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SHOPPING ALONE ONLINE vs. CO-BROWSING:
A PHYSIOLOGICAL AND PERCEPTUAL COMPARISON

by

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A THESIS

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ABSTRACT

Although shopping is a social activity frequently performed with friends and family members, most online shopping is done alone. With the development of Web 2.0 technologies and the increasing popularity of social networking sites, online social shopping has emerged as a new phenomenon that allows more social interaction, participation, and satisfaction for customers while shopping online. Therefore, companies have started to use social shopping tools in their e-commerce websites to facilitate online social shopping. Co-browsing is one of the more recent online social shopping tools available, enabling users to shop or browse together by offering synchronized web views and chat facilities. Prior research in co-browsing focused primarily on the technical and design aspects of co-browsing. More needs to be done to understand the behavioral, emotional, and social aspect of co-browsing. In this study, we focus on the social aspect of co-browsing and explore the following research questions: (1) How does co-browsing affect consumers' cognitive beliefs, emotions, and behaviors? (2) How is co-browsing different than shopping alone online? To address these questions, an experimental study is performed, which includes shopping alone and shopping with a companion by using a co-browsing tool. By recording and analyzing physiological responses such as eye gaze and skin conductance, we are able to gain better insight into how individuals react—both physically and perceptually—to co-browsing during an online shopping task.

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1. INTRODUCTION

One of the most important reasons to shop is to socialize with other people and satisfy social needs (Kang and Park-Poaps, 2011). Therefore, shopping is a social activity frequently performed with companions such as friends and family members (Dennis et al., 2010). Shopping with a companion can affect one's shopping experience, starting with which store to visit, the time spent, and how much time and money will be spent. Companion shoppers can help enhance the shopping experience, increase emotions, provide advice, and encourage social exchange (Chebat et al., 2012). According to Sommer et al. (1992), the presence of other people often leads to more pleasant shopping experiences than shopping alone. While this is true for physical stores and malls, it is challenging for consumers to communicate with each other in an online shopping environment. Therefore, most online shopping activities remain individual-focused (Qui et al., 2006).

With the development of Web 2.0 technologies and the increasing popularity of social networking sites, social shopping has emerged as a new phenomenon which is characterized by offering platforms where consumers collaborate online, get advice from trusted individuals, find the right products of a repository and finally purchase them (Leither and Grechenig, 2007). Social shopping allows more social interaction and participation, and results in more satisfaction for customers during shopping (Leitner and Grechenig, 2007; Leitner and Grechenig, 2008). In social shopping, consumers can interact with other shoppers to get advice, find a proper product, recommend a product, buy a product, rate a vendor, and publish a wish list (Leitner and Grechenig, 2007). Social shopping covers 'Social Media Stores' which enable people to buy where they

connect within the walled gardens of social media platform such as Best Buy's Facebook store; 'Potable Social Graphs' which allow social network users to bring their online social networks to bring their online social networks to e-commerce destinations and interact with their friends and followers directly whilst on the site such as Facebook Connect, Google's FriendConnect; 'Group Buying' which allows people to use their collective buying power to buy together to get better deal such as Dell's Dell Swarm; 'Group Gifting' which enables people to buy a gift collectively online such as Best Buy's Pitch In; 'Social Shopping Portals' which enable people to shop multiple stores together, using social commerce tools such as ratings, reviews, recommendations and referrals and social bookmarking such as Kaboodle, This Next, Polyvore; and 'Co-Browsing' which enables people to shop together on an e-commerce site by offering synchronized page views and integrated chat facilities, for example, fashion retail chain Charlotte Russe offers co-browsing service in its e-commerce site (Mardsen, 2010) because consumers often desire to conduct their shopping activities with others (Zhu et al., 2006).

Social shopping tools have been utilized on e-commerce websites to enhance communication and collaboration. One such tool makes use of co-browsing to enable people to shop together on an e-commerce website by offering synchronized page views and integrated chat facilities. Co-browsing tools allow people to create rooms and invite their friends to chat, browse and shop together. For instance, social shopping leader Kaboodle offered Samesurf co-browsing tool which enables users to co-browse Kaboodle website with others. Members can create rooms and invite their friends and followers to chat, browse, and shop together by simply sharing a link or sending an invite through Facebook, Twitter, or email. There is no need for any downloads, installs or plug-ins

compulsory of any kind. In further to enabling users to crop together in real-time, Samesurf facilities audio and video chat, cursor tracking, shade drawing, private rooms, and multi-platform compatibility (Marketwire, 2012). According to Farnham and his colleagues (2001), co-browsing can significantly enhance users' feelings of enjoyment, beyond its ease of use and functionality, when shopping online together.

Although there are a few studies that focus on shopping with others by using a co-browsing tool, they explore technical (Benbasat and Jiang, 2010) and design (Goswami et al., 2007) aspects of co-browsing. We focus on the social aspect of co-browsing and explore the following research questions: (1) How does co-browsing affect consumers' cognitive beliefs, emotions, and behaviors? (2) How is co-browsing different than shopping alone online? To address these questions, the Stimulus-Organism-Response (S-O-R) model developed by Mehrabian and Russell (1974) is adapted to the social shopping concept, and both physiological and perceptual measures were captured to compare shopping alone online vs. co-browsing.

2. LITERATURE REVIEW

2.1. SHOPPING AS A SOCIAL EXPERIENCE

People are socialized to avoid loneliness and they generally seek others' approval and they fear to be judged by the community (Borges et al., 2010). Consistent with this view, Tauber (1972) recognized that shoppers desire social interaction outside the home, communicating with others having similar interests, and affiliating with reference groups. Shopping is not just a matter of obtaining tangible products but also about experience, enjoyment, and entertainment (Martineau 1958; Tauber 1972). Shopping is a social activity which includes the pleasure of browsing, impulse buying, discovering new shops, topic for casual conversation, and serves as a focal point for planned and unplanned activities with other people (Dennis et al., 2010). Thus, shopping turns out to be a social behavior frequently performed with a companion such as friends and/or family members.

Shopping companion influences everything during the shopping trip starting with which store to visit, the time spent and what and how much will be purchased (Chebat et al., 2012). A shopping companion can enhance the shopping experience by facilitating shared experiences and the opportunity for support and assistance in decision making. A shopping companion can increase emotions (Chebat et al., 2012) and create a more hedonically oriented shopping experience (Borges et al., 2010). In addition, a companion can provide advice and increase the confidence of shoppers for purchase decision (Borges et al., 2010). Therefore, a shopping companion can lead to more pleasant shopping experiences than shopping alone (Sommer et al., 1992).

Shopping experience may vary based on the type of shopping companion.

According to Hartman and Kiecker (1991), hedonic motivations (e.g., for fun, enjoyment, or company) are more likely to be operant with friends as shopping companions and assistance motivations (e.g., to provide moral support for decisions and product expertise) are more operant with family members as shopping companions. For example, western parents' product choices are importantly influenced by their children (Isler et al., 1997). Consumers often prefer their parents as an information source for purchase decision that rely on price, product performance and social acceptance. However, they prefer peers when decisions are primarily related to the issues of social acceptance (Moschis and Moore, 1979). The study of Spiro reports that married couples are generally (88%) disagreeing with each other while they are shopping (Spiro, 1983). Researcher also focused on influence of friends or peers on shopping behavior and it was claimed that the presence of peers can increase the urge to purchase (Mangleburg et al., 2004).

According to Mullikin and Munger (2011), companion shoppers are not necessary be friends and family members, shopping companion also include other individuals who are acquainted with the customer, such as co-workers or other shoppers. The presence of others during shopping is likely to influence the behaviors of shoppers regardless of whether the others are peers or family members because consumers believe that others' opinions and behaviors are credible. In addition, they also may take others' buying behaviors as justification for their own behaviors (Luo, 2005). Shoppers may use others' behaviors and purchases as indicators of socially desirable activities because according to theory of reasoned action, behavioral intentions are not determined only by attitudes but

also by motivation to comply with social norms (Fishbein and Ajzens, 1975). Therefore, shopping companions can influence the purchase decisions of consumers (Luo, 2005).

Shopping companions can reduce uncertainty and risk perception related with a purchase decision. More than 75% of consumers who use a shopping companion reported risk reduction (e.g., social/psychological, financial, functional, time, or physical risk) as a primary reason for asking a companion to come along. Shopping companions provide informational support to shoppers by offering solutions, plans, and interpretations. Informational support includes providing messages, recommendations, advice, or knowledge that can be helpful for the problems (Liang et al., 2011). Mullikin and Munger (2011) also found that companion shoppers perform two main activities: sharing product judgments and advising the consumers. The companion shoppers discuss about the products and provide their personal evaluations about the products under consideration, which reduce decision-making risks (Mullikin and Munger, 2011). Shopping with a companion also increase the confidence of consumers. Thus, they can make a wise purchase decision (Kiecker and Hartman, 1994).

Shopping is a social behavior often performed with a companion (Chebat et al., 2012; Zhu et al., 2010) and a shopping companion can reduce the risk of purchase decision by sharing product judgments and advising the shoppers. The reduced risk and stress make shopping trip more enjoyable. Thus, shopping enjoyment is considered an important aspect of online shopping experiences. This is not only true for visiting physical stores but also applies for online stores where people shop with friends to share ideas and enjoy leisure time (Zhu et al., 2006). According to Anderson et al. (1999), virtual shopping with other shoppers is expected to be fun.

As the outcome of shopping with a companion, it may increase the attachment to the shopping environment. Place attachment (online or physical) is associated with friendship, positive or collaborative relations with people who have shared the same space. Consumers who receive some social support at commercial settings where they can share their problems develop a strong attachment to these places (Chebat et al., 2012) because consumers are forming social links with others through their consumption activities. The link between consumers is perhaps becoming more significant than the actual product. While products may link people to one another via symbolic consumption, locations can also link people. Therefore, consumers may choose the same locations not only for their use value but also for their 'link value' (Johnstone and Conroy, 2008).

Although shopping companions can enhance the shopping experiences positively by reducing the risk, increasing the shopper confidence and attachment to the place, shopping companions may affect the attention on the task to be performed negatively or positively. While Baron and his colleagues claimed (1973, 1978) that the presence of another shopper reduces the attention on the task to be performed because the shopper also must direct some attention towards the companion rather than just focusing the shopping task. However, Chebat et al. (2012) pointed out that co-shoppers can reduce or enhance attention based on the type of the relationship between co-shoppers. If they are in competition, they may try to impress each other with the respective products they purchase, thus attention to the shopping task may be distracted. In contrast, if they are in a cooperative atmosphere, the presence of other shopper may increase attention to the shopping task (Chebat et al., 2012). The study of Mullikin and Munger (2011) supports a

part of this view. In their study, co-shoppers are in a cooperative atmosphere and the results showed that companions can assist the shoppers during the purchase (e.g., by finding desired colors and sizes) and free them up from distracting activities (e.g., by entertaining customers' children). Therefore, consumers can focus on shopping activities and pay more attention to the shopping tasks.

2.2. SOCIAL SHOPPING

Lack of social interaction—either with a salesperson or friends—is one restriction of shopping online (Ahuja et al., 2003). With the development of Web 2.0 technologies and the increasing popularity of social networking sites, social shopping emerges as a new phenomenon that leads to more social interaction, participation, and satisfaction for customers (Leitner and Grechenig, 2007; Leitner and Grechenig, 2008).

Although online social shopping is a new trend, “social shopping” is not a new term in the literature. In the earlier literature, “social shopping” sometimes was used to refer offline social behavior prior 2005 (Wang, 2009). For instance, ‘social shopping’ can be used to refer hedonic shopping behavior, motivations or orientations in the offline setting (Wang and Zhang, 2012). In this study, we focus on social shopping in the online environment. There are many definitions for social shopping. Wikipedia defines it as “a method of e-commerce and of traditional shopping in which consumers shop in a social networking environment similar to MySpace.” The New York Times (2006) calls it “a new category of e-commerce that tries to combine two favorite online activities: shopping and social networking.” About.com describes it as “the combination of social media and e-commerce. In essence, it is taking all the key aspects of the social web – friends,

groups, voting, comments, discussions – and focusing them on the world’s favorite activity: shopping.” The LATimes.com wrote that social shopping “combine[s] two of the Web’s most prominent activities: engaging in commerce and chatting with like-minded folk.” In addition to these definitions, researchers describe social shopping in different ways. Jascanu and his colleagues (2007) define it as a combination of social networking and e-commerce. Shen and Eder (2009) define it as “an extension of Business-to-Consumer e-commerce where consumers interact with each other as a main mechanism in conducting online shopping activities, such as discovering products, aggregating and sharing product information, and collaboratively making shopping decisions.” Kang and Park (2009) describe it as a kind of e-commerce where people can comment on and review items in blogs or online communities while Cha (2009) defines it as shopping services provided by social networking sites.

Although some researchers use terms of “social commerce” and “social shopping” interchangeably (Leitner and Grecheni, 2008; Tedeschi, 2006b). A summary of literature is concerning this concept is given in Table (2.1). It is more commonly accepted that social shopping is a subset of social commerce (Wang and Zhang, 2012). Beisel (2006) distinguishes social commerce from social shopping and describes social commerce as creating places where people can collaborate online, get advice from trusted individuals, and find goods and services and then purchase them while social shopping as the act of sharing the experience of shopping with others. In addition, Mardsen (2010) and Fisher (2010) introduced that social commerce has six components which include ‘Ratings and Reviews’, ‘Recommendations and Referrals’, ‘Forums and Communities’, ‘Social Media Optimization, ‘Social Ads and Apps’ and ‘Social Shopping’. Mardsen (2010) defines

social shopping as a “new kid” in the social commerce block, which allows people to share the act of online shopping together (synchronous shopping). Therefore, social shopping is subset of social commerce and it has a narrower scope than social commerce.

Table 2.1. A summary of literature related with social shopping/social commerce

Literature	Definition	Key Constructs	Research Questions	Key Findings
Leitner & Grechening, 2007	Social shopping/Social commerce is defined as an emerging phenomenon “characterized by offering platforms where consumers collaborate online, get advice from trusted individuals, find the right products of a repository and finally purchase them.”	Analyzing existing best practice social commerce models in detail and summarizing in a concise diagram.	(1) What constitutes social shopping platforms? (2) How must social commerce platforms perform to guarantee user satisfaction?	A framework is developed, which fits all requirements of a multifunctional social shopping platform and it can be adopted for any shopping application or user driven community.
Shen & Eder, 2009	Social shopping is “An extension of Business-to-Consumer Ecommerce where consumers interact with each other as a main mechanism in conducting online shopping activities, such as discovering products, aggregating and sharing product information, and collaboratively making shopping decisions.”	In addition to TAM, three additional constructs: i) an online shopper’s tendency to social comparison, ii) social presence, iii) perceived enjoyment in using the website are tried to be explored to understand the adoption of social shopping sites.	(1) Will users adopt social shopping technology? (2) What are the factors that lead to the adoption?	Perceived Ease of Use (PEOU) has an important positive effect on Perceived Usefulness (PU) and PU has an important positive effect on Behavioral Intention (BI). Social Presence (SP) positively affects Perceived Enjoyment (PE) and PE positively affects BI, which shows the importance of engaging users and providing an enjoyable experience in designing such website. While Tendency to Social Comparison (TSC) has a positive impact on PE, which shows that it does not have an important effect on PU.

Table 2.1. A summary of literature related with social shopping/social commerce (cont.)

Kang & Park, 2009	Social shopping is described as a kind of e-commerce where people can comment and review items in blogs or online communities.	Analyzing social shopping sites as a new business model. Exploring main acceptance factors of social shopping of Korean Consumers.	(1)What are the features of social shopping sites and business models of each of them? (2)What are the main services of social shopping sites and what are their revenue models? (3)What are acceptance factors of social shopping for Korean consumers?	The social shopping sites provide platform to blogger, advertiser and several services like RSS, events or contest to users. The main revenue is advertisement fee. But there are exception revenue model that direct selling like ' Threadless'. The main revenue models of social shopping sites are Onsite Advertising, Affiliate Programs, Direct Sales and the main shopping flows. The main services of social shopping sites are Collaborative Shopping networks, book-marking service, multiple-shop services.
Shin, 2013	Social shopping/Social Commerce is defined as a new form of e-commerce that involves using social media, an online media that supports social interaction and user contributions to assist in the online buying and selling of products and services.	Relationship between the subjective norm and trust, social support, attitude, and intention.	(1)How do users develop their perceptions of social commerce? (2) How do users contribute to ongoing adoption and usage?	High impact of subjective norm suggests that s-commerce users are more influenced by social interactions in their decision to accept s-commerce than conventional e-commerce. This finding implies that s-commerce is not only perceived as a commerce channel, but as a social platform to interact with other users. The significant mediating roles played by Subjective Norms (SN) imply that social commerce users want confirmation through social processes before making their final decision to adopt. SN plays enhancing and facilitating roles for other perceived factors, as well as attitudes and intentions.

Table 2.1. A summary of literature related with social shopping/social commerce (cont.)

Liang et al., 2011	Social commerce is described as an emerging important platform in e-commerce, primarily due to the increased popularity of social networking sites such as Facebook, LinkedIn, and Twitter.	The relationship between social factors such as social support and relationship quality and user's intention of future participation in social commerce.	(1) Does the perceived social support in a social networking site affect the user's intention to continue to use the Web site and to conduct social commerce there? (2) Which factors (social or Web site design factors) are more important in determining the user's intention to continue to use and to conduct social commerce? (3) Does relationship quality between the user and the Web site mediate the effects of social support and Web site quality on customer loyalty?	Social support and Web site quality positively influence the user's intention to use social commerce and to continue using a social networking site. These effects are found to be mediated by the quality of the relationship between the user and the social networking Web site.
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The most important feature of online social shopping is that it focuses on the social aspect of an online shopping experience by offering many unique features to allow consumers to interact with each other for discovering products, aggregating and sharing product information, and collaboratively making shopping decisions (Shen and Eder, 2011). Therefore, in this study, we follow Shen and Eder's (2009) definition on online social shopping and focus on the interactions, communications, and collaborations between the customer and others who are not affiliated with the product and/or vendor.

In online social shopping, a consumer can leave comments, recommend a product, rate a vendor, and publish a wish list. This allows consumers to interact with others, which often leads to greater satisfaction (Leitner and Grechenig, 2008). Consumers can join a platform such as communities or blogs where they can find other shoppers who have the same interests, they can start to make friendships, and they can communicate and chat together to make a proper decision for their shopping (Hajli, 2012).

2.3. COLLABORATIVE BROWSING (CO-BROWSING)

The distinctive feature of social shopping is supporting the social aspect of online shopping (Shen and Eder, 2011). In online shopping concept, it is hard for consumers to communicate with each other at different locations and so most online shopping activities remain individual-focused (Qui et al., 2006). Therefore, social shopping offers co-browsing feature to facilitate communication and collaboration to increase social interactions among customers.

Co-browsing is a communication and collaboration system that enables users to shop or browse together by offering synchronized web views and chat facilities (Yan et al., 2003; Mardsen, 2010). Co-browsing tools may allow the users to create rooms and invite their friends and followers to chat, browse, and shop together by simply sharing a link or sending an invite through Facebook, Twitter, or email. In addition, co-browsing tools may have audio and video chat, cursor tracking, screen drawing, private rooms, and multi-platform compatibility features. According to Farnham et al. (2001), people prefer a shared browser which can significantly enhance users' feelings of enjoyment, beyond

its ease of use and functionality, when shopping online together. In the market, there are some different co-browsing tools that have different features. These different tools and their features can be defined and categorized as;

Page Push: This feature is used to force a specific web page to appear on the end user screen.

Co-scrolling: It is used to scroll web pages in real-time on the end user screen.

Co-filling: Co-filling allows presenter and participants to fill together a common web form.

Session control: It allows the end user to take control of the co-browsing session.

Text Chat: Text chat feature is used to communicate in real-time with the end user inside the co-browsing session.

Live Annotation: It is used to take notes, draw, and highlight words while co-browsing.

Table 2.2 provides the existing co-browsing tools and their features.

Table 2.2. A summary of existing co-browsing tools and their features

	URL Push	Co-scrolling	Co-filling	Session Control	Text Chat	Live Annotation
Samesurf	YES	YES	YES	YES	YES	YES
LiveLOOK	YES	YES	NO	YES	YES	YES
Twiddla	YES	NO	YES	NO	YES	YES
Showdocument	YES	NO	NO	YES	YES	YES
Clavardon	NO	YES	YES	NO	YES	NO
Brosix	NO	YES	YES	NO	YES	YES
PageShare	YES	YES	YES	YES	NO	NO
Voxwire	YES	NO	NO	YES	YES	YES

(Good, 2009).

Co-browsing can facilitate different types of interactions in shopping, such as Customer-Serviceperson interaction, Customer-Agent interaction, and Customer-Customer interaction. According to the results of a customer experience survey by

Forrester's North American Technographics (2010), co-browsing has much higher satisfaction ratings than other live-assist communication channels (co-browsing (78%), phone (74%), chat (69%), email (54%), and web self-service (47%)). Besides that, when co-browsing is used for customer-customer interactions, it has great impact on sales. In Jan 2010, Wet Seal, a leading specialty retailer of fashionable items, launched their "Shop With Me" platform to offer their customers shopping together. This platform allowed users to connect with Facebook, ICQ, Bebo, and AIM to invite any of their online friends to shop with them. According to Jon Kubo, CIO of Wet Seal, this platform increased the e-commerce sales by approximately 20 percent. Novica, a partner of National Geographic that sells the works of artists from around the world, has started to offer co-browsing tool on its website to let customers shop together. According to the news of Katie Deatsch who is a Senior Editor of Internet Retailer (2009), Charles Hachtmann, Chief Marketing Officer at Novica, says "The real-time sessions customers can have with each other, talking about products or artists or advising one another in areas of expertise, go well beyond static forums or customer reviews and this is the next step in the social web on retailer sites."

There are a few studies that focus on shopping with others by using a co-browsing tool but most of them try to explore the effects of different features of co-browsing. These studies are summarized in Table 2.3. Although, there some studies that try to understand social aspect of co-browsing tool (Kamis and Frank, 2011; Farnham et al., 2001), there have not any studies that explore consumers' physiological and perceptual responses while shopping with others in online environments to the best of the authors knowledge.

Table 2.3. A summary of literature related with co-browsing studies

Literature	Co-browsing tools	Research questions	Key constructs	Major findings
Kamis & Frank, 2011	LiveLOOK	How social computing affects Millennials' intention to purchase in a context of online travel planning.	Whether the decision support of online shopping in pairs, connected by screen sharing technology, contributes to a greater intent to purchase vacation travel.	<ul style="list-style-type: none"> - Collaboration has a strong impact on Trust in the shopping website. - Trust has a strong impact on Purchase Intention. - Perceived Effectiveness is influenced by Ease of Use and Trust.
Zhu et al., 2006	MSN 8.0	How telepresence and social presence affect consumers' continuance intention to use collaborative shopping, through the mediating effects of perceived usefulness and shopping enjoyment.	Effects of telepresence and social presence on consumers' continuance intention to use collaborative shopping.	<ul style="list-style-type: none"> - Telepresence significantly affects perceived usefulness and social presence which, in turn, influences shopping enjoyment. - Perceived usefulness, perceived ease of use, and shopping enjoyment all significantly affect intentions to continue collaborative online shopping.
Zhu et al., 2010	MSN 8.0	How navigation support and communication support influence users' coordination performance while shopping with others.	Effects of two collaborative online shopping support tools; navigation support and communication support on the performance.	The use of shared navigation is beneficial for collaborative coordination performance. However, shared navigation has a double-edged effect on reducing different types of uncoupling incidents.

Table 2.3. A summary of literature related with co-browsing studies (cont.)

Farnham et al., 2001	WYSIWIS (What You See Is What I See) window sharing system	How shared browser affects co-presence, visibility, effectiveness, ease of use and enjoyment.	Effects of shared browsing user interfaces on sociability of users.	<ul style="list-style-type: none"> - Browsed together more in the shared browsing condition, - Had a greater sense of feeling that they were in the same place at the same time and working together - Having less conflict over making decisions and coordinating their activities, - Enjoyed themselves more, were more satisfied with their decisions, and preferred the shared browser to the unshared browser.
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In this study, we focus on the social aspect of co-browsing that is a particularly interesting and important but under-studied topic. Our research questions are as follows:

- (1) How does co-browsing affect consumers' cognitive beliefs, emotions and behaviors?
- (2) How is co-browsing different than shopping alone online? To address these questions, the Stimulus-Organism-Response (S-O-R) model introduced by Mehrabian and Russell (1974) is adapted to the social shopping environment (see Figure 3.2.) because this model makes two assumptions. First, people's emotions eventually determine what they do and how they do it. Second, people respond with different sets of emotions to different environments (Tai & Fung, 1997). In this study, there are two environmental conditions for consumers: i) shopping alone ii) shopping with a companion by using a co-browsing

tool. Since this study tries to explore the consumers' physiological and perceptual responses in these two conditions, the SOR model is relevant with this study.

3. RESEARCH DESIGN

3.1. RESEARCH MODEL AND HYPOTHESIS

The effect of shopping environment on consumer behavior is not a new idea in the literature. In 1974, two environmental psychologists, Mehrabian and Russell, introduced the Stimulus-Organism-Response (S-O-R) framework. Their framework states that the physical environment influences individuals' internal states, which, in turn, determine approach and avoidance behavior. This theory links environmental stimuli (stimulus) with the individual's evaluative responses (organism) and approach/avoidance behaviors (response) (Spangenberg et al., 1996). The S-O-R framework initiated a number of marketing studies that have generally supported relationships between store environment and consumer perception, affect, and store patronage intentions (e.g. Donovan and Rossiter, 1982; Baker et al., 1992; Baker et al., 2002). In 2003, Eroglu and her colleagues applied this model for online environments and they explored the atmospheric cues of the online store influence shoppers' emotional and cognitive states, which then affect their shopping outcomes. This model is presented in Figure 3.1. In this model, high task-relevant cues cover "all the site descriptors (verbal or pictorial) that appear on the screen which facilitate and enable the consumer's shopping goal attainment" and low task-relevant cues include "site information that is relatively inconsequential to the completion of the shopping task". The goal of these high task-relevant cues is to help the shopper achieve his or her shopping task which is described as the utilitarian motivation (Babin et al., 1994). For low task-relevant cues, the following examples can be given: colors, borders, background patterns, typestyles and fonts, animation, music and sounds,

entertainment, pictures, a Web counter, site awards, and affiliations. These low task-relevant cues are used to increase the hedonic motivations (Babin et al., 1994; Childers et al., 2001) or the value of shopping. However, with the development of Web 2.0 technologies and the increasing popularity of social networking sites, online retailers have started to create unique forms of value for consumers. For instance, co-browsing tools have started to be used in e-commerce websites to facilitate communication and collaboration and enable people to shop together by offering synchronized page views and integrated facilities. Some studies which applied S-O-R model for online environments are summarized in Table 3.1.

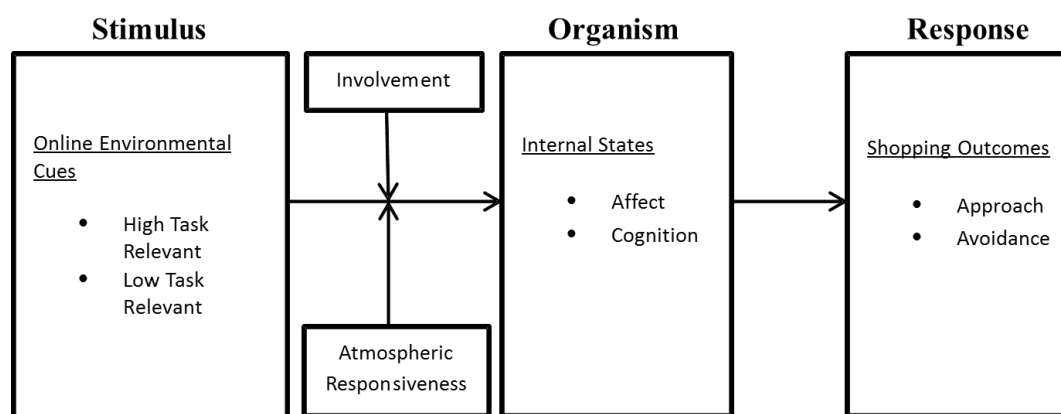


Figure 3.1. An S-O-R model of consumer response to online shopping (Eroglu et al., 2003)

Table 3.1. A summary of literature about the application of S-O-R Model on online environments

Literature	Stimulus	Moderating Variables	Organisms	Responses
Mummalaneni, 2005	Characteristic of electronic store environment	-	<ul style="list-style-type: none"> • Pleasure • Arousal 	<ul style="list-style-type: none"> • Satisfaction • Loyalty • Time spent • The number of items purchased • The amount money spent

Table 3.1.A summary of literature about the application of S-O-R Model on online environments (cont.)

Sautter, 2004	<ul style="list-style-type: none"> • Virtual Store • Operator Environment 	<ul style="list-style-type: none"> • Involvement • Atmospheric Responsiveness • Shopper motivation 	<ul style="list-style-type: none"> • Affect • Cognition • Telepresence 	<ul style="list-style-type: none"> • Approach • Avoidance
Wang et al., 2011	Perceived Web Aesthetics: <ul style="list-style-type: none"> • Aesthetic Formality • Aesthetic Appeal 	Purchase Task	<ul style="list-style-type: none"> • Affective: Satisfaction Arousal • Cognitive: Online Service Quality 	<ul style="list-style-type: none"> • Purchase • Consultation • Search on Other Websites • Re-visit
Chang & Chen, 2008	<ul style="list-style-type: none"> • Website Quality • Website Brand 	<ul style="list-style-type: none"> • Trusting disposition • Risk propensity 	<ul style="list-style-type: none"> • Trust • Perceived Risk 	Purchase Intention
Manganari et al., 2008	<ul style="list-style-type: none"> • Virtual Layout and Design • Virtual Atmospherics • Virtual Theatrics • Virtual Social Presence 	<ul style="list-style-type: none"> • Consumer Navigation Strategy • Atmospheric Responsiveness 	<ul style="list-style-type: none"> • Affect • Cognition 	<ul style="list-style-type: none"> • Approach • Avoidance

For many people, shopping is a shared and sociable experience. When consumers shop together in stores or malls, they can obtain advice from others or just use the activity for social interaction. Comparatively, when shopping online, it is hard for consumers to communicate with each other at different locations. Therefore, most online shopping activities remain individual-focused (Qui et al., 2006). Co-browsing tools have been offered by various e-commerce vendors to facilitate communication and collaboration and to increase social interactions among customers. Therefore, we modified the S-O-R model for the online social shopping environment, as presented in Figure 3.2. Our hypotheses are described in the following sections.

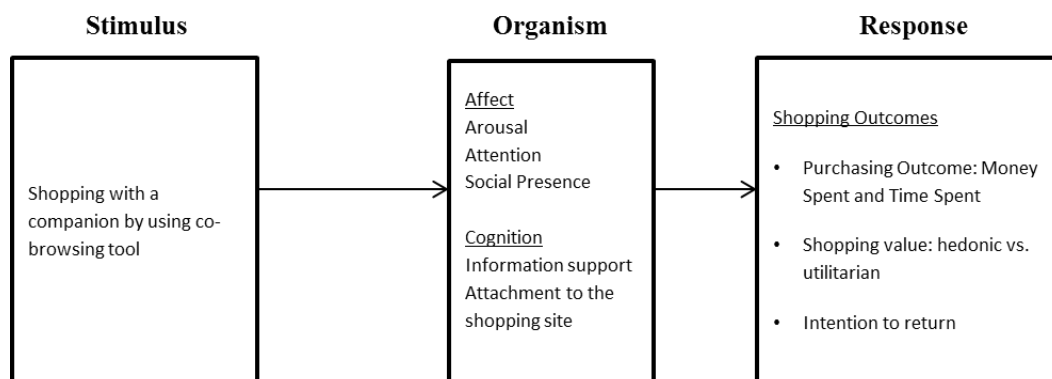


Figure 3.2. The model as empirically operationalized

3.1.1. Arousal. Arousal refers to the degree to which a person feels stimulated, active, or alert (Menon and Kahn, 2002). Mehrabian and Russell (1974) defined arousal as an affective dimension ranging from sleep to frantic excitement and use a self-report scale to measure it. In store environment, social factors have an important effect on the level of arousal. A store environment that is complex, novel, surprising and active increases feeling of arousal (Mehrabian and Russell, 1974). An environment that creates a high level of arousal is likely be more interesting to customers, thus they may stay longer in the store (Milliman, 1982). In addition, a level of arousal increases purchasing intentions, spending and store visit duration (Sherman et al., 1997).

One of the most important social factors during shopping is the presence of a companion. According to Zajonc (1965, 1980), the presence of others increases the level of arousal, which was also confirmed by Newcomb (1978). The study by Chebat and his colleagues (2012) showed that the presence of a shopping companion enhances shopping arousal, since either they are both making purchases together or they are observing each other in his/her respective purchasing activities. Thus, we hypothesize the following:

H1: Compared to shopping alone, shopping with a companion will increase arousal.

3.1.2. Attention. Attention is defined by Stenberg (1996) as “a means of focusing limited mental resources on the information and cognitive processes that are the most salient at a given moment.” According to the capacity theory of attention, cognitive resources affect humans’ cognitive behavior, and the cognitive resources of people are limited. These limited resources can be allocated to a number of activities and the allocation for each activity depends on factors such as the assigned task and given stimuli (Kahneman, 1973). In this context, consumers in a high involvement situation are highly motivated to gather as much information as possible and to pay more attention to the purchase. On the other hand, consumers in a low involvement situation tend to allocate fewer cognitive resources to the decision-making process because they have low motivation related to the information search and attention to the purchase. Therefore, it is generally accepted that the high involvement situation requires focusing more attention on the information search in a buying decision, while the low involvement situation requires less attention from customers (Choi et al., 2012). Eye-tracking is a physiological technique used to sense visual attention by tracing eyesight, and has recently been adopted in various areas such as the usability and psychological analysis of customers in marketing research (Choi et al., 2012). In this study, we investigated whether shopping companion affects the attention of consumers’ on the shopping task. In order to analyze visual attention, we used total fixation duration to measure eyeball fixation and movement path items, which the eye-tracking technique provides.

While Chebat and his colleagues (2012) proposed that shopping with a companion increases attention to the shopping task, Borges et al., (2010) pointed out that shopping companion will take away some attention from the shopping task while

shopping together. Because of the inconsistent findings in the prior literature, we hypothesize that there is difference between consumers' attention in shopping alone online vs. co-browsing, the direction of the difference, however, will be determined by following users' eye movement and fixations on the shopping sites, which will be captured using an eye tracker.

H2: Compared to shopping alone, shopping with a companion will affect attention to the shopping task.

3.1.3. Social Presence. The difference between online shopping experience and offline shopping experience is the lack of social appeal and human warmth of a face-to-face shopping experience (Hajli, 2012). According to some researchers, the lack of social presence may impede the growth of e-commerce because of the lack of human interactions and thus trust (Gefen and Straub, 2003).

In information richness theory, social presence is defined as the extent to which a medium allows a user to experience with other as being psychologically present (Fulk et al., 1987). Social presence can be enhanced by stimulating the imagination of interaction with other humans or by providing means for actual interaction with other humans (Shen, 2011) and e-commerce technologies like online forums and communities, recommendation systems, chat rooms, etc. can enable the feeling of a place where people can interact (Hajli, 2012). Thus, social presence of websites can increase. Therefore,

H3: Compared shopping alone, shopping with a companion will increase social presence.

3.1.4. Informational Support. Informational support can provide solutions, plans, or interpretation (Liang et al., 2011). According to a social commerce survey (Mardsen, 2009), 83% of online shoppers are willing to share shopping information with

their friends, and 67% of online shoppers are likely to purchase more based on the recommendations they get from their community because, the shopping information received from friends is viewed as more valuable. This information sharing behavior plays a key role in social shopping concept (Liang et al., 2011).

Companion shoppers perform two main activities: (1) sharing product judgments and (2) advising the consumer. Companion shoppers share product information with consumers regarding brand names, product quality, substitute or competitive offerings, price, and product availability (Mullikin and Munger, 2011). Co-browsing provides a platform for shoppers to interact with each other, thus making it easier for sharing information, ideas, and suggestions. Therefore, we hypothesize that:

H4: Compared shopping alone, shopping with a companion will increase perceived information support.

3.1.5. Attachment to the Website. According to Bowlby (1969), an attachment is an emotion-laden target-specific bond between a person and a specific object. Kyle et al. (2004) explain that “the place attachment construct examines the meaning places have for people and represents an emotional or affective bond between a person and a particular place.” Place attachment is associated with friendship, when people have positive or collaborative relations with others who shared the same space, such as in the case of coworkers (Elsbach and Bechky, 2007). Consumers who feel some social support at commercial settings where they can talk about their problems develop a strong attachment to these places (Rosenbaum et al., 2007). As co-browsing is a tool to facilitate social shopping, it will lead to more social interaction and offer more social support.

Thus, we predict the following:

H5: Compared to shopping alone, shopping with a companion will increase attachment to the shopping site.

3.1.6. Purchasing Outcome: Money Spent. Shopping companions can influence everything during shopping, starting with which store to visit, the time spent, and how much money will be spent (Chebat et al., 2012). According to Sommer et al. (1992), the presence of other people while shopping often leads to more pleasant shopping experiences than shopping alone. As a result, consumers spend more time and purchase more in stores. Dennis and his colleagues (2010) supported Sommer et al. (1992) and applied it for online social shopping and claimed that social e-shopping can provide a pleasing and arousing motivation that would encourage shoppers to spend more money and return more often to e-retail stores. In addition to pleasant shopping experience, a shopping companion can provide advice and reduce the uncertainty associated with purchase decision thus, shopper can spend more (Chebat, 2012). Thus, we predict the following:

H6: Compared to shopping alone, shopping with a companion will increase money spend on the shopping site.

3.1.7. Purchasing Outcome: Time Spent. Shopping is inherently a social experience. A shopping companion may enhance shopping emotions and create hedonically oriented shopping experience (Borges, 2010), which would encourage shoppers to spend more time in stores (Dennis et al., 2010). The study of Sommer et al. (1992) also supports that and claims the presence of other people while shopping often leads to more pleasant shopping experiences than shopping alone. As a result, consumers spend more time in stores. In addition, Kurt et al. (2011) and Chebat et al. (2012) pointed

out that consumers who shops with others will visit more areas in the store, will spend more time in stores than when shopping alone (Chebat et al., 2012). Therefore,

H7: Compared to shopping alone, shopping with a companion will increase time spend on the shopping site.

3.1.8. Shopping Value: Hedonic Value. Shopping value is defined as “the perceived subjective worth that the consumer perceives in general in consideration of all evaluation standards” (Babin et al., 1994). Shopping can provide both hedonic and utilitarian value (Babin et al., 1994). Hedonic shopping value reflects the value received from the multisensory, fantasy and emotive aspects of the shopping experience, while utilitarian shopping value reflects the acquisition of products and/or information in an efficient manner and can be viewed as reflecting a more task oriented, cognitive, and non-emotional outcome of shopping (Babin et al., 1994). Generally, utilitarian shopping value reflects the task-related value of a shopping experience while hedonic shopping value reflects the value found in the shopping experience itself independent of task-related activities (Babin and Attaway, 2000).

According to Topaloglu (2012), hedonic value occurs when entertainment and emotional value is provided through shopping activities. In collaborative online shopping, people shop with friends both for utilitarian purposes, notably to make a purchase, and for hedonic purposes, such as to enjoy leisure time (Zhu et al. 2006). According to Chebat et al. (2012), a shopping companion can enhance shopping emotions and create a more hedonically oriented shopping experience. Thus, we predict the following:

H8: Compared to shopping alone, shopping with a companion will increase hedonic value of shopping.

3.1.9. Shopping Value: Utilitarian Value. According to Topaloglu (2012), utilitarian shopping value occurs when consumer obtains the needed product, and this value increases when consumer obtains the product with less effort.

A shopping companion can enhance or reduce the utilitarian value though. The presence of a shopping companion can reduce the attention on the shopping task need to be performed (Baron et al., 1973) and be distracting. Thus, a shopping companion can reduce shopping effectiveness by making the utilitarian cues less salient (Borges et al., 2010). In contrast, a shopping companion can provide assistance to customers, freeing them up so that they can focus on the shopping task (Mullikin and Munger, 2011). Hence, they can obtain the products with less effort and more effectively. Thus, we predict the following:

H9: Compared to shopping alone, shopping with a companion will affect utilitarian value of shopping.

3.1.10. Intention to Return. A consumer's intention to return to a website is seen as a result of his/her attitude toward using the technology involved in the site (Koufaris, 2002). Behavioral intentions associated with website usage are identified by Song and Zinkhan (2003) as: repeat purchases; repeat visits to the website; recommendation of website to others; and positive remarks or comments about the website. Shopping with others makes consumers feel more satisfied (Lee and Benbasat, 2003), which increases revisit and repurchase intention (Maditinos and Theodoridis, 2010). Thus, we predict the following:

H10: Compared to shopping alone, shopping with a companion will increase intention to return the website.

3.2. RESEARCH METHODOLOGY

A laboratory experiment method was applied in this research because it gives the researcher the greatest control over the manipulation of the independent variables. It can also control for potential confounding factors such as downloading time and distractions when working at home and other places.

To understand how shopping with a companion by using a co-browsing tool affect consumers' cognitive beliefs, emotions and behaviors, between subject design (shopping with a companion versus shopping alone) was used for this study because it allows to compare two methods to determine whether one is more effective than the other.

The scenario-based method was used to operationalize shopping alone and shopping with a companion. An important feature of a scenario is that it depicts activities in a full context, describing the social setting, resources, and goals of users (Nardi, 1992). For the experiments, 60 participants (30 each) were subject to either shopping alone or shopping with a companion condition.

3.2.1. Subjects. A total of 60 subjects successfully completed the experiment. Subjects were undergraduate and graduate students from a Midwestern University. Among the student subjects, 37 (61.7%) were male and 23 (38.3%) were female. Each participant was randomly assigned to one the two conditions, either shopping alone or shopping with a companion. The subjects they were awarded with extra credits. Table 3.2 summarizes the demographic attributes of all the participants who participated.

Table 3.2. Frequency distributions of respondents' demographics

Sample profile					
Frequency		%	Frequency		%
Gender			Annual House Income		
Female	23	38.3%	\$20000 or less	27	45%
Male	37	61.7%	\$20001 - \$40000	14	23.3%
	60	100%	\$40001- \$60000	5	8.3%
Age			\$60001-\$80000	4	6.7%
Under 18	2	3.3%	\$80001-\$100000	-	
19-24	27	45.0%	More than \$100000	10	16.7%
25-35	26	43.3%		60	100%
36 and older	5	8.3%	Education		
	60	100%	High school	22	36.7%
			Associate degree	7	11.7%
			4 year College degree	17	28.3%
			Master's degree	12	20%
Normal Gift Budget			Other	2	3.3%
\$25 or less	19	31.7%		60	100%
\$26 - \$50	28	46.7%	Area of Studies		
\$51-\$100	10	16.7%	HCI	2	3.3%
\$101-\$150	2	3.3%	ERP	8	13.3%
\$151-\$200	1	1.7%	Social Media	2	3.3%
More than \$200	-	-	Business	17	28.3%
	60	100%	Other	31	51.7%
				60	100%

3.2.2. Experimental Design. The participants were asked to buy a birthday gift for a female friend from the given website and the same scenario was used for both conditions. The participants who assigned for shopping alone condition shopped themselves while the participant who assigned for the shopping with a companion condition shopped with another person by using a co-browsing tool which is embedded the given e-commerce website.

For the companion shopper, a persona was created to provide consistence and the researcher who shop with subjects was acting the character of this persona. According to the persona, the name of the companion was Carol Thompson and she was a store manager in Jashon Home Furniture Store in Chicago. She was 32 years old, married and she had 4 year old daughter. She had an MBA degree from Columbia University. Her computer skills were proficient and she was a netbook user. Generally, she was using the computer for email, web browsing, word processing, social networks and chatting. She liked being casual but chic. She liked quality clothes or accessorizes because she wanted to use them for a long time.

In this study, the companion was not neither a family member nor friend because according to Mullikin and Munger (2011), companion shoppers are not necessary be friends and family members, shopping companion also include other individuals who are acquainted with the customer, such as co-workers or other shoppers. Therefore, the participants were given maximum 5 minutes for online chatting with the companion to get acquainted with each other before starting the shopping. Gmail Chat tool was used as the chat tool in this part.

A representative e-commerce website called www.timetobuy.com, which offers a co-browsing tool was created for this study. The website offers wrist watches for women at three price levels for different styles. Three price levels are determined as under \$50, \$50-\$100, and \$100-\$200. The brands and prices were realistic because they were chosen from the world's largest online retailer. In addition, a survey was conducted to choose unfamiliar brands in order to prevent brand affect.

A popular co-browsing tool was embedded to the e-commerce website, which allows the users to create rooms and invite their friends and followers to chat, browse and shop together by simply sharing a link or sending an invite through Facebook, Twitter, or email. In addition, it offers cursor tracking and private room features. A screenshot of the website which includes the co-browsing tool is shown in Figure 3.3.

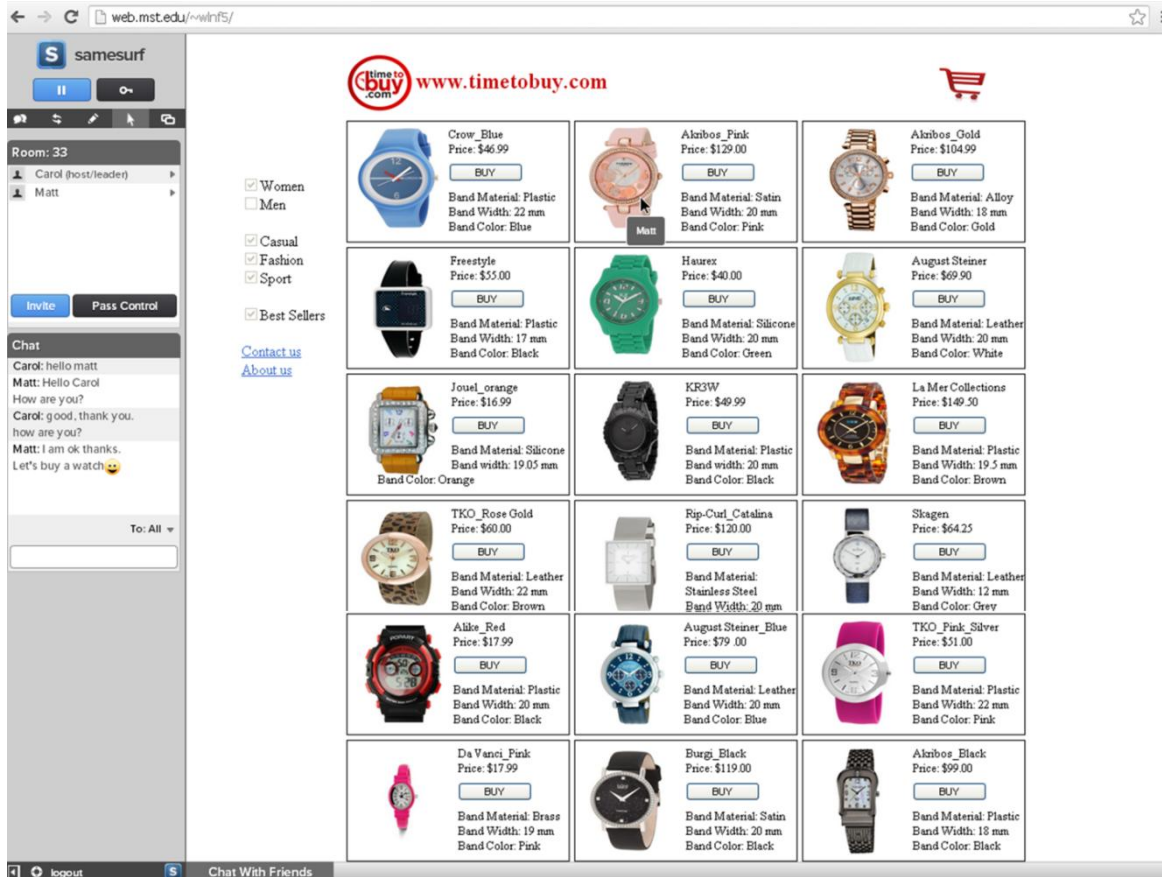


Figure 3.3. A screenshot of the website which includes the co-browsing tool

A training video was recorded to describe the participants how to use the co-browsing tool and it was presented by using VLC player.

Women wrist watch was chosen as a product type for this study. This decision was made for the following reasons: 1) Wrist watches are social products which are used in public situations and serve as value-expressive products; 2) They are relatively complex products, bearing a variety of attributes (e.g. functions, colors) that may require certain level of expertise from consumers; 3) They have standardized sizes and do not necessarily require “trying on”, which is helpful in an online purchasing setting.

3.2.3. Measures. In constructing the questionnaire, 7-point semantic scale questions were used. The Information Support items were adapted from the study of Liang and colleagues (2011). Items for the Attachment to the website were adapted from Moore and Graefe (1994). Item for the Hedonic value and Utilitarian value were adapted from the study of Borges and his colleagues (2010). In addition, items for the Intention to return were modified from the study of Hausman and Siekpe (2009). The questionnaire also collected user information such as demographics, current use of online shopping and social networking website (see Appendix C).

For data collection of the physiological responses, the level of arousal was collected by Affectiva Q sensor which is a wearable, wireless biosensor was used to measure the electro-dermal activity that grows higher during states of excitement and lower during boredom or relaxation. It also measures skin temperature. The EDA is recorded by the Q sensor as it conducts the sweat on users' skin surface. The level of attention was collected by Tobii Eye Tracker T60 which allows measuring an individual's visual attention. Eye-tracking is a physiological technique used to sense visual attention by tracing eyesight, and has recently been adopted in various areas such as the usability and psychological analysis of customers in marketing research. Tobii eye tracker T60 helps in gathering reliable data without hindering participants' performance during the shopping process.

Eye tracking is the process of measuring either the point of gaze or the motion of an eye relative to the head. An eye tracker is a device for measuring eye positions and eye movement. Eye tracker works by reflecting invisible infrared light to a user's eye. The reflection pattern is then recorded with a sensor system, calculating the exact point of

gaze using a geometrical model. After determining the point of gaze, it can be visualized and shown on a computer.

In addition, money spent and time spent data also were collected by eye tracker because of the advantage of screen recording.

3.2.4. Experimental Procedure. Shopping alone: As the participants entered the room, they were given an informed consent form to fill out. They were then seated in a comfortable chair and given a pre-experimental survey which needed to be filled out before they proceeded further. Pre-experimental survey included the questions about demographic information and internet usage. Then, the scenario was presented to each subject. Before the participants started to perform the task, a Q sensor which is a wearable, wireless biosensor was wrapped around the palm of the user to measure emotional arousal via skin conductance while working on the task. Then, the representative e-commerce website was presented on Tobii Eye Tracker monitor in order to measure the level of attention and record the session. Then, each subject was asked to complete the Post-experimental survey which consisted of questions they needed to answer for information support, attachment to the website, hedonic value, utilitarian value and intention to return.

Shopping with a companion: As the participants entered the room, they were given an informed consent form to fill out. They were then seated in a comfortable chair and given a pre-experimental survey which needed to be filled out before they proceeded further. Pre-experimental survey included the questions about demographic information and internet usage. Then, the training video which was presented to the participants to describe them how to use the co-browsing tool and it was presented by using VLC player.

After the training video, the participants and the companion were given maximum 5 minutes for online chatting to get acquainted with each other before starting the shopping and Gmail Chat window was passed the monitor of the participant by the experiment conductor. Then, the scenario was presented to each subject. Before the participants started to perform the task, a Q sensor which is a wearable, wireless biosensor was wrapped around the palm of the user to measure emotional arousal via skin conductance while working on the task. The representative e-commerce website was presented on Tobii Eye Tracker monitor in order to measure the level of attention and record the session. After the participants completed the task, they were asked to complete the Post-experimental survey which consisted of questions they needed to answer for information support, attachment to the website, hedonic value, utilitarian value and intention to return.

4. DATA ANALYSIS AND RESULTS

Data Analysis was conducted using SPSS. The results below are presented in the order of the hypotheses and also listed are the statistical analysis methods used to test each hypothesis.

4.1. EFFECT OF SHOPPING COMPANION ON AROUSAL

Pupil dilation data obtained from the eye tracker was analyzed using a one way ANOVA to compare the effects of the conditions on the level of arousal. The mean values and standard deviations are shown in Table 4.3 while the results of the one way ANOVA test is presented in Table 4.4. In addition, Figure 4.2 shows how the mean changes base on the conditions.

Regarding pupil dilation as an emotional reaction, Hess and Plott (1960) reported pupillary dilation responses to what they call “emotionally toned or interesting visual stimuli”. The study of Aboyoun and Dabbs (1998) also reported pupillary responses to arousal. Therefore, in this study, pupil dilation represents the arousal.

In this study, we also showed the results of the baseline (see Table 4.1) which are significant (see Table 4.2). In addition, Figure 4.1 shows the results of baseline for both conditions. Images of the pupil would vary in size depending on camera position, pupil sizes are measured only relatively, unless one provides a benchmark to compare with (Klingner et al., 2008). This could be a problem if one needs absolute measures of pupil size, which is more reliable. In fact, changes in absolute pupillary diameters are robust to baseline pupil size, say, due to changes in luminance Beatty and Locero-Wagoner (2000).

The results from the one way ANOVA showed that the mean level of arousal of the participant under shopping alone condition was 1.63 whereas the mean level of arousal of the participant under shopping with a companion condition was 2.00. As presented in the Table 4.4, the results are significant ($p < 0.05$). According to the data obtained from eye tracker, H1 is supported.

Table 4.1. Descriptives- Effect of shopping companion on pupil dilation for baseline
1- Shopping alone 2- Shopping with a companion

Pupil_Avg_Baseline								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
1	30	.7213	.19821	.03619	.6473	.7953	.36	1.25
2	30	.8911	.30250	.05523	.7782	1.0041	.40	1.54
Total	60	.8062	.26762	.03455	.7371	.8753	.36	1.54

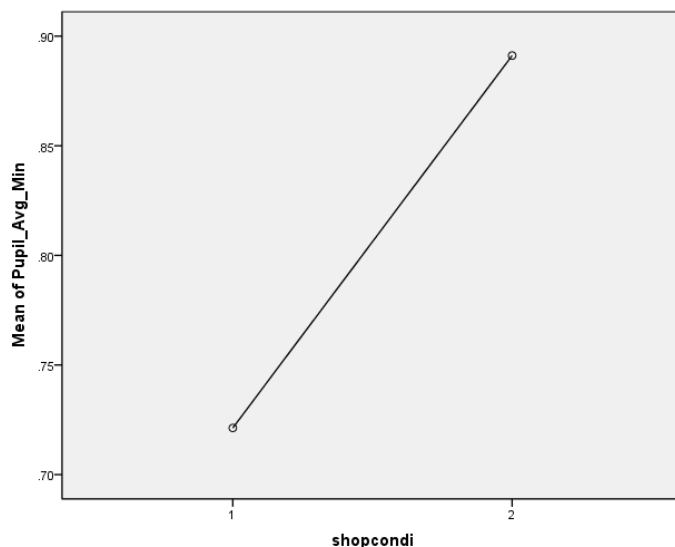


Figure 4.1. The effect of the shopping companion on pupil dilation for baseline
Shopcondi: 1. Shopping alone, 2. Shopping with a companion

Table 4.2. ANOVA- Effect of shopping companion on pupil dilation for baseline

Pupil_Avg_Baseline					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.433	1	.433	6.619	.013
Within Groups	3.793	58	.065		
Total	4.226	59			

Table 4.3. Descriptives- Effect of shopping companion on pupil dilation
1- Shopping alone 2- Shopping with a companion

Pupil_Max_Min								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max
					Lower Bound	Upper Bound		
1	30	1.6292	.57842	.10561	1.4132	1.8452	.75	3.30
2	30	2.0031	.70064	.12792	1.7415	2.2647	.74	3.47
Total	60	1.8161	.66429	.08576	1.6445	1.9877	.74	3.47

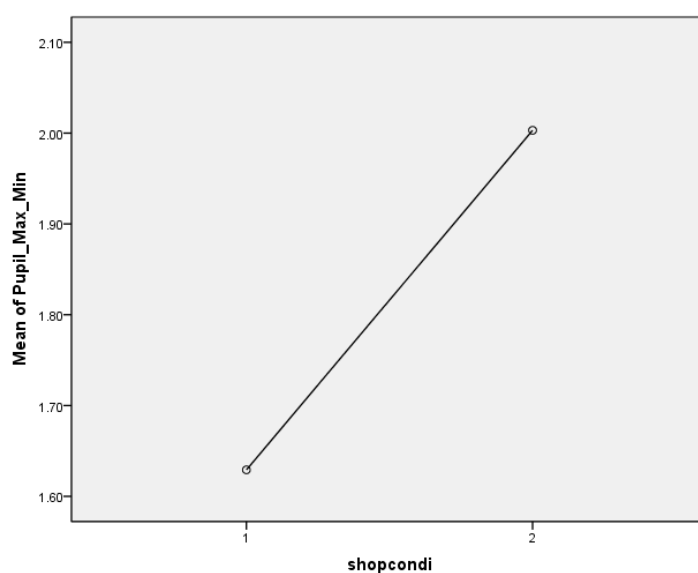
Figure 4.2. The effect of the shopping companion on pupil dilation
Shopcondi: 1. Shopping alone, 2. Shopping with a companion

Table 4.4. Effect of shopping companion on pupil dilation

Pupil_Max_Min

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.097	1	2.097	5.082	.028
Within Groups	23.938	58	.413		
Total	26.036	59			

In addition to eye tracker data, we also used Q sensor to measure the level of arousal to make sure the data obtained from eye tracker is valid.

In this study, skin conductance is used as a measurement for arousal. Skin conductance can be used to show arousal in a virtual environment (Jang et al., 2002). A more common term for skin conductance is EDA. EDA describes all electrical phenomena in the skin (Johnson & Lubin, 1966).

The electrodermal activity (EDA) of the participants was measured using a Q-sensor. Researchers at MIT developed a wrist worn EDA-sensor that can be used outside laboratory settings (Poh, Swenson, & Picard, 2010). This product is released to consumer market by Affectiva. The Q-sensor is the size of a watch and has no wires connected to it. Electrodermal activity is measured with two electrodes pressed to the skin. The skin conductance is expressed in micro-Siemens (μS). The Q-sensor also measures skin temperature and acceleration on the X, Y and Z axes. These measurements are done at 32Hz. Using the button on the Q-sensor it is possible to place markers in the EDA-data.

Arousal data obtained from the Affectiva Q sensor was analyzed using a one way ANOVA to compare the effects of the conditions on the level of arousal. The mean

values and standard deviations are shown in Table 4.5 while the results of the one way ANOVA test is presented in Table 4.6.

The results from the one way ANOVA showed that the mean level of arousal of the participant under shopping alone condition was .99 whereas the mean level of arousal of the participant under shopping with a companion condition was 5.44. As presented in the Table 4.6, the results are significant ($p < 0.05$). Representative screen shots which show the level of arousal are obtained from Q sensor for both conditions and they are presented in Appendix A. In addition, Table 4.7 shows that there is a significant ($p < 0.05$) and positive ($r = .325$) relationship between Q sensor data and Eye Tracker data for the consumers' level of arousal. Therefore, H1 is supported by both Eye tracker data and Q sensor data.

Table 4.5. Descriptives- Effect of shopping companion on the level of arousal
1- Shopping alone 2- Shopping with a companion

nSCR_div_time

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	21	.9887	2.02166	.44116	.0684	1.9089	.02	8.27
2	22	5.4436	3.63256	.77446	3.8331	7.0542	.03	15.05
Total	43	3.2680	3.69067	.56282	2.1321	4.4038	.02	15.05

Table 4.6. ANOVA- Effect of shopping companion on the level of arousal

nSCR_div_time

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	213.236	1	213.236	24.363	.000
Within Groups	358.847	41	8.752		
Total	572.083	42			

Table 4.7 Correlations between eye tracker and Q sensor data for the level of arousal

		nSCR_div_time	Pupil_Avg_Min	Pupil_Max_Min
nSCR_div_time	Pearson Correlation	1	.402**	.325*
	Sig. (2-tailed)		.008	.033
	N	43	43	43
Pupil_Avg_Min	Pearson Correlation	.402**	1	.682**
	Sig. (2-tailed)	.008		.000
	N	43	47	47
Pupil_Max_Min	Pearson Correlation	.325*	.682**	1
	Sig. (2-tailed)	.033	.000	
	N	43	47	47

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

4.2. EFFECT OF SHOPPING COMPANION ON ATTENTION

Shopping attention data obtained from the eye tracker was analyzed using a one way ANOVA to compare the effects of the conditions on the shopping attention of consumers. As presented in Table 4.8, the mean total fixation time on the website for shopping alone condition was 58.01 whereas, the mean total fixation time on the website for shopping with a companion condition was 321.88, which were significant ($p < 0.05$) (Table 4.9). In addition, as presented in the Table 4.8 the mean total fixation on the products for shopping alone condition was 51.99 whereas, the mean total fixation on the products for shopping with a companion condition was 161.78, which were significant ($p < 0.05$) (Table 4.9). According to the results, when compared with shopping alone condition, consumers spent more time and fixated more on products during co-browsing, and their overall time spent and fixated on the shopping site also increased. In addition, as presented in Table 4.10, consumers who shopped with a companion paid more attention to the shopping task than the companion and it is significant ($p < 0.05$) (Table 4.11). However, as presented in Table 4.12, the mean fixation time on the products in percentage for shopping alone condition was .90 whereas, the mean fixation time on the products in percentage for shopping with a companion condition was .54, which were significant ($p < 0.05$) (Table 4.13). Representative heat maps obtained from eye tracker for both conditions are presented in Appendix B. In addition, as presented in the Table 4.12, the mean time consumers spent on the products in percentage for shopping alone condition was .89 whereas, the mean time consumers spent on the products in percentage for shopping with a companion condition was .50, which were significant ($p < 0.05$) (Table 4.13).

In the earlier literature, while Chebat and his colleagues (2012) proposed that shopping with a companion increases attention to the shopping task, Borges et al., (2010) pointed out that shopping companion will take away some attention from the shopping task while shopping together. The result of this study supports both studies. The reason is that when compared shopping alone condition, shopping companion increased the total fixation on the shopping site, which means consumers paid more attention to the shopping task. In addition, consumers who shopped with a companion paid more attention to the shopping task than the companion. These results support the study of Chebat et al. (2012). However, when fixation percentage and time percentage data are interpreted, shopping companion decreased the attention on the shopping task. Therefore, these results support Borges et al., (2010) and shows that shopping companion took away some attention from the shopping task while shopping together.

In conclusion, the results of this study showed that compared the shopping alone condition, shopping companion increases the attention on the shopping task while decreases it in percentage. Therefore, the shopping companion affects the attention on the shopping task and H2 is supported.

Table 4.8. Descriptive Statistics- Effect of shopping companion on total shopping attention

1- Shopping alone 2- Shopping with a companion

	Condition	Mean	Std. Deviation	N
Total fixation time on the site	1	58.0077	32.04765	30
	2	321.8793	249.59744	30
	Total	189.9435	220.97151	60

Table 4.8. Descriptive Statistics- Effect of shopping companion on total shopping attention (cont.)

Total fixation on products	1	51.9920	29.98369	30
	2	161.7770	131.25827	30
	Total	106.8845	109.42810	60

Table 4.9. ANOVA- The effect of shopping companion on total shopping attention

Dependent Variable		Sum of Squares	Df	Mean Square	F	Sig.
Total fixation time on site	Contrast	1044423.847	1	1044423.847	32.986	.000
	Error	1836452.155	58	31662.968		
Total fixation on products	Contrast	180791.193	1	180791.193	19.946	.000
	Error	525704.873	58	9063.877		

Table 4.10. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Total fixations on products	161.7770	30	131.25827	23.96437
	Total fixations on co-browsing	130.3723	30	114.12623	20.83650

Table 4.11. Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Total fixations on products - Total fixations on co-browsing	31.40467	62.14130	11.34540	8.20072	54.60861	2.768	29	.010

Table 4.12. Descriptive Statistics- Effect of shopping companion on shopping attention in percentage

1-Shopping alone 2- Shopping with a companion

	Condition	Mean	Std. Deviation	N
Fixation percentage on products	1	.8958	.07695	30
	2	.5354	.12324	30
	Total	.7156	.20832	60
Time percentage on products	1	.8922	.07712	30
	2	.4959	.13879	30
	Total	.6940	.22874	60

Table 4.13. ANOVA- Effect of shopping companion on shopping attention in percentage

Dependent Variable		Sum of Squares	Df	Mean Square	F	Sig.
Fixation percentage on products	Contrast	1.948	1	1.948	184.588	.000
	Error	.612	58	.011		

Table 4.13. ANOVA- Effect of shopping companion on shopping attention in percentage (cont.)

Time	Contrast	2.356	1	2.356	186.906	.000
percentage	Error	.731	58	.013		
on products						

4.3. EFFECT OF SHOPPING COMPANION ON SOCIAL PRESENCE

Social presence data obtained from the survey was analyzed using a one way ANOVA to compare the effects of the conditions on the perceived social presence of the e-commerce website. The mean values and standard deviations are shown in Table 4.14 while the results of the one way ANOVA test is presented in Table 4.15.

The results from the one way ANOVA showed that the mean social presence for shopping alone condition was 2.95 whereas the mean social presence for shopping with a companion condition was 5.14. As presented in the Table 4.15, the results are significant ($p < 0.05$). Therefore, H3 is supported.

Table 4.14. Descriptive Statistics- Effect of shopping companion on social presence
1- Shopping alone 2- Shopping with a companion

	Condition	Mean	Std. Deviation	N
Social Presence	1	2.9483	1.27016	29
	2	5.1429	1.07890	28
	Total	4.0263	1.61029	57

Table 4.15. ANOVA- Effect of shopping companion on social presence

		Sum of Squares	Df	Mean Square	F	Sig.
Social Presence	Between Groups	75.376	1	75.376	56.537	.000
	Within Groups	77.327	58	1.333		
	Total	152.703	59			

4.4. EFFECT OF SHOPPING COMPANION ON INFORMATION SUPPORT

Information support data obtained from the survey was analyzed using a one way ANOVA to compare the effects of the conditions on the information support. The mean values and standard deviations are shown in Table 4.16 while the results of the one way ANOVA test is presented in Table 4.17.

The results from the one way ANOVA showed that the mean information support for shopping alone condition was 4.00 whereas the mean information support for shopping with a companion condition was 5.31. As presented in the Table 4.17, the results are significant ($p < 0.05$). Therefore, H4 is supported.

Table 4.16.. Descriptives- The effect of shopping companion on information support
1- Shopping alone 2- Shopping with a companion

Condition		Mean	Std. Deviation	N
INFSUP	1	4.0000	1.32737	29
	2	5.3095	.97996	28
	Total	4.6433	1.33424	57

Table 4.17. ANOVA- The effect of shopping companion on information support

		Sum of Squares	Df	Mean Square	F	Sig.
INFSUP	Between Groups	25.259	1	25.259	18.768	.000
	Within Groups	75.369	56	1.346		
	Total	100.628	57			

4.5. EFFECT OF SHOPPING COMPANION ON ATTACHMENT

Attachment data obtained from the survey was analyzed using a one way ANOVA to compare the effects of the conditions on the consumers' attachment to the shopping site. The mean values and standard deviations are shown in Table 4.18 while the results of the one way ANOVA test is presented in Table 4.19.

The results from the one way ANOVA showed that the mean attachment to the shopping site for shopping alone condition was 2.59 whereas the mean attachment to the shopping site for shopping with a companion condition was 2.95. However, as presented in the Table 4.19, the results are not significant ($p > 0.05$). Therefore, H5 is not supported.

Table 4.18. Descriptive Statistics- The effect of shopping companion on attachment
1- Shopping alone 2- Shopping with a companion

	Condition	Mean	Std. Deviation	N
ATTACH	1	2.5862	1.35006	29
	2	2.9464 2.7632	1.54164 1.44576	28
	Total			57

Table 4.19. ANOVA - The effect of shopping companion on attachment

		Sum of Squares	Df	Mean Square	F	Sig.
ATTACH	Between Groups	1.952	1	1.952	.949	.334
	Within Groups	117.209	57	2.056		
	Total	119.161	58			

4.6. EFFECT OF SHOPPING COMPANION ON MONEY SPENT

Data obtained for the money spent on the shopping site from the eye tracker was analyzed using one way ANOVA to compare the effects of the conditions on the amount of money consumers spent. The mean values and standard deviations are shown in Table 4.20 while the results of the one way ANOVA test is presented in Table 4.21.

The results from the one way ANOVA showed that the mean amount of money consumers spent under shopping alone condition was \$69.17 whereas the mean amount of money consumers spent under shopping with a companion condition was \$74.31. However, as presented in the Table 4.21, the results are not significant ($F=0.370$, $p>0.05$). Therefore, H_6 is not supported.

Table 4.20. Descriptive Statistics- The effect of shopping companion on money spent
1- Shopping alone 2- Shopping with a companion

		Condition	Mean	Std. Deviation	N
Money Spent	1		69.1740	32.95615	30
	2		74.3073	32.37857	30
	Total		71.7407	32.49385	60

Table 4.21. ANOVA- The effect of shopping companion on the money spent

Dependent Variable		Sum of Squares	Df	Mean Square	F	Sig.
Money Spent	Contrast	395.267	1	395.267	.370	.545
	Error	61899.910	58	1067.240		

4.7. EFFECT OF SHOPPING COMPANION ON TIME SPENT

Data obtained for the time spent on the shopping site from the eye tracker was analyzed using one way ANOVA to compare the effects of the conditions on the time consumers spent. The mean values and standard deviations are shown in Table 4.22 while the results of the one way ANOVA test is presented in Table 4.23.

The results from the one way ANOVA showed that the mean time consumers spent under shopping alone condition was 65.32 seconds whereas the mean time consumers spent under shopping with a companion condition was 390.88 seconds. As presented in the Table 4.23, the results are significant ($F=33.026$, $p<0.05$). It means that shopping with companion increases the time consumer spent on the online stores. Therefore, H7 is supported.

Table 4.22. Descriptives- The effect of shopping companion on the time consumers spent

1- Shopping alone 2- Shopping with a companion

Condition		Mean	Std. Deviation	N
Total visit time on the site	1	65.3167	34.90923	30
	2	390.8760	308.31419	30
	Total	228.0963	272.52261	60

Table 4.23. ANOVA- The effect of shopping companion on the time consumers spent

Dependent Variable		Sum of Squares	Df	Mean Square	F	Sig.
Total visit time on the site	Contrast	1589833.193	1	1589833.193	33.026	.000
	Error	2792012.462	58	48138.146		

4.8. EFFECT OF SHOPPING COMPANION ON HEDONIC VALUE

Hedonic value data obtained from the survey was analyzed using a one way ANOVA to compare the effects of the conditions on the hedonic value of consumers' shopping experience. The mean values and standard deviations are shown in Table 4.24 while the results of the one way ANOVA test is presented in Table 4.25.

The results from the one way ANOVA showed that the mean hedonic value of consumers' shopping experience for shopping alone condition was 3.59 whereas the mean hedonic value of consumers' shopping experience for shopping with a companion condition was 3.86. However, as presented in the Table 4.25, the results are not significant ($p > 0.05$). Therefore, H8 is not supported.

Table 4.24. Descriptive Statistics - The effect of shopping companion on hedonic value
1- Shopping alone 2- Shopping with a companion

Condition		Mean	Std. Deviation	N
HEDONIC	1	3.5931	1.12056	29
	2	3.8643	1.33117	28
	Total	3.7263	1.22511	57

Table 4.25. ANOVA - The effect of shopping companion on hedonic

		Sum of Squares	Df	Mean Square	F	Sig.
HEDONIC	Between Groups	1.473	1	1.473	1.021	.316
	Within Groups	83.633	58	1.442		
	Total	85.106	59			

4.9. EFFECT OF SHOPPING COMPANION ON UTILITARIAN VALUE

Utilitarian value data obtained from the survey was analyzed using a one way ANOVA to compare the effects of the conditions on the utilitarian value of consumers' shopping experience. The mean values and standard deviations are shown in Table 4.26 while the results of the one way ANOVA test is presented in Table 4.27.

The results from the one way ANOVA showed that the mean utilitarian value of consumers' shopping experience for shopping alone condition was 5.14 whereas the mean utilitarian value of consumers' shopping experience for shopping with a companion condition was 4.76. In addition, as presented in the Table 4.27, the results are not significant ($p > 0.05$). Therefore, H9 is not supported.

Table 4.26. Descriptive Statistics - The effect of shopping companion on utilitarian value

1- Shopping alone 2- Shopping with a companion

	Condition	Mean	Std. Deviation	N
UTILIT	1	5.1379	1.29316	29
	2	4.7589	1.13750	28
	Total	4.9518	1.22332	57

Table 4.27. ANOVA - The effect of shopping companion on utilitarian value

		Sum of Squares	Df	Mean Square	F	Sig.
UTILIT	Between Groups	.600	1	.600	.373	.544
	Within Groups	93.196	58	1.607		
	Total	93.796	59			

4.10. EFFECT OF SHOPPING COMPANION ON RETURN INTENTION

Return Intention data obtained from the survey was analyzed using a one way ANOVA to compare the effects of the conditions on the consumers' intention to return to the shopping site in future. The mean values and standard deviations are shown in Table 4.28 while the results of the one way ANOVA test is presented in Table 4.29.

The results from the one way ANOVA showed that the mean consumers' intention to return to the shopping site for shopping alone condition was 3.44 whereas the mean consumers' intention to return to the shopping site for shopping with a companion condition was 3.76. However, as presented in the Table 4.29, the results are not significant ($F= 0.618, p>0.05$). Therefore, H10 is not supported.

Table 4.28. Descriptive Statistics - The effect of shopping companion on return intention

1- Shopping alone 2- Shopping with a companion

Condition		Mean	Std. Deviation	N
RET	1	3.4417	1.50242	30
	2	3.7583	1.61683	30
	Total	3.6000	1.55561	60

Table 4.29. ANOVA- The effect of shopping companion on return intention

Dependent Variable		Sum of Squares	Df	Mean Square	F	Sig.
RET	Contrast	1.504	1	1.504	.618	.435
	Error	141.271	58	2.436		

5. DISCUSSIONS

5.1. EFFECT OF SHOPPING COMPANION ON ATTACHMENT

Our results from the one way ANOVA showed that the mean attachment to the shopping site for shopping alone condition was 2.59 whereas the mean attachment to the shopping site for shopping with a companion condition was 2.95. However, the results were not significant ($p>0.05$). Therefore, H5 is not supported.

According to Chebat et al., 2012, place attachment (online or physical) is associated with friendship, positive or collaborative relations with people who have shared the same space. Consumers who receive some social support at commercial settings where they can share their problems develop a strong attachment to these places. In our study, the companion shopper was not a friend, it was an acquainted. In addition, some consumers did not intend to collaborate and they just wanted to complete the task such as “This chat is taking too long and I am an impatient person so I am just going to pick the Skagen.” Therefore, consumers may not have a close relationship and cannot have attachment to the shopping site.

5.2. EFFECT OF SHOPPING COMPANION ON MONEY SPENT

According to Sommer et al. (1992), the presence of other people while shopping often leads to more pleasant shopping experiences than shopping alone. Thus, consumers spend more time and purchase more in stores. Our results showed that although consumers who shop with a companion spent more time in the online stores, they did not

spend more money. This result may be explained by the distracting effect of shopping companion because shopping companion can take away some benefits from the shopping experience. The presence of a shopping companion can reduce the attention on the shopping task need to be performed (Baron et al., 1973) and be distracting. Thus, a shopping companion can reduce shopping effectiveness by making the utilitarian cues less salient (Borges et al., 2010). In addition, the products on the site were below the standards of some consumers. Therefore, they did not prefer to spend more such as “My mother and sister all love the high brand names”. Another customer also made the following comment “It would appear so mostly plastic, I can interest in a Rolex.”

5.3. EFFECT OF SHOPPING COMPANION ON HEDONIC VALUE

In our study, the results from the one way ANOVA showed that the mean hedonic value of consumers' shopping experience for shopping alone condition was 3.59 whereas the mean hedonic value of consumers' shopping experience for shopping with a companion condition was 3.86. However, the results are not significant ($p>0.05$). Therefore, H8 is not supported.

The study of Borges et al., (2010) showed that hedonic value increases if the companion is friend, it decreases if the companion is family member. In our study, the companion shopper was not neither friend nor family member, it was an acquainted. Therefore, in our study the results may not supported the literature because of the acquainted shopping companion.

5.4. EFFECT OF SHOPPING COMPANION ON UTILITARIAN VALUE

Our results from the one way ANOVA show that the mean utilitarian value of consumers' shopping experience for shopping alone condition was 5.14 whereas the mean utilitarian value of consumers' shopping experience for shopping with a companion condition was 4.76. The results are not significant ($p > 0.05$). As a result, in our study, when compared shopping alone condition, shopping companion does not increase utilitarian value of shopping experience which can be explained by the distracting effect of shopping companion. A shopping companion can take away some benefits from the shopping experience by reducing the attention on the shopping task need to be performed (Baron et al., 1973) and be distracting. Thus, a shopping companion can reduce shopping effectiveness by making the utilitarian cues less salient (Borges et al., 2010).

According to Topaloglu (2012), utilitarian value increases when consumer obtains the product with less effort. However, according to our chat results some consumers needed to make more effort to obtain the products because they did not feel that the information on the website was enough such as "I want to see it on big screen," "Alright let me Google it when I get back home". However, they were happy with taking suggestions from the companion "alright thank you for your help."

5.5. EFFECT OF SHOPPING COMPANION ON RETURN INTENTION

Our results from one way ANOVA showed that the mean consumers' intention to return to the shopping site for shopping alone condition was 3.44 whereas the mean

consumers' intention to return to the shopping site for shopping with a companion condition was 3.76. However, the results are not significant ($F= 0.618, p>0.05$).

Perceived usefulness has an important impact on return intentions. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his/her performance (Davis, 1989). When customers believe that using the website will enhance their shopping productivity (perceived usefulness), they will be more likely to return (Koufaris, 2002). The study of Koufaris (2002) proved that. In our study, we also asked the subject whether the e-commerce website is useful. As presented in Table 5.1., when compared shopping alone condition, shopping with a companion did not increase the perceived usefulness of the website. The reason consumer did not intent to return the e-commerce website in future can be explained with perceived usefulness.

Table 5.1.Descriptive Statistics-The effect of shopping companion on perceived usefulness

Condition	Mean	Std. Deviation	N
PU 1	4.4083	1.29735	30
2	4.4167	1.57340	30
Total	4.4125	1.42973	60

Table -5.2. ANOVA- The effect of shopping companion on perceived usefulness

Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.
PU Contrast	.001	1	.001	.001	.982
Error	120.602	58	2.079		

6. IMPLICATIONS

According to a social commerce survey (Mardsen, 2009), 83% of online shoppers are willing to share shopping information with their friends, and 67% of online shoppers are likely to purchase more based on the recommendations they get from their community. Signs show that social shopping will play a big role in online retail. Retailers will not only need to adapt to this new social shopping world but learn how to effectively put it into action (Savitz, 2012).

According to the results of a customer experience survey by Forrester's North American Technographics (2010), co-browsing has much higher satisfaction ratings than other live-assist communication channels (co-browsing (78%), phone (74%), chat (69%), email (54%), and web self-service (47%)). Therefore, businesses cannot ignore the advantage of co-browsing tool which facilitates communication and collaboration to increase social interactions among customers.

The findings from this research have implications for both academic researchers as well as retail practitioners. Social factors between customers and companion shoppers in online environments have not been fully studied, so this is a step in the direction of a better understanding and explanation of this phenomenon. The results from this study have further strengthened the importance of social interactions on online shopping experience. Results from this study show that shopping with companion by using a co-browsing tool increases consumers' arousal level, which enhances purchasing intentions, and store visit duration (Sherman et al., 1997). Therefore, it would be beneficial for e-retailers to encourage customer to shop with their friends by providing a co-browsing tool. One way to accomplish this is to develop special programs or events, such "Friend

week”, where customers accompanied with friends will benefit from promotions such buy one and get one for half price. E-retailers can also offer coupons to customers accompanied by a friend. For example, Starbucks recently offered customers who brought a friend to stores a free beverage with purchase. It can also be applied to online environments such as, if they invite a friend to shop together by using co-browsing, they can get some promotions or free products.

This study also showed that when compared to shopping alone condition, consumers who shop with a companion spent more time in online stores. Therefore, co-browsing can be a useful tool for the business which generate from advertising revenue. For example, if they generate ad revenue from time spent on the site, co-browsing can result in spending more time on the website and generate more revenue. In addition, co-browsing can be helpful for the businesses which use context-sensitive advertising. For example, while users are chatting by using a co-browsing tool, the ads associated with the content of the chatting can appear on the site.

In addition, our study showed that co-browsing tool increases the perceived social presence of shopping sites. It is important that the lack of social presence may impede the growth of e-commerce because of the lack of human interactions and thus trust (Gefen and Straub, 2003). By offering co-browsing tool, businesses can encourage consumers to believe they are shopping not just in a machine but also in real world.

The results if this study showed that co-browsing provides a platform for shoppers to interact with each other, thus making it easier for sharing information, ideas, and suggestions. Information sharing and support is important because the shopping information received from friends is viewed as more valuable (Mardsen, 2010). In

addition, from business perspective, if consumers get information support from other shoppers or shopping companion by using co-browsing tool, they may need customer services less, which provides cost saving for businesses. Thus, this paper can provide valuable information for online retailers to understand the advantages of co-browsing tools.

This paper can also provide valuable information for academic researchers.

Although there some studies that try to understand the social aspects of co-browsing tool, they do not try to explore consumers' physiological and perceptual responses by using physiological devices such as eye tracker and Q sensor so this is a step in the direction of a better understanding and explanation of co-browsing phenomenon.

7. LIMITATIONS

The sample used for this study consisted purely of under graduate and graduate students from a Midwest university. But care has been taken to see that the participants have online shopping experience. However, for further research, the sample can be broader which includes subjects from different ages, from different income and education levels.

In this study, the shopping companion is an acquainted shopper. For further research, the shopping companion can be chosen as a friend or family member to understand the social effects of different companions in online shopping environment.

8. CONCLUSIONS AND FUTURE WORK

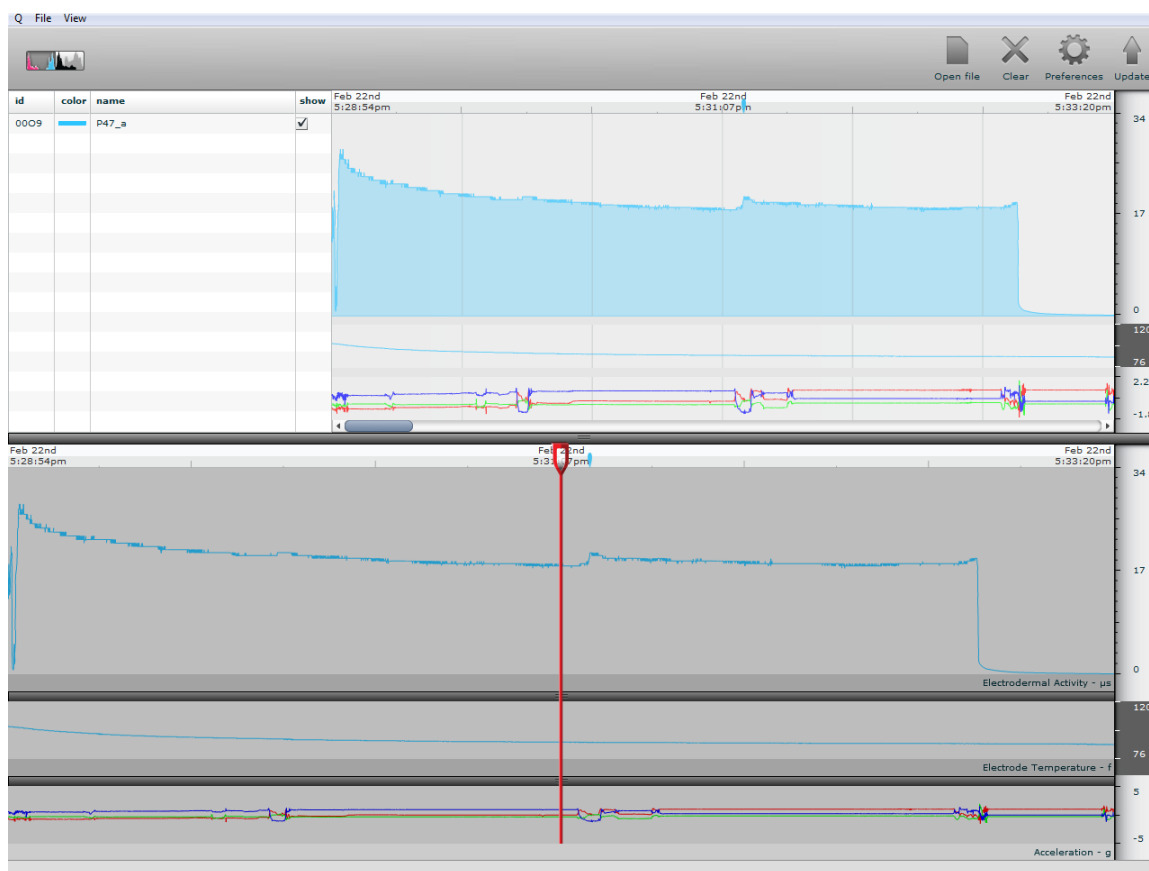
In this study, a representative e-commerce website called www.timebuy.com, which offers a co-browsing tool was created to understand how co-browsing affects consumers' cognitive beliefs, emotions and behaviors and how co-browsing is different than shopping alone online. There were two conditions; shopping alone vs. shopping with a companion by using a co-browsing tool. Participants were asked to shop a wrist watch for female friend as a birthday gift and each participant was randomly assigned to one of the conditions. The results showed that compared to shopping alone, shopping companion increases consumers' arousal level. Also, using co-browsing tool while shopping online increases the social presence of the shopping site. In addition, when consumers shop with a companion, they spend more time in online stores than when they shop alone. However, shopping companion may be distraction and take away some attention from the shopping task.

Future plans for this research will be focused on the effects of different types of companions on the consumers' behaviors, cognitive beliefs and purchase decisions. Although there are some studies on the different types of companions, they are for physical store environment. However, there have not any studies that try to explore the effects of different types of companions such as friends and family member or couples on shoppers' shopping behaviors and purchase decisions for online shopping environments.

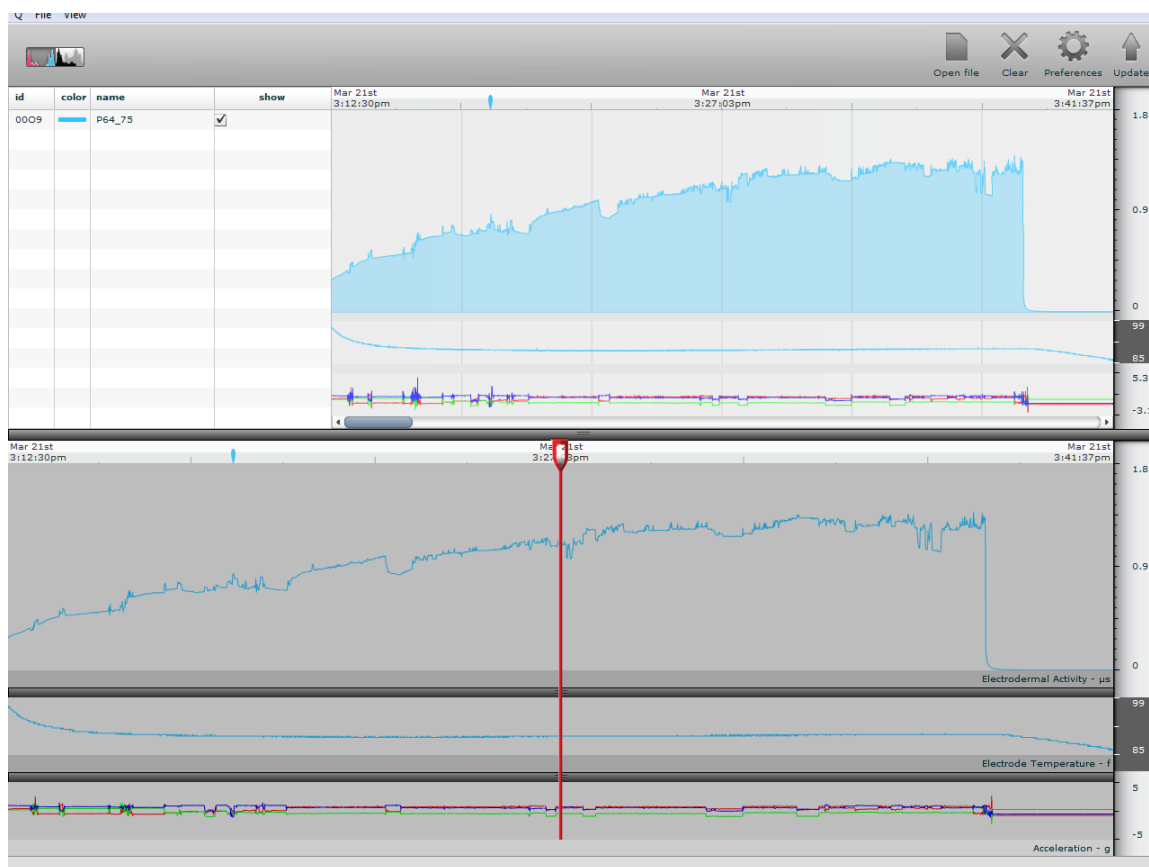
APPENDIX A

LEVEL OF AROUSAL

Shopping alone condition



Shopping with a companion condition



APPENDIX B

HEAT MAPS

Shopping alone condition

5 counts

www.timetobuy.com

Women
 Men
 Casual
 Fashion
 Sport
 Best Sellers

[Contact us](#)
[About us](#)

<p>Crown Price: \$155.00 BUY</p> <p>Band Material: Plastic Band Width: 22 mm Band Color: Blue</p>	<p>Akrbox Price: \$159.00 BUY</p> <p>Band Material: Satin Band Width: 20 mm Band Color: Pink</p>	<p>Akrbox Gold Price: \$159.00 BUY</p> <p>Band Material: Alloy Band Width: 18 mm Band Color: Gold</p>
<p>Crown Price: \$155.00 BUY</p> <p>Band Material: Plastic Band Width: 17 mm Band Color: Black</p>	<p>Haurex Price: \$40.00 BUY</p> <p>Band Material: Silicone Band Width: 20 mm Band Color: Green</p>	<p>Akrbox Price: \$159.00 BUY</p> <p>Band Material: Leather Band Width: 20 mm Band Color: White</p>
<p>Crown Price: \$155.00 BUY</p> <p>Band Material: Silicone Band Width: 19.05 mm Band Color: Orange</p>	<p>Crown Price: \$155.00 BUY</p> <p>Band Material: Plastic Band Width: 20 mm Band Color: Black</p>	<p>Leather Collections Price: \$159.00 BUY</p> <p>Band Material: Plastic Band Width: 19.3 mm Band Color: Brown</p>
<p>Crown Price: \$155.00 BUY</p> <p>Band Material: Leather Band Width: 22 mm Band Color: Brown</p>	<p>Rosa Catalina Price: \$159.00 BUY</p> <p>Band Material: Stainless Steel Band Width: 20 mm Band Color: Silver</p>	<p>Stress Price: \$125.00 BUY</p> <p>Band Material: Leather Band Width: 12 mm Band Color: Grey</p>
<p>Akrbox Red Price: \$179.99 BUY</p> <p>Band Material: Plastic Band Width: 20 mm Band Color: Black</p>	<p>August Steiner Price: \$179.00 BUY</p> <p>Band Material: Leather Band Width: 20 mm Band Color: Blue</p>	<p>Akrbox Price: \$159.00 BUY</p> <p>Band Material: Plastic Band Width: 22 mm Band Color: Pink</p>
<p>Crown Price: \$155.00 BUY</p> <p>Band Material: Brass Band Width: 19 mm Band Color: Pink</p>	<p>Crown Price: \$155.00 BUY</p> <p>Band Material: Satin Band Width: 20 mm Band Color: Black</p>	<p>Crown Price: \$155.00 BUY</p> <p>Band Material: Plastic Band Width: 18 mm Band Color: Black</p>

surf together

index.aspx

Internet | Protected Mode: Off

100%

Shopping with a companion condition

57 counts mesurf

Room: 3 (2 people)
 GUEST2 (leader)
 Carol (guest)

Invite Pass Control

Chat

Guest2: OK, I think I will go with that one
 Carol: ok you can buy it
 Guest2: Thank you for your help
 Carol: I really like it

index.aspx

www.timetobuy.com

Women
 Men

Casual
 Fashion
 Sport

Best Sellers

Contact us
 About us

 Crow_Blue Price: \$46.99 BUY Band Material: Plastic Band Width: 22 mm Band Color: Blue	 Almbos_Pink Price: \$129.00 BUY Band Material: Satin Band Width: 20 mm Band Color: Pink	 Almbos_Gold Price: \$104.99 BUY Band Material: Alloy Band Width: 18 mm Band Color: Gold
 Freestyle Price: \$55.00 BUY Band Material: Plastic Band Width: 17 mm Band Color: Black	 Haurex Price: \$40.00 BUY Band Material: Silicone Band Width: 20 mm Band Color: Green	 August Steiner Price: \$69.90 BUY Band Material: Leather Band Width: 20 mm Band Color: White
 Jouel_orange Price: \$16.99 BUY Band Material: Silicone Band width: 19.05 mm Band Color: Orange	 JBLW Price: \$49.99 BUY Band Material: Plastic Band width: 20 mm Band Color: Black	 La Mer Collections Price: \$149.50 BUY Band Material: Plastic Band Width: 19.5 mm Band Color: Brown
 TKO_Rose Gold Price: \$60.00 BUY Band Material: Leather Band Width: 22 mm Band Color: Brown	 Rap Out Catalina Price: \$50.00 BUY Band Material: Stainless Steel Band Width: 20 mm Band Color: Silver	 Skagen Price: \$64.25 BUY Band Material: Leather Band Width: 12 mm Band Color: Grey
 Albke_Red Price: \$17.99 BUY Band Material: Plastic Band Width: 20 mm Band Color: Black	 Summer_Blue Price: \$40.00 BUY Band Material: Leather Band Width: 20 mm Band Color: Blue	 TKO_Pink Silver Price: \$51.00 BUY Band Material: Plastic Band Width: 22 mm Band Color: Pink
 Da Vinci_Pink Price: \$17.99 BUY Band Material: Brass Band Width: 19 mm Band Color: Pink	 Burgi_Black Price: \$119.00 BUY Band Material: Satin Band Width: 20 mm Band Color: Black	 Almbos_Black Price: \$99.00 BUY Band Material: Plastic Band Width: 18 mm Band Color: Black

Internet | Protected Mode: Off

APPENDIX C

SURVEY QUESTIONS

Gender: Male () Female ()
Age: 18 and younger () 19-24 () 25-34 () 35 and older ()
Please indicate the highest level of education completed High School/GED () 2-Year College Degree () 4-Year College Degree () Master's Degree () Other ()
Please indicate your area of specialization HCI () ERP () Both HCI and ERP () Social Media () Business () Other ()
Please indicate your annual household income \$20000 or less () \$20001 - \$40000 () \$40001-\$60000 () \$60001-\$80000 () \$80001-\$100000 () More than \$100000 ()
Please indicate how much you spend when buying a birthday gift for a friend \$25 or less () \$26 - \$50 () \$51-\$100 () \$101-\$150 () \$151-\$200 () More than \$200 ()
Please indicate how often you use the internet Every day () More than once a week () Once a week () Once a month () Less than once a month ()
Please indicate how often you use the internet for shopping Every day () More than once a week () Once a week () Once a month () Never ()
Please indicate how many times on average you have bought products ONLINE over the last 12 monthstimes
Please indicate how much you have spent on online purchases of products from websites in the last 12 months \$.....

1	2	3	4	5	6	7	
Strongly Disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree	
Perceived Usefulness, Zhu et al., 2006							
Using this website can improve my online shopping performance.	1	2	3	4	5	6	7
Using this website can increase my online shopping productivity.	1	2	3	4	5	6	7
Using this website can increase my online shopping effectiveness.	1	2	3	4	5	6	7
I find using this website useful for online shopping.	1	2	3	4	5	6	7
Information Support							
I was able to get suggestions when I needed help.	1	2	3	4	5	6	7
When I encountered a problem, I was able to get information to help me overcome the problem.	1	2	3	4	5	6	7
When faced with difficulties, I was able to discover the cause and get suggestions.	1	2	3	4	5	6	7
Hedonic Value of Shopping Experience, Borges et al., 2010							
During this shopping activity, I.....							
felt like it was an adventure	1	2	3	4	5	6	7
had a nice time because I could be impulsive	1	2	3	4	5	6	7
felt shopping on this website was nicer than doing something else	1	2	3	4	5	6	7
felt joy	1	2	3	4	5	6	7
was pleased with this shopping website	1	2	3	4	5	6	7

felt like I was shopping not only for the watches, but by the shopping experience itself	1	2	3	4	5	6	7
felt the excitement of the hunt	1	2	3	4	5	6	7
Utilitarian Value of Shopping Experience, Borges et al., 2010							
During this shopping trip I ...							
did exactly what I was expecting to do	1	2	3	4	5	6	7
found exactly what I need	1	2	3	4	5	6	7
could not buy what I was looking for	1	2	3	4	5	6	7
was disappointed because I needed to go elsewhere to complete my shopping	1	2	3	4	5	6	7
Attachment to Shopping Site, Moore and Graefe, 1994							
I feel that I can strongly identify with this shopping site	1	2	3	4	5	6	7
I am very attached to this shopping site	1	2	3	4	5	6	7
I feel like I am the part of the family in this shopping site	1	2	3	4	5	6	7
This shopping site deserves my loyalty	1	2	3	4	5	6	7
I am happy to tell my friends that this shopping site is an excellent place to shop	1	2	3	4	5	6	7
Social Presence, Shen 2012							
There is a sense of human contact in this website	1	2	3	4	5	6	7
There is a sense of sociability in this website	1	2	3	4	5	6	7
There is a sense of human warmth in this website	1	2	3	4	5	6	7
There is a sense of human sensitivity in this website	1	2	3	4	5	6	7

Intention to Return, Hausman and Siekpe, 2009							
I will definitely buy products from this site in the near future	1	2	3	4	5	6	7
I intend to purchase through this site in the near future	1	2	3	4	5	6	7
It is likely that I will purchase through this site in the near future	1	2	3	4	5	6	7
I expect to purchase through this site in the near future	1	2	3	4	5	6	7

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