theory of reasoned action (Fishbein & Ajzen, 1975) and its extensions are considered robust models in a wide variety of contexts, including e-commerce (Elwalda et al., 2016; Ha & Janda, 2014; Pavlou & Fygenon, 2006). One advantage of this theory is that it includes cognitive components such as attitudes, which are known to direct human judgments and behaviors. In particular, the theory of reasoned action assumes that an individual's intention to engage in a behavior is largely determined by the positive attitudes the individual has toward the behavior. However, this is not universal, and some limitations touching this view have been found in recent years. In the context of web advertising, for example, some research suggests that online shoppers are willing to purchase online only if they like the design of web advertisements (Goodrich, 2011). On these lines, several authors such as Sundar and Noseworthy (2014) and Wang, Cheng, and Chu (2013) support this idea, and they suggest that visual appeal has the potential to influence shoppers' behavioral intentions, even without the influence of consumers' cognitive judgment such as attitude. This is also consistent with the theory of Visual Rhetoric (Scott, 1994), which supposes that our behaviors can be affected by visual dimensions (e.g. images and colors) without the need for cognitive responses. In different models (e.g. MacKenzie & Lutz, 1989; Mitchell & Olson, 1981; Shimp, 1981), attitude toward advertising (ATA) and attitude toward brand (ATB) are considered as the main cognitive responses mediating the effect of advertising messages on purchase intention. As such, it is crucial to examine how likely WAVD is to influence consumers' purchase intention with and without the role of cognitive states.

To address this issue, the proposed model postulates: (1) online purchase intention will be influenced directly by WAVD, as suggested by the theory of Visual Rhetoric and previous research; and (2) online purchase intention will be affected indirectly by the power of attitudinal effects, as suggested by the theory of reasoned action. By combining both effects (direct and indirect), we hope to propose a new explanation of how visual dimensions affect consumers' behavioral intentions in online settings. In one study in which the viewing time was examined as an outcome of advertising messages, Olney, Holbrook, and Batra (1991) propose that attitudinal components may not mediate the effect of advertising messages on advertising outcomes. Recently, researchers (e.g. Beullens & Vandenbosch, 2015; Ha & Janda, 2014; Kabadayi & Gupta, 2011) have adopted the "*direct effect model*" to understand how online stimuli can influence consumers' responses. They further believe that such investigations may be beneficial in terms of the prediction of online consumer behaviors.

The moderating effects of gender are assumed by adopting the Selectivity Model (Meyers-Levy, 1989), which suggests that men are selective processors and usually focus on overall message themes, whereas women are comprehensive processors and usually engage in a detailed elaboration of message content. The Selectivity Model has a history of use in a wide variety of domains, including e-commerce (Goodrich, 2014; Tsihla et al., 2014).

The proposed model is the first to combine the direct and indirect effects of WAVD on OPI by employing the theory of reasoned action and the theory of Visual Rhetoric. The model also proposes that of the role of visual elements in online purchase formation varies by gender. To the best of our knowledge, such investigation has not been explored in previous models. Our proposed model is presented in Figure 1.

Figure 1 about here

3.2 Hypothesis development

In this section, the hypotheses that pertain to the proposed model are developed. The first three hypotheses (H1, H2, and H3) specify the expected effect of web advertising's visual design (WAVD) on attitude toward advertising (ATA), attitude toward brand (ATB), and online purchase intention (OPI), respectively. H4 and H5 specify the expected impact of advertising attitude on brand attitude and purchase intention. However, the relationship between brand attitude and purchase intention is explained by H6. The rest of the hypotheses (H7a, H7b, H7c, H7d, H7e, and H7h) specify the expected effects of gender as a moderator on all the relationships in our proposed model.

3.2.1. The effects of WAVD on advertising attitude and brand attitude

For a long time, the advertising message has been considered to have a considerable influence on consumers' attitudes toward advertising, as well as brand and purchase intentions, through hierarchical effects models (MacKenzie & Lutz, 1989; Mitchell & Olson, 1981; Shimp, 1981). However, Smith et al. (2007) speculate that ATA may not mediate the relationship between advertising exposure and brand attitudes at low levels of processing. In a visual context, it is widely accepted that visual dimensions (e.g. color, brightness, size, images, and shapes) often contribute to an individual's judgments. Considering a specific

visual factor, a recent study has revealed that the color green has the potential to generate more positive attitudes toward the stimulus than other colors such as white, yellow, or pink (Jang, Kim, Kim, & Pak, 2014). A study by Cyr, Head, and Larios (2010) showed similar results. In addition, evaluation of the brand name was found to be dependent on its location in the advertisement (right vs. left) and the type of advertising stimulus (verbal stimulus vs. pictorial stimulus) (see Janiszewski, 1988, 1993). Liu et al. (2015) also theorized a positive relationship between the attractive placement of products and ATA. Additionally, several studies have examined the potential effect of site stimuli on visitors' responses (Chen et al., 2010; Ching et al., 2013; Flores et al., 2014; Goodrich, 2014; Hwang, Yoon, & Park, 2011; Moore et al., 2005; Wu et al., 2008). Overall, the findings have suggested that more attractive and interesting stimuli can lead to more favorable attitudes.

Among models providing an explanation for information processing and attitude formation, the Elaboration Likelihood Model (Petty & Cacioppo, 1986) is widely accepted. Based on this model, exposure to an advertising message can create two paths to attitude change (central and peripheral). However, consumers usually follow the peripheral route of processing when their levels of involvement with the stimulus are low; they then make their judgments based on peripheral attributes, such as background colors, images, and animation. This is also consistent with other well-established theories, including mere exposure effects (see Zajonc, 1968). Therefore, in low-involvement situations, it can be reasonable to hypothesize that web advertising displaying charming visual cues (e.g. appropriate colors, and images) is likely to enhance favorable attitudes toward advertising and the brand being advertised. Therefore, we predict the following hypotheses:

Hypothesis 1. *Web advertising's visual design (WAVD) will positively affect attitudes toward advertising (ATA).*

Hypothesis 2. *Web advertising's visual design (WAVD) will positively affect attitudes toward brand (ATB).*

3.2.2. The effect of WAVD on online purchase intention

The above hypotheses (H1 and H2) focus on the potential effects of WAVD on attitudes toward advertising and brand. However, consumers' intentions to purchase online may be directly affected by visual characteristics as well (Goodrich, 2011). Over time, it has been supposed that advertising has a profound impact on customers' behavioral intentions (Lewis,

1981). Previous studies have also shown that online purchase intention, which is defined as consumers' desire to purchase a product online, can be influenced by exposure to web advertising (Becerra & Korgaonkar, 2010). This was confirmed in the context of advertising by the study of Smith et al. (2007). The authors considered the effects of traditional advertising, and they postulated that consumers might have a higher purchase intention if the advertising contained attractive and entertaining characteristics.

In the current study, we suggested that online purchase intention may be significantly and directly influenced by the perceived quality of WAVD as well. Previous marketing studies have reported findings consistent with this view. For example, the study of Rompay, Vries, Bontekoe, and Dijkstra (2012) indicated that consumers showed a higher purchase intention when the visual characteristics in the packaging were placed vertically rather than horizontally. Similarly, Deng and Barbara (2009) noted that purchase intention increased when images of the product were displayed in the bottom-right of the packaging rather than in other positions. More recently, Sundar and Noseworthy (2014) found greater purchase intention for the advertised brand when its logo was placed higher in the visual field compared to a lower position. MacInnis and Price (1987) also demonstrated that visual features of advertising (e.g., pictures) may help the receiver to visually imagine brand usage, which in turn develops consumers' responses to the advertised product.

Considering a specific visual element, blue was found to produce a higher purchase intention than red (Becker, 2002). More recently, Jang et al. (2014) revealed that the human brain tends to respond more positively to stimuli with bright colors (e.g., green) rather than cool colors such as pink. In their study, Wang et al. (2013) also assume that traditional advertising effects, which attitudes are part of, may not mediate the relationship between exposure to attractive images in advertising and purchase intention. In the web advertising context, Li and Bukovac (1999, p.341) profess that "Banner ads function as both image and direct response advertising." Thus, exposure to an appealing visual design on websites may increase the desire to purchase without any cognitive judgments. This is in line with Holis' (2005, p.261) suggestion that "just one exposure to an online advertisement can have an impact on purchase consideration". This premise is also linked to the theory of Visual Rhetoric. According to this theory, Scott (1994, p.253) states "because the pictures seem to be such transparent representations of the reality, we might be tempted to theorize that they are unproblematically absorbed into the consumer's mind without the need for cognitive engagement or the invocation of learned processing strategies."

In the web advertising context, among many research models that aim to explain the impact of web advertising, Wu *et al.*'s. (2008) model is a widely referenced one (e.g., Rasty, Chou, & Feiz, 2013; Ha & Janda, 2014). In the model, design elements are considered to have a direct impact on advertising effects, as measured by click-through, recall effects, brand attitude, and purchase intention. However, Wu *et al.* (2008) did not find a significant relationship between advertising design elements and shopping outcomes. A possible explanation for this lack of direct relationship is that advertising effects in that study were measured as a combination of four measurements (click, recall, brand attitude, and purchase intention). As mentioned by Dreze and Hussherr (2003), the use of different metrics of advertising effectiveness simultaneously, such as click-through (short-term action) with recall (long-term memory), might lead to inaccurate outcomes, and underestimates of the power of web advertisements in brand building. Thus, to overcome the limitations of Wu *et al.*'s (2008) model, the proposed model in this study suggests a single impact of WAVD on online purchase intention. Additionally, it assumes indirect effects by mediating the role of consumers' attitudes. The idea is that when consumers perceive the quality of a web advertisement to be high in terms of its design, they may tend to show more favorable purchase intention for the advertised brand or product, regardless of their attitudes toward it. Kim *et al.* (2010) hypothesized that attitudinal effects may not mediate the effect of web advertising on consumers' purchase intention in low-involvement situations. Of particular relevance to the present study, Ha and Janda (2014) and Beullens and Vandebosch (2015) theorized that exposure to online messages (e.g. customized information) may have a direct impact on behavioral intentions without the role of cognitive and affective components. Therefore, we predict the following relationship between WAVD and online purchase intention:

Hypothesis 3. *Web advertising's visual design (WAVD) will positively affect a consumer's intention to purchase online.*

3.2.3. The effect of advertising attitude on brand attitude and purchase intention

Attitudinal effects have been largely researched in the context of advertising, and it has been found that consumers' attitudes toward advertising influence attitudes toward the brand and purchase intention via hierarchical effects (Homer, 1990; Shimp, 1981). However, Rasty *et al.* (2013) propose that brand attitudes may not mediate the effect of advertising attitudes on

online purchase intention. A study by Hsu, Chuang, and Hsu (2014) found a positive effect of attitude toward online shopping on consumer intention to purchase online. In this context, moreover, a considerable volume of research has established a positive relationship between attitudinal effects and behavioral intentions (Beullens & Vandebosch, 2015; Lwin & Phau, 2013; Rasty et al., 2013; Richard, 2005; Saadeghvaziri et al., 2013; Wu et al., 2008). In summary, a more positive attitude toward a behavior would lead to higher intention to engage in the behavior, proposed by the theory of reasoned action (Fishbein & Ajzen, 1975). As a result, we hypothesize that:

Hypothesis 4. *Attitudes toward web advertising (ATA) will positively affect attitudes toward brand (ATB).*

Hypothesis 5. *Attitudes toward web advertising (ATA) will positively affect online purchase intention (OPI).*

3.2.4. The effect of attitudes toward brand (ATB) on online purchase intention (OPI)

Although brand attitudes have been found to be negatively related to purchase intention in the study of Goodrich (2011), most research assumes that brand attitude has a positive effect on purchase intention (Holbrook & Batra, 1987; Homer, 1990; Hwang et al., 2011; MacKenzie & Lutz, 1989; Mitchell & Olson, 1981; Rasty et al., 2013; Shimp, 1981; Stevenson et al., 2000). This view is more consistent with the popular presumption that behavioral intentions are sensitive to attitudinal effects (Fishbein & Ajzen, 1975). Of particular relevance to our investigation, Park et al. (2015) found that attitudes toward brand mediate the impact of visual attributes on consumers' purchase intention. Thus, we propose the following hypothesis:

Hypothesis 6. *Attitudes toward brand (ATB) will positively affect online purchase intention (OPI).*

3.2.5. Gender differences as a moderator

As mentioned earlier, males and females have different patterns of thinking and behaving. This difference between the sexes may impact on how males and females acquire and process online information and, therefore, moderate the effects of web advertising as theorized in the previous hypotheses. For a long time, gender has been assumed to moderate the effects of communication tools, including advertising (Holbrook, 1986). Relevant to the current study, WAVD deals with the aesthetic beauty of the advertisement. This includes the

use of graphics, colors, images, animation, type styles and fonts, music, and entertainment, to improve the look of the advertisement and to develop consumers' responses (Dreze & Zufryden, 1997; Scott, 1994). Interestingly, men and women have been found to respond differently to such characteristics. For example, it has been found that women focus more strongly on text in advertising, and men focus more strongly on images (Goodrich, 2014). Moreover, male students like images, animation, and colors more than female students (Leong & Hawamdeh, 1999). In another study in which verbal and imagery advertisements were compared, Putrevu (2004) found that males show more positive attitudes toward imagery advertisements than verbal ones, whereas the reverse is true for females. Recently, Cyr (2014) systematically summarized earlier studies on website effects, and she concluded that the overall impact on male behavior of animated objects on the internet is stronger than on female behaviour. Additionally, it was expected and confirmed that men often surf websites for entertainment reasons, whereas females are more likely to surf the web for shopping reasons (Wolin & Korgaonkar, 2003).

Based on the Selectivity Model (Meyers-Levy, 1989) and previous research considering information processing styles (e.g. Goodrich, 2014; Krugman, 1996; Richard et al., 2010), females tend to be more comprehensive processors than males, who are more selective processors. Accordingly, in our case, it is logical to assume that men will pay more attention to whatever is attractive and interesting in advertising than women, and therefore the effect of peripheral cues (e.g., images, colors, animation) will be stronger for men than for women. Particularly, there is some evidence to suggest that female users read more carefully online than male users do (Leong & Hawamdeh, 1999). This has been confirmed by Park (2015) who found that women have a greater tendency to click on banner advertisements for further details than men. Thus, females' responses (e.g. advertising attitudes, brand attitudes and purchase intentions) may not be easily provoked by low task-relevant cues on websites.

Moreover, most hemispheric¹ processing studies (e.g. Bradshaw & Nettleton, 1981; Meyers-Levy, 1994) have argued that females are generally considered to be more left hemisphere dominant and men to be more right hemisphere dominant. This suggests that web advertisements located on the right-hand side of the webpage may attract more visual attention and generate higher responses from males than females. By contrast, females might

¹ "Hemispheric" is a brain theory that explains the differences between men and women in information processing (page 13). In particular, this theory proposes that females are more left hemisphere-dominant, whereas males are more right hemisphere-dominant.

be influenced more by advertisements placed on the left-hand side than males. In this context, Moss et al. (2006) and Mahzari & Ahmadzadeh (2013) speculate that visual design elements displayed on websites (images, colors, shapes, etc.) may have different influences on males' and females' responses. Of particular relevance to the present study, Tsuchla et al. (2014) conducted a study and found that peripheral cues on websites have more influence on males' responses than females. Accordingly, the following research hypotheses are proposed:

Hypothesis 7a. *The effect of web advertising's visual design (WAVD) on attitudes toward advertising (ATA) will be stronger for men than for women.*

Hypothesis 7b. *The effect of web advertising's visual design (WAVD) on attitudes toward brand (ATB) will be stronger for men than for women.*

Hypothesis 7c. *The effect of web advertising's visual design (WAVD) on online purchase intention (OPI) will be stronger for men than for women.*

According to the Elaboration Likelihood Model (Petty & Cacioppo, 1986), attitude changes are highly dependent on which route the consumer follows (peripheral or central). In an online environment where attention to web advertising is low (MediaMind, 2010), consumers are more likely to form attitudes and take purchase decisions through the peripheral route rather than the central one (Park & Srinivasan, 1994). However, the peripheral route may be more adopted by males than females because of the female tendency to actively seek information (Chen & Hu, 2012). In this regard, we might predict that the effect of attitudinal components (generated by visual design elements) on online purchase intention is stronger for males than for females, as females rely more on detailed information to formulate purchase intentions. This view is consistent with the theory of reasoned action (Fishbein & Ajzen, 1975) which assumes that more positive attitudes are often correlated to higher behavioral intentions. Based on these premises, the following hypotheses are proposed:

Hypothesis 7d. *The effect of attitudes toward advertising (ATA) on attitudes toward brand (ATB) will be stronger for men than for women.*

Hypothesis 7e. *The effect of attitudes toward advertising (ATA) on online purchase intention (OPI) will be stronger for men than for women.*

Hypothesis 7f. *The effect of attitudes toward brand (ATB) on online purchase intention (OPI) will be stronger for men than for women.*

4. Research methodology

4.1 Questionnaire design

To test the proposed model, we adopted paper-based questionnaires which included items adapted from previous studies to suit the study context (see Table 2). Generally, a questionnaire is considered the best method to obtain attitudinal and behavioral intention information. An added benefit is that it allows for generalization of the findings (Kerlinger, 1973). All construct items in our study were measured on a five-point Likert scale which ranged from “strongly disagree” (1) to “strongly agree” (5). The questionnaire was piloted among 40 consumers who regularly purchase online in the UK before being accepted as the final version.

Table 2 about here

4.2 Sampling

To achieve the goals of this study, we randomly distributed the questionnaires by hand to students in a large university in the UK. Previous studies have suggested that university students can be an appropriate sample for e-commerce research as they have the opportunity to use the internet for communication purposes and commercial transactions (Walczuch and Lundgren, 2004; Pelling & White, 2009). It has been proven that most online shoppers tend to be young and educated. They are also an appropriate sample because college students (age 18-31 years) are more interested in the aesthetics aspects of site stimuli such as images, background colors, and animation (Cyr, 2014), and visual design is the main interest in the current study. In line with our investigation, student participants have been recently used exploring the gender differences in online shopping attitude and consequent responses

(Hasan, 2010). More recently, several studies have adopted the idea of using student samples in an e-commerce context (e.g. Arpaci, 2016; Lee et al., 2015; Ndasauka et al., 2016).

The questionnaires were distributed in classrooms in different schools at the university. The participants were asked to complete the questionnaires and to return them the following week. To increase the response rate, all participants were given small gifts for his/her participation as suggested by previous research (e.g. Chou et al., 2015). Also, to ensure that our sample comprised of online shoppers, participants were instructed to complete the survey only if they had purchased online in the past three months. To ensure that our sample size represents the study population, we calculated the minimum requirement of the sample size. Accordingly, a total of 390 questionnaires were randomly distributed from the beginning of March 2015 to the middle of May 2015. A total of 355 questionnaires were collected. Any questionnaires that had missing data and were not completed were removed. Finally, a total of 316 questionnaires were used in the data analysis.

Compared with previous studies that adopted student samples with questionnaires (e.g. Arpaci, 2016; Cyr & Bonanni, 2005; Ndasauka et al., 2016), our sample size is not small and it is also representative of the study population. Considering the same population, for example, Ndasauka et al. (2016) surveyed 256 college students in the UK to analyze the effects of site stimuli on consumer behavior.

Table 3 summarizes the demographic profiles of the participants in this study. The sample consisted of 176 men (55.70%) and 140 women (44.30%). The most common age category was between 18 and 27 years (74.10%), followed by the 28-32 years and 33-37 years categories with 16.50% and 8.20% respectively; only 1.26% of the sample were aged 38 years or above. In terms of their current level of education, 43.98% of the respondents were undergraduate students, and 56.01% were graduate students. The vast majority of the sample (96.84%) had more than four years of experience with the internet.

The questionnaire included two parts. The first part included personal and background information (gender, age, level of education, and internet experience) and questions to measure respondents' attitudes toward web advertising in general. In the second part of the questionnaire, we used a recall method to collect data about attitudes toward brand, purchase intentions, and perceived quality of an advertisement's visual design. In this part, the respondents were asked to select and consider a certain brand that they had seen recently in a web advertisement, and then they answered all the questions based on their experience with this particular brand and advertisement. The recall method has been used as an effective way

to collect perceptual data in the context of marketing (Bagozzi & Silk, 1983; Fang et al., 2014; Gardial, Clemons, Woodruff, Schumann, & Burns, 1994). For example, the aforementioned study of Fang et al. (2014) adopted a recall method to obtain data related to a recent online purchase experience by the participants. Similarly, in an advertising context, several studies (e.g. Hyun, Kim, & Lee, 2011; Rasty et al., 2013; Wu et al., 2008) adopted the same approach to examine the communication effects of advertising on brand attitudes and purchase intentions with no specific advertisements being exposed. In order to ensure that the participants focused on and memorized the most recent advertisement, they were asked to think of a web advertisement that they had seen recently and to write down the brand name and product category if possible. This approach has been considered as a valid way to help consumers recall information (Tulving, 1983). Previous studies in the domain of advertising have used different advertisements to extract the overall effects of advertising. For instance, the study of Pieters et al. (2010) evaluated 249 different print advertisements to capture the overall effect of advertising's visual design on viewers' responses. Similarly, the impact of web advertising elements on product attitudes has been evaluated using different advertisements displaying different products (Ching et al., 2013).

Table 3 about here

4.3. Analytical method

The method we apply is structural equation modelling (SEM), as it is a powerful approach that simultaneously tests two or more relationships among directly observable and/or unmeasured latent variables involved in the current study. Although SEM serves purposes similar to multiple regression, it has a unique ability to simultaneously examine a series of dependence relationships (where a dependent variable becomes an independent variable in subsequent relationships within the same analysis) while also simultaneously analyzing multiple dependent variable (Joreskog et al., 1999). SEM also has a less restrictive

assumption of measurement error as it is based on the assumption that each explanatory and dependent variable is associated with measurement error (Bollen, 1989).

5 Data analysis and results

5.1 Reliability, validity analysis and model fit

We conducted various tests to check the reliability and validity of the data, and the results are reported in Table 4. In order to determine whether measurement scales could be accurately explained, we first employed exploratory factor analysis (EFA) using Varimax rotation via Principal Component Analysis. As a result of the EFA, one item for perceived quality of advertising's visual design and one item for advertising attitude were deleted due to their low loadings. The factor loadings of the remaining items ranged from .544 to .875, which exceeded the acceptable level of .50. Moreover, as shown in Table 4, the values of Cronbach's alpha for construct reliability exceeded the acceptable value of .70 (Hair, Anderson, Tatham, & Black, 2006).

Additionally, confirmatory factor analysis (CFA) was conducted to verify the unidimensionality of each construct in the model. As clarified in Table 4, all factor loadings were greater than the required level of 0.6 (Anderson & Gerbing, 1988). Furthermore, the figures for Composite Reliability (CR) were greater than 0.6, indicating that each construct met the requirement for internal consistency (Nunnally & Bernstein, 1994). Regarding the AVE values, all of them were greater than the required level of 0.5, providing support for convergent validity (Fornell & Larcker, 1981).

Based on the study of MacKenzie and Podsakoff (2012), testing method bias is of great importance in marketing studies due to its potential influence on items' validity, reliability, and the covariation between factors. For this reason, we checked common method bias using Harman's single factor test (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). In doing so, all measurements in our model were inserted into exploratory factor analysis. The analysis did not reveal a single factor, and the first factor accounted for only 19.78% of the variance, suggesting that common method bias is not a major problem in our data (Richardson, Simmering, & Sturman, 2009).

Table 4 about here

In terms of the goodness of fit of our model, the GFI value was .94, the AGFI value was .91, the NFI value was .93, the CFI value was .98, and the IFI value was .97, meaning that all were greater than the required level of .90 (Bentler, 1990). The RMR value was .041, and the RMSEA value was .05, indicating a satisfactory goodness of fit of the model. The CFA Chi-square was 113.908 with 71 degrees of freedom ($p < .001$), and a ratio of 1.604, which is also satisfactory (Marsh and Hocevar, 1985).

5.2 Hypothesis testing

To assess the relationships between the factors in the proposed model, a structural equation modeling (SEM) approach was used via AMOS21. As discussed in Section 4.3., since our model tests the multiple influences between the variables, using SEM is the most appropriate choice for this purpose (Anderson & Gerbing, 1988). The results of SEM are summarized in Table 5, which includes the following:

- (1) The relationship between web advertising visual design (WAVD) and consumer attitudes toward advertising (ATA). Our results show a significant and positive relationship between the two factors ($\beta = 0.47$, $p < 0.01$). Therefore, H1 is established.
- (2) The relationship between web advertising visual design (WAVD) and consumer attitudes toward the advertised brand (ATB). Our results indicate that the two factors are significantly and positively correlated ($\beta = 0.31$, $p < 0.01$). Therefore, H2 is supported.
- (3) The relationship between web advertising visual design (WAVD) and online purchase intention (OPI). The results show an insignificant relationship between these factors ($\beta = 0.05$, $p > 0.10$). Therefore, H3 is not supported by our data.
- (4) The relationship between advertising attitude and brand attitude. Our results show a significant and positive relationship between advertising attitudes and brand attitudes ($\beta = 0.47$, $p < 0.01$), supporting H4.
- (5) The relationship between advertising attitudes and purchase intention. Our results indicate that consumer purchase intention is significantly and positively influenced by advertising attitudes ($\beta = 0.37$, $p < 0.01$), supporting H5.
- (6) The relationship between brand attitudes and purchase intention. The results show that the two factors have a significant and positive correlation ($\beta = 0.33$, $p < 0.01$). Thus, H6 is established.

Table 5 about here

The moderating effect of gender was tested by conducting multi-group analysis; one for males (N = 176), and one for females (N = 140). The overall goodness of fit statistics were excellent for both groups (male: $\chi^2/df = 1.7$, $P < 0.001$; CFI = .96; RMSEA = .047; female: $\chi^2/df = 1.5$, $P < 0.001$, CFI = .98; RMSEA = .042).

Table 6 shows the results of the two models. For the male group, the results showed positive and significant relationships between WAVD and advertising attitudes ($\beta = 0.45$, $p < 0.01$) as well as between WAVD and brand attitudes ($\beta = 0.38$, $p < 0.01$). For the female group, we found marginally significant effects of WAVD on advertising attitudes ($\beta = 0.28$, $p < 0.10$) and brand attitudes ($\beta = 0.18$, $p < 0.10$), marginally supporting H7a and H7b. The results also showed a positive and significant relationship between WAVD and purchase intention for the male group ($\beta = 0.19$, $p < 0.10$), but an insignificant association for the female group ($\beta = -0.21$, $p > 0.10$), supporting H7c.

The relationship between advertising attitude and brand attitude was positive and significant for both groups (male: $\beta = 0.45$, $p < 0.01$; female: $\beta = 0.39$, $p < 0.01$), failing to support H7d. Similarly, the impact of advertising attitude on purchase intention was positively and significantly correlated for both the male and female groups (male: $\beta = 0.40$, $p < 0.05$; female: $\beta = 0.51$, $p < 0.01$), rejecting H7e. Finally, a significant relationship was found between attitudes toward brand and purchase intention for both groups (male: $\beta = 0.42$, $p < 0.01$; female: $\beta = 0.48$, $p < 0.01$), rejecting H7f.

Table 6 about here

6 Discussions and conclusions

6.1 Discussion of the results

The rapid growth in the advertising industry and new technologies provides formidable opportunities for both practitioners and academics. The current study primarily attempts to propose a model investigating: (1) whether visual aspects of web advertising (WAVD) directly and indirectly affect consumers' purchase intentions, and (2) how gender differences can moderate the relationships between web advertising and its communication effects as measured by advertising attitude, brand attitude, and online purchase intention. The overall pattern of results provided strong support for the hypothesis that visual aesthetics in advertising play a key role in the formation of consumers' attitude and online purchase intention. From our data, most hypotheses related to the direct relationships between the variables were strongly supported. As expected, WAVD had a direct and positive effect on both advertising attitudes ($WAVD \rightarrow ATA$) and brand attitudes ($WAVD \rightarrow ATB$), providing evidence for our hypotheses H1 and H2. Additionally, these findings support the stream of research that considers that a single exposure to a web advertisement can boost viewers' attitudinal components (e.g. Briggs & Hollis, 1997; Ching et al., 2013; Flores et al., 2014). The findings of the current study also provide clear evidence of the fact that visual design (e.g. colors, font style, graphical information, shape, and size) improves website aesthetics, which in turn results in more positive responses (Cyr et al., 2009). As such, more attractive web advertising results in online consumers paying more attention and developing more positive attitudes toward it.

For the overall model, this study did not find a direct impact of WAVD on consumers' purchase intention, failing to support H3. Interestingly, such a direct effect was found only for the male group ($WAVD \rightarrow OPI$), as depicted in Table 6. The lack of such an impact in the female model solidifies the Selectivity Model in the context of web advertising. As discussed previously, the Selectivity Model (Meyers-Levy, 1989) suggests that visual dimensions, such as colors, images, shapes, and animation, are more influential on males' responses than on females'. In other words, online purchase intentions for male shoppers are more likely to be affected by WAVD than those of females. Understanding such differences may be a big challenge for online advertisers and marketers, in order to adapt their promotional strategies between the genders.

In fact, previous gender-related research (Richard et al., 2010; Tsihla et al., 2014) emphasized the importance of understanding differences between the sexes in an online setting. While these studies rarely distinguish between the effects of WAVD on males' and females' responses, our findings also suggest that advertisers should take gender differences

into consideration in order to produce attractive web advertisements that meet males' and females' needs.

Even though our study did not reveal a strong and direct effect of WAVD on online purchase intention, indirect impacts have been found through attitudinal effects (WAVD → ATA → OPI), and (WAVD → ATB → PI). In addition, our findings solidify the theory of reasoned action in the web advertising context (Fishbein & Ajzen, 1975), in which attitudinal effects are considered to be positively related to behavioral intentions. The positive effect of advertising attitudes and brand attitudes on online purchase intentions also supports the findings of previous studies in this field (e.g. Hwang et al., 2011). However, these findings are at odds with previous advertising research that shows a negative relationship between brand attitudes and online purchase intentions (e.g. Goodrich, 2011). Under low-involvement conditions, Park and Srinivasan (1994) believe that consumers' purchase intention may be sensitive to low task-relevant cues such as colors, images, and animation. To examine this issue, the proposed model posits that consumers' purchase intention can be formulated directly by visual elements in web advertising and indirectly by the mediating effect of consumers' attitudes toward the advertisement and brand.

As hypothesized by H4, consumer attitudes toward web advertising had a positive and significant effect on brand attitudes (ATA → ATB). As such, consumers who form more favorable attitudes toward web advertising overall are more likely to prefer the brand being advertised, which in turn influences their intentions to purchase over the internet. As indicated in Table 6, the effects of advertising's visual features on advertising attitudes, brand attitudes, and purchase intention were stronger for males than for females. These results are in agreement with the hypotheses proposed by Meyers-Levy (1989), which explain that men's responses can be boosted by simple, straightforward information, whereas women need detailed and complex information to be stimulated. Contrary to expectations, the influences of advertising attitude and brand attitude on purchase intention were positively and significantly correlated for both the male and female groups. This may be due to the nature of attitudinal effects on intentional behaviors as suggested by the theory of reasoned action (Fishbein & Ajzen, 1975) and its extensions (e.g. Pavlou & Fygenson, 2006).

6.2 Contributions of this study

This study contributes to e-commerce literature both theoretically and empirically. From a theoretical perspective, this investigation contributes to the literature in several ways. First,

this study examines both the direct and indirect effects of web advertising stimuli on online purchase intention in an integrated model so as to provide a better understanding of how online consumers respond to this growing medium (Goodrich, 2011). Second, the study expands the theory of Visual Rhetoric (Scott, 1994) by its application in an online environment. Alongside this, our study expands previous studies concerning gender issues in the internet context (Cyr & Head, 2013; Goodrich, 2014; Sun et al., 2010; Tsihla et al., 2014).

Empirically the study tests the relationships between visual design in web advertisements, attitude toward advertising, attitude toward brand and online purchasing intention, and how gender influences these relationships. Therefore, the results of this study have important practical implications and can provide guidelines for web advertisers and e-commerce companies for their communication strategies. For example, male users might be best targeted with more attractive visual elements and summary content, whereas female users could be targeted by verbal advertisements and text-heavy content due to their tendency to seek information.

6.3 Limitations and future research

This study has a few limitations that need to be addressed. First, this study examines the effects of WAVD on purchase intentions. However, actual behavior is considered to be the main goal of any advertising. Therefore, identifying the impact of WAVD on actual behavior is an avenue for future research. Second, our proposed model focuses on the effect of advertising attitude and brand attitude as important cognitive predictors of purchase intention. However, it is interesting to combine cognitive and affective factors, such as emotional responses and online trust, in order to mediate the effects of visual dimensions on purchase intention. Future research can extend the proposed model by incorporating these factors and thereby providing a deeper and more comprehensive insight into the effectiveness of web advertising. Finally, this study examined the moderating role of gender in an online advertising context. However, other characteristics (e.g. age, education level, and internet experience) may influence the relationship between online stimuli and consumer responses (Goodrich, 2013). Future work could expand this study by investigating the moderating role of such factors in an online advertising context.

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Table 1: Summary of recent literature that investigated the moderating effect of gender in the online shopping context

The study	The study's objectives	Methodology/ sample size	The main findings
Richard et al. (2010)	The aims of the study are to examine the effect of internet experience and web atmospherics on consumer responses (site involvement, exploratory behavior, pre-purchase evaluations, and site attitudes), and how gender can moderate these relationships.	Online survey, 261 online consumers (116 males and 145 females)	Men and women differed in web navigation behavior, with men engaging in less exploratory behavior and developing less website involvement than women. Gender was found to moderate the major relationships.
Sun et al. (2010)	The objectives of the study are to investigate the interaction impact of beliefs about web advertisements (informativeness and entertainment) on advertising attitudes, and how gender can moderate such effects.	A laboratory experiment and survey, 134 college students (47 males and 87 females).	The interaction effect of informativeness and entertainment on advertising attitudes was stronger for females than males.
Porter, Donthu, and Baker (2012)	Based on social role theory and a uses and gratifications approach, the study aims to explore how gender affects the process of trust formation online in virtual communities.	A survey, 232 virtual community members (119 males and 113 females)	The relationships between trust influences and the direct determinants of trust were significantly moderated by gender.
Cyr and Head (2013)	The study aims to explain gender differences in higher masculinity countries compared with lower masculinity countries regarding perception of design elements of web sites (e.g. visual design and navigation design). The study also considers the moderating impact of gender on the relationships between web site design elements and consumers' trust in an online vendor.	An experiment and online survey, 955 participants in different countries (432 males and 523 females)	More gender differences relating to the perceptions of a web site's design were found in higher masculinity countries in comparison with lower masculinity countries. Gender was found to act as a moderator of the relationship between web site visual design and consumers' responses (e.g. online trust).
Goodrich (2014)	This study aims to establish a relationship between web advertisement location and attitudes toward web advertising among males and females.	Controlled experiment and survey, 882 online consumers (485 males and 397 females).	The study found that males show more favorable attitudes toward web advertisements on the left of the page, whereas females indicated more favorable attitudes toward advertisements on the right of the page.
Tsichla et al. (2014)	A goal of the study is to test the moderating effect of gender on the relationship between atmospheric cues of museum websites and site attitudes.	A laboratory experiment and survey, 215 college students (104 males and 111 females).	The findings have indicated that gender moderates the effect of site cues on attitudinal responses.

Table 2: Items adapted from previous studies

Construct	items	Source (s)
Web ad visual design (WAVD)	<ul style="list-style-type: none"> - Overall, the visual elements of the advertisement (e.g., colors, images, lighting, size, shape etc.) were of high quality. - Overall, the visual design elements used made the advertisement look professional and well-designed. - The advertisement contained attractive visual connections. - In general, the visual elements in the advertisement were pleasing. 	Cyr et al. (2010) and Smith et al. (2007)
Attitude toward ad (ATA)	<ul style="list-style-type: none"> - Overall, I like web advertising. - In general, I am favorable toward web advertising. - Overall, I find web advertising a good thing. - Most web advertisements are pleasant. 	Saadeghvaziri et al. (2013)
Attitude toward brand (ATB)	<ul style="list-style-type: none"> - After viewing the web advertisement, I am more in love with the advertised brand. - After viewing the web advertisement, I developed a preference for the brand in the advertisement. - After viewing the web advertisement, my impression of the product brand is strengthened. 	Wu et al. (2008)
Online purchase intention (OPI)	<ul style="list-style-type: none"> - After viewing the web advertisement, I became interested in making a purchase. - After viewing the web advertisement, I am willing to purchase the product being advertised. - After viewing the web advertisement, I will probably purchase the product being advertised. 	Zhang (1996) and Bock, Lee, Kuan, & Kim. (2012)

Table 3: Sample characteristics

Characteristic	Category	Frequency	%
Gender	Male	176	55.7
	Female	140	44.3
Age	18-22	123	39
	23-27	111	35.1
	28-32	52	16.5
	33-37	26	8.2
	38-42	3	0.95
	43 or above	1	0.31
Level of education	Undergraduate student	139	43.98
	Graduate student	177	56.01
Internet experience	Less than 1 year	0	0.0
	1-3 years	10	3.16
	4-6 years	34	10.76
	More than 6 years	272	86.08

Table 4: The results of reliability tests

Construct	Items	Factor loadings	Composite reliability	Cronbach's alpha	Average variance extracted
Web advertising visual design (WAVD)	Overall, the visual elements of the advertisement (e.g., colors, images, lighting, size, shape etc.) were of high quality (WAVD1).	.72	.781	.832	.584
	Overall, the visual design elements used made the advertisement look professional and well-designed (WAVD2).	.76			
	The advertisement contained attractive visual connections (WAVD3).	.88			
	In general, the visual elements in the advertisement were pleasing (WAVD4).	.67			
Attitude toward advertising (ATA)	Overall, I like web advertising (ATA1).	.71	.825	.875	.638
	In general, I am favorable toward web advertising (ATA2).	.81			
	Overall, I find web advertising a good thing (ATWA3).	.79			
	Most web advertisements are pleasant (ATA4).	.62			
Attitude toward brand (ATB)	After viewing the web advertisement, I am more in love with the advertised brand (ATB1).	.75	.836	.764	.711
	After viewing the web advertisement, I developed a preference for the brand in the advertisement (ATB2)	.85			
	After viewing the web advertisement, my impression of the product brand is strengthened (ATB3).	.81			
Online purchase intention (OPI)	After viewing the web advertisement, I became interested in making a purchase (OPI1).	.77	.855	.841	.763
	After viewing the web advertisement, I am willing to purchase the product being advertised (OPI2).	.82			
	After viewing the web advertisement, I will probably purchase the product being advertised (OPI3)	.85			

Table 5: Summary of hypothesis testing

Paths	Hypothesized	β	Result
Web advertisement visual design → advertising attitudes	+	0.47***	Supported
Web advertisement visual design → brand attitudes	+	0.31***	Supported
Web advertisement visual design → purchase intention	+	0.05	Not supported
Advertising attitudes → brand attitudes	+	0.47***	Supported
Advertising attitudes → purchase intention	+	0.37***	Supported
Brand attitudes → purchase intention	+	0.33***	Supported

Notes: *** $p < 0.01$

Table 6: Summary of hypothesis testing across gender

Paths	Hypothesized	β		Result
		Male	Female	
Web ad visual design → advertising attitudes	+	0.45***	0.28*	Marginally supported
Web ad visual design → brand attitudes	+	0.38***	0.18*	Marginally supported
Web ad visual design → purchase intention	+	0.19*	-0.21	Supported
Advertising attitudes → brand attitudes	+	0.45***	0.39***	Not supported
Advertising attitudes → purchase intention	+	0.40**	0.51***	Not supported
Brand attitudes → purchase intention	+	0.42***	0.48***	Not supported

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

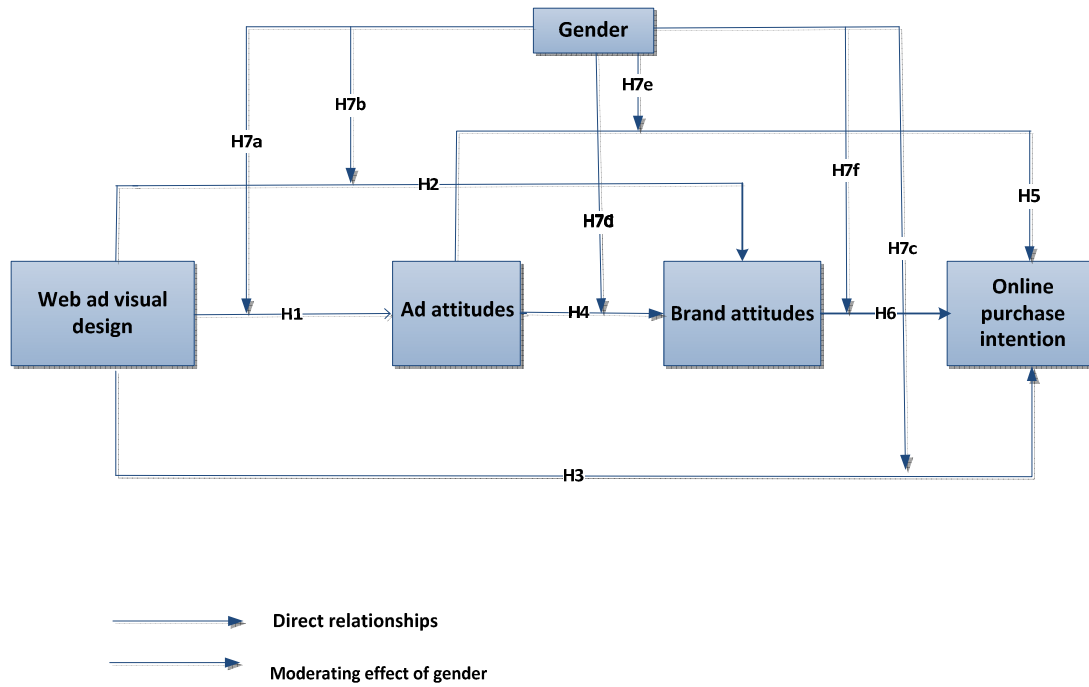


Figure 1: Proposed research model