WEB PAGE BACKGROUND COLOR EVALUATIVE EFFECT ON SELECTED PRODUCT ATTRIBUTES

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WEB PAGE BACKGROUND COLOR EVALUATIVE

EFFECT ON SELECTED PRODUCT ATTRIBUTES

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PREFACE

This exploratory study was conducted to evaluate the effect of Web page background hue on consumers' attitudes toward selected product attributes and to determine if these attributes impact consumers' likelihood of purchase. The participants' experiencing of background hues resulted in only limited significant differences in mean attribute scores for the products. Products featured on the orange background and the blue background received the most positive attribute scores. The positive results pertaining to the orange background may reflect a current fashion trend for that color. Significant differences were observed in relation to demographic characteristics. This reinforces the marketing belief that business owners need to identify their target market and adapt marketing strategies to the characteristics of that target. The results of this study provide baseline data for future research on the effect of Web page characteristics.

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CHAPTER I

INTRODUCTION

Businesses operated from the home are the fastest growing entrepreneurial segment in the United States increasing at a rate of two million a year (Dannhauser, 1999). Estimates vary as to the number of home-based entrepreneurs and range from 10 million to 50 million and it is estimated that these entrepreneurs operate 18.3 million home-based businesses (Allen & Moorman, 1997; Editors, 1998; Goodman & Moeller, 1998; Griffin, 1998; Ruhling, 2000). The increase in the number of home-based businesses is attributed to corporate downsizing, technological advances, and a desire to have control over one's lifestyle (Bates, 1998; Pratt, 1993).

The desire to have control over one's lifestyle is especially true for home-based business owners who live in rural areas (Saylor, 1987). Rural families, whose livelihoods are derived from agriculture-based resources, may have lost or suffered a reduction in family income as agriculture commodity prices declined (Rowley, 1998). These families often seek alternative sources of income that yield minimal disruption to other parts of their lives (Loker, Owen, & Stafford, 1995). Minimum disruption occurs if the family can continue to live in the community where they have an established home, familiar surroundings and services, and a network of family and neighbors (Owen, Heck, & Rowe, 1995). Helping rural families remain in their communities while sustaining family income has stimulated the need for a new economic development strategy to help revitalize rural America.

One non-agriculture income generation option, which can provide family income as well as allow families to remain in their present home, is operating a home-based business. Home-based business owners tend to be long term residents of their communities (Masuo, Walker, & Furry, 1992) and frequently live on farms or in rural areas (Biers, 1993; Williams-Miles, 1993). The number of rural households with a member engaged in home-based work ranges from 6.2 percent to 17 percent, depending upon the definition of home-based work that is used (Stafford, Winter, Duncan, & Genalo, 1992). Home-based businesses add diversity to the products and services available in rural communities (Rowe, Haynes, & Stafford, 1999). Due to advances in technology and transportation, income generating activities once dependent on urban economies can now be located and operated in rural areas (Vias, 1999). However, remoteness appears to be an economic liability for rural home-based business owners who manufacture and sell products (Drabenstott & Smith, 1996).

Marketing Needs of Home-Based Business Owners

Home-based business owners start a business because they have the skill to produce a product or provide a service, but they frequently lack business management skills or marketing skills (Soldressen, Fiorito, & He, 1998). Information about marketing is the most frequently cited topic with which home-based business owners report needing assistance (Biers, 1993; Biers & Burns, 1998). The majority of home-based business owners sell their products or services within their communities and/or state (Abells, 1997; Biers, Duncan, Lastovica, Smith, & Couchman, 1997; Rowe, Haynes, & Bentley, 1993). Although the local market is convenient, it may not be the best place to sell. Artisans and craftspeople can have difficulty selling products in a local market, as there may be an

abundance of highly skilled persons in the area producing the same or similar products to a limited size target market. The dependence upon agriculture for income may limit the ability of rural families to purchase the work of local artisans and craftspeople. "One of the problems a business owner must solve is his or her narrow view of the potential market" (Hondale & Tanner, 1987, p. 81). Business owners who sell products outside their state report significantly more income (Harms, 1989; Rowe et al.).

Home-based business owners are frequently responsible for all aspects of the business operation including production, management, and marketing. One of the challenges of operating a home-based business is identifying and connecting with the target market (Biers, 1993; Biers & Burns, 1998; Edwards & Edwards, 1998). Connecting with the target market is especially difficult for rural home-based business owners. Rural home-based business owners tend to market products within the local area and use strategies such as word of mouth referrals, craft shows, printed catalogs, and flyers. The limited size of the target market in the local area leads to competitive pricing among producers. Competitive pricing can reduce or eliminate profit and may increase the likelihood that the business will not financially break even. Level of competition was found to be among the important predictors of economic success and business survival (Kalleberg & Leicht, 1991).

Home-based business owners attending Cooperative Extension marketing workshops are seeking economic success and are beginning to address the issue of extending the geographical reach of their marketing efforts. Expanding marketing efforts beyond the community offers the potential for home-based business owners to reach target customers who are external to the community. Export base theory posits that a rural community's

economic vigor depends upon the sale of goods and services to consumers external to the community (Shaffer, 1989). The World Wide Web, hereafter referred to as the Web, portion of the Internet provides an opportunity for home-based business owners to reach external markets.

Home-Based Business and E-Commerce

Popular press articles indicate that e-commerce is the way to do business in today's world and that businesses need a Web site on the Internet (Nucifora, 1997; Roha & Henry, 1998). Although commerce on the Web is young, it is anticipated that its impact will be large. Forrester Research Inc. estimated that electronic commerce totaled approximately $22 billion in 1998 with 78% of that total spent on business to business transactions (Coy, 1998). In 1998, it was predicated that e-commerce would increase to $350 billion by the year 2000 (Coy). But by the year 2000, consulting firms were predicting that business to business (b2b) e-commerce would reach $2.7 trillion by 2004 and that online sales of consumable goods would reach $119 billion by 2005 (McGarvey, 2000). As e-tailers focus on identifying their target market, the estimate of online sales continues to rise. Emarketer estimates that Internet sales will grow to $428 billion by 2004 (Whelan, 2001).

In addition to selling products and services, Web sites help businesses control inventory, inform customers of new products and developments, communicate with suppliers and customers, and handle customer inquiries and complaints (McGarvey, 1995). When e-commerce started, the popular belief was that the Web would eliminate the advantages of size and thus equalize opportunities for large and small businesses McGarvey; Nucifora; 1997; Resnick & Taylor, 1995). As business to consumer (b2c)

commerce becomes more popular, consumers are warned to conduct business with online companies that they know and trust by name ("ho-ho-ho...holiday shopping on the Internet, 1998). Name recognition makes it easier for online shoppers to locate the business's Web site, provides assurance that the business is legitimate, and based upon the shoppers previous experience with the business, provides a clue to the quality of the goods or services offered. The lack of name recognition and monetary resources for Web development may be a disadvantage for home-based business owners. An effective Web site atmosphere may help reduce this disadvantage.

Limited research has been conducted on small businesses with established Web sites. In a survey of small business owners, 24% reported having a Web site (Edwards & Edwards, 1998). Forty-six percent of those having a Web site reported that the site was worth their time and energy, 37% weren't sure the site was worth their time and energy and 6% indicated the site was not worth their investment (Edwards & Edwards). Home-based business owners attending Cooperative Extension marketing seminars report that they are either interested in developing a Web site or have an established site. Business owners with established sites want to know how to improve their site and business owners who are considering developing a Web site want to know how to design the site to maximize consumers' shopping experience and patronage. Some owners report they have invested in a site or sites, and due to low or no response, have removed the site from the Web (D. Nielsen, personal communication, February 10, 2000).

A Web site serves as a mediator between the buyer and seller, by which the buyer is enabled to evaluate the seller and his/her products. In previous studies, exchange theory has been used to study traditional relationships between the buyer and the seller (Miller,

Kean, & Littrell, 1999). In e-commerce and in this project, the Web site is the point of contact between buyers and sellers. Exchange theory, therefore, provides the framework for studying consumers' evaluative responses elicited by characteristics of the Web site.

Building upon exchange theory, Bagozzi (1979) identified four determinants that influence whether an economic exchange will occur or will be voided. These determinants are: (1) social influence between actors, (2) characteristics of social actors, (3) effects of third parties, and (4) situational contingencies. Situational contingencies include the qualities of the physical environment (such as Web site background hue). Bagozzi also identified three consequences of exchange: outcomes, actions, and experiences. A consumer's evaluation of selected product attributes represents a type of consumer experience (Bagozzi). Bagozzi's model is found in Appendix A.

Need for the Study

Web site design can create an atmosphere that elicits a positive or a negative evaluation of viewed product(s). Kotler (1973/74) identified atmospherics as a marketing tool that is often overlooked when planning marketing strategy. Atmospherics is "the conscious designing of space to create certain effects in buyers" (p. 50). Atmosphere is experienced through the senses and color is one of the visual dimensions of atmospherics. To simulate shopping environments, previous retail studies had participants view products on projected slides with differently colored backgrounds. Results of these studies suggested that background hue affects consumers attitudes toward product attributes and likelihood of purchase (Bellizzi & Hite, 1992; Middlestadt, 1990). Findings from a study by Mandel and Johnson (1999) indicated that Web page background color and design can change consumers' product preference by influencing the importance of different product

attributes. Crowley (1993) identified consumers' responses to color as activation (or deactivation) related behaviors and as evaluative responses. Researchers are just beginning to test the concept of atmospheric effects on online shoppers' behaviors.

Statement of the Problem

Current research contains limited information about the effect of Web site background hue on online shoppers' attitudes toward featured products. This project addressed consumers' evaluative responses to selected products featured on selected Web background hues. Exchange theory provided the framework for studying consumers' evaluative responses elicited from one physical characteristic of the Web site (*i.e.*, background hue). This project tested the impact of this situational contingency (as an independent variable) upon consumers' attitudes toward product attributes, the dependent variable. The independent variables for this project were the Web site background hue and a selected product, while the dependent variables were the consumers' attitudes toward the product attributes and inclinations to purchase that product.

Purpose and Objectives

The purpose of this study was to evaluate the effect of Web page background hue on consumers' attitudes toward selected product attributes and consumers' likelihood of product purchase. The selected products were utilitarian and were products familiar to college students, the participants in this study. The objectives of this study were to:

1. measure and compare participants' attitudes toward a fleece vest in relation to a simulated Web page background hue,
2. measure and compare participants' attitudes toward a chest of drawers in relation to a simulated Web page background hue,

3. measure and compare participants' attitudes toward a bicycle bag in relation to a simulated Web page background hue, and
4. develop recommendations for home-based business owners concerning the use of Web page background hues to positively impact consumers' attitudes toward product attributes.

To accomplish the above objectives the following null hypotheses were tested:

1. There is no significant difference between participants' attitudes toward a featured product's attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to the simultated Web site background hue.
2. There is no significant difference between participants' likelihood of product purchase in relation to the simulated Web site background hue.
3. There is no significant relationship between participants' attitudes toward a featured product's attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to selected participant demographics (*i.e.*, age, gender, college major, size of community, frequency of online shopping, amount of time spent online, and credit card ownership) and the simulated Web site background hue.
4. There is no significant relationship between participants' attitudes toward a featured product's attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to the Web site background hue and the participants' personal preferences for selected hues.

Definition of Terms

The following terms are defined as they were used in the study:

Attitude – an individual's internal evaluation of an object (Mitchell & Olson, 1981).

Home-based business - profit ventures operated in or from the home.

Home-based business owners - individuals who own and operate a profit venture in or from the home.

Hue - name of a color

Electronic commerce (e-commerce) - conducting sales or other business transactions over the Internet or private networks (McCollum, 1997).

Revitalization - internally driven effort by community members to bring about new economic activity to support an upturn in the community's quality of life (Darling, McAdoo, & Randel, 1994).

Saturation - the brightness of a color.

Value - the lightness or darkness of a color.

Web site – the point of contact between online buyers and online sellers.

World Wide Web - a portion of the Internet; a global implementation of a hypermedia computer-media environment (Hoffman & Novak, 1996).

Assumptions and Limitations

This study should be evaluated in terms of certain limitations and assumptions.

Limitations:

- Only three product categories were evaluated.
- Evalation of product attributes was limited to the characteristics of Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness.

- Hues tested were limited to blue, green, orange, purple, red, yellow, and neutral white.
- The hues tested were at the full saturation level for the website software.
- Data was collected in the field, therefore:
  - to control for the quality of the Web site hue, the simulated pages used in this study were pressed onto a compact disk which the participants used to view selected hues.
  - the physical environment of the testing sites varied and the sites had a different environment than a home shopping environment.

Assumptions:

- It is assumed that the participants were representative of online shoppers.
- It is assumed that the participants responded with their honest reactions to the products.
- It is assumed that the featured products were new to the participants, and therefore they had no previous attitude toward the products.

CHAPTER II

LITERATURE REVIEW

The estimate of home-based business started annually in the United States ranges from a half million to two million (Dannhauser, 1999; Fraser, 1999). Corporate downsizing, technological advances and the desire to have control over one's lifestyle have contributed to the increase of businesses being operated from the home (Bates, 1998; Pratt, 1993). Rural families, especially those with generational ties to family farm ownership, are reluctant to forego the benefits of a rural lifestyle (Owen et al., 1995). While rural residents want to remain in the community where they have family ties and support and services, there frequently is limited income generating potential from non-agriculture sources. Rural families, who have a reduced income due to a downturn in the agriculture industry may supplement or replace family income through the operation of a home-based business. The need to generate income while remaining in the family home has led to the establishment of rural home-based businesses (Biers, 1993; Biers et al., 1997). A home-based business started by rural residents frequently builds on the owner's existing skills and talents. The owners have the technical ability to produce the product or provide the service, but lack training or experience in business management skills. As with many home-based business owners, owners in rural areas need assistance in conducting marketing research to determine the wants and needs of their target customer and in determining how to reach their target market (Biers; Biers et al.).

The use of the Internet to reach target markets is the buzzword in the popular press. News articles feature home-based business owners who have successfully used the World

Wide Web (Web) portion of the Internet for marketing their products or services (Roha & Henry, 1998). Home-based businesses are unique in that the product line(s) is limited and designed to fill the needs of a niche market. Internet marketing provides home-based business owners the opportunity to reach a larger number of individuals in their target market. Home-based business owners may have limited financial and human resources to develop an elaborate or extensive Web site. Research has not been conducted to determine what Web site attributes are important for home-based business sites. The purpose of this study was to evaluate the effect of Web page background hue on consumers' attitudes toward selected product attributes and consumers' likelihood of product purchase. The literature review focuses on atmospherics, characteristics of Web sites which enhance the exchange process, the potential of the Internet as a marketing medium, consumers and the Internet, home-based businesses, marketing strategies used by home-based business, and exchange theory.

Atmospherics

Consumer behavior studies indicate that the atmosphere of a retail establishment influences consumers' attitude toward price and quality of products and services (Kotler, 1973/74). According to Kotler, atmospherics is the conscious design of a shopping environment to produce a desired effect in consumers and to enhance the probability of purchase. Consumers perceive the atmosphere of a retail establishment through the senses of sight, sound, touch, and scent. Color is one of the visual dimensions that contributes to the atmosphere of a retail establishment. Previous background color studies used simulated retail shopping experiences to investigate the impact of background color on consumers' evaluation of selected merchandise and on consumers' intent to purchase

selected merchandise. Red and blue were used as a background color in the majority of the studies. Merchandise exhibited on a blue background elicited a more positive attitude toward the merchandise. Consumers were more likely to postpone purchase decisions when the merchandise was exhibited on a red background. A study by Mandel and Johnson (1999) indicated that Web background color and design influenced consumers' attitudes toward product attributes. A summary of the studies reviewed for this project is shown in Table 1.

Color

Color is a sensation produced in the human brain through a combination of light and the human visual system (Levkowitz, 1997). Color has been found to produce physical reactions and create emotional responses (Pegler, 1983; Pile, 1988). In general, research with human subjects and with animals indicates that warm colors such as red and yellow are physically stimulating while cool colors such as blue and green are more relaxing (Bellizzi, Crowley, & Hasty, 1983). Sharpe (1974) indicates that people respond emotionally to color rather than intellectually. When hues, saturation, and values are held constant, people perceive color differently. Physiological changes are believed to be instrumental in color perception. As people age, color discrimination declines. This decline is attributed to the yellowing of the lens (Sharpe). Experience and memory, which is gained as people age, mediates color perception (Levkowitz). It is believed that children do not attain accurate color discrimination until around the age of fifteen years (Sharpe). Gender is also a factor in color perception. Females of all ages have higher color discrimination abilities than males (Levkowitz; Sharpe).

Table 1

Previous Background Color Studies

Author and Date	Shopper Population	Sample Size	Background Colors	Merchandise	Findings
Bellizzi, Crowley, & Hasty (1983)	Female	125	Blue, green, red, yellow, and white	Furniture store	Cool colors resulted in more positive evaluation of the environment. Red environment was rated more colorful. Warm color environments were considered unpleasant.
Middlestadt (1990)	Female	84	Blue and red	Bottle of perfume, writing pen, and bottle of mineral water	Blue environment resulted in a more positive attitude toward purchasing the pen. No significant effects of the background color on attitudes toward the other two products.
Bellizzi & Hite (1992)	Part I: Adult Females Part II: Undergraduate students	Part I: 70 Part II: 107	Blue and red	Part I: Television sets Part II: Furniture	Blue environment resulted in more simulated purchases, fewer postponements of purchase and a stronger inclination to shop and to browse.
Crowley (1993)	Female	100	Blue, green, red, and yellow	Furniture store	Blue environment resulted in more positive evaluative effects.
Mandel & Johnson (1999)	Part I: Undergraduate students Part II: Web users	Part I: 76 Part II: 364	Blue and green Red /orange and green	Sofa Car	Participants' perception of product attributes was influenced by the background color and design of the Web page.

Color preferences also vary by gender and age. Young children tend to prefer bright colors (Pegler, 1983). When value and saturation are controlled, the color preference of men and women in North American follow the order of blue, red, green, violet, orange, and yellow with women showing a slight preference for red over blue and men showing a slight preference for blue over red (Sharpe, 1974). In North America there is a preference for saturated colors over unsaturated colors (Sharpe), although Arnheim (1969) suggests using saturated colors in small amounts. Color preference refers to a person's choice of color and suggests that the person finds one color more desirable than other colors (Guerin, Park, & Yang, 1995). In addition to color preference, colors have different meanings (Guerin et al.; Sharpe). Color meanings are frequently influenced by cultures. Meanings reflect the underlying significance that is attached to the color.

From the observer's aspect, color is composed of three dimensions including hue, value, and saturation. Hue is the actual color that is seen (*i.e,*. red, blue, green, etc.). The perception of a hue depends on the surrounding hues and the amount of each of the hues (Levkowitz, 1997; St. Marie, 1973; White, 1990). Value specifies the lightness or darkness of a color. Value depends upon the amount of light that is reflected or absorbed. A shade is a hue that has been darkened and a tint is a hue that has been lightened. Value strongly affects the perception of a color. Saturation specifies the intensity of the color. The corresponding dimensions in light terminology are dominate wavelength (hue), luminance (lightness or darkness), and purity (saturation) (Levkowitz).

Color and Consumers

The written and spoken word is the most commonly used method to communicate with customers. However, non-verbal communication methods are also used to convey

meaning about products to consumers (Bellizzi et al., 1983). Non-verbal communication includes the use of color, sound, and scent. It is through this system of non-verbal communication that retail stores provide cues to shoppers (Markin, Lillis, & Narayana, 1976). Color cues can be used to make the shopper feel responsive to buying, while other color cues may make the shopper impossible to reach (Pegler, 1983).

Retailers use color to attract consumers' attention to displays and to create an image. Color is typically what the shopper sees first and for some customers is more important than style or price. Warm colors have been found to draw customers into a retail setting and warm colors may increase the purchase of unplanned impulse items (Bellizzi et al., 1983). However, the use of warm colors with items normally requiring forethought before purchase, such as high priced items, may create a tense environment and result in a consumer's termination of the shopping trip (Bellizzi et al.). Color and emotion are closely related, but people react differently to the same color (Pegler, 1983). In general, people have been found to prefer cool colors to warm colors. Studies indicate that as age, education, income, and exposure to color associations increase so does the tendency to select subtle colors with little contrast (St. Marie, 1973). According to White (1990), the initial reaction to an object is a response based strongly on color (p. 22). Marketing studies indicate that entrepreneurs need to have a good understanding of consumers' reactions to various colors if they are to succeed in the marketplace. For example, green is not successfully used as a packaging color for sugar as green connotes sourness (Danger, 1969).

Electronic Color

The additive system is used in electronic coloring. Red, blue, and green are the additive primary hues (Pile, 1988). Additive colors mix together the wavelengths that represent the three hues considered primary, as these hues cannot be made by mixing other hues. A problem with color displays on computer monitors is that the monitors vary in the way they produce colors (Levkowitz, 1997). Colors that are selected on one computer monitor tend to appear differently on other monitors. Saturation on the computer is achieved from the phosphors that form the color image and red, green, and blue display the highest possible saturation (Norman, 1990). Some computer systems use the RGB model to create colors. This system is based on the red, green, and blue phosphors. When the RGB model is at 255 or the maximum amount of each color, white is created (the presence of all color) and when the RGB model is at 0, black is created or the absence of color. Other systems use the LHS model in which the user specifies the hue, the lumination, and the saturation.

Internet Marketing

The impact of technology on marketing practices is great and changing more rapidly than at any previous time. Historically, marketing practices changed as advances in transportation enabled producers to reach distant markets as well as enabled consumers to extend shopping areas. The introduction of the radio increased the potential of reaching a larger advertising area and television provided the opportunity to include visual advertising with sound (Powell, 1995). The advent of the Internet provided an avenue on which to conduct business.

The Web is where most exchange transactions occur (Peterson, Balasubramanian, & Bronnenberg, 1997). Early Web sites were criticized for being little more than brochureware because they placed existing marketing brochure information on a Web site (Levy, 1998; Robb, McCarthy, & Sheridan III, 1997). These sites were developed to raise an awareness of a company and its products, but did not provide interactivity with consumers nor did they give consumers a reason to return to the site (Breitenbach & Van Doren, 1998). The lack on interaction between the consumer and the business, which is found in traditional marketing practices, makes brochureware unsuitable for Web marketing use as the Internet consumer is used to active communication and interaction (Cronin, 1994).

A mistake business owners make is setting unrealistic expectations about what the Internet can do for the business (Levy, 1998). Business owners establish a Web site without really knowing what it can do for their particular business, then they just wait for the benefits to happen (McCollum, 1997). The majority of 14 small business owners, participating in a Small Business Development Center (SBDC) Web page development program, reported that their respective page generated less than two Web based sales over a twelve-month period. Yet the participants felt a Web presence should remain a part of their marketing strategy and that they should continue to use it to provide customer support (McCue, 1998). Small business owners hesitate to use the Internet because they are concerned about (a) getting consumers to connect with their site, (b) maintaining security, and (c) tracking and responding to consumers' needs (McCue). The time and resources involved in designing and maintaining a responsive site that consumers can locate and that is user friendly present barriers to small business owners (McCue).

The number of Web sites worldwide grew from 2.8 million in 1998 to 9.5 million in 1999 ("Internet at a Glance", 2000). To compete effectively with other Web sites, a business must keep the information on the site fresh, useful, compelling, and respond quickly to consumer requests (McCollum, 1997). The content of a site provides the means for a business to differentiate itself from other business sites ("White Paper", 1998). Internet marketers need to design sites to meet the needs and wants of their target customer in order to attract the customers to the site.

Internet marketing differs from traditional forms of marketing, such as television advertising and direct mail, because consumers choose which sites they want to access ("White Paper", 1998). The power to select sites gives consumers greater control over the marketing information they receive. Marketing on the Web provides a business the opportunity to customize a product to meet a consumer's need. In addition, a Web site allows a business to have greater control over inventory, increase market reach, and provide a means to lower advertising costs (Berthon, Pitt, & Watson, 1996; Spar & Bussgang, 1996; "White Paper). The Internet allows a business to be operated from any location and to range from a one person to a multi-employee operation (Berthon et al.; Nucifora, 1997). It is anticipated that marketing with a Web site will diminish the advantage of business size (Ainscough & Luckett, 1996; Holstein, Thomas, & Vogelstein, 1998; Lewis & Lewis 1997). Cronin (1994) stated " Through the Internet it is possible for any size company to create a customer-oriented environment" (p. 183).

Internet User

Early research related to the Internet focused on profiling the typical online user (Hoffman, Kalsbeek, & Novak, 1996). The typical user in the mid 1990s was a young,

(mid-thirties), white, urban, well-educated, male with an income level in the $60,000 range ("Cyberatlas:Demographics," 1996; "GVU's WWW User Surveys: Tenth Survey," 1998). The typical online user is changing. In the year 2000, the number of females online surpassed the number of males online, the number of users over 55 years of age increased, the socioeconomic status became more working class, and the ethnic composition diversified (Weiss, 2001). According to Interactive Solutions Group (ISG), a division of Market Facts, 62 million Americans or 30% of the population 16 years of age or older, surf the Web (Maguire, 1998). Estimates of the number of online users vary. However, research firms conducting Web use studies concur that the number of users is increasing. FIND/SVP, a New York technology research firm, estimates that in the United States 37.8 million adults have access to the Internet (McCollum, 1997). Worldwide it is estimated that up to 48 million people consider the Internet accessible ("Internet Commerce," 1998; Miller, 1996). Other accounts maintain that by the year 2001, five percent of the world's population will be reachable via the Internet. This percentage will amount to 200 million people. According to Miller, the number of persons using the World Wide Web part of the Internet tripled from 2.2 million in 1994 to 6.6 million in 1995.

Forrester Research, Inc. estimates that 33% of households in the United States are online and that 10% of these households have shopped online within the three previous months before January, 1999 ("Internet at Glance," 1999). Other estimates indicate that over 30 million businesses and households use the Internet (Breitenbach & Van Doran, 1998). Parks and Associates research group estimates that the number of U. S. households with online capabilities will increase to 73 million by 2004 (Ruhling, 2000). It is projected

that within the next five years the Internet will be available to even the remotest areas of the world via a satellite system referred to as the 'Internet in the sky' (Cook, 1997).

Internet Sales

In 1995, electronic retail sales in the United States reached $1 billion, which was only a small portion of the $1.7 trillion total retail sales (Lohse & Spiller, 1998). Electronic sales have continued to increase and Forrester Research, Inc. forecasts that consumer spending will reach $108 billion in 2003 ("Internet at a Glance", 1999). Internet-related commerce for both business and retail sales was projected to reach $200 billion by the year 2000 with retail sales accounting for only four percent of the total (McCollum, 1997). Emarketer estimates that by the year 2004 Internet sales will reach $428 billion (Whelan, 2001). Some businesses report an increase in sales from sites, while others experienced disappointment with Web site sales (Heath, 1997, May; McCue, 1998; Rao, Salam, & DosSantos, 1998). As more and more large retailers with established brand names enter the e-commerce arena, the small and midsize retailers are capturing only 9 percent of Web-based sales. This is expected to drop to 6 percent by 2003 (Fryer, 1999).

Over one-third (37.5%) of 645 Internet users reported that they had made Web purchases of $500 or more in the previous six months with 34% of the female respondents and 39.4% of the male respondents reporting spending this amount (GVU's WWW User Surveys: Tenth Survey: Total Spending", 1998). The largest number of respondents was in the 26-50 years of age range and 40.3% of this age group reported spending $500 or more on Web purchases in the previous six months ("GVU's WWW User Surveys: Tenth Survey: Total Spending").

Some seven percent of U.S. households have already made at least one purchase by computer ("Shopping Goes Online,"1998). Approximately one-third of the people who have Internet access report they have purchased products or services through the Web (Ackerman, 1998) while in 1995 only 13% of users indicated that they had made purchases via the Web (Resnick & Taylor, 1995).

Consumers and the Internet

Consumers are empowered by the electronic marketing and are becoming more proactive and assertive (Peterson, 1997). Online shopping is expected to shift power from the retailer to the consumer as consumers become active participants in the interactive market and will be able to control when and where they shop (Berthon et al., 1996; Sheth & Sisodia, 1997). According to Cronin (1994), consumers are demanding customized products and services and with the power of interactivity, the Web enables sellers to provide this customization. Alba et al. (1997) describe interactivity as "Quality of two-way communication between two parties" (p. 38). Interactivity helps business owners develop one-to-one relationships with customers, which can lead to the development of customer loyalty.

Online Shopping

It is estimated that online shopping accounted for between $200 and $350 million of the $50 to $60 billion spent in 1995 on home shopping in the United States (Burke, 1997). In 1996, retail sales over the Web accounted for $530 million or just 4% of the total e-commerce (McCollum, 1997). Forrester Research firm of Cambridge, MA. projected that e-commerce would increase to $200 billion by the year 2000 and that business to business e-commerce would reach $327 billion by 2002 (Hof, McWilliams, & Saveri,

1998; McCollum). But by the year 2000, consulting firms were projecting that busines to business e-commerce would reach $2.7 trillion by 2004 and that retail sales to consumers would reach $119 billion by 2005 (McGarvey, 2000). When compared to the first six months of 2000, online sales in the first six months of 2001 has increased 13 percent (Whelan, 2001). A 1999 report from Roper Starch Worldwide indicates that 49 percent of consumers expect to do most of their shopping from the home environment within the next decade (Ruhling, 2000). Females are the fastest growing segment of online shoppers ("Females Lead Online Growth Spurt", 1999; Greer & Kenner, 1999). Early online shopping adapters were considered affluent (Holstein et al., 1998), but as the number of Web surfers increases, their buying habits, behaviors, attitudes, and demographics are becoming more like the general population ("Consumer Survey of WWW Users," 1995; Maguire, 1998; Weiss, 2001).

Among U. S. adult online shoppers, the level of satisfaction with Web based shopping decreases after the first purchase ("Cyber | Dialogue," 1999). Nearly 60% of adults who had made one online purchase were very satisfied, only 40% of those who had made online purchases two to four times were very satisfied, and 50% of adults who purchased online five times or more were very satisfied ("Cyber | Dialogue"). However, Jupiter Communications reported 74% of online shoppers were satisfied with their Web shopping experience (Page, 1999). Ninety-seven percent of 4,742 experienced Internet shoppers indicated that they planned to continue making purchases online ("Experienced Internet Shoppers", 2000). Over one-third (35%) of Internet shoppers who experienced problems with a particular site left the site and 88% of experienced Internet shoppers reported

abandoning their online shopping cart during the 1999 holiday shopping season ("Experienced Internet Shoppers").

As e-commerce becomes more popular, two types of online shoppers have emerged. These two types include persons who shop online because it is convenient and those who shop online because they are bargain hunters seeking the best price (Whelan, 2001). Traditionally, male shopping behavior has been stereotyped as (a) grab and go, (b) whine and/or wait, and (c) fear of feminine (Otnes & McGrath, 2001). However, males who shop online tend to take their time and search for the best price while female online shoppers use electronic shopping as a time saving convenience (Whelan, 2001).

It is suggested that Internet-based selling is best suited to businesses that have (a) a geographically dispersed customer base with a specialized interest, (b) information-based products whose users are already heavy Internet users, (c) small sellers with nothing to lose by using the Internet as an inexpensive advertising medium, and (d) upscale, high end products when the company has an outstanding reputation and brand names that are known for quality (Phillips et al., 1997). It is further suggested that successful retail businesses sell products that are well known to the consumer or that may not be well known but have a high nonprice cost. A high nonprice cost would include the resource(s), such as time or fuel, expended in locating the product.

In a study of consumers reactions to virtual shopping for groceries and over the counter drug products, those consumers who were most favorable to the concept were those who had limited time or mobility constraints (Peterson, 1997). Consumers, who have the time to shop for groceries in the traditional retail store, use the experience for socializing and entertainment.

Online shoppers report that they are disappointed in the depth of electronic retailers' product offerings and online retailers who offer a greater variety of products seemed to be more successful (Jarvenpaa & Todd, 1996). Two-thirds of persons having Internet access report using it to collect information about products or services before purchasing from a traditional storefront (Ackerman, 1998). Shoppers, who obtained pre-purchase product information on the Internet, reported spending $10.4 million after searching ("Cyber | Dialogue," 1999). Pre-purchase information is especially sought before buying higher dollar items. In general, products offered on the Web that sell for under $50 sell better than those priced above $50 (Quelch & Klein, 1996). Nearly one-third of the online merchants in a study by ActivMedia reported selling products for under $100 ("Online Retail Revenue," 1999). Online merchants reported that only two percent of the online transactions were for products priced less than $10 ("Online Retail Revenue"). It is less costly to engage in direct marketing with e-commerce and shoppers believe this saving should be passed on to the consumer (Alba et al., 1997).

Consumer Adoption of Online Shopping

Before consumers adopt a new buying practice they go through a five-step process including (a) awareness, (b) interest, (c) evaluation, (d) trial, and (e) adoption (Breitenbach & Van Doren, 1998; Sproles, 1979). Applying this adoption process to a Web site, the business owner needs to incorporate the site into the total business marketing plan so that consumers are aware that a business has a Web site and knows the site address (URL). To create an awareness of a Web presence, home-based business owners need to include the URL on business cards, letterhead, and in printed advertisements. Attractive, well-designed sites that are easy to navigate and are updated

regularly help to create interest among consumers. This study addressed the role of Web site background color impact on consumers' evaluation of products. A positive evaluation could reinforce consumers' move to the trial stage.

A survey of previous studies suggested that the following issues were of concern to online shoppers:

1. Credibilty of products and vendors (Ackerman, 1998; "GVU's WWW User Surveys: Tenth Survey: Reasons for Not Purchasing", 1998; Holstein et al., 1998; Jarvenpaa & Todd, 1997; Then & DeLong, 1999).
2. Visual display (Then & DeLong).
3. Privacy and security ("Be E-Wise: Shopping Safely Online", 1999; "GVU's WWW User Surveys: Tenth Survey: Reasons for Not Purchasing").
4. Return policies and customer service (Jarvenpaa & Todd; Then & DeLong).
5. Convenience (Then & DeLong).

Burke (1997) proposes that to entice consumers, online shopping will have to provide advantages and benefits over shopping in a traditional retail outlet. In the past, convenience and economy were the two benefits that prompted consumers to adopt different shopping behaviors. These benefits led to the development of convenience stores and megamarkets or superstores for one stop shopping. The Web has the potential to provide both convenience and economy. Burke also states: " Few of the firms developing interactive shopping applications have conducted research on the consumers' needs and desires for such services, instead focusing on what is technically possible" (p. 83).

Theoretically, the Web enables consumers to (a) access merchandise which may not be readily available, (b) gather pre-purchase information at a low cost, (c) screen offerings of

various businesses, (d) locate the lowest price, and (e) develop consideration sets (Alba et al., 1997). A consideration set would be a list of stores that handle the desired product at a price the consumer would be willing to pay. The development of a consideration set would reduce the high nonprice cost of a product.

Types of Products

According to Peterson et al. (1997), "The suitability of the Internet for marketing to consumers depends to a large extent on the characteristics of the products and services being marketed" (p. 334). Expensive products, complicated products or services and some customized products may not lend themselves to direct sales on the Web (Lewis & Lewis, 1997). However, information about these products or services can be provided on the Web and merchants can provide an interactive site enabling consumers to contact the company. Peterson et al. proposed a method for classifying products and services sold on the Internet. The method classified products and services as either search products or services or as experience products or services. Features of search goods could be evaluated from information while features of experience goods could only be evaluated by personal inspection. Consumers could readily obtain search product information via the Internet, but would need to use traditional markets to evaluate experience goods. On the Internet the product itself means far less than the service around it and services will be added value ("From Here to Eternity", 1997)

Consumable products are beginning to take a larger share of Web sales. In 1999, sales of consumable products accounted for 3.8 billion of total Web sales and it was projected that consumables would account for 9.1 billion of the total Web sales in 2000 ("Consumables Market", 2000). Gourmet foods accounted for 0.7 billion of consumable

sales in 1999 and this category was projected to increase to 1.6 million of sales in 2000 ("Consumables Market"). Web sales accounted for 17% of the gift sales of household items and appliances and 11% of the food and wine sales to 541 Internet shoppers during the 1999 holiday season ("Experienced Internet Shoppers", 2000).

Computer related items continue to be the most popular products for Web sales garnering 40% of the sales. Other items in order of sales include (a) books—20%, (b) travel—16%, (c) clothing—10%, and (d) recorded music—6% (Ackerman, 1998). Internet users indicated that software was the most frequently purchased online item, followed by books, hardware, music, and travel. Generic groceries such as milk and eggs accounted for 0.6% of the items purchased, brand name groceries accounted for 0.3% of the items purchase, and apparel accounted for 3.5% of the items purchased. The largest percentage of online purchases by females was books, followed by software, music, hardware, and travel. Females reported purchasing more apparel and grocery items than males. Males reported software to be the number one item purchased online followed by hardware, books, music, and travel ("GVU's WWW User Surveys: Tenth Survey: Items Purchased", 1998). Based on current trends it is estimated that the lead sellers in Web commerce will be PC hardware and software, gifts and flowers, groceries, and clothing. Items selling well at this point in time are impulse items (Heath, 1997, June).

Web Marketing Strategies to Create an Exchange

There are several different types of sites currently found on Web pages. Some of these sites are designed to lead to transactions while others lead to the development of exchange relationships (Lewis & Lewis, 1997). Customer service has been identified as a factor of successful Web sites (Krauss, 1999; Lewis & Lewis). Jarvenpaa and Todd (1996) used

identified dimensions of customer service to determine which were important factors for online shoppers. The two dimensions of customer service that consumers considered most important when shopping on the Web were responsiveness and tangibility (Jarvenpaa & Todd). A responsive Web merchant provided quality information and made the purchase process effortless (Jarvenpaa & Todd). Quality information was informative about the products and about company policies related to returns, delivery time, and guarantees. In addition to providing for electronic orders, responsive merchants provided ordering alternatives including telephone, mail, or fax numbers (Jarvenpaa & Todd). Sites also provided information about product usage, which can lead to increased consumption of the product (Jarvenpaa & Todd). Information control is one of the factors that impacts the consequences of an exchange. The seller controls the quality and quantity of information provided, but if it does not meet the needs of Web consumers they will click to another site. Tangibility, or the visually pleasing and professional presentation of the product(s), was the customer service dimension most frequently cited as being important in a successful Web retail site (Jarvenpaa & Todd). Sites rating high on this dimension provided a clear visual and verbal presentation of the product or service. Businesses that produce known brands may choose to feature a Web design to reinforce the overall image of the business but sell products through retail outlets. These sites may provide product information or may be designed to be entertaining.

World Wide Web Site

A Web site needs to be a part of the total marketing strategy of a business. Business sites are used to sell products and services, promote brands for purchase at a retail store, and to provide product and business information to consumers. A Web site can be used by

a home-based business owner to create an image of a larger company (McGarvey, 1998). Sites that focus on technology and not on marketing or on meeting the consumers' needs tend to be unsuccessful (Heath, 1997, June). It is estimated that nearly 90% of Web startup sites go out of business in the first year ("Consumer Web Sites", 1997). Several issues can account for this high rate of failure including: (a) lack of consumer focus, (b) adherence to one revenue production model, (c) lack of linkage to related sites, (d) lack of credibility, and (e) inadequate customer service ("Consumer Web Sites"). Many business sites do not use the full capabilities available from the interactive aspects of the Web. Web sites need to offer value-added services and features which are unique to the Web and not just be a reproduction of material which the business uses in other media (Breitenbach & Van Doren, 1998).

Because of the volume of information available on the Web, the accuracy, clarity and relevance of the information provided by a business will determine the long-term success of the site (Cronin, 1994). A site must provide both quantity and quality information which will enable consumers to predict shopping satisfaction (Alba et al., 1997). Consumers must be able to identify what distinguishes a business's offerings from other businesses (Cronin).

Berthon et al. (1996) note that the Web is a mix of direct selling through interactivity, and advertising through provision of information without interaction. A productive Web site needs to make surfers aware of the site, enable surfers to hit the site for a visit, establish a dialogue with the visitor, make placing an order easy, and follow up queries to determine post purchase satisfaction (Berthon et al.).

Some business owners design their own Web sites while other owners hire professionals to develop the business site. Sauer (1996) proposed a framework for analyzing and comparing Web sites. The main elements in this framework include:

1. The maintenance and operation of the site, which includes the site organization, structure, and care.

2. The site connections, which include the communication with the consumer, consumer surveys, and links to, related sites.

3. The rewards from visiting the site, which includes registration for prizes and free offers.

4. The information available at the site, which includes answers to specific questions related to the product.

5. The attractions and entertainment available at the site, which includes adequate use of text, audio, pictures, and music.

McGarvey (1998) suggested using graphics sparingly because they take time to load and you can lose a potential customer. Erect a site and your hard work may be just beginning. You must promote your site the way you promote your telephone and address (McGarvey). The quickest way to Web-site failure is not delivering on what you promise (McGarvey).

Robb et al. (1997) propose that Web sites created in the future will have to provide a compelling real-world experience which was lacking in the early Web sites. For Web sites to attract consumers they contend that the interaction is compelling if it is engaging, unique, responsive, complete, valuable, and reliable. One way to achieve these qualities is through rich content, active intelligence, and collaborative communications. Rich content

provides concise information for the consumer. Active intelligence takes the programming and tailors it to the individual consumer and allows the consumer to take any desired action. Collaborative communications puts the consumer in contact with the right people when they need help or assistance.

A Web site should complement other marketing strategies. With the amount of information available on the Web it is important that consumers know how to locate a site. Products should appeal to the typical online shopper. It is suggested that business owners test market their Web product offerings. Factors to consider when selling products on the Web are simplicity, retail convenience, immediacy and relevance of offers (Yoegel, 1997). Online shoppers expect immediate fulfillment or response to an order or request. It should provide an easy way to contact the business and to place an order. Consumers want to be able to link with product offerings or ordering information without having to scroll through the complete site.

Sales prospects for online retailing are viewed as having potential by many in the marketing field. As the number of products offered increases and as new developments in three-dimensional graphics improve the ability to make purchases less "sight unseen", more consumers are expected to start using the Web as a retail source. The majority of e-commerce has been business to business. A study of small businesses with a Web site found that few of the businesses had sales through the site, but most felt that the presence gave them an expanded geographic area as they received requests for information from Web users outside their traditional marketing area (McCue, 1998).

Home-Based Businesses and Rural Economies

For many years, rural economies were dependent upon agricultural production and/or extraction of natural resources such as oil and gas (Rowley, 1998). As agricultural prices and oil and gas prices declined, rural communities turned to recruiting outside businesses such as manufacturing and service-related industries to provide employment opportunities for residents (Smith & Ferguson, 1995). Enticements, in the form of tax breaks or concessions, were frequently made to businesses in exchange for locating in a community (Barrett, 1999). The location of a new business frequently leads to rapid growth of the community as non-residents migrate to the source of employment. Gallagher (1997) defines rapid growth as "sustained growth of more than 5 percent population increase per year for at least three years" (p. 1). Rapid growth can create challenges for a community including fiscal problems and an overload on available services (Gallagher; Johnson & Beale, 1995). Moreover, rapid growth can lead to an escalation of prices, such as the cost of housing. Depending upon the type of business, community issues may accompany rapid growth (Miller, 1997). These issues may include environmental issues such as clean air and water and social issues, such as lack of adequate space in schools and health care facilities as well as lack of qualified school and health care personnel.

In some rural areas non-agriculture entities such as manufacturing and service have increased the income generating diversity, however, it is predicated that the low wage global market will lead to a decline in the availability of manufacturing employment ("Rural Employment", 1999). The number of manufacturing jobs available in the rural Great Plains is limited. In 1993, manufacturing accounted for only 8% of the jobs in the Great Plains compared to 18% of available jobs in other rural areas of the United States

(McGranahan, 1998). Even with incentives, few manufacturing employment opportunities are available in the rural areas of the central United States (McGranahan, 1998). Manufacturing companies have increased output, but this increase reflects the use of labor saving technology, rather than an increase in employment of more workers (Barkley). Manufacturing companies locating in rural areas frequently bring in their own mangers and highly skilled workers and provide only low-wage and low-skill jobs to local residents (Barkley, 1996; Rowe, Haynes, & Stafford, 1999).

Retail establishments, which have been a source of employment in rural communities, have decreased from approximately three-fifths to one-fifth of all small town businesses (Drabenstott & Smith, 1996). The tourist industry has shown growth in the western states, but available jobs in this industry tend to be low-wage positions. Employment opportunities in the service industry are limited in rural areas that have few natural amenities (McGranahan). Employment opportunities in the service industry are low-wage, low-skill jobs and may only provide seasonal work (Rowe, Haynes, & Stafford, 1995). The development and support of home-based businesses provide a means for residents of rural communities to generate family income while retaining their preferred lifestyle. Although home-based businesses provide employment opportunities in manufacturing, service, and retail sales, operating a business from home reduces the business overhead expenses as well as work related expenses such as wardrobe needs, fuel, etc.

Although sources do not agree on the number of persons who operate home-based businesses, estimates range from 10 million to 50 million (Allen & Moorman, 1997, Cheney, 1996; DeMott, 1995; Editors, 1998; Goodman & Moeller; 1998; Griffin, 1998; Lipton, 1999). It is difficult to obtain an accurate count of home-based business owners

because (a) small business owners do not report that they are also home-based, (b) some localities do not require a home-based business to be registered, and (c) some business owners do not identify with the home-based business label (Griffin). Only 8.7 million of an estimated 18.3 million home-based business owners identify with the home-based business owner label (Editors). It is the consensus of those making these estimates that the number of persons operating a business from the home is increasing.

Home-Based Business Owner Profile

Profiles of a home-based business owner and of a home-based business have been developed from research findings. The typical home-based business owner is white, between the ages of 40-50 years, has attained an educational level beyond high-school, and is married (Biers, 1993; Biers et al., 1997; Niemeyer, Thayer, & Kean, 1994; Soldressen et al., 1998; Stafford et al., 1992). There is disagreement among studies regarding the majority gender of home-based business owners (Biers; Biers et al.; Cheney, 1996; Editors, 1998; Harms, 1989; Rowe, Stafford, & Owen, 1992). This disagreement reflects different methods of sample selection. The population of home-based business owners is unknown and convenience samples of known home-based business owners are frequently used in studying this population. Depending upon the source from which the sample is selected, the convenience sample may be gender biased.

Home-Based Business Profile

The typical home-based business is located in a rural area or small town, organized as a sole proprietorship, has been in operation from two years to over 10 years, and provided supplemental family income (Biers, 1993; Biers et al., 1997; Niemeyer et al., 1994; Williams-Miles, 1993). Since the majority of home-based businesses are located in rural

areas, the operation of a home-based business has been proposed as a way for persons living in rural areas to replace family income or supplement family income. The home location nurtures the business and provides the opportunity to evaluate new products and services while keeping operating costs to a minimum (Hewes, 1981; Pratt, 1986). The nurturing process allows for a business to grow and expand to provide employment opportunities for people in the community. There has been anecdotal evidence of home-based businesses stimulating economic growth (Rowe et al., 1992).

Economic Impact of Home-Based Businesses

The money generated by home-based businesses impacts local economies as owners purchase supplies, equipment, and services within the area (Biers et al., 1997). Home-based business owners pay local, county and state taxes and some owners have paid employees, who are frequently family members (Biers, 1993). However, home-based business owners tend to market their products and services in the local area and this localized selling circulates money in the community but does not add new dollars to the circulation. Owners who expand market reach outside the community could potentially increase the circulation of outside money within the community.

The income generated by home-based businesses varies greatly. The income distribution for home-based businesses had been described as being like two humps of a camel-under $20,000 and over $60,000 (Edwards & Edwards, 1996). Nationally, a self-selected convenience sample of home-based business owners reported 1997 average business sales of $365,000 with a reported range of no sales ($0) to $15 million in sales (Doran, 1999). In 1994, Oklahoma home-based business owners reported a wide range of business gross income (Biers & Burns, 1998). The average business gross income

reported by Oklahoma respondents with an income of $4,999 or less was $1,563 and for respondents reporting a business income of $5,000 or greater, the income average was nearly $31,000 (Biers & Burns).

According to the research firm, International Data Corp.(IDC)/LINK, the average full-time home-based business in the United States earns $58,000 annually with 20% of the home-based businesses reporting a business gross income between $100,000 and $500,000 (Cheney, 1996). The average annual business gross income reported for craft-related businesses in Pennsylvania was $35,000 with two of the businesses grossing over $100,000 (Saylor, 1987). The average annual gross sales reported for craft producers in Alberta, Canada was $12,000, however, almost one-half of the $12,000 was spent to produce the craft (Abells, 1997). Home-based business owners in four southern states reported an average business gross income of approximately $16,000 (Biers et al., 1997). The average business gross income reported by Oklahoma home-based business owners was approximately $17,500 (Biers & Burns, 1998). Nationally, the average work at home household income in 1996 was reported at $59,200 (Allen & Moorman, 1997). In a sampling of home-based business owners in ten states, the contribution of home-based business income to the household income ranged from 13 percent to 39.7 percent (Owen et al., 1995; Soldressen et al., 1998).

When comparing home-based business income figures it is important to note if the income is net, gross, or total household income. The amount of income generated by home-based businesses has been studied in relation to gender, geographic location of the business, and the type of business.

Home-Based Business Income and Gender

Male home-based business owners report higher average business gross income than female business owners (Biers, & Burns, 1998; Biers et al., 1997; Rowe & Bentley, 1992; Williams-Miles, 1993). Several reasons have been put forth to explain the gender difference in business income. It has been noted that self-employed women tend to operate businesses that generate less income such as retail sales businesses or businesses that provide personal or educational services (Kalleberg & Leicht, 1991). Tiggs and Green (1994) report that women in rural areas tend to operate businesses with less growth potential, but that self-employment offers more opportunity for women in rural areas than working as an employee. Women may lack business experience and management skills, both factors that contribute to the success of a business operation (Kalleberg & Leicht).

However, not all business success is measured in monetary terms. Some female home-based business owners report business success in terms of personal satisfaction, professional recognition, and/or production of a quality product or service (Littrell, Stout, & Reilly, 1991; Misner, 1986; Soldressen et al., 1998). An internal sense of satisfaction and peer recognition is a strong measure of success for females who produce original works of art including paintings and fiber arts.

Home-Based Business Income and Geographic Location

There is disagreement in findings among studies regarding the amount of income generated by home-based businesses located in rural areas. Little difference was found when the average gross income of home-based businesses operated in large cities was compared with the average gross income of businesses operated on farms/ranches (Biers & Burns, 1998; Biers et al., 1997). This supports the idea that home-based business

income is not dependent on geographic location. However, in a study of Utah home-based business owners, business income reported by rural residents was significantly less than business incomes reported by urban residents (Williams-Miles, 1993). Rural Utah females made less than one-half of the amount reported by their urban counterparts and less than onethird of the amount reported by rural male respondents (Williams-Miles). The net business income reported by rural home-based business owners in nine states was $5,000 less than net business income reported by urban-based businesses (Rowe et al., 1993).

Home-Based Business Income and Business Category

One explanation for the amount of income generated by a home-based business is the type of work (Rowe & Bentley, 1992). Home-based businesses can be separated into either service-oriented or product-oriented businesses (Brabec, 1989). Service-oriented businesses are diverse including such businesses as computer consulting/programming, childcare, sewing as a business, accounting, and public relations. Product-oriented businesses include craft-related businesses, value-added agriculture products, and resale of products. The majority of home-based business owners report operating a serviceoriented business (Biers & Burns, 1998; Rowe et al., 1992). There is disagreement among studies regarding which one of the two types of businesses generates the larger net income. Service related business owners have reported lower business net incomes than product-oriented type business owners (Rowe et al.). However, Biers et al. (1997) found that collectively service-oriented business owners reported higher gross business incomes.

Home-Based Business Marketing Strategies

Home-based business owners start a business because they have the skill to produce a product or provide a service, but they frequently lack business management skills or

marketing skills (Soldressen et al., 1998). Women tend to become entrepreneurs because they have an idea for a product they feel will sell and for these women the emphasis is on the product rather than the customer (Misner, 1986). A study of female owned textile craft businesses, revealed that business owners who sold needle art supplies and accessories focused offerings on consumers' wants and needs while business owners selling finished products focused on producing the product and then finding a buyer (Misner). The women business owners who focused on product orientation to the market promoted the uniqueness, quality, and originality of the product and frequently produced the item because they enjoyed making it (Misner). Business owners in this study used word of mouth to promote products and mass media was rarely or never used. Soldressen et al. (1998) found that textile artists sold products through galleries, craft shows, retail shops, printed catalogs, and wholesale trade shows and that catalog offerings generated the least amount of sales. These same textile artists reported that business cards and public demonstrations were the two primary forms of advertising used to promote business offerings.

Home-based business owners in four southern states reported selling the majority of their product/service in the local community (Biers et al., 1997) and Canadian craft producers reported selling directly from the home, at craft fairs, and in stores and galleries on a consignment basis (Abells, 1997). Although the local market is convenient, it may not be the best place to sell. Artisans and craftspeople can have difficulty marketing a product in a local market, as there may be an abundance of highly skilled persons in the area producing the same or similar product. Or the local populace, especially in rural areas, may lack the financial means to purchase the product(s). "One of the problems a home-

based business owner must solve is his or her narrow view of the potential market" (Hondale & Tanner, 1987, p.81). Iowa home-based business owners reported sales volume increased as the geographic markets expanded (Harms, 1989). The modal frequency for community, county, and multi-county sales was less than $5,000 while Iowa businesses selling in the national market place reflected a modal sales frequency of greater than $100,000 (Harms). Another study found that over 80% of family home-businesses sold their products or services within their respective states (Rowe et al., 1993). Family home businesses that used sales representatives averaged $177,000 a year more income than those businesses not using reps and business owners who sold outside their state reported significantly more income (Rowe et al.). These findings would support the export base theory of community development which posits that a rural community's economic vigor depends upon the sale of goods and services to consumers external to the community (Shaffer, 1989).

For a variety of reasons including financial limitations, lack of skill, and limited time, home-based business owners frequently do not conduct market research. Previous research has found that small business owners tend to seek marketing information from informal sources that are convenient and require minimal effort to contact (Biers, 1993). Individuals may develop a written business plan, but may not give depth and breadth to the marketing portion of the plan. Some home-based business owners are establishing Web sites to market their product or service. While some owners may select this marketing strategy based on market research and planning, other owners select it because they hear the hype that every business should have a Web site.

Theoretical Framework

Exchange is the core concept of marketing (Bagozzi, 1975; Kotler, 1994). According to Bagozzi (1979), "The fundamental phenomenon to be explained, predicated, and controlled in the marketplace is the exchange relationship" (p. 431). Exchange is a social process, which involves the transfer of something tangible or intangible between two parties. Exchange includes transactions (a one time exchange occurrence between parties) and exchange relationships (continuous exchanges between parties) (Johnston, 1978). To understand the exchange process, it is important to understand why individuals engage in exchange and to understand how exchanges are created, resolved, or avoided (Bagozzi).

Exchange Participation and Creation

Individuals have needs and wants. Through information seeking, individuals determine ways to satisfy needs. One way to satisfy needs is to engage in an exchange process. In this process, individuals have something of value that they are willing to exchange for something else of value. This includes value derived from the product as well as value derived from participating in the exchange process. The assumption that each individual involved in the exchange process both gives and receives something of value separates the exchange process from other forms of needs satisfaction (Houston & Gassenheimer, 1987). The value expected and that which is actually derived or perceived impact the consequences of the exchange.

Exchange Consequences

Consequences of an exchange include actions, experiences, and outcomes (Houston & Gassenheimer, 1987). Actions are all the behaviors in which individuals engage during the exchange process including the gathering of pre-purchase information as well as post

exchange behavior. Experiences are the psychological aspects of engaging in the exchange process and include the level of satisfaction from the shopping experience and the perception of the value of the exchange. The outcome indicates that the exchange process was completed or avoided. The consequences of the exchange process impact whether a transaction occurs or whether a marketing relationship develops. Bagozzi reasoned that several factors impact the exchange process.

Determinants of Exchange

The exchange model designed by Bagozzi (1979) is a circular, self-contained concept that is built on the theory that exchange is "a social process functioning under economic and psychological constraints" (p. 441). He theorized that there were four general determinants of the exchange process. These determinants include (a) social influence between actors, (b) characteristics of social actors, (c) third parties, and (d) situational contingencies. Bagozzi's model is found in Appendix A.

Social Influence Between Actors

Individuals engage in an exchange process as a way to satisfy wants and needs. In a typical exchange process individuals communicate these needs and wants through a series of offers and counter offers until an agreement is reached or not reached and the process is completed or avoided. The offers and counteroffers are referred to as the negotiation phase of the exchange process. Negotiations may include promises, threats, warnings, and information control.

A Web site can provide a way for buyers and sellers to satisfy needs and wants. Negotiations in e-commerce can include the factors outlined by Bagozzi as promises, threats, warnings, and information control. Promises include sites that offer special deals

such as a buy one and receive one free or it may be a site that promises to accept returned merchandise, if the merchandise does not meet the buyer's expectations. Threats can appear as limited time offerings and with the immediacy of e-commerce, a limited time offer may be of shorter duration than what is offered in a fixed retail location. A seller can control the amount of information provided at the site, but the buyer has the option of selecting other sites to find information. The buyer controls the sites selected and the amount of time spent at the site (Rao et al., 1998).

Characteristics of Social Actors

Each of the parties engaging in an exchange process brings their own set of characteristics to the negotiations. Bagozzi classifies these characteristics as source/receiver and as interpersonal orientation. The source/receiver characteristics include attraction, credibility, prestige, trustworthiness or status. The interpersonal orientation includes attitudes and perceptions that each party brings to the exchange process. Bagozzi proposes that individuals engaging in exchange may approach the negotiation phase with the intent to maximize the value they gain at the expense of the other person or with the intent to receive equal value from the exchange. Individuals may also approach the exchange process with the intent to engage in either a transaction or to establish an exchange relationship. The attitudes and perceptions each individual brings to the exchange will impact the give and take of the negotiation.

A Web site portrays the seller to the buyer. The seller will have to use the site to project trustworthiness to the buyer. Some buyers use the Web for comparative price shopping. These buyers may try to achieve value at the expense of the seller.

Effects of Third Parties

Parties engaging in the exchange process will compare offerings. The purchasing party will establish a level of satisfaction, which must be met in order for the exchange to occur. Bagozzi refers to this level of satisfaction as the comparison level. If the level of satisfaction falls below what is acceptable to the buyer, the buyer may choose an alternate offering and the exchange will be avoided. However, if the offering meets or exceeds the comparison level of other offerings, the exchange is more likely to occur. The nature of the Web has the potential to allow buyers the opportunity to compare offerings and determine which offering satisfies the consumer's need.

Situational Contingencies

The physical environment, psychological environment, social environment, and legal aspects comprise the fourth determinant, which can impact the exchange process. The physical environment includes the quantity and quality of air, light, and noise. The Internet service provider will be instrumental in determining the quality and cost of using the Web as a shopping location. The amount of time available and concern for personal safety can influence whether an individual chooses to use online shopping for an exchange process.

Psychological factors impacting the exchange process relate to the emotional and cognitive stimuli surrounding the exchange. If there is a high level of anxiety or frustration attached to the exchange process, either party may choose to avoid the exchange process. Peer pressure, internalized norms, mores, and/or ethics will influence whether or not the exchange process is created and resolved. Individuals whose peer group uses the Web will be more likely to perceive the Web as an acceptable choice for shopping. Sellers may view the Web as an acceptable marketing strategy if other related businesses are using this

strategy. Business owners may feel obligated to have a Web presence so they will not be perceived as "being out of date". Both parties are more likely to use the Web as a marketing strategy or as a shopping location if they have a positive attitude toward technology. The attitude of the buying party toward technology and computers impact whether or not an exchange relationship develops or a transaction occurs.

CHAPTER III

METHOD AND PROCEDURE

The purpose of this study was to evaluate the effect of Web page background hue on consumers' attitudes toward selected product attributes and consumers' likelihood of product purchase. Home-based business owners, and educators who work with home-based business owners, can use the results to select Web background hues that will enhance consumers' attitudes toward selected products. Home-based business owners need knowledge of how consumers' reactions toward Web site attributes impact consumers' attitudes toward featured products. Topics discussed within this chapter are: (a) research design, (b) population and sample selection, (c) research instrument, and (d) data collection and analysis.

Research Design

Independent Variables

An exploratory study was conducted to evaluate the effect of Web site background hue on consumers' attitudes toward product attributes and consumers' likelihood of product purchase. To measure participants' attitudes toward Web page background hues, a 7 (hues) x 3 (products) mixed design factorial experiment was formulated. The background hue and product of each simulated page were manipulated and served as the independent variables. The simulated Web site's background hues were developed using macromedia ® Dreamweaver™ 3 software, which has a 256-color mode. The Dreamweaver™ 3 hues used were red (0), blue (160), green (80), yellow (40), orange (20), and purple (180). Hues used were at the full saturation level (240) for this software.

The saturation value (240) and the lumination value (120) were held constant as the hue numbers changed. Many contemporary Web sites use white as a background hue. Therefore, a white background, number 160 with a saturation value of 0 and an illumination value of 240, also was included in this study. The red, green, blue (RGB) values for each of these colors are found in Appendix B. The selected background hues were transferred from the Dreamweaver™ software into Microsoft PowerPoint™ and the products were transferred from Photoshop™ onto each of the selected hues. Minimal verbiage (*i.e.*, only a generic name) accompanied each of the products.

Participants were randomly assigned to one background hue and viewed each product on the assigned background hue. Each participant viewed all three products on the same background hue. To control for sequencing, the viewing order of products was rotated within each hue. Participants were randomly assigned to one viewing order. The products were all utilitarian and included a fleece vest, a chest of drawers, and a bicycle bag. Each of the viewing orders was pressed into a compact disk (CD). The use of a disk helped to control for the quality of the hues.

After viewing all the products, participants were asked to rank all of the hues used in the study (of which they viewed only one as a background hue) in order of their personal preferences. Participants also provided selected demographic information and Web usage information.

Dependent Variables

After viewing each product page, participants were asked to complete a semantic differential scale to measure their attitudes toward that selected product's attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and

Attractiveness). Participants also rated the likelihood of purchase for each of the products.

Population and Sample Selection

The sample population consisted of a convenience sample of students enrolled in classes at a western land grant university. Students from eight colleges within that university were asked to volunteer to participate in the study. The current profile of the online shopper indicates that the shopper is white, has a college degree, is predominately female, and has an above average family income. The student population at the selected university was predominately white, and more females volunteered to participate in the study because two of the colleges had a higher percentage of female enrollment. The sample consisted of 213 participants allowing each background hue to be viewed by at least 30 participants.

Research Instrument

A questionnaire to collect participants' attitudes toward each product's Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness was developed. A 7-point semantic differential scale was used to collect attitudinal scores concerning these product attributes. A 7-point semantic differential scale also was used to assess the likelihood of purchase. If the likelihood of purchase was 4 or less, participants were asked to explain their disinterest in purchasing the product. Data related to personal color preferences were collected using a ranking system. Open-ended questions and checklists were used to collect demographic information, such as age, gender, college major, size of community, and Web usage including frequency of online shopping and the amount of time spent online. Online shoppers need access to a credit card. Therefore,

a question about credit card availability was included. Each instrument was coded with a viewing order number and a subject number. This insured a randomized viewing order and allowed testing for viewing order effects. The questionnaire was printed in booklet format. A copy of the questionnaire is in Appendix C.

Pilot Testing

The questionnaire and procedure were pilot tested, using a sample of interior design students. Using a test-re-test format, the pilot testing was used to assess the reliability of the instrument. Cronbach's alpha, a reliability test that measures correlation with a group of questions, was used to determine the reliability of the instrument by comparing the attitude scores of the first product on the first questionnaire and that same product on a second questionnaire. In this study, reliability was an indication of the extent to which the scale produced errors, as indicated by a comparison of the participant's two attitudinal scores for each product evaluation.

To begin the reliability testing, thirty participants viewed all three products on one background hue. One of the six possible product-viewing orders was randomly assigned to each participant. The viewing orders allowed each product to be viewed first by ten of the participants. Purple was randomly selected as the background hue for the pilot test. After viewing each product, the participant completed the portion of the questionnaire pertaining to that product's attributes before viewing the next product and corresponding booklet page. Following the viewing of the third product, the questionnaire was collected. Each participant immediately was given a second questionnaire instructing her/him to view the first product again and to reassess that product's attributes. The second questionnaire was coded with numbers that matched the first questionnaire and when

completed was attached to the first questionnaire. The scale reliability for the fleece vest was .94, the scale reliability for the chest of drawers resulted in an alpha of .85, and the scale reliability for the bicycle bag was .72.

Results of the pilot test indicated no significant difference by viewing order for any of the products. The first choice for a personal preference color was blue (36.7%), green was second (33.3%) and the last choice was orange with 53.3% of the participants ranking orange as the least preferred color. Purple, red and yellow were neutral with rankings evenly distributed between the rankings of 1 through 6. Details of the pilot test procedure and results are in Appendix D.

Data Collection and Analysis

Data Collection

Data were collected from a convenience sample of participants enrolled in colleges of a western land grant university. Each participant signed an informed consent form prior to participating in the project. A copy of the informed consent is in Appendix E. Participants were randomly assigned to one of the seven hues and to one of the six viewing orders for that hue. After viewing each product, participants completed that portion of the questionnaire pertaining to that product's attributes before viewing the next page and product. Data were collected from participants one at a time. To control for random viewing and the possibility of repeat participants, participants' names were recorded beside the viewing order they experienced. At least three participants viewed each of the viewing orders; therefore, participants' names could not be linked to any one completed instrument.

A laptop computer was used to view the products. The use of the same computer controlled for differences in hardware. Each research questionnaire was coded with the background hue and viewing order. Upon completion of the questionnaire, each participant received a coupon for a free dip of ice cream from the university dairy store.

Data Analysis

The following statistical methods were used to test the null hypotheses:

Hypothesis 1. There is no significant difference between participants' attitudes toward featured product attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to the simulated Web site background hue.

A mean attribute score was obtained for each product on each background hue. A one-way analysis of variance (ANOVA) between-groups design was conducted on all attributes across each product to determine if there were any significant mean differences between the attitudes toward the products' attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) when the products were featured on different background hues. Fisher's least significant difference (LSD) post hoc test was conducted on those attributes that were found to be significantly different. This post hoc procedure was used to make pairwise comparisons among a set of *t* population means.

An independent-samples t-test was conducted to determine if there were significant differences between participants' attitudes toward attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) when

the products were featured on a hue background and when they were featured on a white background.

A one-way ANOVA also was conducted to determine if there was a significant difference between participants' attitudes toward attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) when the hues were collapsed into warm colors (*i.e.*, orange, red, and yellow) and cool colors (*i.e.*, blue, green, and purple).

A one-way ANOVA was conducted to determine if there were significant differences between the product attribute scores when the products were featured on a warm background color, a cool background color, or on a white background.

Hypothesis 2. There is no significant difference between participants' likelihood of product purchase in relation to the simulated Web site background hue.

A mean likelihood of purchase score was obtained for each product on each background hue. A one-way ANOVA with between-groups design was conducted to determine if there was a significant interaction between likelihood of purchase and background hue. To increase cell size, the hues were collapsed into warm colors (*i.e.*, orange, red, and yellow) and cool colors (*i.e.*, blue, green, and purple) and a one-way ANOVA was conducted to determine if there were significant differences between likelihood of purchase scores when the products were featured on a warm background color or a cool background color. An independent-samples t-test was conducted to determine if there were significant differences between the likelihood of purchase when the products were featured on a hue background and when they were featured on a white

background. A one-way ANOVA was conducted to determine if viewing sequence was a factor in likelihood of purchase.

Hypothesis 3. There is no significant difference between participants' attitudes toward featured product attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to selected participant demographics (*i.e.*, age, gender, college major, size of community, frequency of shopping online, and amount of time spent online) and the simulated Web site background hue.

A mean attribute score was obtained for each product on each background hue by each demographic characteristic. A two-way ANOVA with two between-groups design was conducted to determine if there were significant interactions between selected demographic characteristics of the participants and each background hue. To increase cell size, the background hues were collapsed into cool colors (*i.e.*, blue, green, and purple) and warm colors (*i.e.*, orange, red, and yellow) and a two-way ANOVA was conducted to determine if there was significant interactions between the two color categories and demographic characteristics of the participants. A LSD post hoc test was conducted on those variables found to be significant. A two-way ANOVA with two between-groups design was conducted to determine if there was significant interaction between hue backgrounds and the white background. An independent-samples t-test was conducted for the variable 'gender'. A one-way ANOVA between-groups design was conducted on the demographic variables and product attributes.

Hypothesis 4. There is no significant difference between participants' attitudes toward featured product attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to the Web site background hue and the participants' personal preferences for selected hues.

To increase cell size, hues were collapsed into two levels (warm vs. cool) and color preference was collapsed into those same two levels. A two-way ANOVA with two between-groups design was conducted to determine if there was interaction between color preference and attribute scores. Mean attribute scores were obtained for each product by color preference and background color.

Objective 4: Develop recommendations for home-based business owners concerning the use of Web page background hues to positively impact consumers' attitudes toward product attributes.

Mean attribute scores for all hues across attributes were obtained. Although it violated the assumption of independence, all responses to each background hue across all three products were combined and a one-way ANOVA between-groups design was conducted to determine if a hue(s) emerged as a 'best' background for each of the attributes.

Viewing Order

A one-way ANOVA with between-groups design was conducted to determine if there were significant mean differences in attribute scores and likelihood of purchase scores in relation to viewing order. The results of the ANOVA indicated the need for further testing of the gender and viewing order relationship. Mean attribute scores were obtained

for each product by viewing order and gender. To increase cell size, the viewing orders were collapsed across all products into three levels. A two-way ANOVA between-groups design was conducted to determine if there was interaction between the three viewing orders, gender, and the likelihood of purchase.

CHAPTER IV

THE EFFECTS OF BACKGROUND HUE UPON CONSUMERS' ATTITUDES TOWARD WEB SITE PRODUCTS

MANUSCRIPT FOR PUBLICATION

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The effects of background hue upon consumers' attitudes
toward Web site products

Abstract

An exploratory study was conducted to evaluate the effects of Web site background hues on consumers' attitudes toward selected product attributes and consumers' likelihood of purchase using a mixed design factorial experiment. In this experiment, simulated Web pages were created using fully saturated colors from a Web page software program. This study increased the number of background colors tested beyond those of previous investigations. Seven levels of hue, including neutral white, and three levels of product were the independent variables. Attitudes toward products and likelihood of purchase were the dependent variables.

Data were collected from 213 students enrolled in a western land grant university. Data analysis used frequency distribution, means, one-way and two-way analysis of variance (ANOVA), and t-tests. The results indicated a trend for two of the three products to receive more positive attribute scores when featured on a blue or purple background, and for those same two products to receive the most negative attribute scores when featured on a yellow or red background. In addition, viewing order and several demographic variables had significant impact on the likelihood of product purchase.

The effects of background hue upon consumers' attitudes toward Web site products

Introduction

Retailers use nonverbal communication methods to convey meaning about products to consumers. Nonverbal communication is perceived through the visual, aural, olfactory, and tactile senses. Retailers use color, sound, scent, and touch to stimulate these senses. These nonverbal forms of communication are used to create an atmosphere in the shopping environment, which Kotler (1973/74) suggested should be "the conscious designing of space to create certain effects in buyers". If used effectively in the shopping environment, nonverbal communication can have a positive impact upon consumers' attitudes toward products and on purchase decisions.

The development of the World Wide Web has led to the creation of an electronic shopping environment. Mathwick, Malhotra, and Rigdon (2001) warn that the electronic shopping environment can be dull and lifeless and result in an aesthetically unpleasant shopping experience. Color, a visual stimulus, can be used to create an atmosphere in an electronic shopping environment that may result in positive or negative experiences for consumers. In addition, color can influence consumers' attitudes toward product attributes (Mandel & Johnson, 1999; White, 1990).

Conceptual Background

Exchange is the core component of marketing (Bagozzi, 1975; Kotler, 1994). Exchange theory explains the factors that impact the exchange process, resulting in either an approach or avoidance of the exchange of goods or services. Bagozzi (1979) identified four determinants that influence the consequences of the exchange process: (a) social

influence between actors, (b) characteristics of social actors, (c) effects of third parties, and (d) situational contingencies within the physical, psychological, and social environments. These determinants can serve as independent variables in studies of the exchange process.

A Web site serves as a mediator between the buyer and the seller, by which the buyer is enabled to evaluate the seller and his/her products and thus make a decision to purchase or not purchase the product(s). Characteristics of a Web site constitute the physical environment of an Internet commercial exchange, or in other words, the situational contingencies in the exchange process. These contingencies can impact consumers' attitudes toward a business and the product(s) offered by that business and therefore are congruent with Kotler's (1973/74) concept of retail atmospherics.

Color Research in Retail Settings

Color is one of the visual dimensions of the physical environment and is a nonverbal communication tool used to convey meaning about products (Bellizzi, Crowley, & Hasty, 1983; Neal & Torres, 2000). It is through this system of nonverbal communication that retail stores provide cues to customers about the store and/or product image (Markin, Lillis, & Narayana, 1976). Previous studies, simulating retail settings and using fully saturated colors, have indicated that products featured on a blue background elicit more positive evaluative responses and greater likelihood of purchase than those same products observed on a red background (Bellizzi & Hite, 1992; Crowley, 1993; Middlestadt, 1990). Because of the potential to subsequent sales, business owners using a Web site business format similarly need to consider physical contingencies when they are planning their Web marketing strategy, including the impact of Web site background color.

Purpose

The purpose of this exploratory study was to evaluate the effects of simulated Web site background hues on consumers' attitudes toward selected product attributes and consumers' likelihood of purchase. Three null hypotheses guided this study.

H_1. There is no significant difference between participants' attitudes toward featured product attributes (*i.e.,* Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to the simulated Web site background hue.

H_2. There is no significant difference between participants' likelihood of product purchase in relation to the simulated Web site background hue.

H_3. There is no significant difference between participants' attitudes toward featured product attributes (*i.e.,* Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to selected participant demographics (*i.e.,* age, gender, college major, and size of community, frequency of shopping online, amount of time spent online, and credit card ownership) and the simulated Web site background hue.

Methods

Research Design

In order to test the effect of background hue on product attitudes, a mixed design factorial experiment was conducted using two independent variables. Hue, with seven levels (*i.e.,* blue, green, orange, purple, red, yellow, and neutral white), was an independent variable. White was included in the study as it is frequently used as a Web site background color. Featured product, with three levels (*i.e.,* fleece vest, chest of drawers, and bicycle bag), was the other independent variable. Simulated Web pages

were created with each of the products featured individually on each of the selected hues. The background hues were created using Web page development software. The hues were at full saturation for the software, and saturation value and lumination value were held constant. The generic name of the product, in black print, was included on the page.

Participants' attitudes toward selected product attributes and likelihood of purchase were the dependent variables. The product attributes, for which attitudes were assessed, included Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness. Participant's attitude scores were obtained for all these attributes for each product in relation to randomly assigned background hues. Likelihood of purchase scores also were obtained for each product in relation to assigned hues.

Sample

A convenience sample consisted of 213 college students enrolled in classes at a western land grant university. Students enrolled in eight different colleges within the university participated. Data were collected in the student center and in classroom settings.

Products

Prior to selecting which products to feature in this study, four criteria were established: (a) the products would be useful to college students, (b) the products would be utilitarian, (c) the products would be of the type manufactured by home-based or micro business owners, and (d) the products would be currently sold via a Web site. The final product selections consisted of a fleece vest, a chest of drawers, and a bicycle bag.

Research Instrument

A questionnaire, consisting of 7-point semantic differential scales, was used to collect attitudinal scores and to assess the likelihood of purchase. In addition, if the likelihood of purchase was scored 4 or less, participants were asked to briefly explain their disinterest in purchasing the product. Checklists were used to collect information concerning the number of hours per week spent online and the frequency of online shopping (*i.e.*, making an actual purchase).

Demographic information (*i.e.*, age, gender, college major, size of hometown, and possession of a credit card) was collected using checklists and open-ended items. Also, participants were asked to rank the colors that were used in the study in order of their personal preference. The questionnaire was published in a booklet format. Using a test-retest methodology, a pilot test was conducted to assess the reliability of the instrument. Cronbach alpha coefficients were .94 for the fleece vest, .85 for the chest of drawers, and .72 for the bicycle bag.

Experimental Procedures

Prior to viewing the products and completing the questionnaire, participants read and signed a letter of informed consent that explained their rights as participants. Participants were informed that the purpose of the study was to find out more about how individuals evaluate products on the Web. Thereafter, the participants consecutively viewed the three products on one of the background hues. The viewing orders of the products were randomly varied. After viewing each product, participants completed the portion of the questionnaire pertaining to that product's attributes and likelihood of purchase before viewing the next product.

Data Analysis

Descriptive statistics were used to analyze demographic characteristics of the sample. These are displayed in Table 2. Overall the participants had online experience with 85.9 percent spending at least one hour or more per week online and 68.9 percent shopping online at least once a year or more. Nearly three-fourths (72.3%) of the participants had a credit card.

Insert Table 2 about here

To test Hypothesis 1 (product attitudes in relation to background hues), a one-way analysis of variance (ANOVA) between–groups design was employed. Analysis of responses to the bicycle bag failed to reveal a significant mean difference at the .05 level for any of the product attributes in relation to hue. However, when viewed on the orange background, the bag did receive the highest mean scores for the three attributes of Quality, Durability, and Workmanship. When viewed on the yellow background the bicycle bag received the lowest mean scores for the attributes of Uniqueness, Quality, and Expensiveness. Table 3 displays the mean attribute scores for the bicycle bag.

Insert Table 3 about here

Concerning the fleece vest, ANOVA revealed a significant mean difference for the Attractiveness attribute, F (6, 206) = 2.161, p = .048 and for the Durability attribute, F (6, 206) = 1.920, p = .079, in relation to background hue. Results of Fisher's least significant difference (LSD) post hoc test indicated that when the fleece vest was featured on the blue background it received a significantly higher score for Attractiveness than when featured on the purple, red, or yellow backgrounds. The fleece vest also received a significantly higher mean score for Attractiveness when featured on the orange

background than when featured on the purple background. Concerning the Durability attribute, the fleece vest was scored significantly higher when featured on the blue background than when featured on the yellow background and significantly higher when featured on the orange background than when featured on the yellow or white background.

The fleece vest received the highest mean scores for five of the seven attributes (Usefulness, Quality, Expensiveness, Workmanship, and Attractiveness) when it was featured on the blue background. When the fleece vest was featured on the orange background it received the highest mean scores on two of the attributes (Uniqueness and Durability) and the second highest scores for the remaining five attributes. When the fleece vest was featured on the yellow background it was given the lowest mean scores for five of the seven attributes (Uniqueness, Quality, Durability, Expensiveness, and Workmanship). The mean attribute scores for the fleece vest are displayed in Table 4.

Insert Table 4 about here

The chest of drawers received the highest mean attribute scores for all seven attributes when viewed on the purple background and the lowest mean attribute scores for five of the seven attributes (Usefulness, Quality, Durability, Expensiveness, and Attractiveness) when viewed on the red background (See Table 5). Analysis of responses concerning the chest of drawers revealed a significant mean difference for the Workmanship attribute F (6, 206) = 2.219, p = .043 and the Quality attribute, F (6, 206) = 2.162, p = .048. Fisher's LSD post hoc test indicated that there was a significant mean difference for Workmanship between both the purple and the white backgrounds when each was compared to the red background and the green background.

Insert Table 5 about here

The hues were collapsed into warm colors (*i.e.*, orange, red, and yellow) and cool colors (*i.e.*, blue, green, and purple). Results then were analyzed using a one-way ANOVA, between-groups design. This analysis failed to reveal a significant mean difference for any of the product attributes across all the hues. An independent-samples t-test was conducted to determine if there were significant mean differences between attribute scores when the products were viewed on a hue background or on a white background. This test did not reveal significant means differences. However, there was a trend for the fleece vest to be rated more positively when viewed on a hue background and for the chest of drawers and the bicycle bag to be rated more positively when viewed on a white background.

The results pertaining to Hypotheses 1 indicated that when the selected products were featured on differing hues, there were a few significant differences in product attitudes. Although significance was not attained when the colors were collapsed, both the fleece vest and the chest of drawers received the highest scores across all attributes when they were featured on cool color backgrounds.

Results for Hypotheses 2 (purchase likelihood in relation to background hue) were analyzed using a one-way ANOVA, with between-groups design. This analysis failed to reveal a significant effect for background hue for the fleece vest, F (6, 206) =1.881, p = .086, the chest of drawers F (6, 206) =1.480, p = .187, or the bicycle bag, F (6, 206) =0.379, p = .892. This finding supports the null Hypothesis 2. The mean scores for likelihood of purchase are displayed in Table 6.

Insert Table 6 about here

Results for Hypotheses 3 (product attributes in relation to demographic characteristics and background hue) were analyzed using a two-way, between-groups ANOVA. This analysis failed to reveal interaction between individual hues and participants' demographic characteristics. To increase cell size, hues were collapsed into cool colors (*i.e.*, blue, green, and purple) and warm colors (*i.e.*, orange, red, and yellow) and the resulting variable was labeled 'color'. The results indicated that gender played a significant role in how participants perceived the product attributes in relation to the background 'color'. Males tended to mark higher attribute scores when the products were featured on cool color backgrounds and females tended to mark higher attribute scores when the products were viewed on the warm color backgrounds. Results indicated significant interaction between background 'color' and gender for the fleece vest attributes of Workmanship, F (1, 179) = 8.430, p = .004, Durability, F (1, 179) = 6.628, p = .011, Attractiveness, F (1, 179) = 7.148, p = .008, and Quality, F (1, 179) = 3.750, p = .054. Results also indicated significant gender interaction for the chest of drawers Workmanship attribute, F (1, 179) = 8.278, p = .018.

Regarding other demographic variables, the results of a two-way ANOVA with two between-groups factors revealed no significant interaction between age and attitude toward products in relation to background 'color'. The results of a two-way ANOVA, with two between-groups factors, revealed that interaction between college and attitude toward products in relation to background 'color' was not significant. However, regardless of background hue, participants from the College of Family Life had more positive attitudes toward the featured products and participants from the College of Business had the least positive attitudes toward the featured products.

There were three levels of community size. Communities classified as urban had a population of 'greater than 60,000 people', midsize communities had a population of '20,000 to 60,000 people', and a community of 'less than 20,000 people was classified as rural. A two-way ANOVA, with two between-groups factors, failed to result in a significant interaction. However, there was a trend for the midsize community participants to rate products more positively when they were featured on a cool background color. Both urban and rural participants rated the chest of drawers and the bicycle bag more positively when they were viewed on warm backgrounds. The urban participants tended to rate the fleece vest more positively when it was viewed on a cool hue. Rural participants rated the fleece vest positive on both warm and cool background hues.

Although no significant differences emerged, participants who reported spending greater than seven hours per week online scored product attributes more positively when the products were featured on a cool background color. Participants who frequently shopped (once a month or once a week) on the Web, rated the product attributes higher when the products were featured on a cool background. Analysis did not reveal significant interaction between demographic characteristics and hours online or frequency of shopping.

Because this was an exploratory study, additional findings not specific to the hypotheses were investigated. A one-way ANOVA was conducted to determine if there were significant mean differences in attribute scores and likelihood of purchase scores in relation to the viewing order for the study. A two-way ANOVA did not reveal significant

interaction between background hue and viewing order for the attribute mean scores or for the likelihood of purchase mean scores.

Regardless of background hue, likelihood of purchase scores were lower when the products were the first item viewed as shown in Figure 1. Fischer's LSD post hoc test indicated a significant difference between viewing order one and viewing order two for both the fleece vest and the chest of drawers and a significant difference between viewing order one and viewing order three for both the fleece vest and the chest of drawers. These findings suggest that likelihood of purchase was more influenced by viewing sequence than by background hue.

Insert Figure 1 about here

A two-way ANOVA was conducted to determine if there was interaction between the three viewing orders, gender, and the likelihood of purchase. Significant interaction was found for the fleece vest, $\underline{F}$ (2, 210) = 2.924, $\underline{p}$ = .056, the chest of drawers, $\underline{F}$ (2, 210) = 9.652, $\underline{p}$ = .000, and the bicycle bag, $\underline{F}$ (2, 210) = 7.681, $\underline{p}$ = .001. Males indicated that they were more likely to purchase the fleece vest and the bicycle bag when the products were viewed second and females were more likely to purchase the fleece vest and the bicycle bag when the products were viewed last. Males indicated that they were more likely to purchase the chest of drawers when it was viewed last and females were more likely to purchase the chest of drawers when it was viewed second.

Mean attribute scores were obtained for each product by viewing order and gender. The fleece vest was rated more positively by both genders when it was viewed last. Males rated the chest of drawers more positively when it was viewed last and females rated the chest of drawers more positively when it was viewed second. Males rated the bicycle bag

more positively on five of the seven attributes when it was viewed second and females rated the bicycle bag highest on all seven attributes when it was viewed last.

Discussion

The results of this study provide implications for business owners and for future research.

Implications for Business Owners

Findings from this study reaffirm that business owners need to identify their target market regardless of the business marketing strategy that they prefer to use. The demographic characteristics of the participants in this study were associated with significant differences in the effect of Web background color upon attitudes toward products.

Gender played a significant role in how participants perceived the products' attributes when they were featured on different background colors. The results of this study indicate there was interaction between gender, viewing order, and likelihood of purchase. In addition, trends were revealed between the participant's age, college major, size of hometown and the participant's attitude toward the products' attributes. Participants who frequently shopped online and those who spent more hours online per week tended to rate products more positively when they were featured on cool (*i.e.*, blue, green, and purple) background colors. This finding suggests that repeat customers (*i.e.*, persons who shop frequently online) may respond most positively to a Web site with a cool color background.

Previous research has revealed that customers tend to postpone purchases when higher priced products are featured on warm colors. In this study, participants indicated a

higher likelihood of purchase when the furniture item, which may have been perceived as the most expensive of the three products, was featured on a cool background. In other words, business owners who are selling high end products on the Web may be able to enhance sales through use of cool background colors.

A perusal of fashion magazines and catalogs, published at the time of the study, revealed that the color orange was a fashionable apparel color. The seemingly positive impact of the orange background upon participants' attitude toward the products' attributes and likelihood of purchasing the products may reflect an affinity for a current fashion trend. If this is the case, then as fashion color trends change, the impact of Web site background colors upon consumers may change.

This study found a significant correlation between consumers' attitudes toward the products and the likelihood of purchasing those products. Correlation was especially high for the perception of Attractiveness in relation to likelihood of purchase, across all products and all hues, except for the fleece vest when viewed on a yellow background. Therefore, taking steps to ensure customers' perceptions of product Attractiveness may stimulate sales.

Participants' perceptions of product Quality and Durability also were highly correlated with the likelihood of purchase across all products. The inclusion of facts relevant to Quality and Durability, within the product description, may translate into improved e-tailer sales. Additionally, there was a modest correlation between participants' attitudes toward product Uniqueness and likelihood of purchase.

Home-based business owners tend to produce items that fill niche market needs. Frequently these items are unique, which may give home-based business owners a small advantage in the e-commerce market place.

Implications for Future Research

Color has been found to play a significant role in consumers' attitudes toward products in retail stores. In a previous study, Web background hue and design were found to influence attributes that consumers valued when making purchase decisions about selected products. The present study extended the study of color affect on consumers' attitudes to those products sold by e-tailers. The findings indicated that when the selected products were featured on cool colors versus warm colors, they received higher attribute scores. However, when hue backgrounds were compared to the neutral white background two of the products received more positive attribute scores on the neutral white background. This suggests that tints, which are hues with white added, might be better backgrounds on which to feature products. Future research should compare the impact of different value levels of one hue, from tints to shades, upon consumers' reactions to products.

The hues included in this study also were at full saturation for the software used to develop the simulated pages. Sharpe (1974) found that North Americans preferred saturated colors to unsaturated colors. However, Arnheim (1969) suggested using saturated colors in only limited quantities. The extensive and exclusive use of fully saturated colors for Web page background hues, in this study, may have created a negative experience for some participants.

Although no significant relationship between Web background hue and likelihood of purchase was observed, the chest of drawers did receive higher likelihood of purchase scores when featured on the purple background and participants indicated they were more likely to purchase the fleece vest and the bicycle bag when they were featured on a red or orange background. This finding is consistent with simulated retail studies in which consumers indicated a greater likelihood to purchase products perceived as expensive when those products were featured on cool color backgrounds, while impulse items and less costly items were more likely to be purchased when featured on a warm background colors. Although this study did not include the price for the products, the chest of drawers may have been perceived to be more costly than the fleece vest or the bicycle bag. Future research should continue to investigate the impact of Web background color on consumers' attitude toward high end products and the likelihood of purchase.

Finally, products selected for future research should be screened prior to being investigated, to be sure that they are likely to be purchased by the participants. Participants who provided low scores for likelihood of purchase commented that they did not have a need for the product as they already had one or several of the item, thereby negating an accurate evaluation of color influence upon purchase intentions.

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Table 2
Demographic Characteristics of Participants

Characteristics	N	Percent
Age	213	
18-20 years		24.4
21-23 years		47.4
24-26 years		19.7
27 years and older		8.5
Gender	213	
Male		42.7
Female		57.3
College	213	
Agriculture		13.6
Business		12.2
Education		16.9
Engineering		10.8
Family Life		14.1
Humanities, Arts & Social Sciences		11.7
Natural Resources		11.7
Science		8.9
Size of community	212	
Urban		29.6
Midsize		34.7
Rural		35.2
Diagnosed as color blind	213	
Yes		1.4
No		98.6

Table 3

Mean Attribute Scores for Bicycle Bag by Background Hue

		Attributes						
Hue	n	Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
Blue	30							
M		**5.767**	*4.600*	4.733	4.967	4.800	4.867	*3.967*
SD		1.305	1.694	1.112	1.299	1.297	1.008	1.377
Green	31							
M		5.548	4.645	5.032	5.097	5.097	4.710	4.065
SD		1.567	1.942	1.169	1.274	0.978	0.938	1.590
Orange	31							
M		5.645	4.936	**5.290**	**5.226**	5.097	**5.032**	4.290
SD		1.496	1.181	1.039	1.087	1.076	0.983	1.442
Purple	31							
M		5.548	4.710	4.710	*4.548*	5.065	4.677	**4.677**
SD		1.480	1.532	1.039	1.261	1.340	1.137	1.514
Red	30							
M		5.433	4.667	4.933	4.867	**5.167**	*4.633*	4.400
SD		1.569	1.749	1.258	1.306	1.511	1.426	1.476
White	30							
M		5.600	**5.133**	5.233	5.167	**5.167**	4.933	4.500
SD		1.163	1.008	0.935	1.020	1.177	0.868	1.526
Yellow	30							
M		*5.167*	4.700	*4.567*	4.633	*4.633*	4.667	4.233
SD		1.744	1.622	1.135	0.850	1.098	0.959	1.547

Note. The scores in bold and large print indicate the highest mean score for the attribute across hues and the the scores in italics indicate the lowest mean score for the attribute across the hues.

Table 4

Mean Attribute Scores for Fleece Vest by Background Hue

		Attributes						
Hue	n	Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
Blue	30							
M		3.133	**5.667**	**5.367**	5.367	**4.667**	**5.233**	**5.933**
SD		1.279	1.213	0.809	0.809	0.994	1.006	0.944
Green	31							
M		2.677	5.258	5.194	5.290	4.419	4.742	5.452
SD		1.166	1.237	1.223	1.071	0.992	1.182	1.338
Orange	31							
M		**3.323**	5.323	5.355	**5.516**	4.484	5.129	5.710
SD		1.492	1.166	1.050	0.996	0.996	1.204	1.071
Purple	31							
M		3.161	*4.968*	5.161	5.290	4.258	4.774	*4.936*
SD		1.530	1.560	1.214	1.039	1.437	1.203	1.548
Red	30							
M		2.900	5.000	5.167	5.133	4.467	4.633	5.133
SD		1.398	1.083	0.874	0.860	0.900	1.189	1.525
White	30							
M		2.867	5.100	4.867	4.967	4.367	4.833	5.333
SD		1.480	0.923	0.860	1.033	1.273	0.986	1.269
Yellow	30							
M		*2.500*	5.300	*4.700*	*4.800*	*3.900*	*4.567*	5.233
SD		1.253	0.915	1.055	0.997	1.062	1.073	1.165

Note. The scores in bold and larger print indicate the highest mean score for the attribute across hues and the scores in italics indicate the lowest mean score for the attribute across the hues.

Table 5

Mean Attribute Scores for Chest of Drawers by Background Hue

		Attributes						
Hue	n	Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
Blue	30							
M		3.100	6.033	5.100	5.333	4.700	4.833	4.933
SD		1.689	1.129	1.029	1.093	1.208	1.147	1.363
Green	31							
M		*2.484*	6.161	4.839	5.194	4.452	*4.258*	4.548
SD		1.435	0.820	1.068	1.078	1.234	1.341	1.524
Orange	31							
M		3.258	6.129	4.807	5.129	4.710	4.710	4.936
SD		1.549	0.763	1.195	1.088	1.071	1.296	1.436
Purple	31							
M		**3.452**	**6.258**	**5.226**	**5.548**	**4.936**	**5.129**	**5.333**
SD		1.690	0.930	1.023	0.961	1.031	0.991	1.295
Red	30							
M		2.933	*5.800*	*4.300*	*4.900*	*4.367*	4.300	*4.300*
SD		1.461	1.243	1.535	1.494	1.712	1.317	1.897
White	30							
M		3.067	6.200	5.000	5.400	4.667	4.967	5.000
SD		1.574	0.925	1.232	1.133	0.922	1.245	1.531
Yellow	30							
M		3.167	5.933	4.600	5.067	4.500	4.567	4.733
SD		1.341	0.980	1.070	1.143	1.167	1.135	1.437

Note. The scores in bold and larger print indicate the highest mean score for the attribute across hues and the scores in italics indicate the lowest mean score for the attribute across the hues.

Table 6

Mean Attribute Scores for Likelihood of Purchase by Background Hue

Hue	n	Likelihood of Purchase		
		Fleece Vest	Chest of Drawers	Bicycle Bag
Blue	30			
M		4.633	4.467	2.833
SD		1.671	1.634	1.821
Green	31			
M		4.258	3.710	2.871
SD		1.673	1.657	1.689
Orange	31			
M		**4.839**	4.323	2.871
SD		1.294	1.351	1.432
Purple	31			
M		*3.710*	**4.484**	*2.645*
SD		1.865	1.435	1.762
Red	30			
M		3.800	*3.667*	**3.233**
SD		1.669	1.561	1.775
White	30			
M		4.200	4.067	2.933
SD		1.710	1.574	1.530
Yellow	30			
M		4.033	3.900	2.733
SD		1.752	1.709	1.552

Note. The scores in bold print indicate the highest mean score for likelihood of purchase across hues and the scores in italics indicate the lowest mean score for likelihood of purchase across the hues

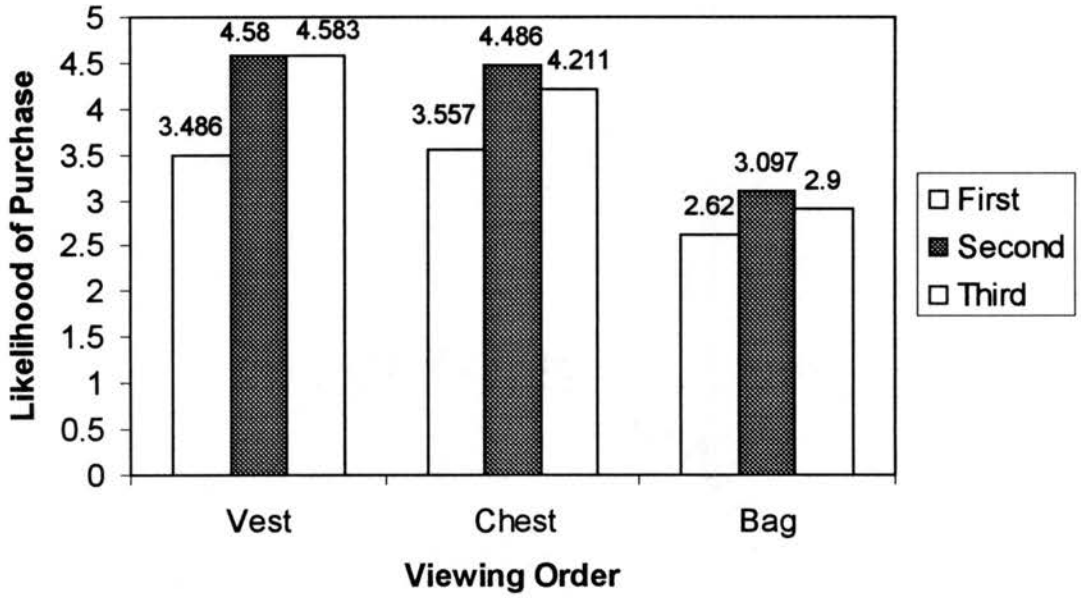

Figure 1. Likelihood of purchase by viewing order.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

This exploratory study tested the effect of Web page background hues on consumers' attitudes toward selected product attributes and consumers' likelihood of purchase. The scope of the study was limited to testing six fully saturated hues and neutral white and three products. This chapter discusses conclusions drawn from the analysis of data, as well as the implications that these findings have for home-based business owners and for future research.

Conclusions

The retail environment is changing from traditional brick and mortar retailers to multi-channel retailing, which includes e-tailing. Mathwick, Malhotra, and Rigdon (2001) question whether the Web, in its current form, is too dull and lifeless to provide an aesthetically pleasing shopping experience. Kotler (1973/74) noted the role that atmospherics plays in consumer behavior. Color is one of the visual dimensions of atmospherics and has been found to play a significant role in consumers' attitudes toward products in retail stores. This study extended the study of color by investigating the effect of background hues on consumers' attitudes toward products sold by e-tailers.

The results from this study indicated that the participants' experiencing of background hues (a situational contingency) resulted in only limited significant differences in mean attribute scores for the products. Although North American adults tend to prefer saturated colors, the extensive and exclusive use of fully saturated colors

for Web page background hues in this study may have provided an unpleasant experience that led participants to devalue the featured products.

One of the surprising findings of this study pertained to the orange background. When the fleece vest and the bicycle bag were featured on the orange background, the products received either the highest or second highest rating across all the attributes except Attractiveness. This seemingly positive impact of the orange background may reflect a current fashion trend for the color orange. If this is the case, then as fashion color trends change, the impact of Web site background colors upon consumers also may change.

Although the white background was not associated with highly positive or highly negative attribute scores, when compared to all hues there was a trend for the chest of drawers and the bicycle bag to receive more positive scores when featured on the white background. The fleece vest received more positive scores when featured on a colored background. Consistent with previous studies, males preferred blue and rated products more positively when featured on a blue background. On the other hand, females in this study preferred products that were presented on a warm background. Females also tended to rate all products higher than males.

Implications for Home-Based Business Owners

Findings from this study reaffirm that home-based business owners need to identify their target market regardless of the business marketing strategy that they prefer to use. The demographic characteristics of the participants in this study were associated with significant differences in effect of color upon attitudes toward products. Males rated products more positively when they were viewed on cool color backgrounds and females tended to mark higher attitude scores when the products were viewed on one of the warm

colors. When neutral white was compared to colors, females tended to give higher attribute scores across all products when the products were featured on the white background and males when the products were featured on a cool background. Participants from midsize communities (20,000 to 60,000 population) gave higher attribute scores to all three products when they were viewed on a cool background color. Participants from urban areas (greater than 60,000 population) and rural areas (less than 20,000 population) rated the chest of drawers and the bicycle bag more positively when they were viewed on warm background colors. Urban participants tended to rate the fleece vest higher when it was viewed on a cool background, however, a trend did not emerge for rural participants.

When the fleece vest and the bicycle bag were featured on warm backgrounds, they received higher likelihood of purchase scores and the chest of drawers received a higher likelihood of purchase score when it was featured on a cool background. Although prices were not included in the study, indications from previous research are that consumers' tend to postpone purchase decisions when higher priced products are featured on warm background colors. In this study, the chest of drawers may have been perceived as most expensive. These findings suggest that when business owners want to sell high end products on the Web, cool background colors may enhance sales.

This study found a significant positive correlation between consumers' attitudes toward the products and the likelihood of purchase. Participants' attitude toward the Attractiveness attribute was highly correlated with the likelihood of purchase across all products and all hues, except for the fleece vest when it was viewed on a yellow background. In this study, if participants' attitude toward the products' Attractiveness

attribute was positive, they were more likely to indicate that they would purchase the item. However, if their attitude toward the products' Attractiveness attribute was less positive, their likelihood of purchase was low. This would indicate that a product's Attractiveness is an important product attribute for e-tailers to feature on a Web site.

Participants' attitudes toward the products' Quality and Durability attributes also were highly correlated with the likelihood of purchase across all products. In this study, there was only modest correlation between participants' attitude toward the products' Uniqueness and likelihood of purchase. Home-based business owners tend to produce items that fill niche market needs. Frequently these items are unique, which may give home-based business owners a small e-commerce advantage.

In regards to the Expensiveness and Workmanship attributes, there was a correlation between likelihood of purchase and attitudes toward both the fleece vest and the chest of drawers. However, there was only a low correlation for the bicycle bag between participants' attitude toward the Workmanship attribute and likelihood of purchase and no correlation between the Expensiveness attribute and likelihood of purchase. Because bicycle bags are frequently replaced, these two attributes may not have been perceived to be as important as the Usefulness attribute, which was highly correlated with likelihood of purchasing the bicycle bag.

Although no significance was found, participants whose favorite color was a cool color tended to rate all products higher when viewed on a cool background hue. Participants whose favorite colors were warm tended to rate all products higher when the products were featured on a warm background.

The results of this study are similar to those obtained from studies conducted in simulated retail settings (See Table 1). Until further e-commerce research is conducted, e-tailers may find the results of retail studies useful for selecting Web colors.

Implications for Future Research

Although this study had limited significant findings, the results provide baseline data for future research. This study examined the color effects of fully saturated hues and white. When the white background was compared to the hues and the collapsed hues of warm colors and cool colors, the white background emerged with more positive attitude scores for the chest of drawers and the bicycle bag. This suggests that tints, which are hues with white added, might be better backgrounds on which to feature products. Future researchers might compare the impact of different levels of one hue, from tints to shades, upon consumers' reactions to products.

Future researchers also should pre-determine prior to testing, if the products selected are ones that participating consumers would purchase through the Web distribution channel. If the products selected for testing are ones that consumers would not purchase via the Web, a test for effect of background hue upon purchase likelihood would be invalid. After the product selection has been established, future researchers also should pre-determine the attributes that participating consumers value when they purchase the products.

Although the fleece vest received more positive attribute scores when viewed on cool colors, the likelihood of purchase was greater when the vest was featured on a warm color background. Previous studies have found that impulse type purchases and the purchase of less expensive products are more prevalent on red backgrounds. Researchers

might further investigate whether high end products and less expensive products receive different evaluations against identically colored backgrounds.

This study was conducted during the spring season during the day. In a home setting, Web-based shopping can occur during all hours. It might be beneficial to test the impact of Web background color during different times of the day. Research also might be conducted during different seasons of the year to determine if business owners should change background hues as the seasons change.

This study used a convenience sample of traditional college age students of European American ethnicity. Internet users are becoming more like the general population. Therefore future researchers should investigate the effect of Web color on a sample consumers who more closely fit the profile of the general population.

This study tested the effects of only a limited number of background hues and a limited number of products using a convenience sample. The color of the products was not controlled. Additional study is needed concerning the interactive effect of the Web background color in relation to product color. Future researchers also should investigate the interactive effect of non-verbal image of the product in relation to various symbolic meanings associated with background colors.

Obviously, the subject of Web site atmospherics is complex and multi-faceted. It is hoped that this study will provide information to encourage further research about the affect of the Web site environment upon the exchange process.

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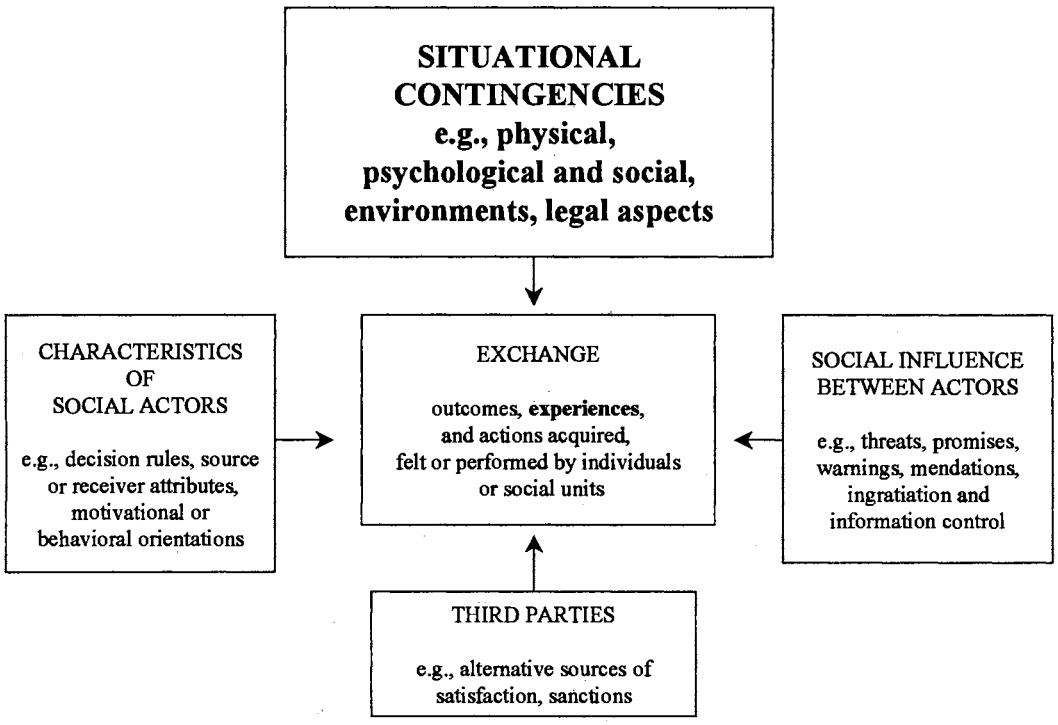
APPENDIXES

APPENDIX A

BAGOZZI'S DETERMINTS OF EXCHANGE



The Determinants of Exchange

Note: The determinant guiding this study is in bold print.

APPENDIX B

PROPERTIES OF BACKGROUND COLORS

PROPERTIES OF BACKGROUND COLORS

Name	Hue	Saturation	Luminescence	Hexadecimal Value	RGB Value		
					Red	Green	Blue
Red	0	240	120	FF0000	255	0	0
Orange	20	240	120	FF8000	255	128	0
Yellow	40	240	120	FFFF00	255	255	0
Green	80	240	120	00FF00	0	255	0
Purple	180	240	120	8000FF	128	0	255
Blue	160	240	120	0000FF	0	0	255
White	160	0	240	FFFFFF	255	255	255

Note. Hexadecimal values from micromedia® DreamWeaver™ 3 software.

APPENDIX C

QUESTIONNAIRE

VO#_____

EVALUATION OF PRODUCT ATTRIBUTES

This is a study designed to learn more about consumers' evaluations of products on the Web.

Your participation will take approximately 15 minutes. The number on the questionnaire is for record keeping, only. Your responses will remain anonymous. You may omit answering any questions with which you feel uncomfortable. However, your responses will provide valuable and useful information. Therefore, we hope you will complete all parts of the questionnaire.

PLEASE CONTINUE ON NEXT PAGE →

Evaluation of Product Attributes

This is a study designed to learn more about consumers' evaluations of products on the Web. The task before you is to view three different products. After viewing each product please indicate your evaluation of the product, before viewing the next product. There are no right or wrong answers. After viewing all three products, complete the rest of the questionnaire.

Product #1:

Directions: Please circle the number that reflects your evaluation of the featured product.

The product appears to be	NOT UNIQUE	1	2	3	4	5	6	7	VERY UNIQUE
The product appears to be:	NOT USEFUL	1	2	3	4	5	6	7	VERY USEFUL
The product appears to be:	VERY LOW QUALITY	1	2	3	4	5	6	7	VERY HIGH QUALITY
The product would seem to be:	NOT DURABLE	1	2	3	4	5	6	7	VERY DURABLE
The product appears to be:	INEXPENSIVE	1	2	3	4	5	6	7	VERY EXPENSIVE
The workmanship of the product appears to be:	VERY LOW	1	2	3	4	5	6	7	VERY HIGH
The appearance of the product is:	UNATTRACTIVE	1	2	3	4	5	6	7	VERY ATTRACTIVE
What is the probability that you would purchase the featured product?	NO CHANCE (0 IN 100 CHANCES)	1	2	3	4	5	6	7	VERY CERTAIN (99 IN 100 CHANCES)

If the likelihood of purchase (above) was 4 or less, please briefly explain your disinterest in purchasing this product. _____

_____

PLEASE CONTINUE ON NEXT PAGE →

Product #2:

Directions: Please circle the number that reflects your evaluation of the featured product.

The product appears to be	NOT UNIQUE	1	2	3	4	5	6	7	VERY UNIQUE
The product appears to be:	NOT USEFUL	1	2	3	4	5	6	7	VERY USEFUL
The product appears to be:	VERY LOW QUALITY	1	2	3	4	5	6	7	VERY HIGH QUALITY
The product would seem to be:	NOT DURABLE	1	2	3	4	5	6	7	VERY DURABLE
The product appears to be:	INEXPENSIVE	1	2	3	4	5	6	7	VERY EXPENSIVE
The workmanship of the product appears to be:	VERY LOW	1	2	3	4	5	6	7	VERY HIGH
The appearance of the product is:	UNATTRACTIVE	1	2	3	4	5	6	7	VERY ATTRACTIVE
What is the probability that you would purchase the featured product?	NO CHANCE (0 IN 100 CHANCES)	1	2	3	4	5	6	7	VERY CERTAIN (99 IN 100 CHANCES)

If the likelihood of purchase (above) was 4 or less, please briefly explain your disinterest in purchasing this product. _____

_____

PLEASE CONTINUE ON NEXT PAGE →

Product #3

Directions: Please circle the number that reflects your evaluation of the featured product.

The product appears to be	NOT UNIQUE	1	2	3	4	5	6	7	VERY UNIQUE
The product appears to be:	NOT USEFUL	1	2	3	4	5	6	7	VERY USEFUL
The product appears to be:	VERY LOW QUALITY	1	2	3	4	5	6	7	VERY HIGH QUALITY
The product would seem to be:	NOT DURABLE	1	2	3	4	5	6	7	VERY DURABLE
The product appears to be:	INEXPENSIVE	1	2	3	4	5	6	7	VERY EXPENSIVE
The workmanship of the product appears to be:	VERY LOW	1	2	3	4	5	6	7	VERY HIGH
The appearance of the product is:	UNATTRACTIVE	1	2	3	4	5	6	7	VERY ATTRACTIVE
What is the probability that you would purchase the featured product?	NO CHANCE (0 IN 100 CHANCES)	1	2	3	4	5	6	7	VERY CERTAIN (99 IN 100 CHANCES)

If the likelihood of purchase (above) was 4 or less, please briefly explain your disinterest in purchasing this product. _____

_____

PLEASE CONTINUE ON NEXT PAGE →

On average, how many **hours per week** do you spend online? *(Check one.)*

_____ NONE
_____ LESS THAN 1HOUR
_____ MORE THAN 1 HOUR BUT NOT OVER 7 HOURS
_____ MORE THAN 7 HOURS BUT NOT OVER 14 HOURS
_____ MORE THAN 14 HOURS BUT NOT OVER 28 HOURS
_____ MORE THAN 28 HOURS

How frequently do you **shop** (make an actual purchase) online? *(Check one.)*

_____ NEVER
_____ ONCE A YEAR OR LESS
_____ SIX OR MORE TIMES A YEAR
_____ ONCE A MONTH
_____ ONCE A WEEK
_____ DAILY

In which college are you enrolled? *(Check one.)*

_____ AGRICULTURE
_____ BUSINESS
_____ EDUCATION
_____ ENGINEERING
_____ FAMILY LIFE
_____ HUMANITIES, ARTS, SOCIAL SCIENCES
_____ NATURAL RESOURCES
_____ SCIENCE

What is the zip code of your home town? _____

What is your age?

_____

PLEASE CONTINUE ON NEXT PAGE →

What is your gender? (*Check one*)

_____MALE
_____FEMALE

Please rank the following colors in order of your personal preference, from 1 to 6.--Place a one (1) beside your favorite color, a two (2) beside your second favorite color, etc., until all the listed colors have been ranked.

_____ BLUE
_____ GREEN
_____ ORANGE
_____ PURPLE
_____ RED
_____ YELLOW

Have you been diagnosed as color blind? (*Check one.*)

_____ YES
_____ NO

Do you have a credit card?

_____ YES
_____ NO

Please do not discuss these products with your classmates until after everyone has completed the study.

THANK YOU FOR YOUR PARTICIPATION.

THE END.

APPENDIX D

PILOT STUDY

Table 7

Raw Scores Used for Reliability Testing.

	Unique		Useful		Quality		Durable		Expensive		High		Attractive		Likelihood	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Fleece Vest																
S1	4	4	4	5	6	6	6	6	4	5	6	6	6	5	7	6
S2	1	2	4	4	4	4	5	5	4	4	4	5	4	3	2	2
S3	1	1	5	5	5	5	5	5	3	4	4	4	4	5	5	5
S4	3	4	6	6	5	5	6	5	4	5	7	6	7	7	7	7
S5	3	3	3	4	5	4	5	4	3	3	5	4	4	2	1	1
S6	2	3	7	7	6	4	7	6	3	4	4	5	6	6	3	3
S7	1	2	7	6	6	4	7	7	4	4	4	4	4	4	3	3
S8	2	2	6	5	5	5	5	5	5	5	5	4	6	4	5	3
S9	1	1	3	5	4	3	4	3	2	2	2	3	2	3	1	1
S10	1	1	5	5	5	5	5	5	4	4	4	4	6	6	2	2
Chest of Drawers																
S1	3	4	6	6	4	5	5	6	5	4	4	5	6	5	1	1
S2	1	2	6	5	4	5	4	6	6	5	6	6	5	6	5	4
S3	2	3	6	5	5	5	6	6	3	3	5	5	2	3	3	3
S4	2	2	7	7	5	4	6	5	2	2	2	3	1	2	1	1
S5	3	3	6	6	3	2	4	4	2	3	3	3	2	4	4	4
S6	2	1	5	4	4	4	4	4	4	4	4	4	2	2	1	1
S7	2	2	7	7	3	4	4	4	4	4	4	4	4	3	5	5
S8	4	4	7	7	5	7	6	7	3	5	5	6	3	3	2	2
S9	5	4	7	7	4	4	6	6	4	5	3	3	5	4	4	4
S10	1	2	7	6	4	3	3	3	4	4	1	1	4	3	2	2
Bicycle Bag																
S1	4	5	6	5	6	6	5	7	5	7	6	5	7	6	4	4
S2	7	6	3	4	6	6	6	6	6	6	6	6	6	6	2	2
S3	5	5	6	6	6	5	5	5	6	6	4	5	6	6	2	2
S4	5	5	5	5	4	4	4	4	3	4	4	4	5	6	5	5
S5	4	5	5	5	4	4	5	5	2	4	5	4	4	4	2	2
S6	5	5	4	5	5	6	5	6	3	3	5	5	4	5	4	4
S7	6	6	5	5	5	5	5	5	6	6	5	4	6	6	2	1
S8	5	5	6	6	5	5	5	5	3	4	5	6	3	2	1	1
S9	5	3	5	6	3	3	4	3	2	3	4	4	7	4	3	3

S10—One person did not complete the reassessment information.

APPENDIX E

INFORMED CONSENT

Informed Consent
Evaluation of Product Attributes

Introduction and Purpose

Assistant Professor/Extension Specialist Karen Biers in the Department of Human Environments at Utah State University is conducting a research study to find out more about how individuals evaluate products on the Web. In order to achieve a representative sample, approximately 30 students from each of the colleges at Utah State University are asked to participate in the research project. There will be a total of approximately 240 participants from the University.

Procedures

If you agree to be in this study, you will view three different products on a laptop computer screen. After viewing each product, you will complete a series of questions about the product. After viewing all three products, you will be asked questions about online shopping and frequency of use of the Internet. You will also be asked some demographic information such as age, gender, etc. It will take approximately 15 minutes to view the pictures and complete the survey.

New Findings

During the course of this study, you will be informed of any significant new findings (either good or bad), such as changes in the risks or benefits resulting from participation in the research, or new alternatives to participation which might cause you to change your mind about continuing the study. If new information is provided to you, your consent to continue participating in this study will be reobtained.

Risks/ Unforeseeable Risks

There is minimal risk to you for participating in this study.

Benefits

There may or may not be any direct benefit to you from participating in this study. The investigator, however, may learn more about how Web shoppers evaluate products. The information obtained from this study will be used to assistance business owners in evaluating the products sold on their Web site.

Informed Consent
Evaluation of Product Attributes

Explanation and Offer to Answer Questions

Karen Biers has explained this study to you and answered your questions. If you have other questions or research related problems, you may reach Karen Biers at (435) 797-1534.

Extra Costs

There will be no costs to you for participating in this study.

Payment

After you have viewed the products and completed the questionnaire, you will receive a coupon for a dip of Aggie ice cream. If you withdraw from the study, you will not receive the coupon.

Voluntary nature of participation and right to withdraw without consequence

Participation in this research is entirely voluntary. You may refuse to participate or you may withdraw at anytime without consequence.

Confidentiality

To control for random viewing order of the products, your name will be recorded beside the number of the order you view. At least three participants will view the same order as you, therefore, your name will not be linked to any one completed questionnaire. Completed questionnaires will not be available to the public. All information will be reported in aggregate form (*i.e.*, as a total group rather than individually). The viewing order and list of names will be kept in a locked drawer. After verification that there are no duplicate participants the list will be shredded.

IRB Approval Statement

The Institutional Review Board (IRB) for the protection of human subjects at Utah State University has reviewed and approved this research project.

Informed Consent
Evaluation of Product Attributes

Copy of Consent

You have been given two copies of this Informed Consent. Please sign both copies and retain one copy for your files.

Investigator Statement

"I certify that the research study has been explained to the individual, by me or my research staff, and that the individual understands the nature and purpose, the possible risks and benefits associated with taking part in this research study. Any questions that have been raised, have been answered."

Signature of PI

_____

Karen Biers
Principal Investigator
(435) 797-1534

By signing below, I agree to participate.

Signature of Subject Date

_____ _____

APPENDIX F

SUMMARY OF FINDINGS

SUMMARY OF FINDINGS

The purpose of this study was to evaluate the effect of Web page background hue on consumers' attitudes toward selected product attributes and consumers' likelihood of product purchase. The specific objectives were to:

1. measure and compare participants' attitudes toward a fleece vest in relation to a simulated Web page background hue,
2. measure and compare participants' attitudes toward a chest of drawers in relation to a simulated Web page background hue,
3. measure and compare participants' attitudes toward a bicycle bag in relation to a simulated Web page background hue, and
4. develop recommendations for home-based business owners concerning the use of Web page background hues to positively impact consumers' attitudes toward product attributes.

To accomplish these objectives four null hypotheses were tested. The results of this exploratory study are reported in this section. As an exploratory study, findings not specific to these objectives were revealed. These additional findings are reported in this section as they provide insight into consumer online behavior. This section begins with the descriptive statistics of the demographic characteristics of the sample used for the study. This is followed by the results for each hypothesis.

Demographic Characteristics

A convenience sample of 213 college students participated in the study, representing eight colleges within the university. Participants were asked questions about age, gender, college major, size of community, and if they had been diagnosed for color blindness.

Participants were asked to give the zip code for their hometown. These codes were used to determine the size of the community based on the 2000 Census population report. For this study, towns with a population of less than 20,000 were classified as rural, towns with a population 20,000 to 60,000 were classified as midsize, and towns with a population greater than 60,000 were classified as urban. The geographical layout of the state also was factored into determining whether participants were from urban areas. The state's urban area is located along a mountain range and extends approximately 85 miles from north to south. Although some of the towns within this area have census report populations less than 60,000, they are part of the greater urban area. Table 8 displays the frequencies associated with the demographic variables used in this study.

Participants were asked about their frequency of shopping online, the amount of time they spend online, and credit card availability. Overall, the participants had online experience with 85.9 percent spending at least one hour or more per week online and 68.9 percent shopping online at least once a year or more. Nearly three-fourths (72.3%) of the participants had a credit card. As ordering online requires access to a credit card, lack of a card would limit a participant's ability to purchase and thus could impact their intent to purchase. Table 9 profiles the online behavior of the participants.

Table 8

Demographic Characteristics of Participants

Characteristics	N	Frequency	Percent
Age	213		
18-20		52	24.4
21-23		101	47.4
24-26		42	19.7
27 and older		18	8.5
Gender	213		
Male		91	42.7
Female		122	57.3
College	213		
Agriculture		29	13.6
Business		26	12.2
Education		36	16.9
Engineering		23	10.8
Family Life		30	14.1
Humanities, Arts & Social Sciences		25	11.7
Natural Resources		25	11.7
Science		19	8.9
Size of community	212		
Urban		63	29.6
Midsize		74	34.7
Rural		75	35.2
Diagnosed as color blind	213		
Yes		3	1.4
No		210	98.6

Table 9

Web Usage Characteristics of Participants (N=213)

Characteristics	Frequency	Percent
Number of hours spent online per week		
None	3	1.4
Less than one hour	27	12.7
One to seven hours	125	58.7
Greater than seven, but less than 14	41	19.2
Greater than 14, but less than 28	9	4.2
Greater than 28	8	3.8
Frequency of shopping online		
Never	66	31.0
Once a year	78	36.6
Six times per year	51	23.9
Once a month	15	7.0
Once a week	3	1.4
Credit card ownership		
Yes	154	72.3
No	59	27.7

Hypotheses Testing

Hypothesis One

Hypothesis 1. There is no significant difference between participants' attitudes toward a featured product's attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to the simulated Web site background hue.

Fleece vest.

Mean attribute scores were obtained for each product on each background hue. The fleece vest received the highest mean scores for five of the seven attributes when it was viewed on the blue background and received the lowest mean scores for five of the seven

attributes when featured on the yellow background. Table 10 displays the mean attribute scores and the standard deviation of the scores for the fleece vest for the background hues used in the study.

Table 10

Mean Attribute Scores for Fleece Vest by Background Hue

		Attributes						
Hue	n	Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
Blue	30							
M		3.133	**5.667**	**5.367**	5.367	**4.667**	**5.233**	**5.933**
SD		1.279	1.213	0.809	0.809	0.994	1.006	0.944
Green	31							
M		2.677	5.258	5.194	5.290	4.419	4.742	5.452
SD		1.166	1.237	1.223	1.071	0.992	1.182	1.338
Orange	31							
M		**3.323**	5.323	5.355	**5.516**	4.484	5.129	5.710
SD		1.492	1.166	1.050	0.996	0.996	1.204	1.071
Purple	31							
M		3.161	*4.968*	5.161	5.290	4.258	4.774	*4.936*
SD		1.530	1.560	1.214	1.039	1.437	1.203	1.548
Red	30							
M		2.900	5.000	5.167	5.133	4.467	4.633	5.133
SD		1.398	1.083	0.874	0.860	0.900	1.189	1.525
White	30							
M		2.867	5.100	4.867	4.967	4.367	4.833	5.333
SD		1.480	0.923	0.860	1.033	1.273	0.986	1.269
Yellow	30							
M		*2.500*	5.300	*4.700*	*4.800*	*3.900*	*4.567*	5.233
SD		1.253	0.915	1.055	0.997	1.062	1.073	1.165

Note. The scores in bold and larger print indicate the highest mean score for the attribute across hues and the scores in italics indicate the lowest mean score for the attribute across the hues.

Results for the fleece vest were analyzed using a one-way analysis of variance (ANOVA), with between-groups design. For the fleece vest, this analysis revealed a significant mean difference for the Attractive attribute, F (6, 206) = 2.161, p = .048 and a significant mean difference for the Durability attribute, F (6, 206) = 1.920, p = .079. A

least significant difference (LSD) post hoc test showed that when the fleece vest was featured on the blue background it received a significantly higher score for Attractiveness than when featured on the purple background, the red background, or the yellow background. The fleece vest also received a significantly higher mean score for Attractiveness when featured on the orange background than when featured on the purple background.

Concerning the Durability attribute, the fleece vest was scored significantly higher when featured on the blue background than when featured on the yellow background and significantly higher when featured on the orange background than when featured on the yellow background or the white background. Table 11 displays the ANOVA results for the fleece vest.

Chest of drawers.

The chest of drawers received the highest mean attribute scores on all seven attributes when featured on the purple background. The product received the lowest attribute mean scores for five of the attributes when featured on the red background. Table 12 displays the mean attribute scores for the chest of drawers for the hues used in this study.

Table 11

Analysis of Variance for Fleece Vest Attributes and Background Hue

Source	df	MS	F	p
Attractiveness				
Between hues	6	3.559	2.161	.048
Within hues	206	1.647		
Durability				
Between hues	6	1.834	1.920	.079
Within hues	206	0.955		
Uniqueness				
Between hues	6	2.555	1.347	.238
Within hues	206	1.897		
Usefulness				
Between hues	6	1.731	1.249	.283
Within hues	206	1.385		
Quality				
Between hues	6	1.839	1.746	.112
Within hues	206	1.054		
Expensiveness				
Between hues	6	1.735	1.413	.211
Within hues	206	1.228		
Workmanship				
Between hues	6	1.864	1.473	.189
Within hues	206	1.266		

Results for the chest of drawers were analyzed using a one-way ANOVA, with between-groups design. For the chest of drawers, this analysis revealed a significant mean difference for the Workmanship attribute, F (6, 206) = 2.219, p = .043 and a significant mean difference for the Quality attribute, F (6, 206) = 2.162, p = .048. The LSD post hoc test showed that when the chest of drawers was featured on the purple

Table 12

Mean Attribute Scores for Chest of Drawers by Background Hue

		Attributes						
Hue	n	Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
Blue	30							
M		3.100	6.033	5.100	5.333	4.700	4.833	4.933
SD		1.689	1.129	1.029	1.093	1.208	1.147	1.363
Green	31							
M		*2.484*	6.161	4.839	5.194	4.452	*4.258*	4.548
SD		1.435	0.820	1.068	1.078	1.234	1.341	1.524
Orange	31							
M		3.258	6.129	4.807	5.129	4.710	4.710	4.936
SD		1.549	0.763	1.195	1.088	1.071	1.296	1.436
Purple	31							
M		**3.452**	**6.258**	**5.226**	**5.548**	**4.936**	**5.129**	**5.333**
SD		1.690	0.930	1.023	0.961	1.031	0.991	1.295
Red	30							
M		2.933	*5.800*	*4.300*	*4.900*	*4.367*	4.300	*4.300*
SD		1.461	1.243	1.535	1.494	1.712	1.317	1.897
White	30							
M		3.067	6.200	5.000	5.400	4.667	4.967	5.000
SD		1.574	0.925	1.232	1.133	0.922	1.245	1.531
Yellow	30							
M		3.167	5.933	4.600	5.067	4.500	4.567	4.733
SD		1.341	0.980	1.070	1.143	1.167	1.135	1.437

Note. The scores in bold and larger print indicate the highest mean score for the attribute across hues and the scores in italics indicate the lowest mean score for the attribute across the hues.

background it received a significantly higher score for Workmanship than when featured on the green background or the red background. The chest of drawers also received a significantly higher score for Workmanship when featured on the white background than when featured on the red background or the green background. Concerning the Quality attribute, the post hoc test indicated that when the chest of drawers was featured on the purple background it received a significantly higher score than when it was featured on

the red background or on the yellow background. The chest of drawers also received a significantly higher score when featured on the blue background and on the white background than when featured on the red background. Table 13 displays the ANOVA results for the chest of drawers attributes.

Table 13

Analysis of Variance for Chest of Drawers Attributes and Background Hue

Source	df	MS	F	p
Workmanship				
Between hues	6	3.281	2.219	.043
Within hues	206	1.479		
Quality				
Between hues	6	2.987	2.162	.048
Within hues	206	1.382		
Uniqueness				
Between hues	6	2.854	1.205	.305
Within hues	206	2.369		
Usefulness				
Between hues	6	0.792	0.824	.553
Within hues	206	0.961		
Durability				
Between hues	6	1.458	1.103	.362
Within hues	206	1.322		
Expensiveness				
Between hues	6	1.138	0.773	.592
Within hues	206	1.473		
Attractiveness				
Between hues	6	3.382	1.487	.184
Within hues	206	2.274		

Bicycle bag.

The mean attribute scores for the bicycle bag did not indicate a trend. When featured on the orange background, the bag received the highest mean scores on Quality, Durability, and Workmanship. The bicycle bag received the highest mean score for Usefulness and for Expensiveness when it was featured on a white background (See Table 14).

Table 14

Mean Attribute Scores for Bicycle Bag by Background Hue

		Attributes						
Hue	n	Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
Blue	30							
M		**5.767**	*4.600*	4.733	4.967	4.800	4.867	*3.967*
SD		1.305	1.694	1.112	1.299	1.297	1.008	1.377
Green	31							
M		5.548	4.645	5.032	5.097	5.097	4.710	4.065
SD		1.567	1.942	1.169	1.274	0.978	0.938	1.590
Orange	31							
M		5.645	4.936	**5.290**	**5.226**	5.097	**5.032**	4.290
SD		1.496	1.181	1.039	1.087	1.076	0.983	1.442
Purple	31							
M		5.548	4.710	4.710	*4.548*	5.065	4.677	**4.677**
SD		1.480	1.532	1.039	1.261	1.340	1.137	1.514
Red	30							
M		5.433	4.667	4.933	4.867	**5.167**	*4.633*	4.400
SD		1.569	1.749	1.258	1.306	1.511	1.426	1.476
White	30							
M		5.600	**5.133**	5.233	5.167	**5.167**	4.933	4.500
SD		1.163	1.008	0.935	1.020	1.177	0.868	1.526
Yellow	30							
M		*5.167*	4.700	*4.567*	4.633	*4.633*	4.667	4.233
SD		1.744	1.622	1.135	0.850	1.098	0.959	1.547

Note. The scores in bold and large print indicate the highest mean score for the attribute across hues and the scores in italics indicate the lowest mean score for the attribute across the hues.

The bicycle bag received the lowest mean attribute scores when featured on the yellow background. When featured on a blue background, a purple background, or a red background the bag received both the highest score and the lowest score for attributes.

Results for the bicycle bag were analyzed using a one-way ANOVA, with between-groups design. For the bicycle bag, this analysis revealed a significant mean difference for the Quality attribute, F (6, 206) = 1.885, p= .085. The LSD post hoc test indicated that the bicycle bag received a significantly higher mean score on Quality when it was featured on an orange background rather than a blue, purple, or yellow background. The bag also received a significantly higher mean score on Quality when featured on a white background rather than a yellow background. Table 15 displays the ANOVA results for the bicycle bag attributes.

Warm hues and cool hues.

A one-way ANOVA, between-groups design, also was conducted to determine if there was a significant difference between participants' attitudes towards attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) when the hues were collapsed into cool colors (*i.e.*, blue, green, and purple) and warm colors (*i.e.*, orange, red, and yellow). This analysis failed to reveal significant mean differences for product attributes between the cool colors and the warm colors.

Table 15

Analysis of Variance for Bicycle Bag Attributes and Background Hue

Source	df	MS	F	p
Quality				
Between hues	6	2.289	1.885	.085
Within hues	206	1.215		
Uniqueness				
Between hues	6	1.083	0.491	.815
Within hues	206	2.207		
Usefulness				
Between hues	6	1.123	0.460	.837
Within hues	206	2.442		
Durability				
Between hues	6	2.095	1.534	.169
Within hues	206	1.366		
Expensiveness				
Between hues	6	1.267	0.849	.533
Within hues	206	1.492		
Workmanship				
Between hues	6	0.733	0.653	.687
Within hues	206	1.122		
Attractiveness				
Between hues	6	1.850	0.825	.552
Within hues	206	2.243		

Hues and neutral white.

White is frequently used as a background color for Web sites therefore, it was included in this study. An independent-samples t test was conducted to determine if there were significant differences between the product attribute mean scores when the products were featured on a hue background and when they were featured on a white background. No significant differences emerged from this analysis, but there was a trend for the fleece

vest to receive more positive attribute scores when it was featured on one of the six hues. The chest of drawers and the bicycle bag received more positive attribute scores when they were featured on the white background. The results of the t-test for the fleece vest are reported in Table 16, for the chest of drawers in Table 17, and for the bicycle bag in Table 18.

Table 16

T-Test for Fleece Vest by Hue Background and White Background

Attribute	Background		df	t
	Hue (n=183)	White (n=30)		
Uniqueness				
M	**2.951**	2.867	211	.308
SD	1.372	1.479		
Usefulness				
M	**5.251**	5.100	211	.650
SD	1.219	0.923		
Quality				
M	**5.159**	4.867	211	1.432
SD	1.060	0.860		
Durability				
M	**5.235**	4.967	211	1.379
SD	0.980	1.033		
Expensiveness				
M	4.366	**4.367**	211	-.002
SD	1.091	1.273		
Workmanship				
M	**4.847**	4.833	211	.061
SD	1.157	0.986		
Attractiveness				
M	**5.399**	5.333	211	.255
SD	1.313	1.269		

Note. The scores in bold print indicate the highest mean score for the attribute.

Table 17

T-Test for Chest of Drawers by Hue Background and White Background

Attribute	Background		df	t
	Hue (n=183)	White (n=30)		
Uniqueness				
M	3.066	**3.067**	211	-.004
SD	1.543	1.574		
Usefulness				
M	6.055	**6.200**	211	-.754
SD	0.987	0.925		
Quality				
M	4.814	**5.000**	211	-.789
SD	1.190	1.232		
Durability				
M	5.197	**5.400**	211	-.896
SD	1.155	1.133		
Expensiveness				
M	4.612	**4.667**	211	-.229
SD	1.252	0.922		
Workmanship				
M	4.634	**4.967**	211	-1.369
SD	1.233	1.245		
Attractiveness				
M	4.797	**5.000**	211	-.679
SD	1.519	1.531		

Note. The scores in bold print indicate the highest mean score for the attribute.

The hue variable was then divided into warm colors (*i.e.*, orange, red, and yellow) and cool colors (*i.e.*, blue, green, and purple) and a one-way ANOVA was conducted to determine if there were significant differences between the product attribute scores when the products were featured on a warm background color, a cool background color, or on a

Table 18

T-Test for Bicycle Bag by Hue Background and White Background

Attribute	Background		df	t
	Hue (n=183)	White (n=30)		
Uniqueness				
M	5.519	**5.600**	211	-.278
SD	1.522	1.163		
Usefulness				
M	4.710	**5.133**	211	-1.388
SD	1.617	1.008		
Quality				
M	4.880	**5.233**	211	-1.615
SD	1.137	0.935		
Durability				
M	4.891	**5.167**	211	-1.191
SD	1.199	1.020		
Expensiveness				
M	4.978	**5.167**	211	-.784
SD	1.227	1.177		
Workmanship				
M	4.765	**4.933**	211	-.810
SD	1.082	0.868		
Attractiveness				
M	4.273	**4.500**	211	-.770
SD	1.491	1.526		

Note. The scores in bold print indicate the highest mean score for the attribute.

white background. The results of this analysis indicated that the fleece vest received slightly higher attribute scores when it was featured on cool colors. The chest of drawers received more positive attribute scores on four of the attributes when it was featured on the white background. The bicycle bag received higher mean scores on six of the seven attributes when it was featured on the white background.

These findings indicate that Web background hues can impact consumers' attitudes toward selected product attributes. When featured on a white background, the fleece vest received lower attribute scores than when featured on a hue background. The chest of drawers and bicycle bag received more positive attribute scores when featured on a white background.

Further analysis was conducted to determine if there was a relationship between hue and attribute mean scores across products. The results of this analysis were not significant for any of the attributes. The F values for each of the attributes included: Uniqueness, $F(6, 206) = 1.316$, $p = .252$, Usefulness, $F(6, 206) = .526$, $p = .788$, Quality, $F(6, 206) = 1.638$, $p = .138$, Durability, $F(6, 206) = 1.285$, $p = .265$, Expensiveness, $F(6, 206) = .931$, $p = .473$, Workmanship, $F(6, 206) = 1.671$, $p = .130$, and Attractiveness, $F(6, 205) = .817$, $p = .558$.

Hypothesis Two

Hypothesis 2. There is no significant difference between participants' likelihood of product purchase in relation to the simulated Web site background hue.

Mean likelihood of purchase scores were obtained for each product on each background hue. The sample mean scores and the standard deviation of the scores are displayed in Table 19.

Results were analyzed using a one-way ANOVA, between-groups design. This analysis failed to reveal a significant effect for background hue on likelihood of purchase for the fleece vest, $F(6, 206) = 1.881$, $p = .086$, the chest of drawers, $F(6, 206) = 1.480$, $p = .187$, or the bicycle bag, $F(6, 206) = .379$, $p = .892$. Further analysis did not find a

significant relationship between background hue and likelihood of purchase across products, F (6, 206) = .952, p = .459.

Table 19

Mean Attribute Scores for Likelihood of Purchase by Background Hue

		Likelihood of Purchase		
Hue	n	Fleece Vest	Chest of Drawers	Bicycle Bag
Blue	30			
M		4.633	4.467	2.833
SD		1.671	1.634	1.821
Green	31			
M		4.258	3.710	2.871
SD		1.673	1.657	1.689
Orange	31			
M		**4.839**	4.323	2.871
SD		1.294	1.351	1.432
Purple	31			
M		*3.710*	**4.484**	*2.645*
SD		1.865	1.435	1.762
Red	30			
M		3.800	*3.667*	**3.233**
SD		1.669	1.561	1.775
White	30			
M		4.200	4.067	2.933
SD		1.710	1.574	1.530
Yellow	30			
M		4.033	3.900	2.733
SD		1.752	1.709	1.552

Note. The scores in bold print indicate the highest mean score for likelihood of purchase across hues and the scores in italics indicate the lowest mean score for likelihood of purchase across the hues.

Warm hues and cool hues.

The hues were collapsed into warm colors (*i.e.*, orange, red, and yellow) and cool colors (*i.e.*, blue, green, and purple) and these two color groups were compared with white. Results were analyzed using a one-way ANOVA, between-groups design. This analysis failed to reveal a significant difference between 'color', white, and the likelihood of purchase for the fleece vest, F (2, 210) = .011, p = .990, the chest of drawers, F (2, 210) = .580, p = .561, or the bicycle bag, F (2, 210) = .246, p = .783. These results support hypothesis two.

Hues and neutral white.

An independent-samples t-test was conducted to determine if there were significant differences between the likelihood of purchase when the products were featured on a hue background and when they were featured on a white background. No significant differences emerged from this analysis. The mean scores are displayed in Table 20.

Table 20

Mean Attribute Scores for Likelihood of Purchase by Hue Background and White Background

		Likelihood of Purchase		
Background	n	Fleece Vest	Chest of Drawers	Bicycle Bag
Hue	183			
M		**4.213**	**4.093**	2.863
SD		1.691	1.578	1.663
White	30			
M		4.200	4.067	**2.933**
SD		1.710	1.574	1.530

Note. The scores in bold print indicate the highest mean score for likelihood of purchase.

A Spearman rho was conducted for each product to determine if there was a relationship between likelihood of product purchase and consumers' attitudes toward product attributes. With the exception of the Expensive attribute for the bicycle bag, significant correlation was found between likelihood of purchase and consumers' attitudes toward each of the product attributes. The more positive the attitude the more likely consumers were to indicated they would purchase the product. The correlation coefficients are displayed in Table 21.

Table 21

Correlation Between Likelihood of Product Purchase and Consumers' Attitudes

	Likelihood of Product Purchase		
Consumers' Attitudes Toward Product Attributes	Fleece Vest (N=213)	Chest of Drawers (N=213)	Bicycle Bag (N=213)
Unique	.289**	.221**	.180**
Useful	.387**	.429**	.531**
Quality	.466**	.537**	.399**
Durable	.468**	.416**	.333**
Expensive	.299**	.386**	.106
Workmanship	.385**	.449**	.187**
Attractive	.567**	.581**	.501**

** $p < .01$

A Spearman rho was conducted to determine if there was a relationship between likelihood of purchase and consumers' attitudes toward each product when it was featured on each of the hues. The results for the fleece vest are displayed in Table 22, the results for the chest of drawers are displayed in Table 23, and the results for the bicycle bag are displayed in Table 24.

Table 22

Correlation Between Likelihood of Fleece Vest Purchase and Consumers' Attitudes by Background Hue

	Likelihood of Fleece Vest Purchase						
Consumers' Attitudes Toward Fleece Vest Attributes	Blue	Green	Orange	Purple	Red	White	Yellow
Uniqueness	-.103	.136	.323	.708**	.425*	.323	.036
Usefulness	.257	.244	.370*	.527**	.347	.531**	.388*
Quality	.332	.448*	.495**	.606**	.585**	.167	.528**
Durability	.530**	.398*	.492**	.421*	.285	.519**	.588**
Expensiveness	.547**	.237	.185	-.040	.493**	.329	.363*
Workmanship	.348	.305	.433*	.260	.374*	.405*	.422*
Attractiveness	.688**	.395*	.708**	.616**	.618**	.494**	.311

*p < .05. **p < .01.

Table 23

Correlation Between Likelihood of Chest of Drawers Purchase and Consumers' Attitudes by Background Hue

	Likelihood of Chest of Drawers Purchase						
Consumers' Attitudes Toward Chest of Drawers Attributes	Blue	Green	Orange	Purple	Red	White	Yellow
Uniqueness	.220	.103	.136	-.157	.550**	.445*	.227
Usefulness	.521**	.184	.482**	.528**	.568**	.151	.445*
Quality	.773**	.330	.282	.340	.685**	.612**	.567**
Durability	.399*	.363*	.163	.412*	.639**	.375*	.353
Expensiveness	.249	.243	.449*	.491**	.639**	.204	.393*
Workmanship	.563	.328	.359*	.173	.438*	.476**	.596**
Attractiveness	.421*	.598**	.714**	.501**	.726**	.505**	.453*

*p < .05. **p < .01.

Table 24

Correlation Between Likelihood of Bicycle Bag Purchase and Consumers' Attitudes by Background Hue

Consumers' Attitudes Toward Bicycle Bag Attributes	Likelihood of Bicycle Bag Purchase						
	Blue	Green	Orange	Purple	Red	White	Yellow
Uniqueness	-.042	.068	.274	.538**	.252	.015	.159
Usefulness	.450*	.650**	.470**	.586**	.591**	.357	.521**
Quality	.493**	.414*	.260	.719**	.460*	-111	.421*
Durability	.297	.451*	.459**	.426*	.485**	-.063	.204
Expensiveness	-.052	.397*	.100	.366*	.067	-.158	.043
Workmanship	-.017	.250	.315	.263	.405*	-.156	.163
Attractiveness	.436*	.574**	.545**	.683**	.560**	.433*	.424*

*$p < .05$. **$p < .01$.

Hypothesis Three

Hypothesis 3. There is no significant difference between participants' attitudes toward featured product attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to selected participant demographics (*i.e.*, age, gender, college major, size of community, frequency of shopping online, and amount of time spent online) and the simulated Web site background hue.

Results were analyzed using a two-way ANOVA, with two between-groups factors. This analysis failed to reveal interaction between individual hues and participants' demographic characteristics. To increase cell size, the hues were collapsed into cool colors (*i.e.*, blue, green, and purple) and warm colors (*i.e.*, orange, red, and yellow) and

this variable was labeled 'colors'. Further analysis revealed significant interaction between background color and selected demographic variables.

Gender.

Gender played a significant role in how participants perceived the products' attributes. Males tended to mark more positive attitude scores for products when the products were viewed on one of the cool color backgrounds and females tended to mark more positive attitude scores when the products were viewed on one of the warm colors or neutral white. Table 25 displays the interaction of gender and background color for the fleece vest and Table 26 displays the results for the chest of drawers. There was no significant interaction between gender and background color for the bicycle bag.

Table 25

Analysis of Variance for Interaction Between Gender and Colors for Fleece Vest Attributes

Source	df	MS	F	p
Workmanship				
Colors	1	1.252	1.041	.309
Gender	1	4.211	3.502	.063
Colors * Gender	1	10.138	8.430	.004
Error	179	1.203		
Durability				
Colors	1	5.117	5.693	.018
Gender	1	17.891	19.906	.000
Colors * Gender	1	5.957	6.628	.011
Error	179	0.899		
Attractiveness				
Colors	1	0.364	0.233	.630
Gender	1	0.808	0.518	.473
Colors * Gender	1	11.147	7.148	.008
Error	179	1.560		
Quality				
Colors	1	5.597	5.282	.023
Gender	1	9.495	8.961	.003
Colors * Gender	1	3.974	3.750	.054
Error	179	1.060		

Note. The term colors refers to the six hues that were collapsed into warm colors (*i.e.*, orange, red, and yellow) and cool colors (*i.e.*, blue, green, and purple).

Table 26

Analysis of Variance for Interaction Between Gender and Colors for the Chest of Drawers

Source	df	MS	F	p
Workmanship				
Colors	1	0.121	0.083	.774
Gender	1	0.003	0.002	.960
Colors * Gender	1	8.278	5.685	.018
Error	179	1.456		

Note. The term colors refers to the six hues that were collapsed into warm colors (*i.e.*, orange, red, and yellow) and cool colors (*i.e.*, blue, green, and purple).

Further analysis revealed interaction between hue background, white background, and gender. The significant interactions for the fleece vest are shown in Table 27. There were no significant interactions for the chest of drawers and the results for the bicycle bag are shown in Table 28.

Analysis also revealed interaction between warm color background, cool color background, white background, and gender. The significant interactions for the fleece vest are displayed in Table 29 and for the chest of drawers in Table 30. There were no significant interactions for the bicycle bag.

Table 27

Analysis of Variance for Interaction Between Gender, Hue Background, and White Background for the Fleece Vest Attributes

Source	df	MS	F	p
Workmanship				
White * Hue	1	0.417	0.336	.563
Gender	1	11.846	9.527	.002
White * Hue * Gender	1	7.760	6.241	.013
Error	209	1.243		
Expensiveness				
White * Hue	1	0.195	0.160	.689
Gender	1	9.335	7.679	.006
White * Hue * Gender	1	4.264	3.508	.062
Error	209	1.216		

Table 28

Analysis of Variance for Interaction Between Gender, Hue Background, and White Background for the Bicycle Bag Attributes

Source	df	MS	F	p
Expensiveness				
White * Hue	1	0.150	0.104	.748
Gender	1	13.164	9.143	.003
White * Hue * Gender	1	6.756	4.692	.031
Error	209	1.440		

Table 29

Analysis of Variance for Interaction Between Gender, Warm Background, Cool Background, and White Background for the Fleece Vest Attributes

Source	df	MS	F	p
Workmanship				
Backgrounds	2	1.014	0.827	.439
Gender	1	10.804	8.806	.003
Backgrounds * Gender	2	6.192	5.047	.007
Error	207	1.227		
Attractiveness				
Backgrounds	2	1.085	0.673	.511
Gender	1	6.968	4.319	.039
Backgrounds * Gender	2	9.428	5.844	.003
Error	206	1.613		

Table 30

Analysis of Variance for Interaction Between Gender, Warm Background, Cool Background, and White Background for the Chest of Drawers Attributes

Source	df	MS	F	p
Workmanship				
Backgrounds	2	3.229	2.181	.116
Gender	1	1.294	0.874	.351
Backgrounds * Gender	2	6.134	4.143	.017
Error	207	1.481		

Results for the gender variable were analyzed using an independent-samples t test. This analysis revealed a significant difference between the two groups in their attitude toward selected attributes of each of the products. Females consistently rated the featured products more positively on all attributes. The fleece vest attributes with significant mean differences are displayed in Table 31. The chest of drawers attributes with significant mean differences are displayed in Table 32 and the bicycle bag attributes with significant mean differences are displayed in Table 33.

Table 31

T-Test for Significantly Different Fleece Vest Attributes and Gender

Attribute	Gender		df	t
	Male (n=91)	Female (n=122)		
Quality				
M	4.890	5.287	211	-2.806**
SD	1.069	0.983		
Durability				
M	4.879	5.434	211	-4.207**
SD	0.998	0.918		
Expensiveness				
M	4.187	4.500	211	-2.043*
SD	1.095	1.115		

*p < .05. **p < .01.

Table 32

T-Test for Significantly Different Chest of Drawers Attributes and Gender

Attribute	Gender		df	t
	Male (n=91)	Female (n=122)		
Usefulness				
M	5.769	6.303	211	-4.085**
SD	1.106	0.802		

**p < .01

Further analysis revealed that females' attitudes toward product attributes were more positive than male attitude across all products with a few exceptions when the product was featured on the blue background.

Table 33

T-Test for Significantly Different Bicycle Bag Attributes and Gender

Attribute	Gender		df	t
	Male (n=91)	Female (n=122)		
Quality				
M	4.725	5.082	211	-2.332*
SD	1.076	1.125		
Durability				
M	4.725	5.082	211	-2.207*
SD	1.184	1.154		
Expensiveness				
M	4.802	5.156	211	-2.111*
SD	1.157	1.247		
Workmanship				
M	4.582	4.943	211	-2.498*
SD	0.944	1.108		

*$p < .05$.

Age.

Participants ranged in age from 18 years to 46 years with a mean of 22.66 years. The age variable was divided into four groups: (1) 18-20 years, (2) 21-23 years; (3) 24-26 years; and (4) 27 years and older. Results were analyzed using a two-way ANOVA, with two between-groups factors. The interaction between background hues and age proved to not be significant. The 18-20 year age group tended to rate the fleece vest and the bicycle bag higher on the majority of attributes and the 24-26 age group tended to rate the chest of drawers higher across the majority of attributes. Further analysis using a one-way ANOVA was conducted on all product attributes across the four age groups to determine if there were significant mean differences by age. Table 34 lists the attributes that were found to be significantly different by age for the chest of drawers. Table 35 displays the

ANOVA results for the bicycle bag. There were no significant means differences for the fleece vest.

Table 34

Analysis of Variance for Significantly Different Chest of Drawers Attribute Scores by Age

Source	df	MS	F	p
Expensiveness				
Between age groups	3	4.205	2.953	.034
Within age groups	209	1.424		
Usefulness				
Between age groups	3	2.448	2.618	.052
Within age groups	209	0.935		

Table 35

Analysis of Variance for Significantly Different Bicycle Bag Attribute Scores by Age

Source	df	MS	F	p
Durability				
Between age groups	3	5.384	4.051	.008
Within age groups	209	1.329		
Expensiveness				
Between age groups	3	3.263	2.235	.085
Within age groups	209	1.460		

A LSD post hoc test was conducted on those attributes which were found to significantly different by age. This test revealed a trend for the younger age group (*i.e.*, 18 to 20 years) to rate the bicycle bag significantly higher on Durability and Expensiveness and the chest of drawers higher on Usefulness than the older groups. The 24-26 age group rated the Expensiveness of the chest of drawers significantly higher than either the 21-23 age group or the 27 + age group.

College major.

Participants were drawn from the eight colleges within the university. Results from a two-way ANOVA, with two between-groups factors, revealed that interaction between background hues and college was not significant. There was a trend for participants from the College of Business to have the least positive attitudes toward the products.

Participants enrolled in the College of Humanities, Arts and Social Sciences rated the fleece vest lowest on five attributes; however, no pattern emerged for highest rating. The mean attribute scores and the standard deviations for the fleece vest are shown in Table 36.

Participants enrolled in the College of Natural Resources rated the chest of drawers highest on four of the seven attributes and participants enrolled in the College of Business rated the chest of drawers lowest on four of the attributes. Table 37 displays the mean attribute scores and standard deviations for the chest of drawers.

Table 36

Mean Attribute Scores for Fleece Vest by College

College	n	Attributes						
		Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
Agriculture	29							
M		*2.517*	5.276	5.172	5.379	**4.793**	4.828	5.448
SD		1.271	1.334	0.805	0.942	1.177	1.136	1.429
Business	26							
M		2.769	5.231	*4.615*	4.923	4.039	4.577	5.039
SD		1.632	1.275	1.416	1.383	0.824	1.138	1.637
Education	36							
M		**3.222**	5.361	5.278	**5.417**	4.417	5.028	5.667
SD		1.267	1.046	0.849	0.732	1.052	0.941	0.986
Engineering	23							
M		3.217	*4.826*	5.130	5.130	4.261	**5.174**	5.391
SD		1.413	1.154	0.757	0.626	1.010	0.778	1.158
Family Life	30							
M		3.133	5.133	5.433	5.400	4.300	5.033	5.567
SD		1.332	1.008	0.728	0.814	1.055	1.189	1.165
HASS	25							
M		2.720	5.160	4.800	*4.920*	*3.920*	*4.320*	*4.960*
SD		1.595	1.434	1.384	1.352	1.288	1.314	1.541
Natural Resources	25							
M		3.160	**5.480**	4.960	5.040	4.640	4.800	5.240
SD		1.179	0.872	0.889	0.841	1.150	1.080	1.091
Science	19							
M		2.632	5.316	**5.526**	5.211	4.526	4.947	**5.737**
SD		1.342	1.377	1.172	1.032	1.219	1.393	1.368

Note. The scores in bold and large print indicate the highest mean score for the attribute across hues and the scores in italics indicate the lowest mean score for the attribute across the hues. HASS is the College of Humanities, Arts, & Social Sciences.

Table 37

Mean Attribute Scores for Chest of Drawers by College

		Attributes						
College	n	Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
Agriculture	29							
M		3.276	6.379	4.759	5.276	4.793	4.414	5.035
SD		1.623	0.903	1.455	1.192	1.320	1.376	1.679
Business	26							
M		*2.500*	*5.615*	*4.500*	5.115	*4.385*	4.500	4.440
SD		1.703	1.235	1.208	1.033	1.134	1.241	1.734
Education	36							
M		3.111	6.167	**5.167**	5.222	**4.917**	4.861	5.167
SD		1.687	1.000	1.108	1.149	1.296	1.199	1.254
Engineering	23							
M		2.870	5.957	4.739	*4.913*	4.391	4.870	4.870
SD		1.218	0.706	1.137	1.276	1.158	0.815	1.576
Family life	30							
M		3.300	**6.500**	4.700	5.067	4.433	4.600	4.833
SD		1.236	0.682	1.119	1.173	1.382	1.354	1.440
HASS	25							
M		3.120	6.080	4.760	5.480	4.480	4.840	*4.200*
SD		1.481	1.038	1.200	1.159	1.123	1.405	1.443
Natural Resources	25							
M		**3.600**	5.720	5.120	**5.520**	4.880	**4.960**	**5.200**
SD		1.472	1.021	0.971	0.872	0.971	1.172	1.354
Science	19							
M		2.526	6.000	4.895	5.211	4.526	*4.316*	4.632
SD		1.712	0.882	1.329	1.398	1.124	1.157	1.640

Note. The scores in bold and large print indicate the highest mean score for the attribute across hues and the scores in italics indicate the lowest mean score for the attribute across the hues. HASS is the College of Humanities, Arts, & Social Sciences.

The mean attribute scores indicated a trend for participants enrolled in the College of Family Life to rate the bicycle bag highest on six of the seven attributes while participants enrolled in the College of Business rated the bicycle bag lowest on five of the seven attributes as displayed in Table 38.

Table 38

Mean Attribute Scores for Bicycle Bag by College

College	n	Attributes						
		Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
Agriculture	29							
M		5.724	5.069	5.103	5.241	**5.310**	4.759	4.448
SD		1.099	1.534	0.939	0.951	0.968	1.058	1.378
Business	26							
M		5.308	*4.308*	*4.500*	4.654	*4.423*	*4.500*	*3.654*
SD		1.871	1.594	1.140	1.231	1.332	1.140	1.468
Education	36							
M		5.583	4.722	5.028	5.056	5.111	4.833	4.500
SD		1.339	1.427	0.971	1.145	1.116	0.910	1.502
Engineering	23							
M		5.565	5.044	5.087	4.826	4.870	4.522	4.217
SD		0.896	1.022	0.949	1.029	0.968	0.898	1.204
Family Life	30							
M		**6.200**	**5.100**	**5.300**	**5.400**	5.267	**5.133**	**4.867**
SD		1.157	1.749	1.291	1.276	1.461	1.008	1.634
HASS	25							
M		*5.080*	4.400	4.560	*4.520*	4.800	4.600	4.080
SD		1.441	1.472	1.325	1.327	1.607	1.384	1.631
Natural Resources	25							
M		5.200	4.560	4.720	4.720	5.120	4.920	4.200
SD		1.826	1.710	0.891	1.061	0.881	0.862	1.354
Science	19							
M		5.368	4.947	5.053	4.790	5.000	5.000	4.263
SD		1.921	1.779	1.268	1.228	1.106	1.106	1.593

Note. The scores in bold print indicate the highest mean score for the attribute across hues and the scores in italics indicate the lowest mean score for the attribute across the hues. HASS is the College of Humanities, Arts, & Social Sciences.

Results were analyzed using a one-way ANOVA, between-groups design, to determine if there were significant mean differences among product attribute scores by college. The fleece vest attributes that were significant are displayed in Table 39.

Table 39

Analysis of Variance for Significantly Different Fleece Vest Attributes and College

Source	df	MS	F	p
Quality				
Between colleges	7	2.411	2.341	.026
Within colleges	205	1.030		
Expensiveness				
Between colleges	7	2.271	1.880	.074
Within colleges	205	1.208		

The LSD post hoc test indicated that participants enrolled in the College of Agriculture, the College of Education, the College of Family Life, or the College of Science rated the fleece vest significantly higher on Quality than participants enrolled in the College of Business and participants enrolled in the College of Family Life or the College of Science rated the fleece vest significantly higher on Quality than participants enrolled in the College of Humanities, Arts and Social Sciences.

Participants enrolled in the College of Agriculture rated the fleece vest significantly higher on Expensiveness than students enrolled in the College of Business or in the College of Humanities, Arts and Social Sciences.

Table 40 displays the results of a one-way ANOVA, between-groups design, to determine if there were significant mean differences on the chest of drawers attribute scores by college.

Table 40

Analysis of Variance for Significantly Different Chest of Drawers Attributes and College

Source	df	MS	F	p
Usefulness				
Between colleges	7	2.497	2.762	0.009
Within colleges	205	0.904		

A post hoc test (LSD) indicated that participants enrolled in the College of Agriculture, the College of Family Life, or the College of Education rated the chest of drawers higher on Usefulness than participants enrolled in the College of Business. Participants in the College of Agriculture rated the chest of drawers higher than participants enrolled in the College of Natural Resources and participants enrolled in the College of Family Life also rated the chest of drawers higher than participants enrolled in the College of Engineering.

Size of community.

A two-way ANOVA, with two between-groups factors, was used to analyze interaction between size of community and background hue. This analysis proved to be not significant. Hues were collapsed into warm colors (*i.e.*, orange, red, and yellow) and cool colors (*i.e.*, blue, green, and purple). A two-way ANOVA was used to analyze interaction between size of community and color. This analysis also proved to be not significant. However, there was a trend for the midsize group (population 20,000 to 60,000 people) to give more positive attribute scores, across all products, when the products were featured on one of the cool color backgrounds and for the urban (population greater than 60,000 people) and rural (population less than 20,000 people) groups to give more positive attribute scores when the products were featured on one of

the warm colors. These mean scores for the size of community and colors for the fleece vest are displayed in Table 41, for the chest of drawers in Table 42, and the bicycle bag in Table 43.

Table 41

Mean Attribute Scores for Fleece Vest by Size of Community and Background Color

	Size of Community					
	Urban (n=53)		Midsize (n=62)		Rural (n=67)	
Attribute	Warm	Cool	Warm	Cool	Warm	Cool
Uniqueness						
M	2.846	**3.000**	2.607	**2.941**	**3.194**	3.032
SD	1.461	1.038	1.370	1.301	1.470	1.622
Usefulness						
M	5.385	**5.593**	2.607	**2.941**	**5.278**	5.000
SD	0.941	1.001	0.803	1.471	1.137	1.483
Quality						
M	5.077	**5.296**	4.964	**5.206**	4.944	**5.226**
SD	1.017	0.724	0.881	1.149	1.145	1.309
Durability						
M	5.231	**5.370**	5.179	**5.235**	4.944	**5.355**
SD	1.142	0.742	0.905	1.017	1.094	1.112
Expensiveness						
M	4.269	**4.407**	4.250	**4.471**	4.250	**4.452**
SD	0.874	0.971	1.431	1.308	1.079	1.179
Workmanship						
M	**4.962**	4.926	**4.857**	4.853	4.750	**4.968**
SD	1.039	0.997	1.079	1.306	1.204	1.110
Attractiveness						
M	**5.615**	5.222	5.357	**5.794**	**5.417**	5.226
SD	1.061	1.086	1.162	1.274	1.228	1.586

Note. The scores in bold print indicate the highest mean score for the attribute across color and size of community

Table 42

Mean Attribute Scores for Chest of Drawers by Size of Community and Background Color

	Size of Community					
	Urban (n=53)		Midsize (n=62)		Rural (n=67)	
Attribute	Warm	Cool	Warm	Cool	Warm	Cool
Uniqueness						
M	**3.115**	2.963	2.786	**2.912**	**3.500**	3.161
SD	1.728	1.480	1.287	1.848	1.404	1.573
Usefulness						
M	6.154	**6.185**	5.929	**6.324**	**6.194**	5.936
SD	0.967	0.921	0.940	1.007	0.786	0.929
Quality						
M	**4.846**	4.815	4.464	**5.206**	**6.194**	5.936
SD	1.120	1.001	1.071	0.914	0.786	0.929
Durability						
M	**5.462**	5.222	4.821	**5.471**	5.306	**5.355**
SD	0.905	0.934	1.124	1.135	1.215	1.050
Expensiveness						
M	**4.846**	4.444	4.429	**4.971**	**4.639**	4.613
SD	0.881	1.086	1.168	1.167	1.073	1.202
Workmanship						
M	**4.846**	4.667	4.464	**4.941**	**4.889**	4.581
SD	0.967	1.301	1.347	1.153	1.304	1.205
Attractiveness						
M	**5.039**	4.667	4.607	**5.294**	**5.056**	4.767
SD	1.216	1.468	1.423	1.315	1.620	1.455

Note. The scores in bold print indicate the highest mean score for the attribute across color and size of community

Table 43

Mean Attribute Scores for Bicycle Bag by Size of Community and Background Color

	Size of Community					
	Urban (n=53)		Midsize (n=62)		Rural (n=67)	
Attribute	Warm	Cool	Warm	Cool	Warm	Cool
Uniqueness						
M	**5.769**	5.704	4.964	**5.735**	**5.694**	5.419
SD	1.210	1.203	1.795	1.582	1.327	1.501
Usefulness						
M	**5.231**	4.852	4.536	**4.706**	**5.028**	4.419
SD	1.336	1.748	1.347	1.508	1.183	1.911
Quality						
M	**5.308**	5.000	4.571	**4.853**	**5.250**	4.645
SD	1.050	1.038	1.136	1.077	0.906	1.199
Durability						
M	**5.039**	4.963	**4.929**	4.794	**5.083**	4.871
SD	1.113	1.286	1.193	1.410	0.841	1.176
Expensiveness						
M	**5.039**	4.444	4.821	**5.177**	**5.056**	4.903
SD	0.958	1.200	1.362	1.193	1.068	1.248
Workmanship						
M	**5.154**	4.667	4.750	**4.912**	**4.833**	4.645
SD	0.925	0.832	0.887	1.111	0.941	1.082
Attractiveness						
M	4.192	**4.370**	4.250	**4.353**	**4.556**	4.000
SD	1.698	1.668	1.481	1.390	1.362	1.528

Note. The scores in bold print indicate the highest mean score for the attribute across color and size of community.

Hours spent online.

Results for hours spent online and hue were analyzed using two-way ANOVA, with two between-groups factors. To increase cell size the variable 'hours spent online per

week' was collapsed into three levels. These levels were (a) less than one hour, (b) one up to seven hours, and (c) seven or more hours. This analysis revealed a significant interaction between time spend online and hue for the fleece vest Durability attribute. Table 44 displays the interaction.

Table 44

Analysis of Variance for Interaction Between Hours Spent Online and Hue for the Fleece Vest

Source	df	MS	F	p
Durability				
Hue	6	2.349	2.770	.013
Hours	2	6.145	7.246	.001
Hue * Hours	12	1.784	2.103	.018
Error	192	0.848		

In order to increase cell size, hues were collapsed into warm colors (*i.e.*, orange, red, and yellow) and cool colors (*i.e.*, blue, green, and purple) and the resulting two factors were analyzed using a two-way ANOVA. This analysis revealed interaction for the fleece vest as displayed in Table 45, the chest of drawers as displayed in Table 46, and for the bicycle bag as shown in Table 47. When featured on cool background colors, the products tended to receive more positive attribute scores from participants who spent greater than seven hours per week online. When featured on warm background colors, the fleece vest received more positive attribute scores on four of the seven attributes (*i.e.*, Usefulness, Quality, Expensiveness, and Attractiveness) from participants who spent less than one hour per week online, the chest of drawers received more positive scores on five of the seven attributes (*i.e.*, Uniqueness, Usefulness, Expensiveness, Workmanship, and Attractiveness) from participants who spent from one to seven hours online, and the bicycle bag received more positive attribute scores from participants who spent from less

than one to seven hours online per week. The mean scores for hours spent online and background color for the fleece vest are displayed in Table 48. Table 49 displays the mean scores for the hours spent online and background color for the chest of drawers and the mean scores for the bicycle bag are displayed in Table 50.

Table 45

Analysis of Variance for Interaction Between Hours Spent Online and Color for the Fleece Vest

Source	df	MS	F	p
Usefulness				
Color	1	0.695	0.489	.485
Hours	2	0.761	0.536	.586
Color * Hours	2	3.493	2.459	.088
Error	177	1.420		
Quality				
Color	1	0.704	0.671	.414
Hours	2	5.643	5.383	.005
Color * Hours	2	2.853	2.722	.069
Error	177	1.048		

Table 46

Analysis of Variance for Interaction Between Hours Spent Online and Color for the Chest of Drawers

Source	df	MS	F	p
Usefulness				
Color	1	0.105	0.126	.724
Hours	2	1.192	1.429	.242
Color * Hours	2	2.548	3.055	.050
Error	177	1.420		

Table 47

Analysis of Variance for Interaction Between Hours Spent Online and Color for the Bicycle Bag

Source	df	MS	F	p
Usefulness				
Color	1	5.190	2.339	.128
Hours	2	3.594	1.620	.201
Color * Hours	2	8.840	3.984	.020
Error	177	1.420		
Attractiveness				
Color	1	1.348	0.611	.436
Hours	2	2.978	1.349	.262
Color * Hours	2	6.145	2.783	.065
Error	177	2.208		

Table 48

Mean Attribute Scores for Fleece Vest by Hours Spent Online Weekly and Background Color

	Hours Spent Online Weekly					
	Less than one		1-7		Greater than 7	
Attribute	Warm[a] (n=14)	Cool[b] (n=13)	Warm[a] (n=50)	Cool[b] (n=54)	Warm[a] (n=27)	Cool[b] (n=25)
Uniqueness						
M	2.643	**2.769**	3.000	**3.037**	2.852	**3.000**
SD	1.447	1.691	1.443	1.400	1.460	1.000
Usefulness						
M	**5.500**	4.615	5.240	**5.407**	5.111	**5.400**
SD	0.941	1.850	1.021	1.311	1.013	1.118
Quality						
M	**5.143**	4.692	5.220	**5.426**	4.444	**5.120**
SD	0.864	1.601	0.864	1.092	1.188	0.600
Durability						
M	5.000	**5.077**	5.360	**5.519**	4.667	**5.000**
SD	0.877	1.382	0.875	0.906	1.271	0.764
Expensiveness						
M	**4.500**	4.231	4.360	**4.537**	3.926	**4.360**
SD	0.941	1.423	1.084	1.059	1.269	1.254
Workmanship						
M	4.643	**4.846**	**5.080**	5.000	4.519	**4.760**
SD	1.151	1.144	1.007	1.213	1.189	1.012
Attractiveness						
M	**5.357**	5.308	5.560	**5.574**	**5.222**	5.200
SD	0.842	1.702	1.248	1.326	1.188	1.225

Note: The numbers in bold indicate the highest mean scores per level of hours spent online.

[a] Products viewed on warm background (*i.e.*, orange, red, and yellow).

[b] Products viewed on a cool background (*i.e.*, blue, green, and purple).

Table 49

Mean Attribute Scores for Chest of Drawers by Hours Spent Online Weekly and Background Color

	Hours Spent Online Weekly					
	Less than one		1-7		Greater than 7	
Attribute	Warm[a] (n=14)	Cool[b] (n=13)	Warm[a] (n=50)	Cool[b] (n=54)	Warm[a] (n=27)	Cool[b] (n=25)
Uniqueness						
M	**3.357**	3.077	**3.220**	2.926	2.963	**3.160**
SD	1.823	1.605	1.461	1.647	1.344	1.700
Usefulness						
M	**6.143**	5.846	**6.280**	6.167	5.704	**6.280**
SD	0.663	1.281	0.701	0.906	1.171	0.891
Quality						
M	4.714	**4.846**	4.960	**5.111**	4.556	**5.040**
SD	1.326	1.144	1.124	1.040	1.155	1.020
Durability						
M	4.929	**5.308**	5.380	**5.389**	5.000	**5.320**
SD	1.141	1.109	1.028	1.036	1.240	1.069
Expensiveness						
M	4.714	**5.000**	**4.700**	4.630	4.444	**4.680**
SD	1.138	1.080	1.015	1.233	1.086	1.069
Workmanship						
M	4.357	**4.692**	**4.880**	4.685	4.704	**4.880**
SD	1.499	1.548	1.206	1.179	1.103	1.130
Attractiveness						
M	4.429	**4.539**	**5.040**	4.833	4.852	**5.375**
SD	1.828	1.664	1.484	1.356	1.167	1.377

Note: The numbers in bold indicate the highest mean score per level of hours spent online.

[a] Products viewed on warm background (*i.e.*, orange, red, and yellow).

[b] Products viewed on a cool background (*i.e.*, blue, green, and purple).

Table 50

Mean Attribute Scores for Bicycle Bag by Hours Spent Online Weekly and Background Color

	Hours Spent Online Weekly					
	Less than one		1-7		Greater than 7	
Attribute	Warm[a] (n=14)	Cool[b] (n=13)	Warm[a] (n=50)	Cool[b] (n=54)	Warm[a] (n=27)	Cool[b] (n=25)
Uniqueness						
M	5.214	**5.615**	**5.640**	5.611	5.296	**5.640**
SD	2.045	1.325	1.242	1.510	1.589	1.411
Usefulness						
M	**5.071**	3.770	**5.180**	4.722	4.370	**4.960**
SD	1.072	1.964	1.101	1.698	1.573	1.513
Quality						
M	**4.714**	4.308	**5.280**	5.000	**4.741**	4.720
SD	1.204	1.251	0.927	1.028	1.196	1.137
Durability						
M	**4.857**	4.539	**5.260**	5.000	4.630	**4.760**
SD	1.100	1.561	0.853	1.182	1.149	1.363
Expensiveness						
M	4.929	**5.000**	**5.280**	5.167	4.407	**4.600**
SD	0.997	1.732	0.991	1.042	1.248	1.190
Workmanship						
M	**4.429**	4.385	**5.180**	4.926	4.556	**4.560**
SD	1.089	1.446	0.873	0.929	0.801	0.917
Attractiveness						
M	**4.643**	3.692	**4.580**	4.315	3.741	**4.360**
SD	1.151	1.548	1.458	1.451	1.583	1.630

Note: The numbers in bold indicate the highest mean scores per level of hours spent online.

[a] Products viewed on warm background (*i.e.*, orange, red, and yellow).

[b] Products viewed on a cool background (*i.e.*, blue, green, and purple).

A factorial ANOVA with three independent variables (*i.e.*, gender, background color, and hours spent online per week) was conducted to determine if there were any

significant interactions. The results of this test indicated that none of the three interactions were significant.

Frequency of online shopping.

A two-way ANOVA, with between groups factors, was used to determine if there was interaction between frequency of online shopping and product attributes scores. To increase cell sizes, shopping frequency was collapse into four levels (never, once a year, six or more time a year, and once a month, week) and hues were collapsed into two levels (cool colors and warm colors). The results indicate that participants who shopped once a month or once a week tended to rate the chest of drawers more positively on the Expensive attribute when it was featured on cool colors than participants who only shopped online once a year. Participants who shopped online once a month/week tended to rate the bicycle bag lower when featured on cool colors on both the Attractive attribute and the Unique attribute than participants who shopped online less frequently.

Hypothesis Four

Hypothesis 4. There is no significant difference between participants' attitudes toward featured product attributes (*i.e.*, Uniqueness, Usefulness, Quality, Durability, Expensiveness, Workmanship, and Attractiveness) in relation to a simulated Web page background color and the participants' personal preferences for selected colors.

The majority of the participants (106) indicated that blue was their personal color preference. A chi-square analysis was conducted, but due to the small cell size was not a reliable test. The hues were collapsed into warm colors (*i.e.*, orange, red, and yellow) and cool colors (*i.e.*, blue, green, and purple) and a two-way between-groups ANOVA was

conducted. This test did not reveal a relationship between personal color preference, the Web page background color viewed, and the products attributes scores, however a trend emerged. Participants who preferred warm colors rated the fleece vest attributes and the bicycle bag attributes more positively when they were featured on a warm background color and participants who preferred cool colors rated them more positively when they were featured on a cool background color. However, this trend did not hold for the chest of drawers for participants who preferred cool colors. Participants who preferred warm colors scored the chest of drawers more positively when viewed on a warm color, but the positive attribute scores among participants whose personal color preference was a cool color, were divided between responses to the warm background and the cool background. The mean attribute scores for the fleece vest by background color and personal preference color are displayed in Table 51, the chest of drawers are displayed in Table 52, and the bicycle bag scores are displayed in Table 53.

Table 51

Mean Attribute Scores for the Fleece Vest by Background Color and Color Preference

	Background Color			
	Warm		Cool	
Attribute	Warm[a] (n=17)	Cool[b] (n=73)	Warm[a] (n=21)	Cool[b] (n=70)
Uniqueness				
M	**2.941**	2.904	2.905	**3.029**
SD	1.600	1.416	1.446	1.318
Usefulness				
M	5.177	**5.260**	4.857	**5.414**
SD	0.529	1.093	1.493	1.313
Quality				
M	**5.000**	4.973	5.238	**5.243**
SD	0.791	1.080	1.411	1.000
Durability				
M	**5.294**	5.041	5.286	**5.329**
SD	0.772	1.099	1.146	0.928
Expensiveness				
M	**4.588**	4.192	4.381	**4.457**
SD	0.795	1.186	1.532	1.045
Workmanship				
M	4.824	**4.863**	**4.952**	4.900
SD	1.185	1.097	1.244	1.131
Attractiveness				
M	**5.824**	5.343	4.857	**5.600**
SD	0.951	1.216	1.797	1.160

Note. The n does not include participants who viewed the products featured on a white background.
[a] Personal color preference is a warm color. [b] Personal color preference is a cool color.

Table 52

Mean Attribute Scores for the Chest of Drawers by Background Color and Color Preference

	Background Color			
	Warm		Cool	
Attribute	Warm[a] (n=17)	Cool[b] (n=73)	Warm[a] (n=21)	Cool[b] (n=70)
Uniqueness				
M	**3.588**	3.055	**3.429**	2.886
SD	1.584	1.452	1.832	1.584
Usefulness				
M	**6.235**	6.041	6.143	**6.157**
SD	0.752	0.920	0.910	0.987
Quality				
M	**5.177**	4.726	**5.048**	5.043
SD	1.286	1.134	1.024	1.056
Durability				
M	**5.353**	5.151	**5.667**	5.271
SD	1.057	1.139	0.856	1.089
Expensiveness				
M	**4.706**	4.603	4.571	**4.714**
SD	1.105	1.051	1.165	1.169
Workmanship				
M	4.412	**4.836**	4.667	**4.743**
SD	1.698	1.093	1.238	1.212
Attractiveness				
M	**5.118**	4.836	**5.143**	4.855
SD	1.654	1.424	1.352	1.448

Note. The n does not include participants who viewed the products featured on a white background.
[a] Personal color preference is a warm color. [b] Personal color preference is a cool color.

Table 53

Mean Attribute Scores for the Bicycle Bag by Background Color and Color Preference

	Background Color			
	Warm		Cool	
Attribute	Warm[a] (n=17)	Cool[b] (n=73)	Warm[a] (n=21)	Cool[b] (n=70)
Uniqueness				
M	**5.824**	5.397	5.429	**5.714**
SD	1.468	1.498	1.777	1.309
Usefulness				
M	**5.118**	4.863	4.333	**4.743**
SD	0.928	1.367	1.770	1.708
Quality				
M	**5.059**	5.014	4.810	**4.829**
SD	1.029	1.099	1.289	1.063
Durability				
M	4.765	**5.055**	4.810	**4.900**
SD	0.903	1.039	1.504	1.230
Expensiveness				
M	**5.118**	4.932	4.905	**5.014**
SD	0.993	1.171	1.480	1.136
Workmanship				
M	4.647	**4.932**	**4.905**	4.714
SD	0.786	0.977	1.261	0.950
Attractiveness				
M	**4.706**	4.233	3.905	**4.329**
SD	1.160	1.550	1.610	1.491

Note. The n does not include participants who viewed the products featured on a white background.
[a] Personal color preference is a warm color. [b] Personal color preference is a cool color.

Viewing Order

Results of the pilot test indicated that viewing order did not have an effect on the attribute scores or the likelihood of purchase scores. However, a one-way ANOVA was conducted to determine if there were significant mean differences in attribute scores and likelihood of purchase scores in relation to the viewing order for the study. A two way ANOVA did not find any interaction between background hue and viewing order for the attribute mean scores or for the likelihood of purchase mean scores.

Likelihood of purchase scores were lower when the products were the first item viewed as shown in Figure 2. Table 54 contains the results of a one-way ANOVA of viewing order and likelihood of purchase. The LSD results indicate a significant difference between viewing order one and viewing order two for both the fleece vest and the chest of drawers and a significant difference between viewing order one and viewing

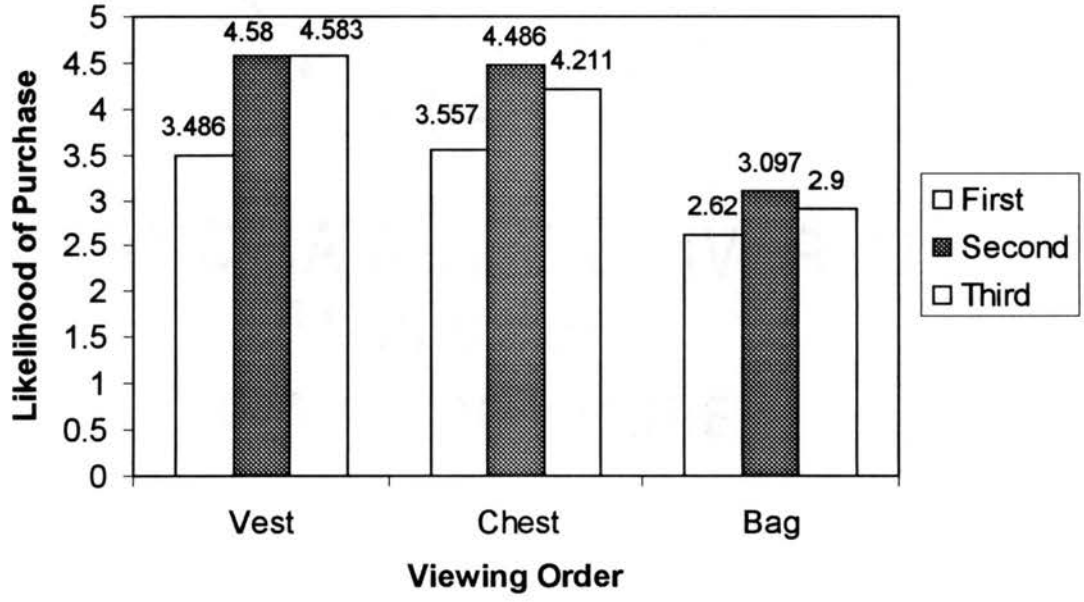


Figure 2. Likelihood of purchase by viewing order.

order three for both the fleece vest and the chest of drawers. These findings indicate that likelihood of purchase was more influenced by viewing sequence than by background hue.

Table 54

Analysis of Variance for Significantly Different Viewing Order and Likelihood of Purchase

Source	df	MS	F	p
Fleece vest				
Between viewing order	2	28.598	10.953	0.000
Within viewing order	210	2.611		
Chest of drawers				
Between viewing order	2	16.108	6.860	0.001
Within viewing order	210	2.348		

A two-way ANOVA, between-groups design, was conducted to determine if there was interaction between the three viewing orders, gender, and the likelihood of purchase. This analysis revealed significant interaction for the fleece vest, F (2, 210) = 2.924, p = .056, the chest of drawers, F (2, 210) = 9.652, p = .000, and the bicycle bag, F (2, 210) = 7.681, p = .001. Males indicated that they were more likely to purchase the fleece vest and the bicycle bag when the products were viewed second and females were more likely to purchase the fleece vest and the bicycle bag when they were viewed last (See Figure 3 and Figure 4). As displayed in Figure 5, males were more likely to purchase the chest of drawers when it was viewed last and females were more likely to purchase the chest of drawers when it was viewed second.

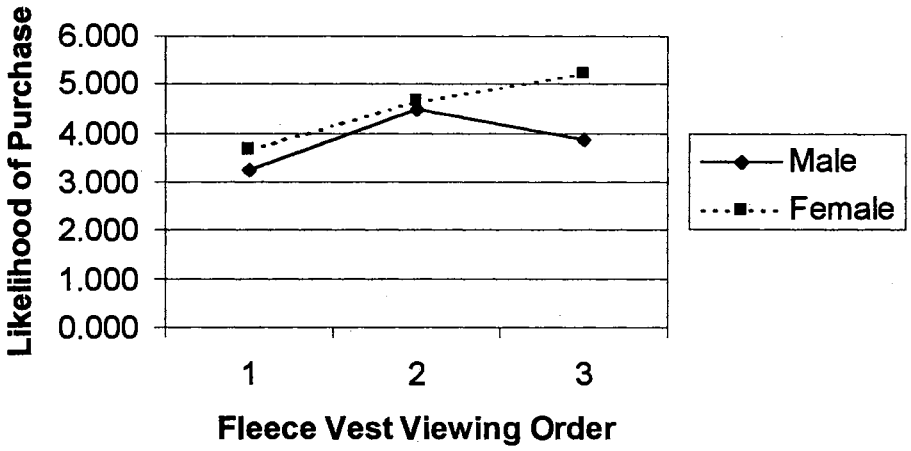


Figure 3. Likelihood of fleece vest purchase by gender and viewing order.

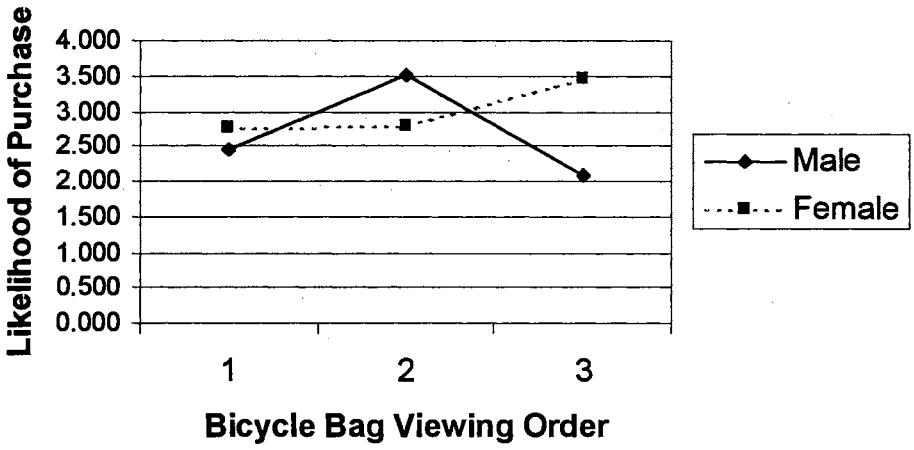


Figure 4. Likelihood of bicycle bag purchase by gender and viewing order.

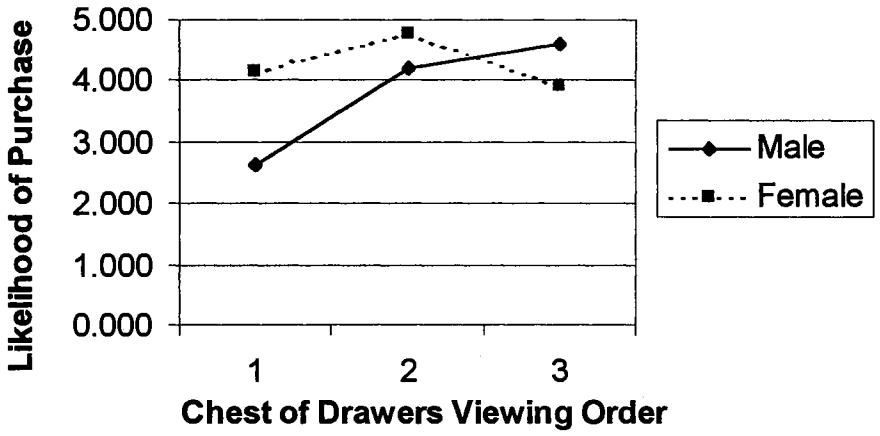


Figure 5. Likelihood of chest of drawers purchase by gender and viewing order.

Mean attribute scores were obtained for each product by viewing order and gender. The fleece vest received more positive attribute scores from both genders when it was viewed last. Table 55 displays the attribute scores for the fleece vest by viewing order. Males rated the chest of drawers more positively when it was viewed last and females rated the chest of drawers more positively when it was viewed second. The mean attribute scores are displayed in Table 56. Males rated the bicycle bag higher on five of seven attributes when it was viewed second and females rated the bicycle bag highest on all seven attributes when it was viewed last (See Table 57).

Table 55

Mean Attribute Scores for Fleece Vest by Viewing Order and Gender

Viewing Order	n	Attributes						
		Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
First								
Male	32							
M		2.750	4.688	4.625	4.594	4.125	4.594	5.031
SD		1.244	1.230	1.212	1.188	1.264	1.132	1.356
Female	40							
M		2.825	5.025	4.925	5.150	4.225	4.750	5.100
SD		1.375	1.166	1.228	1.099	1.143	1.006	1.533
Second								
Male	25							
M		2.760	**5.520**	4.920	4.920	4.200	4.480	**5.640**
SD		1.422	1.046	0.954	0.759	0.913	1.123	0.907
Female	44							
M		2.864	5.500	5.409	5.546	**4.705**	5.068	5.568
SD		1.408	1.210	0.757	0.730	1.153	1.043	1.108
Third								
Male	34							
M		**2.971**	5.088	**5.118**	**5.118**	**4.235**	**4.912**	5.147
SD		1.337	1.026	0.978	0.913	1.075	1.240	1.374
Female	38							
M		**3.395**	**5.526**	**5.526**	**5.605**	4.553	**5.079**	**5.842**
SD		1.480	1.180	0.830	0.856	1.005	1.217	1.242

Note. The scores in bold and larger print indicate the highest mean score for the attribute by gender.

Table 56

Mean Attribute Scores for Chest of Drawers by Viewing Order and Gender

Viewing Order	n	Attributes						
		Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
First								
Male	27							
M		2.852	5.333	4.111	4.778	3.889	4.074	4.074
SD		1.244	1.230	1.155	1.121	1.050	1.141	1.542
Female	43							
M		3.070	6.349	4.884	5.233	4.395	4.512	4.930
SD		1.438	0.720	1.051	1.109	1.198	1.352	1.564
Second								
Male	35							
M		**3.114**	5.857	4.771	5.086	4.600	4.857	4.853
SD		1.676	1.216	1.239	1.246	1.218	1.033	1.654
Female	37							
M		**3.432**	**6.487**	**5.595**	**5.568**	**4.919**	**5.135**	**5.351**
SD		1.519	0.651	0.865	0.929	1.211	1.084	1.207
Third								
Male	29							
M		2.724	**6.069**	**5.241**	**5.586**	**5.103**	**4.862**	**5.138**
SD		1.730	0.923	1.123	1.119	1.012	1.125	1.432
Female	42							
M		3.071	6.095	4.381	5.071	4.738	4.571	4.500
SD		1.583	0.958	1.188	1.238	1.231	1.382	1.469

Note. The scores in bold and larger print indicate the highest mean score for the attribute by gender.

Table 57

Mean Attribute Scores for Bicycle Bag by Viewing Order and Gender

Viewing Order	n	Attributes						
		Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
First								
Male	32							
M		4.625	4.406	4.500	4.531	4.375	4.438	**4.219**
SD		1.454	1.365	1.244	1.319	1.157	1.076	1.408
Female	39							
M		4.846	5.000	5.154	5.077	5.128	4.923	4.539
SD		1.615	1.433	1.136	1.010	1.218	1.244	1.603
Second								
Male	25							
M		**5.742**	**4.936**	**4.903**	**4.871**	4.871	**4.710**	4.194
SD		1.437	1.436	0.978	1.024	1.024	0.783	1.167
Female	41							
M		5.805	4.268	4.854	4.854	4.976	4.707	4.122
SD		1.487	1.718	1.108	1.038	1.405	1.031	1.536
Third								
Male	28							
M		5.714	4.571	4.786	4.786	**5.214**	4.607	3.821
SD		1.117	1.501	0.957	1.197	1.166	0.956	1.442
Female	42							
M		**6.310**	**5.333**	**5.238**	**5.310**	**5.357**	**5.191**	**4.738**
SD		0.950	1.572	1.122	1.352	1.100	1.018	1.594

Note. The scores in bold and larger print indicate the highest mean score for the attribute by gender.

The viewing orders were collapsed for each of the products into three levels including viewed first, viewed second, and viewed third. A one-way ANOVA, between-groups design, was conducted. When the products were viewed second or third in sequence, they received more positive attribute scores then when they were viewed first. Results of viewing order for the fleece vest attribute scores are displayed in Table 58, for the chest of drawers in Table 59, and for the bicycle bag in Table 60.

Table 58

Analysis of Variance for Fleece Vest and Viewing Order

Source	df	MS	F	p
Uniqueness				
Between viewing orders	2	3.570	1.879	.155
Within viewing orders	210	1.900		
Usefulness				
Between viewing orders	2	7.477	5.592	.004
Within viewing orders	210	1.337		
Quality				
Between viewing orders	2	5.950	5.781	.004
Within viewing orders	210	1.029		
Durability				
Between viewing orders	2	4.769	5.054	.007
Within viewing orders	210	0.944		
Expensiveness				
Between viewing orders	2	2.124	1.720	.181
Within viewing orders	210	1.234		
Workmanship				
Between viewing orders	2	1.842	1.442	.239
Within viewing orders	210	1.277		
Attractiveness				
Between viewing orders	2	5.690	3.421	.035
Within viewing orders	210	1.663		

Table 59

Analysis of Variance for Chest of Drawers and Viewing Order

Source	df	MS	F	p
Uniqueness				
Between viewing orders	2	2.501	1.050	.352
Within viewing orders	210	2.381		
Usefulness				
Between viewing orders	2	0.890	.930	.396
Within viewing orders	210	0.957		
Quality				
Between viewing orders	2	7.197	5.244	.006
Within viewing orders	210	1.372		
Durability				
Between viewing orders	2	1.523	1.150	.319
Within viewing orders	210	1.324		
Expensiveness				
Between viewing orders	2	9.456	6.817	.001
Within viewing orders	210	1.387		
Workmanship				
Between viewing orders	2	7.668	5.212	.006
Within viewing orders	210	1.471		
Attractiveness				
Between viewing orders	2	4.857	2.129	.122
Within viewing orders	210	2.281		

Table 60

Analysis of Variance for Bicycle Bag and Viewing Order

Source	df	MS	F	p
Uniqueness				
Between viewing orders	2	34.264	18.331	.000
Within viewing orders	210	1.869		
Usefulness				
Between viewing orders	2	4.046	1.694	.186
Within viewing orders	210	2.389		
Quality				
Between viewing orders	2	0.853	0.683	.506
Within viewing orders	210	1.249		
Durability				
Between viewing orders	2	1.530	1.105	.333
Within viewing orders	210	1.385		
Expensiveness				
Between viewing orders	2	4.906	3.376	.036
Within viewing orders	210	1.453		
Workmanship				
Between viewing orders	2	1.479	1.336	.265
Within viewing orders	210	1.107		
Attractiveness				
Between viewing orders	2	1.272	0.568	.568
Within viewing orders	210	2.241		

Web Background Hue Selection

Although it violated the assumption of independence, all the responses to each background hue across all three products were combined and a one-way ANOVA was conducted to determine if a hue(s) emerged as a 'best' background hue for each of the attributes. The blue background and the orange background emerged as the two hues with

the most positive attribute scores. The mean attribute scores for all hues across attributes are displayed in Table 61. The results of the one-way ANOVA indicated that the mean attribute scores were significantly different for four of the attributes as shown in Table 62. Collectively, the most positive score for likelihood of purchase (4.183) was when the products were featured on an orange background. The second most positive likelihood of purchase score (4.033) was when the products were featured on a blue background.

Table 61

Combined Mean Attribute Scores for Hues for Three Products

		Attributes						
Hue	n	Unique	Useful	Quality	Durable	Expensive	Workmanship	Attractive
Blue	90							
M		4.011	**5.311**	5.156	5.233	**4.711**	**5.111**	**5.278**
SD		1.783	1.466	0.959	1.006	1.094	1.011	1.438
Green	93							
M		3.634	5.054	5.140	5.226	4.645	4.731	4.989
SD		1.881	1.521	1.194	1.134	1.028	1.095	1.557
Orange	93							
M		**4.097**	5.194	**5.333**	**5.419**	4.688	5.097	5.237
SD		1.842	1.173	1.036	1.025	1.053	1.124	1.371
Purple	93							
M		3.957	4.882	5.011	5.043	4.527	4.742	4.850
SD		1.876	1.538	1.166	1.160	1.442	1.169	1.525
Red	90							
M		3.744	4.889	5.089	5.044	4.700	4.633	4.889
SD		1.876	1.336	1.013	1.027	1.175	1.258	1.532
White	90							
M		3.778	5.111	4.989	5.033	4.633	4.867	5.056
SD		1.883	0.942	0.893	1.022	1.285	0.939	1.401
Yellow	90							
M		3.389	5.100	4.656	4.744	4.144	4.600	4.900
SD		1.900	1.218	1.072	0.943	1.117	1.026	1.374

Note. The scores in bold indicate the highest score for the attribute across hues.

Table 62

Analysis of Variance for Attributes for all Products Across Hues

Source	df	MS	F	p
Uniqueness				
Between groups	6	5.429	1.563	.155
Within groups	632	3.472		
Usefulness				
Between groups	6	2.188	1.237	.285
Within groups	632	1.769		
Quality				
Between groups	6	3.970	3.578	.002
Within groups	632	1.110		
Durability				
Between groups	6	4.146	3.772	.001
Within groups	632	1.099		
Expensiveness				
Between groups	6	3.653	2.630	.016
Within groups	632	1.389		
Workmanship				
Between groups	6	3.952	3.304	.003
Within groups	632	1.196		
Attractiveness				
Between groups	6	2.675	1.256	.276
Within groups	632	2.129		

APPENDIX G

INSTITUTIONAL REVIEW BOARD

APPROVAL

Oklahoma State University
Institutional Review Board

Protocol Expires: 1/21/02

Date: Tuesday, May 15, 2001 IRB Application No HE0137

Proposal Title: WEB PAGE BACKGROUND COLOR EVALUATIVE EFFECT ON SELECTED PRODUCT ATTRIBUTES

Principal Investigator(s):

Karen Biers
2949 Old Main Hill
Logan, UT 74078

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact Sharon Bacher, the Executive Secretary to the IRB, in 203 Whitehurst (phone: 405-744-5700, sbacher@okstate.edu).

Sincerely,

Carol Olson

Carol Olson, Chair
Institutional Review Board

VITA

Karen Schenk Biers

Candidate for the Degree of

Doctor of Philosophy

Thesis: WEB PAGE BACKGROUND COLOR EVALUATIVE EFFECT ON SELECTED PRODUCT ATTRIBUTES

Major Field: Human Environmental Sciences

Biographical:

Education: Graduated from Watonga High School, Watonga, Oklahoma, in May, 1962; received Bachelor of Science degree in Home Economics Education from Oklahoma State University, Stillwater, Oklahoma in May, 1966; received Master of Science degree in Human Environmental Sciences from Oklahoma State University, Stillwater, Oklahoma in July, 1993. Completed the requirements for the Doctor of Philosophy degree in Human Environmental Sciences at Oklahoma State University in December, 2001.

Professional Experience: Entrepreneurship/Home-Based Business and Clothing/Textiles Extension Specialist, Utah State University, 1997 to present; Graduate Research Assistant, Oklahoma Cooperative Extension Service Home-Based Business Program, 1988-1996; Nutrition Site Manager, Northwest Oklahoma Senior Citizens Nutrition Council, Inc., Guymon, Oklahoma, 1985-1988; Owner-Operator, Stead Manufacturing, Guymon, Oklahoma, 1981-1988; Owner-Operator, Karen's Fabric Shop, Guymon, Oklahoma, 1971-1979, Extension Home Economist, Texas County, 1968-1971; Extension Home Economist, Ellis County, 1966-1968.

Professional Memberships: National Home-Based/Micro Business Design Team; International Textiles and Apparel Association, serve on the Extension and Outreach Committee; Epsilon Sigma Phi; National and Western Region E-Commerce Design Team; Utah State University Association of Extension Specialists, serve as Secretary/Treasurer.