Culture and E-Commerce: Culture Based Preferences for Interface Information Design

Thesis submitted to the Faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of Master of Science In Industrial and Systems Engineering

Keywords: **Cultural differences, cultural effects, culture and computers, human-computer Interaction**

ABSTRACT

Global companies face the challenge of offering their products or services to a wider audience. While the Internet has made it easier to distribute information globally, information design for different cultures is still very difficult. Cultural models can be used to identify differences between cultures that may have an effect on how people make decisions. Geert Hofstede (1980, 1997) has defined a cultural model with five dimensions. One of these dimensions, individualism vs. collectivism has been shown to affect the type of information people prefer when viewing printed advertisements. A study was conducted to determine if the individualism vs. collectivism dimension affects the type of information Anglo-American and Hispanic-American people prefer for purchasing tasks in a computer-based environment. The findings of this study suggest that there is no difference between the cultures on preference for information. Nonetheless, there are cultural aspects that have to be considered when designing interfaces for a Hispanic audience as opposed to an Anglo-American audience. Based in these cultural aspects, design guidelines were developed. These aspects are the basis of the design guidelines provided in this paper.

Chapter 1 Introduction

As global competition increases, companies are faced with the challenge of offering their products or services to a wider global audience. While e-commerce and the World Wide Web have made it easier to distribute information electronically for a global audience, the challenge still remains because consumer behavior is influenced by culture (Hofstede, 1998). The designs and information displays that are effective for one culture will not necessarily be as effective for others, thus requiring customized designs for each cultural group. With the increasing trend of product localization from competitors, customers around the world expect product localization. Consequently companies have to compete at high levels of internationalization to stay competitive in an international market (del Galdo, 1996). Cultural models can be used to identify differences between cultures (Hoft, 1996). There are many cultural models, each one defined by analyzing different data. Hofstede's model (1997) focused on data about patterns of thinking, feeling, and acting of employees of a multinational organization. He defined a cultural model in which cultures were found to vary along five dimensions. The dimensions were named: Power distance, Collectivism vs. Individualism, Femininity vs. Masculinity, Uncertainty Avoidance, and Long-term vs. Short term orientation. This research explores the Individualism vs. Collectivism dimension. People rely on different types of information to make decisions, and culture has an influence on the type of information people depend upon (Han & Shavitt, 1994; Hofstede, 1998; Triandis, 1995; Zandpour & Harich, 1996). Various researchers have suggested that individualistic and collectivistic characteristics are the major cause of the differences between national cultures (Han & Shavitt, 1994; Zandpour & Harich, 1996). Research in the marketing area has addressed cultural differences on presentation of information in advertisements related to cultural dimensions, including the individualism vs. collectivism dimension (Albers-Miller & Gelb, 1996; Han & Shavitt, 1994; Zandpour & Harich, 1996). The research has found that there are cultural differences in information appeals. Information appeals vary in terms of context, images, and values presented in the commercials. The question still stands for interface and Web design -- do cultural dimensions have an effect on the type of information preferred by individuals when navigating through the Web? If this question is answered affirmatively, it could have an impact on e-commerce, interface and Web design, and especially for marketing and advertisement purposes.

Chapter 2 Literature Review

Culture has received various definitions in the literature. The proposed study uses Hofstede's definition of culture: "the collective programming of the mind which distinguishes the members of one group or category of people from another" (1997, p. 5). In the definition of culture, group or categories of people refers to people that are in contact with each other or that have something in common (e.g. gender, religion, ethnicity). This study focuses specifically on ethnic culture. After anthropologists made popular the idea that all cultures have the same basic problems, but differ in how they approach them, sociologist Inkeles and psychologist Levinson determined the specific problems common

in the society by surveying literature on national culture (Hofstede, 1997). Hofstede (1980, 1997) provided empirical analyses that support these findings. He administered a survey to IBM employees of over 50 different countries around the world and came to the same conclusion - that different cultures have the same issues but vary in the way they approach them. He also called the issues "dimensions of culture" because they can be measured relatively between cultures. Following is the list of the four dimensions of cultures Hofstede defined and a brief description of each.

- Power Distance – The way members of a culture handle power difference.
- Individualism vs. Collectivism – The extent to which individuals just look out for themselves or are loyal to a group.
- Masculinity vs. Femininity – The degree to which gender roles are defined.
- Uncertainty Avoidance – The degree to which a member of a culture feels anxious towards unpredictable situations.

People rely on different types of information to help them make decisions, and culture has an influence on the type of information people find more appealing (Han & Shavitt, 1994; Hofstede, 1998; Triandis, 1995; Zandpour & Harich, 1996). The literature review could only uncover few empirical studies of cultural differences in decision-making in other areas than advertising. Papers were found that focused on group decision-making in different cultural settings (Dunckley & Smith, 2000; Harris & Nibbler, 1998; Tan, Wei, Watson, Clapper, & McLean, 1998). This study is more concerned about differences in decision-making at an individual level and how information on interfaces is influenced by cultural groups' preferences for information design. But the literature review was not able to uncover empirical studies of individual decision-making in different cultural settings in any other area besides advertising. Hofstede (1998) discussed information preference based on cultural dimensions. People from individualistic cultures are verbally oriented and tend to read more than people from collectivistic cultures, which are more visually oriented and prefer high-context communication. Cultures with high uncertainty avoidance prefer clear and direct information. People from masculine cultures are more interested in data and facts than people from feminine cultures, who, in turn, prefer to know the story behind the facts. Large power distance cultures rely heavily on information from authority figures, while people from small power distance rely more on facts and their own reasoning. Various researchers have suggested that individualistic and collectivistic characteristics are the major cause of the differences between national cultures (Han & Shavitt, 1994; Zandpour & Harich, 1996). Still, the implications that the individualism vs. collectivism dimension has in the globalization and internationalization of computer applications have not been fully studied. Whether the individualism vs. collectivism dimension of culture has an effect on the user's preference for information for decision-making on a Web-based task is yet to be determined. The focus of this study is to contribute to the body of knowledge of individualism vs. collectivism dimension, particularly its effect on preference for information on web-based interfaces. The individualism vs. collectivism dimension will be discussed further in the next sections.

Individualisms vs. Collectivism

Similar constructs to the individualism vs. collectivism dimension have been studied by many disciplines including philosophy, anthropology, sociology, political science, economists, and psychologists, contributing to the body of knowledge of the individualism vs. collectivism dimension (Triandis, 1995). Throughout the literature review, reference will be made to different studies about the individualism vs. collectivism concept, but the main definition used for the proposed study is the one given by Hofstede (1997). Hofstede (1997) defined individualism vs. collectivism dimension as follows: Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after himself or herself and his or her immediate family. Collectivism as its opposite, pertains to societies in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty. (p. 51) Immediate families are not the only members in the tight groups from collectivistic societies; the group may also include distant family and non-relatives. Individuals are identified or recognized by their membership in a group. In collectivist societies confrontation is avoided to maintain group harmony; people are more polite when making negative responses. Group opinion is the individual's opinion, if there is a difference the individual is considered to have a bad character. Individuals do not need to talk to feel comfortable in groups; their presence is enough. Collectivistic people think about their group needs, they adjust to the needs of others. Individualists think about their own needs. In individualistic cultures, people are more upfront and honest, and accept negative remarks. Individuals that have their

own opinions are considered strong characters. When in social groups, individualistic people have the need to talk. Individuals are identified by their own merits. Collectivists share with group members, while individualists identify what belongs to them exclusively. Collectivists use “we” often and depend on context to convey meaning. Individualistic communication is verbally explicit and clear. Hofstede could distinguish individualists from collectivists from their work- related goals. Individualists were those who identified personal time, freedom and challenge as characteristic of their ideal job. Collectivists were those who preferred a job that provided training, good working conditions and that required the full use of their skills and abilities. Table 1 lists the key differences between collectivistic and individualistic societies as defined byHofstede.

Table 1: Differences Between Collectivists and Individualists (adapted from Hofstede, 1997)

Collectivists	**Individualists**
People are born into extended families or other in-groups which continue to protect them in exchange for loyalty	Everyone grows up to look after him/ herself and his/her immediate (nuclear) family only
Identity is based in the social network to which one belongs	Identity is based in the individual
Harmony should always be maintained and direct confrontations avoided	Speaking one's mind is a characteristic of an honest person
High-context communication	Low-context communication
Trespassing leads to shame and loss of face for self and group	Trespassing leads to guilt and loss of self-respect
Purpose of education is learning how to do	Purpose of education is learning how to learn
Diplomas provide entry to higher status groups	Diplomas increase economic worth and/or self-respect
Relationship employer-employee is perceived in moral terms, like a family link	Relationship employer-employee is a contract supposed to be based on mutual advantage
Hiring and promotion decisions take employees' in-group into account	Hiring and promotion decisions are supposed to be based on skills and rules only
Management is management of groups	Management is management of individuals
Collective interests prevail over individual interests	Individual interests prevail over collective interests
Private life is invaded by group(s)	Everyone has a right to privacy
Opinions are predetermined by group membership	Everyone is expected to have a private opinion
Laws and rights differ by group	Laws and rights are supposed to be the same for all
Low per capita GNP	High per capita GNP
Dominant role of the state in the economic system	Restrained role of the state in the economic system
Economy based on collective interests	Economy based on individual interests
Political power exercised by interest groups	Political power exercised by voters
Press controlled by the state	Press freedom
Imported economic theories largely irrelevant because unable to deal with collective and particularistic interests	Native economic theories based on pursuit of individual self-interests
Ideologies of equality prevail over ideologies of individual freedom	Ideologies of individual freedom prevail over ideologies of equality
Harmony and consensus in society are ultimate goals	Self-actualization by every individual is an ultimate goal

Hofstede (1998) mentions that individualistic cultures tend to prefer low context communication while collectivistic cultures prefer high context. Hall (1977) defines high context communication as one where most of the information

is internalized and implied by the context(i.e. non-verbal behavior, physical setting, social circumstances, interpersonal relations and basic values) and low context communication is very explicit. Every communication can be categorized as high or low context. High context communication would assume that most information is known by the receiver and is contained in the setting so that textual information is minimum. On the other hand, in low context communication everything is expressed in a textual manner. The same information can be communicated in a high or low context manner. As an example, if a friend or family member asks for directions on how to get to a specific place, the explanation can be given in a high context manner because there is a common ground between the people involved in the conversation. If an unknown person asks the same question, the answer would have to be transmitted in a low context form because there in no common ground between the persons involved in the communication. Figure 1 illustrates an example.

Figure 1:Example of High-Context vs. Low-Context Communication

Measurement of Individualism vs. Collectivism Dimension

Hofstede identified two dimensions after analyzing the data from questionnaires where IBM employees rated 14 work related goals by importance. One of the dimensions was masculinity vs. femininity (refer to the first section of the Literature Review for definition), the other dimension was individualism vs. collectivism, which is the focus of this research. The individualism vs. collectivism index, or the Individualism Index as named by Hofstede, was calculated by adding the country score of each question, multiplying it by 25 and adding a constant of 50. The index score denotes the relative positions of 50 countries and 3 regions and is in a range from 0 for the most collectivist country to 100 for the more individualist. That is the higher the score the higher the individualism and the lower the score the lower individualism. Countries with relatively lower scores in the individualism dimension are labeled as collectivists. Hofstede (1997) found that the USA scored 91 in the individualism index, ranking number one since it obtained the highest score by any country or region involved in the study. Hispanic- American countries were in the opposite extreme ranking 29 or lower, excluding Argentina that ranked 22/23 tied with Japan (see Table 2 for scores of different countries). Therefore the differences between the United States and Hispanic-American countries along the individualism vs. collectivism dimension should be noticeable. But it should be considered that the scores are only relative positions of the different countries along the index.

Table 2: Individualism Index Values for 50 Countries and 3 Regions (from Hofstede, 1997)

Different scales for measuring the individualism vs. collectivism construct have been designed (Kim, Triandis, Kagitçibasi, Choi, & Yoon, 1994; Triandis, 1995). Hui was the first one to measure the construct at an individual level with a scale he called the INDCOL scale (Bierbrauer, Meyer, & Wolfradt, 1994; Triandis, 1995). The INDCOL scale consisted of 63 items, which individuals answered using a 6-point scale. Based on the INDCOL scale, Bierbrauer et al. (1994) designed the Cultural Orientation Scales (COS), a shorter scale that supports the concepts of the individualism vs. collectivism dimension as defined by Hofstede and others (Bierbrauer et al., 1994). The scale was validated with German and Korean participants. The internal consistency of the scale was found to be acceptable (a total = 0.82; a Germans = 0.56; a Koreans=0.70). The correlation between items about norms and items about evaluation of behaviors was positive for both the German and the Korean group ($r=.30$, $p<.10$ and $r= 0.51$, $p<0.01$ respectively); for the Korean group the correlation between norms and behavior was stronger, a characteristic of the collectivists groups. The COS is shown in Appendix A. The scale contains 26 items; 13 of them measure norms and the rest measure the perception of these norms. Individuals respond using a seven-point scale with anchors of 1 to 7 with the labels of “not at all” to “always” or “very bad” to “very good” depending on the question. The COS is shorter and easier to manipulate for research purposes than the INDCOL, and in addition, it was validated using different cultures including German, Korean, Turkish and Iranian, as opposed to other scales, which only used participants from the United States and Asia. The COS scale was created in response to criticism of other scales that only measured individual vs. group interests. The COS measures values and practices separately, which is an important factor to consider when dealing with persons that are influenced by two different cultures. Measuring values and practices separately is important because the behavior of people that are influenced by different cultures might differ from what the values of their culture of origin dictates. Individuals learn new behaviors and values to adapt to a new environment, but the adaptation process is unlikely to be linear or gradient (Berry, 1980). Therefore values by themselves will not be an accurate indicator of the individualism level of people exposed to different cultures. The data obtained from the COS or other similar scales would be data about individuals. If it is desired to draw conclusions at a cultural level from data gathered at an individual level, several considerations must be made.

Triandis, Kashima, Shimada, and Villareal (1986) suggest a method that would simplify the process of drawing conclusions about cultures. The method is discussed in the next section. Acculturation Index as Means of Simplifying Cross-Cultural Research In cross-cultural studies, there might be some confounding variables with culture such as social class, ethnicity, and religion. Instead of controlling all these external variables to guarantee that effects are due to cultural differences, Triandis, Kashima, Shimada, and Villareal (1986) demonstrated that if indexes of acculturation were used, the statistical control of the onfounding variables would not be necessary. If cultural differences exist, highly acculturated individuals

will behave as individuals from the majority culture. Acculturation level is the degree to which individuals from a minority have learned to function in a dominant society, adopted values of the dominant society, and have integrated into the new or dominant social network (Hofstede, 1997). Impact of acculturation has been considered in the areas of analysis of assessment results, in physical and mental health, and to make sense of the differences within ethnic groups (Stephenson, 2000). Many acculturation indexes have been designed to measure acculturation levels of specific groups, for example Filipino-Americans (dela Cruz, Padilla, & Agustin, 2000) Mexican-Americans, (Cuellar, Arnold, & Maldonado, 1995) and Puerto Ricans (Tropp, Erkut, García, Alarcón, & Vazquez, 1999). (See further discussion in Dana 1996 and Stephenson 2000.) Stephenson (2000) designed the Stephenson Multigroup Acculturation Scale (SMAS), an acculturation scale that can be used across five ethnic groups, including African-Americans, participants of African descent, Asian-Americans, European-Americans, and Hispanic- Americans (i.e. Hispanics from the Western Hemisphere). The Hispanic-American participants that were used to validate the scale were from different origins, including Mexico, the Caribbean (Cuba, Dominican Republic, Puerto Rico), South America (Bolivia, Brazil, Colombia, Ecuador, Peru) and Central America (Costa Rica). The SMAS has two dimensions, one that measures dominant society immersion (DSI) and another that measures ethnic society immersion (ESI). The scale measures preference, use, and attitude towards language, interaction, food, and media in both of the dimensions. The alpha coefficient was 0.94 for the ESI subscale and 0.75 for the DSI subscale. The convergent and discriminant validity was examined by comparing the SMAS sub-scales with two other acculturation scales. One of the scales was the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II), which has two sub-scales that measure Mexican orientation (MOS) and Anglo orientation (AOS). The second scale used was the Bidimensional Acculturation Scale for Hispanics (BAS), which measures Hispanic orientation and non- Hispanic orientation. The ESI subscale was positively correlated with the MOS of the ARSMAII and with the BAS Hispanic scale ($r=0.87$ and $r=0.83$ respectively, $p<0.01$ in both cases). The ESI was negatively correlated with the AOS of the ARSMA-II scale and with the BAS non- Hispanic scale (-0.28 and –0.25 respectively, $p<0.01$ in both cases). The DSI subscale was positively correlated with the AOS of ARMA-II and with the non-Hispanic BAS scale ($r=0.49$ and $r=0.48$ respectively, $p<0.01$ in both cases). The DSI subscale was negatively correlated with the MOS of the ARMA-II scale and the BAS Hispanic scale ($r=-0.15$ and $r=-0.17$, p=ns in both cases). The SMAS can be found in Appendix B. Conclusions about cultural differences that are made when using acculturation scales for confirming cultural values could be biased by the responses of the acculturation scales. Triandiset al. (1986) warned about the effects that acculturation patterns might bring to the acculturation evaluation such as overshooting the responses to “join” the other culture, or ethnic affirmation of the responses to over-emphasize their original culture. He discusses the ping-pong effect in the acculturation process, and these effects on behavioral expectation, roles and stereotypes.

Individualism and Collectivism Research in the Advertising Area

The advertisement industry has conducted several studies in which they consider the individualism vs. collectivism dimension. The studies in the advertising industry demonstrate the extent of the implications of the individualism vs. collectivism dimension. As previously mentioned, individualistic cultures prefer low context communication while collectivistic cultures prefer high context communication (Hofstede, 1998). Mueller (1996) and Samli (1995) discussed the implications that high context vs. low context characteristics will have on consumer behavior. Mueller mentions that messages from high context cultures might not be understood by low context cultures because the message does not get to the point. Likewise, messages from low-context cultures might not be understood by high-context cultures because the messages omit essential contextual material. As an example, Japanese advertisements focus less on the product merits and more on creating a mood while American advertisements are more focused on product merits. Figure 2 illustrates an example of how high context commercials and low context commercials differ.

High-Context

Sometimes in life there are difficult decisions. Knowing that your children will be provided for after your gone will let you enjoy the time you have with them. At Peterson & Williams with 25 years experience in Will preparation and estate planning you can be at ease, every detail will be taken care of. We take care of the future of your family so you can relax and enjoy your time with them.

Low-Context

Peterson & Williams provides services for will preparation and estate planning, including:

- Advisement regarding tax issues and minimization of estate transfer tax.
- Preparation of your last Will and Testament.
- Document naming your executor and beneficiaries.
- Nomination of a guardian for your children.
- Appointment of a person who will act as your health care agent should you become incapacitated

Figure 2: Example of High-Context and Low-Context Advertisements

Samli (1995) analyzed high-context vs. low-context dichotomy on the basis of five factors: values, consumption pattern, information, purchase behavior and affinity to new ideas, products and services. The last three will be discussed as they pertain more to the proposed research. Information in high context-cultures comes from other people, but it could be modified by values and other externalities. Their purchasing behavior is affected by their relationship with stores, salespeople, and other contextual attributes. Hall (1977) implies the same when he compares the French business practice with America's business practice. French businessmen need to know their employees and clients to serve them well, thus resulting in long-lasting relationships. American businessmen, who are from a lower context society, do not follow the long relationship approach as a standard. High context societies' acceptance of new products depends on the opinion of leaders. For low-context cultures, information comes from written documents and media. Their purchasing behavior is gathering information to compare and their acceptance of new products depends on the information they can obtain from the mass media. Samli (1995) also discusses the implications that the individualism vs. collectivism dimension has on the same factors. In collectivistic cultures, the group shares information, so the information should be directed to the groups or to the leaders. The groups from a collectivist culture motivate their members purchasing behavior; therefore in order to accept new ideas or products, the opinions of the group or leaders of the group are crucial for the members. For individualistic cultures, the information should be directed to individuals. Individuals are encouraged to be internally motivated to purchase, and their affinity to new ideas comes from the information they can find on their own. Furthermore Samli (1995, pp 51-52) cites Richard Brislin in a conference given at the University of Hawaii titled Understanding Cultural Differences for Management on International Assignment. In the conference, Brislin mentions that the individualism vs. collectivism dimension is critical for understanding how individuals behave. In addition, Brislin gives characteristics to the individualism vs. collectivism dimension similar to the ones given by Hofstede (1997). Samli goes on to discuss the implications that these characteristics have on marketing. For example, in collectivistic societies, the elderly have an important status so marketing must make an effort to appeal to them. In individualistic societies, individuals solve their own problems, so the marketing efforts should be targeted towards individuals. In collectivistic societies, groups solve the problems so marketing should be targeted towards the group. In individualistic societies, emotions are from within, so marketing should help individuals recognize on their own the need for a product. In collectivistic societies emotions are influenced by the environment, so individuals are told that they need a certain product or service. In individualistic societies, people learn from their own experience, thus marketing should provide them with special experiences related to the product or service. In collectivistic societies, people learn from others hence marketing should provide the experience to leaders of the group. Since in collectivistic societies relationships are maintained over a long period of time, it is easier to communicate about the product. In contrast, in individualistic societies relationships are not as long, so marketing needs to communicate with individuals in a direct manner. Albers-Miller and Gelb (1996) used Hofstede's model to analyze the advertising appeals of cultures that score relatively different in the cultural dimensions. Print advertisements of eleven different countries were analyzed taking into consideration that the values incorporated in advertisements consider the values that appeal to the customers. Albers-Miller and Gelb (1996) classified Pollay's list about common advertisement appeals into Hofstede's cultural dimensions. It was found that the relative frequency of distinctive appeals in advertising was positively correlated with the individualism score, and popular and succorance appeals (i.e. expressions of love, not to be confused with expressions of sexuality,

gratitude, pats on the back, and to feel deserving) were negatively correlated with country scores in the same index. Han and Shavitt (1994) found that the individualism vs. collectivism dimension was reflected in advertisements of the US and Korea by analyzing the information content of magazine advertisements from both countries. U.S advertisements were found to be more individualistic, while Korean advertisements were found to be more collectivistic. Han and Shavitt considered that the commercials oriented to individualistic audiences included appeals about independence, reflections of self-reliance with hedonism or competition (mostly expressed in pictures), emphasis on self-improvement or self-realization, and emphasis on the benefits of the product for the consumer. For the collectivistic audiences, advertisement included appeals about family integrity, focus on group integrity or group well-being, concerns about others or support of society, focus on interdependent relationships with others, and focus on group goals. Han and Shavitt found that product characteristics, shared products vs. personal products, had an effect on the individualism or collectivism characteristic of the content in the advertisement. Personal products tend to have more individualistic appeals in both countries; this is expected since the target audience is an individual. However the shared products had different appeals in the countries studied. In the US, the shared products were more individualistic, while in Korea the shared products were more collectivistic. Moreover, Han and Shavitt (1994) studied the effectiveness of individualistic and collectivistic appeals of commercials with U.S and Korean participants. Han and Shavitt found that members of individualistic societies were more persuaded by advertisement of shared products with an individualistic approach, while members of collectivistic societies were more attracted to shared products with a collectivistic approach. In addition, Han and Shavitt found that for personal products, both cultures were more attracted to products with an individualistic appeal. An analysis made of advertisements of several countries, (Zandpour, Campos, Catalano, Chang, Cho, Hoobyar, Jiang, Lin, Madrid, Scheideler, & Osborn, 1994) found that collectivistic cultures were more likely to use advertising strategies with an explicit statement of product benefits, emotion, and interpretation of facts. Individualistic cultures were more likely to use advertisement strategies in news format, with plain facts, providing no explicit conclusions. A news format was less frequent for food-beverages and personal care-cosmetic-drugs products and more for car and car products and services. Considerations that should be made to advertise products in international markets will be further discussed in the next section. Considerations for Globalization of Products Several characteristics of a product must be considered to decide how it should be marketed at an international level. Appeal or preference for certain kinds of products might be different to individuals and to cultures because of the benefits the products provide (Albers- Millers & Gelb, 1996; Cheng & Scheweitzer, 1996; Han & Shavitt, 1994; Zandpour et. al, 1994). Mooij (1994) mentions that product category has an influence on the consumer's acceptance of the product. Mooij provides a list of products that can be considered for marketing standardization. The list consists of the least culturally bound products: cigarettes, hard liquor, industrial products and services, hi-tech products (computers, compact disc players, television), and hi-touch products (fashion, perfumes, jewelry). On the other hand, culturally bound products like food and decorations would be more difficult to market at an international level. Distinction should also be made between products directed to a group or those for personal use. Shared products could be targeted to either individuals or groups, because their benefits are for individuals or for groups. On the other hand, personal products tend to be targeted to individuals because their benefits are for individuals. Han and Shavitt (1994) classified different products into these categories by averaging the results of a survey (Table 3). Han and Shavitt asked 24 American students and 24 Korean students to rate the products basedon which opinions (theirs only or including family or friends) the student consider when purchasing the product and if they use the products individually or share with family members or friends. No differences between respondents of different cultures were obtained in the mean ratings of the products. In the selection of products to evaluate the effectiveness of advertisement appeals in cultural groups, Han and Shavitt (1994) considered that the products they selected covered a broad range of cost and length of purchase cycle so they represent a large variety of products in the market. Another consideration was that the products selected were familiar to participants in both countries and their appeal could be manipulated (individual vs. shared product appeal).

Human-Computer Interaction Research in Globalization

Just like in the advertisement industry, the computer industry is trying to market products in an international market. Globalization of computer products is a relatively new issue that has gained popularity since the rise of the World Wide Web. When designing interfaces for a global audience, language is not the only thing to consider. Other characteristics of interface design must be considered to maintain the usability of the product; it must be determined

if the product matches metaphors, attitudes, and preferences of other cultures. With the increasing trends of localization of products from competitors, the customers will expect the same from any product (del Galdo, 1996). Rare is the case when a product designed for universal use will be accepted globally (Marcus, 2001). So in order to stay internationally competitive, companies must consider a localized level of customization for their product designs. There are several references that serve as a guide for designing user interfaces (e.g. del Galdo & Nielsen, 1996; Fernandes, 1995; Stephanidis, 2001). Cultural models have been considered in the HCI area. Hoft (1996) suggested that cultural models, such as the one defined by Hofstede, could be considered for designing an interface targeted to an international audience so that the audience's needs could be met. Different models were created for different purposes. Hoft (1996) gives examples of the purposes of several models. Hofstede's model, the model that is considered for the proposed study, was created with the purpose of determining patterns of thinking, feeling, and acting that form a culture's mental model. Another cultural model is the one defined by Edward T. Hall, with the purpose of determining what releases the right responses for effective communication. Fons Trompenaars developed a model of culture with the purpose of determining the way in which a group of people solve problems. Hoft also discusses David A. Victor's model that was created to determine the aspects of culture that affects communication in a business setting. The purpose of the model must be considered in order to determine if the model matches the needs of the company, the products, and the user community. Marcus and Gould (2000) illustrate the cultural effect by comparing websites from different countries. The observed countries differ along a particular dimension defined by Hofstede. By pointing out the differences between the interface designs of the different countries, Marcus and Gould provide a set of guidelines to be considered when designing interfaces for different cultures. There is a set of guidelines for each dimension of culture defined by Hofstede. Marcus and Gould noticed that individualistic cultures give more importance to youth and action, while collectivists prefer aged, experienced, wise leaders and states of being (Marcus & Gould, 2000). Individualists' image of success is shown through consumerism and materialism, while collectivists' image of success is shown through the achievement of socialpolitical agendas. Individualistic people are motivated with products shown with individuals, while collectivistic people tend to prefer products shown with groups or by themselves. And finally, individualists like to emphasize change (i.e. what is new and unique), while collectivists prefer tradition and history. These preferences result in the appeal of collectivistic groups towards products that are traditionally good or known, products with an image targeted towards groups, and products with a presentation of benefits toward the group. In contrast, individualistic cultures will prefer new products, products with images targeted to the individual, and products with a presentation of benefits toward individuals. Marcus and Gould work provided no evaluation of the effectiveness or practical use of these guidelines, although some overlap with research done in advertising can be observed. This study attempted to prove with empirical data the effects that the individualism vs. collectivism dimension of culture has on preferences of interface information design, especially for e-commerce interfaces. The information gathered throughout the literature review, including the research done in advertisement area and in the human-computer interaction area, was considered for the design of the study.

Chapter 3 Statement of Research

A study was conducted to determine if the individualism vs. collectivism dimension has an effect on the preference or use of information for decision-making in purchasing tasks presented on a web-based interface. The design of the interface used in the study models the interfaces used in e-commerce environments. Effects of individualism vs. collectivism dimension could be measured in other tasks related to e-commerce, but it was restricted to purchasing tasks to increase participant involvement. The study attempted to determine if the type of information that individuals look for and use on a web interface, when faced with a decision, are related to the individualism vs. collectivism dimension. In addition, the study attempted to determine if individuals from the same culture prefer the same type of information, and if acculturation to other cultures has an effect over preference for information. The underlying basis of the preferences were determined by using a post-task questionnaire. The implications of the results on interface design are discussed. If differences in preference between the cultural groups would have been found, an interface design aid for culturally sensitive information would have been created to increase awareness of cultural issues during interface design.

Chapter 4 Research Objectives

Cultural differences are known to exist, but prior to this research there were no empirical studies that address whether the information appeal in web applications varies along cultures. The objectives of this research were:

1. Validate Hofstede's Individualism vs. collectivism dimension classification of two groups – Anglo-Americans and Hispanic-Americans (i.e. individuals of Latin-American descent born in the Western Hemisphere, including the United States);
2. Determine if culture has an effect on preference for information in an e-commerce environment; and
3. Provide an interface design aid for culturally sensitive information that organizes literature to increase designer awareness of cultural effects on usability in humancomputer interaction.

Chapter 5 Research Questions and Hypotheses

To achieve the research objectives, the following questions, hypothesis, and goals were formulated for the study:
Research Question 1: Is there a difference between the individualism level of HispanicAmerican participants and Anglo-American participants? Hypothesis 1: Hispanic-American participants will be more collectivistic than Anglo-American participants. The scores obtained on the COS will reveal the difference. It is important to confirm Hofstede's findings about the differences in the individualism vs. collectivism dimension between the cultures involved in the study (i.e. Anglo-American and Hispanic-American cultures) to determine if the participants of the study are representative of their culture of origin.
Research Question 2: Would there be a relationship between culture and preference for information?
Hypothesis 2: Hispanic-American participants will prefer collectivistic designs more that Anglo-American participants. The relationship between culture and preference for information presented on a web page would determine if the individualism vs. collectivism dimension has implications for the design of interfaces. The conclusions about the relationship between individualism vs. collectivism dimension and preference for information would be the basis for an interface design aid for culturally sensitive information. If there is a pattern across cultural groups pertaining to preference for information, the interface design aid will be created. The interface design aid would be the product of the proposed research. The interface design aid will be created with qualitative data obtained from post-task questionnaire responses. The purpose of interface design aid would be to increase designer awareness of cultural effects on usability in human-computer interaction. Currently, the main issues interface designers consider are if the product is usable and effective. But when interface designers are designing a product for different cultures, they need to consider cultural differences. Interface designers need to consider the different needs and desires of other cultures to present an understating of the cultures in their design and to remain competitive in the international market.

Chapter 6 Method for Participant Screening Participants

The participants selected for the experiment were Anglo-Americans and Hispanic-Americans. The Anglo-American classification was limited to Caucasians of European descent born and raised in the United States. The Hispanic-American classification to included individuals of Latin American descent born in the western hemisphere, including the United States. The Anglo-American participants represent individualistic culture and the Hispanic- American participants represent a collectivistic culture. Participants were matched as closely as possible on demographic characteristics so the cultural difference can stand out clearly (Hofstede, 1997; Vijver & Leung, 1997). Participants selected for the study were in their junior or senior year of college in the Industrial and Systems Engineering, Electrical and Computer Engineering or Computer Science area so participants match in terms of educational experience and age. Participants were selected from the population of Virginia Tech students. Due to the limited Hispanic population in Virginia Tech, Hispanic participants were also selected from Puerto Rico. Hispanic participants were selected from the population of the University of Puerto Rico, Mayaguez Campus. A demographic questionnaire (see next section for more detail) was used to confirm the similarities among participants. Students were recruited through announcements around campus and listservs. As many participants as possible were recruited for the Participant Screening. From the Participant Screening, a total of 52 participants were selected for the next part of the study, the experiment (refer to the Data Analysis in the Experiment section for justification of the number of participants).

Questionnaires

Several questionnaires were used to select participants. To assure similarities between the participants of the study, participants completed a demographic questionnaire that included questions about:

- Age

- Gender
- First language
- Country of origin
- Ethnicity
- Years living in the US or native country
- Years lived in another country
- Marital Status

Hispanic-American participants were asked to answer the following additional questions:

- Period of time spent in the United States
- Country of family origin
- Language spoken in country of family origin

In addition, participants from Puerto Rico were asked if they felt comfortable answering questionnaires in English. Those who answered negatively were not considered for the study. All participants were prescreened with the Cultural Orientation Scale (COS; Appendix A) to measure their relative scores in the individualism index. The Stephenson Multigroup Acculturation Scale (SMAS; Appendix B) was administered to the Hispanic-American participants to assure that there was a wide range of acculturation levels among the selected participants. The responses of the questionnaire were used to classify participants into two groups, high acculturated and low acculturated. The SMAS consists of two subscales that measure the level of cultural immersion into the dominant society (i.e. Anglo-American culture) and the level of immersion into the ethnic society (i.e. country of origin). The ratio of the dominant society score over the ethnic society score was calculated. The larger the ratio of the scores, the larger the immersion into the dominant culture compared with the immersion to the ethnic culture. Anglo-American participants were not screened using the SMAS. Since Anglo- Americans are part of the dominant culture, they are not immersed into two different ethnic cultures. To assure that Anglo-American participants are not acculturated into another culture, the demographic questionnaire assessed whether the participants have resided in any other country other than the United States. Only participants that have not resided in any other country were selected for the second part of the study. The scores of the SMAS of the Hispanic participants and the scores of the COS of the Anglo-American and Hispanic participants were the criteria for classifying participants into groups. The participants were classified into one of three profiles; Low acculturated and collectivist Hispanic-Americans, High acculturated and collectivistic Hispanic-Americans, Individualistic Anglo-Americans.

Sampling Frame

The selection of participants for the second part of the experiment was based on several criteria that defined the three profiles into which participants were classified. Hofstede (1997) found that Hispanic-American cultures are relatively low individualistic groups. Therefore it was expected that in the prescreening section of the experiment, Hispanic-American participants were going to score relatively low on the Cultural Orientation Scale (COS). On the other hand, Hofstede (1997) found that participants from the US scored the highest in the individualism index, therefore it is expected that Anglo-American participants will score relatively higher in the COS. Acculturation levels between Hispanic-Americans were expected to vary since it depends on the level of exposure that individuals have with the American culture. Participants were classified into high and low acculturated. It was desired to have representation of both these groups to determine if there are differences in information preference due to acculturation. On the other hand, Anglo-American participants are part of the dominant culture in the United States, thus other cultural groups will have a very small contribution to the culture of Anglo- Americans (Berry, 1980). Therefore the acculturation levels from the Anglo-American participants were not measured. The demographic questionnaire asked if the participants had resided in any other country than the United States to determine if they have been influenced by any other culture. Only Anglo-American participants that responded negatively were selected for the second part of the study. Table 4 summarizes the assumptions just mentioned. It should be clarified that considering the literature, the researcher did not expect to find a significant number of participants that scored low in the acculturation level and high in the individualism index. Hofstede (1997) found that Hispanic-American participants scored relatively low in the individualism scale. Participants that scored low in acculturation level and high in the individualism index are low acculturated Hispanic-American participants that are individualistic, which are not representative of the majority of the Hispanic-American population. Therefore Hispanic-American participants that scored high in the individualism level and low in acculturation were not selected for the second part of the study.

Table 4: Profiles of Participants

The selection of the participants was made considering the assumptions summarized in Table 4. Considering that the lower the score in the INDCOL scale the more individualistic is the person, the18 Anglo-Americans participants that scored lower in the COS were selected for the next part of the study. Considering also that the higher the ratio of the scores of the Stephenson Multigroup Acculturation Scale (SMAS) the more acculturated the participant is, the 17 Hispanic-Americans participants that had a higher ratio of the scores of the SMAS and higher score in the Cultural Orientation Scale (COS) were selected. In addition, 17 Hispanic-American participants that had a lower ratio of the scores of the SMAS and a high score in the COS were selected. In summary, the selected participants were going to be classified into one of three profiles or groups: high acculturation and high individualism, high acculturation and low individualism, low acculturation and low individualism, and. The selected participants were called back to participate in the next portion of the study.

Facilities

The prescreening sessions were held in a classroom in Virginia Tech and in University of Puerto Rico, Mayaguez Campus.

Procedure

Once the Institutional Review Board (IRB) approved the experiment (see IRB Application in Appendix C), participants were recruited. Since different persons conducted sessions in Puerto Rico and in Virginia, the conductors followed a script that contained directions. The recruited participants were provided with an Informed Consent Form (Appendix D) that contained a description of the experiment and the participants' responsibilities. Participants were instructed to read the Informed Consent Form and sign it if they agreed and if they did not agree, they were excused from participation. Upon acquisition of informed consent, participants were asked to complete a demographic questionnaire (see Questionnaires section), the Stephenson Multigroup Acculturation Scale (SMAS; Appendix B), and the Cultural Orientation Scale (COS; Appendix A).

Chapter 7 Results of Participant Screening Data Analysis

A t-test of the Cultural Orientation Scale results was conducted to determine if Hispanic- American participants are more collectivistic than Anglo-American participants (Hypothesis 1). The analysis served as a validity check to determine consistency with Hofstede's Cultural Classifications. Participants for the next phase of the study were selected and classified using the COS and The SMAS scores.

Demographics

Due to the small number of Hispanic students at Virginia Tech, the Hispanic-American participants were recruited from the University of Puerto Rico- Mayaguez Campus. Data obtained from a total of 87 students were used during the screening session of the study. The demographic information gathered from the participants is shown in Table 8.

Table 5:Participant Screening Demographic Data

Hypothesis 1- COS Scores and t-Test

The COS, a 7-point Likert-type scale, was administered to participants to measure the relative level of collectivism. The highest possible score that could be obtained by the participants was 7. A summary of the COS scores obtained by the participants is shown in Table 9. Figure 5 shows the frequency of the scores obtained by Anglo-American and Hispanic- American groups. The actual scores obtained by each participant can be found in Appendix G.

Table 6: Descriptive Statistics for COS Scores

Figure 3: Frequency of COS Scores

It was determined that the distribution of the scores was normal and that the variances were equal with the skewness, kurtosis, and F-test. Therefore parametric tests could be applied to the data. Appendix H contains the results for these analyses. After verifying that the data satisfied the conditions for conducting parametric tests, a ttest was conducted on the mean COS values for both groups (see Table 10). The t-test indicated that the COS scores of the Anglo-American participants were significantly lower than the COS scores of Hispanic-American participants [$t(85) = 3.65$, $p < .0005$], which provided support to reject the null hypothesis of no difference. Thus, Anglo-American participants had significantly lower collectivism scores than Hispanic-Americans.

Participant Selection and Classification

Data gathered from the questionnaires were used for the selection of participants for the second phase of the study. To get a representative sample of the three different groups, (i.e. Anglo-American, High acculturated Hispanic-American, and Low Acculturated Hispanic- American) several decision rules were developed. The highest COS score of the selected Anglo-American participants had to be lower than the lowest score of the selected Hispanic-American participants. The cutoff point for Anglo- American participants was defined to be the scores above a quarter of a standard deviation from the mean. A total of 18 participants were selected for this group. The highest score was 4.54. The cutoff point for Hispanic-American participants was defined to be a quarter of a standard deviation below the mean. A total of 34 participants were selected. The lowest score was 4.69. The 34 selected Hispanic participants were classified into High Acculturated and Low acculturated groups using the ratio of the Stephenson Multigroup Acculturation Scale (SMAS) scores. The ratio was defined as the dominant society score over the ethnic society score; therefore participants with higher ratios are more immersed in the dominant society than those with lower ratios. The cutoff point was defined to be the mean of the ratios. A total of 17 participants were assigned to each group. The SMAS scores are found in Appendix I.

Chapter 8 Method for Experiment Participants

A total of 52 participants were selected in the prescreening phase of the study (see Part 1of Method – Participants Screening).

Experimental Design

The experiment used a 2 x 3 mixed factor design. The independent variables in the experiment are information type for the description of product (two levels within-subject variable), and participant profile (three levels, between-subject variable). The participant profile information was derived from the previous administration of the acculturation and individualist/collectivistic scales. The dependent variable is the product selections, which indicate the preference for information type, and responses on the post-task questionnaire. Product selection indicates information preference because the product shown in each task was identical except for their descriptions. To confirm the relationship between product selection and preference, the post-task questionnaire asked participants to rank the products description from most preferred to least preferred. If selection and rank of products description match, then there is a relationship between selection of product and information preference. Examination of ranks of product descriptions would have revealed patterns of preference if any. Open-ended questions were developed to be used as a basis for design recommendations.

Facilities

The experiment was web based. Each participant did the experiment in his or her preferred computer facility.

Equipment and Questionnaire

Participants performed the tasks on a computer. A prototype of an online store interface was developed using HTML and Perl CGIs that allowed participants to perform the tasks. Due to technical difficulties when using another browser, participants were asked to use Internet Explorer as their browser. After performing the tasks of product selection, participants had the final task of completing the post-task questionnaire. The post-task questionnaire (Appendix E) was used to gain feedback about information design opinions and preferences in order to determine existence of culture-based differences and gain more specific information about why products were selected. In addition the final question asked participants to rank the information featured in the products in order of preference.

Products for Tasks

The products selected to be included in the tasks of the experiment are products that are the least culturally bound, products categorized as shared products, and products that cover a broad range of cost and length of purchase cycle (Albers-Millers and Gelb, 1996; Han and Shavitt, 1994; Mooij, 1994). It was also decided that the products should be familiar to the participant population (Han and Shavitt, 1994), namely students. Therefore, the products to be used in the proposed research were:

- Laundry detergent

- Telephone
- Sofa (furniture)
- Air conditioner
- Hotel accommodations

Product Interface Design

A prototype interface was developed that allowed participants to read description of products, view images related to products, and to make the selection of products. The prototype took the participants from one task to the next when participants were ready and showed the products in the order in which the participant is supposed to see them (i.e., counterbalanced order). Figure 4 demonstrates the information content and the flow of information in the interface to be used in the proposed design. Appendix E shows images of the actual interface used in the experiment. The general information provided about each product included:

- Identity of products (e.g. Laundry Detergent A, Telephone A)
- Image of products (i.e. a picture to create an image of the product)
- Description of features (i.e. description of the product with an individualistic or collectivistic appeal, see Figure 5 below for example.)

The information contained in the images of the products and in the description of products varied in terms of what is preferred or more appealing to individualist and collectivist societies. Table 5 summarizes the information from the literature review about the appeal or preference for information of individualistic and collectivistic societies. Based on the information contained in Table 5, a sample of appeals or preferences for information design were selected to be included in the information design of products for the proposed study (Table 6). To illustrate the description of products, an example is given in Figure 5.

Procedure

Since the participants were prescreened and selected by their responses to the Stephenson Multigroup Acculturation Scale (SMAS) and the Cultural Orientation Scale (COS), awareness of acculturation and the Individualism issues could have occurred. Therefore the participants did the experiment after a period no less than two weeks from the prescreening session to avoid possible effects on the tasks due to possible priming by previous exposure to culturally relevant assessment. Participants had five tasks of purchasing or selecting products from a computer-based environment, which models an e-commerce environment. Each task presented two competing products (i.e. products that serve the same purpose), which varied in their description. The description varied in terms of what in theory would be preferred by either individualistic or collectivistic groups (see discussion in previous section and Appendix E for the actual descriptions). The participants were asked to select one of the competing products for each task. The order of showing the Individualistic and Collectivistic product to the participants was counterbalanced. Table 7 shows the counterbalanced order in which the first description is alternated from one task to the next and from one group of participants to another. A product order effect was not expected because the products selected for the tasks are for different uses. In addition, the interface design among products was identical. However, the order of products presented to the participants was randomly selected to avoid any overlooked task order effect. Twelve orders of presentation of products were randomly generated using Excel. A random order was assigned to each participant and rotated in groups of twelve. After performing the tasks of product selection, participants completed the post-task questionnaire (Appendix E).

Chapter 9 Results of Experiment - Data Analysis

A Chi-square test of independence was conducted to determine if there is a relationship between the user's profile and the preference for information type. The test was used to determine if Hispanic-American participants prefer collectivistic designs significantly more than Anglo-American participants (Hypothesis 2). Since the type of information has two levels (i.e. individualistic and collectivistic) and there are three different profiles of participants, there are six different groups in the null hypothesis of the Chi-square test. So at least six participants will be needed for the experiment. The experiment attempted to recruit at least a total of 48 participants, 8 per group of the Chi-square test. The post-task questionnaire (Appendix E) was used to gain feedback about information design opinions and preferences in order to determine existence of culture-based differences and gain more specific information about why products were selected. The data obtained from the open-ended questions was analyzed with content

analysis methods. Ranks were analyzed by comparing the mean ranks between groups of user's profiles using a Kruskal-Wallis Analysis of Variance. The analysis was used to determine if there is a pattern of preference within each profile (i.e., Anglo-American individualists, High-acculturated and collectivist Hispanic- Americans, and Low-acculturated and collectivists Hispanic-American) and to determine if there are differences between the three profiles.

Demographic Data

Not all the participants selected from for the second part of the study participated. Table 11 contains the demographics of those who did participate in the Experiment.

Product Selection

Frequencies for product choice for each group were determined for all participants regardless of their profile. Collectivistic products were chosen 57% of the time (113/ 200) and Individualistic products were selected 43% of the time (87/200). When considering each profile separately, Anglo-Americans selected collectivistic products 51% of the time (36/70) and individualistic products 49% of the time (34/70). High Acculturated Hispanic-Americans selected collectivistic products 51% of the time (33/65) and individualistic products 49% of the time (32/65). Low acculturated Hispanic-American selected collectivistic products 68% of the time (44/65) and individualistic products 32% of the time (21/65). Figure 6 illustrates the product selection of each profile.

Hypothesis 2 - Chi-square Test of Independence

Several 3 (Profile) X 2 (Product Choice) Chi-Square tests (alpha=0.05) were conducted to determine if product selection was dependent upon the participant profile (Hypothesis 2). There was a significant association [chi-square(2)=6.14, $p<0.05$] between participant profile and hotel selection (see Table 12 for results). The lower the acculturation, the more the preference of the collectivistic hotel description is. No other associations were found between other product selections and the three profiles. Other Chi-square results are found in Appendix J. Additional Chi-Square tests were performed on the data considering only two groups or profiles at a time. There was a significant association [chi-square(1)=5.04, $p<0.05$] between Anglo-American and Low-Acculturated Hispanic-American participant profile and hotel selection. Low acculturated Hispanic-Americans preferred more collectivistic descriptions than Anglo-Americans did. Results are shown in Table 13. A Chi-square test was conducted considering all product selections, regardless of product type. A significant difference was found between the High acculturated Hispanic-American participants and the Low acculturated Hispanic-American participants [chi-square(1)=3.85, $p<.05$]. The lower the acculturation the more the preference towards collectivistic product descriptions. See Table 14 for results. A chi-square analysis considering Anglo-American and Low Acculturated Hispanic- American profiles and their product selections approached significance [chi-square(1)=3.7, $p=0.055$]. Lower Acculturated Hispanic-American participants preferred collectivistic designs more than Anglo-Americans did. Table 15 shows the results for this test. Other Chi-Square Analysis can be found in Appendix J. No other significant differences were found comparing two profiles at the same time.

Features Ranks

Participants were asked to rank features of information presented with the products from one to eight (one to two for image features), with one indicating the most preferred and eight indicating the least preferred. The features were either verbal descriptions of the product or images referring to the product. For verbal descriptions, participants ranked eight features. For image features, participants were asked to rank two features. The feature presented to the participants were the following:

Verbal Descriptions Features

- Information focused on facts (e.g. the detergent formula contains color brightening agents, with color safe bleach, smell removal agents, and a new fragrance)
- Information focused on a familiar mood (e.g. the brand of detergent your family has always trusted…)
- Indication of new product (e.g. you will notice the difference with this new detergent)
- Indication of well-known product (e.g. the brand you have always trusted)
- Emphasis on benefits towards customer (e.g. you will see the difference in your clothes)

- Emphasis on benefits towards a group (e.g. your family clothes will look better)
- No explicit conclusions (e.g. the detergent formula contains color brightening agents, with color safe bleach, smell removal agents, and a new fragrance)
- Explicit statement of benefits and interpretation of facts (e.g. the detergent will make your clothes look brighter, your white looks whiter, and with the scent you love)

Image Features

- Images of product presented with a person
- Images of products presented with a group of people
- Appendix K illustrates the frequencies of the ranks given to each product. The rank level is shown in the X-axis and the frequency is in the Y-axis.

Hypothesis 2 - Kruskal-Wallis Analysis of Variance

Kruskal-Wallis ANOVA or H test was conducted to determine if the three profiles differed on how they ranked the preference for information features. The explicit conclusions and interpretation feature ranks approached significance [H (2)=5.57, p=0.06]. As can be seen in Table 16, the High-Acculturated Hispanic gave more importance to the explicit conclusion and interpretation feature than the other profiles, but this difference was not statistically different. No significant differences were found. Other results are found in Appendix L.

Hypothesis 2 - Additional Analysis

A Spearman Rho-Correlation was used to determine if there was a relationship between the COS score and SMAS scores and the ranks of information features. The positive correlation between SMAS scores and Information Focused on Facts feature rank approached significance[r (22)=. 40386, p=0.0503]. The lower the acculturation level of Hispanic-Americans the higher the rank for factual information. A significant negative correlation was found between SMAS and Explicit Statement and Benefits Interpretations feature[r (22)=-.41841, p<. 05]. The more acculturated the Hispanic-American participants the lower they ranked explicit statements and benefits interpretation. A significant positive correlation was found between COS score and No Explicit Conclusion feature [r (36)=-.32638, p<. 05]. The more individualistic, the higher the participants ranked "No explicit conclusion" statement. The correlation matrixes are presented in Table 17 and Table 18. To understand the correlations, it should be noted that the higher the COS score, the more the collectivistic, the higher the SMAS score, the more acculturated the participant, and that the higher the rank, the lesser the preference for the feature.

Content Analysis

The post-task questionnaire included open-ended questions (See Appendix F). The data gathered from this part of the study were analyzed using content analysis. The qualitative data were organized into categories or keywords, and then subcategories were created to distinguish between the different points of view. When participants were asked which factors affected their product choice, 23% (3 out of 13) of Anglo-American responded that advertisements targeted to families were negative. Such descriptions as "turn off" were used to express a negative reaction to family-oriented advertisements. Regarding product descriptions, 31% (4/13) of Anglo-Americans stated that they like to the rich descriptions (elaborated descriptions of the product) while 23% (3/13) preferred to- the-point descriptions. Hispanic-American participants were more concerned about how the product is presented. From the high-acculturated Hispanic-American group, 38% (5/13) responded that they were affected by how the product is presented, and 31% (4/13) from the low acculturated Hispanic-American group were also affected by how the product is presented. In addition, two participants from the High Acculturated Hispanic-American group mentioned that interpretation of product features positively affected their product choice. Table 19 lists the more frequent factors that affected product choice. Participants were asked if they were looking for specific information in the advertisements (see Table 20 for summary of responses). Fifteen percent (2 /13) of Anglo- Americans stated that they like advertisements to be targeted to themselves, 31% (4/13) stated that they look for rich descriptions of products, and 15% (2/13) stated that they were only looking for specifics of the product. Thirty one percent (4/13) of the Anglo-American group, 31% (4/13) of the high Acculturated Hispanic-American group and 23% (3/13) of the low acculturated Hispanic-American group responded that they were looking for better features of the products. When participants were asked which features of the interface most influenced their product choice, 31% (4/13) of Anglo-

Americans responded that rich descriptions of the products influenced their product choice. The same percentage, 31% (4/13), answered that specific information such as a bulleted list was an influence. In addition, 31% (4/13) of Anglo-Americans and 31% (4/13) of high acculturated Hispanic-American responded that how the information was presented had an influence in their decision. Images had an influence on 31% (4/13) of Anglo- Americans, on 15% (2/13) of high-acculturated Hispanic-American, and on 31% (4/13) of low acculturated Hispanic. Other participants were more specific in their responses. Fifteen percent of high acculturated Hispanic-American participants and 31% (4/13) of low acculturated Hispanic-American participants stated that the mood created by the images had an influence on their choice of products. Meanwhile 31% (4/13) of Anglo-Americans stated that images had no effect on their decision. Table 21 lists the responses to this question. The fourth question was about specific words or phrases that appealed to the participants. From the Anglo-American group, 31% (4/13) responded that facts (specific features, with no conclusions provided) appealed to them. From both Hispanic-American profiles, 15% (2/13) of each profile responded that phrases that gave them assurance that the product is good appealed to them. Phrases that targeted a group of family appealed to 38% (5/13) of the low acculturated Hispanic-American. Anglo-American responded 38% (5/13) of the time that phrases that address the customer appealed to them, but only one participant specified that the customer was a group or family and another participant stated that the customer is the individual. Table 22 summarized the most frequent responses for this question. The fifth question presented in the questionnaire asked participants if there were some images that had a special appeal (see Table 23 for a summary of the responses). From the Anglo- American and high-acculturated Hispanic-American, 23% (3/13) and 15% (2/13) respectively responded that they liked images that demonstrate product features. The mood created by group images appealed to 15% (2/13) of Anglo-American and 31% (4/13) of low acculturated Hispanic-American. An interesting observation is that only Anglo-American participants made comments regarding the opposite gender in the images. One participant expressed discontent to the fact that most images were of the opposite gender, while 31% (4/13) expressed that they were attracted to images of the opposite gender. Other participants, 15% (2/13) of Anglo-Americans and 38% (5/13) of both high and low acculturated Hispanic, stated that images had no special appeal to them. Question six asked participants if there were other features of the interface that appealed to them (see Table 24). Since the question gave colors as an example, most of the participants responded that colors had a special appeal (i.e. 31% or 4/13 of Anglo-American, 31% or 4/13 of High Acculturated Hispanic-American, and 23% or 3/13 of low acculturated Hispanic- American). A few participants responded that the description of the products is what appealed to them, and other stated that the presentation of the information had an effect. acculturated Hispanic and 54% (7/13) of low acculturated Hispanics. From the participants that shopped online before, 27% (3/11) of Anglo-American participants prefer brief product descriptions on online product advertising. From the high acculturated Hispanic-American group 30% (3/10) like when images show the product accurately and 20% (2/10) stated that they like when the description of the product is accurate. See Table 25 for more responses to this question. When participants that shopped online before answered what type of things should be included in product advertisement (Ninth question, summarized in Table 26), 27% (3 /11) of Anglo American responded concise product descriptions, as so did 29% (2/7) of low acculturated Hispanic-American. However, 18% (2/11) of Anglo-Americans and 1 from each Hispanic profile stated that detailed descriptions should be included. Forty-five percent of Anglo-Americans (5/11), 40% (4/10) of high-acculturated Hispanic-American, and 71% (5/7) of low acculturated Hispanic-American said that Features and specifications of the products should be included. Forty-five percent (5/11) of Anglo-Americans, 40% (4/10) of high acculturated Hispanics- American and 29% (2/7) of low acculturated Hispanic-American said that product images should be included in product advertisements . The final question asked how should the interface be designed so that it would appeal to members of their own cultural groups (see Table 27 for summary of results). A well designed and professional looking interface was the response of 38% (5/13) the Anglo-Americans. From the high-acculturated Hispanic-American group, 31% (4/13) responded that the native language should be used. From the low acculturated group, 23% (3/13) stated that if it were up to them, they would offer affordable prices. Images is another desired feature by 31% (4/13) of Anglo- Americans, 54% (7/13) of high acculturated Hispanic-American, and 23% (3/13) of low acculturated Hispanic-American. In addition, 15% (2/13) of Anglo-Americans, 46% (6/13) of high-acculturated Hispanic-American, and 31% (4/13) of low acculturated Hispanic-American said that product description should be included. Only the more frequent codes were included in this discussion. Appendix M has a more detailed content Analysis. No statistical analysis could be done to the data gathered from this analysis due to the low frequencies of the culture relevant codes.

Chapter 10 Discussion and Conclusions

Based on the results of the statistical analyses presented in the previous section, conclusions about the hypotheses tested in this research were made. Support for hypothesis 1 (differences in COS scores) was found. Hispanic-American participants had significantly higher scores than Anglo-American participants. Therefore it can be stated that Hispanic-American participants were more collectivistic than Anglo-American participants. This analysis serves as a validation of Hofstede's cultural dimensions theory. At the same time it makes possible to conclude that the participants represent their culture of origin, Hispanic-Americans are collectivists and Anglo-American are individualists. In addition, since Hofstede's study did not include participants from Puerto Rico, it was crucial for this research to find a difference between the groups so the second hypothesis could be tested. Several analyses were performed to the data obtained from the experiment regarding product selection and preference for information. There were very few cases in which significant differences were found between the different profiles. There was a significant difference of the hotel product choice between the groups. The distribution of the Hispanic-American group's selections of the hotel product was remarkable-- 77% (10 out of 13) of the High Acculturated Hispanic-American and 85% (11/13) of the low acculturated Hispanic-American selected the hotel with the collectivistic description. From the Anglo-American group, 43% (6/14) selected the collectivistic description, and 57% (8/14) selected the individualistic description. The difference in the hotel choice might be obvious because the hotel is the only one of the presented products that the consumers can enjoy with a group or by themselves. This could have provoked the participant to think about the possibility of a collectivistic vs. individualistic enjoyment of the product and make a decision based on their preference. In addition, when a Chi-Square test was done considering all product selections and all profiles, there was a significant difference between product selections of high-acculturated Hispanic and low acculturated Hispanics. Even thought their behavior is more like the dominant society, this was shown without an effect in their individualism/collectivism scale. Lowacculturated participants preferred more collectivistic designs than high-acculturated participants. This observation validates Triandis, Kashima, Shimada, and Villareal theory (1986) that states that the higher the acculturation of individuals, the more likely their behavior to be similar to the dominant society. It is possible that if more observations were made, other differences could have been found. The Spearman Rho Correlation approached to a significant positive correlation between the SMAS scores and the ranks given to the "Information Focused on Facts" feature. The lower the acculturation level of Hispanic-Americans the higher the rank for factual information, meaning that the lower the acculturation the more the preference for facts. A significant correlation would have contradicted the expected outcomes of this research were it was stated that the higher the acculturation of the Hispanic-American, the more they would behave like Anglo-Americans. Zandpour et al. (1994) mention that individualistic societies prefer factual driven information. Hofstede (1998), Mueller (1996) and Samli (1995) also state that individualistic cultures prefer low context communication, communication that the message gets to the point (Mueller, 1996). There was a significant negative correlation between SMAS scores and "Explicit Conclusions and Benefits Interpretations" feature. Therefore the more acculturated the Hispanic- American participants the lower they ranked explicit conclusions and benefits interpretation, or the less they prefer the explicit conclusions and benefit interpretations. Zandpour et al. (1994) discuss that collectivistic societies were more likely to use in advertisements explicit statements of product benefits and interpretation of facts, while individualistic societies use more facts without explicit conclusions. Therefore this correlation supports the aforementioned prediction, the higher the acculturation of the Hispanic-American, the more they would behave like Anglo- Americans. Another correlation reinforces this point. There was a significant positive correlation between SMAS score and "No Explicit Conclusion" rank. The more individualistic, the higher the participants ranked "No explicit conclusion" statement; in other words, the moreindividualistic, the less the preference for explicit conclusions. The open-ended questions of the post-task questionnaire were designed to determine if there was a trend of reasoning behind the product selection. No trends were found in the responses between individuals of the same group. Therefore no conclusive statements about cultural groups preferences could be made based on these responses. Findings of this study do not justify the necessity of an interface development aid for culturally sensitive information. Open-ended questions might not have been useful for the development of the interface development tool, but important information about the research was gathered from the questions. Responses from participants state that they found no difference between the two advertisements. Participants mention that information and pictures are too similar in both versions of the product. A participant mentioned that the selections were purely random selections. A reason for this could be that the design of the advertisements did not convey a content or message targeted to individualists or collectivists, as the case pertained. Participants also

commented that the interface was not believable enough. Some participants commented that some pictures were of poor quality and that they affected their product choice, others that the layout and presentation made it look more like a dictionary than a store. There are other several reasons that could justify the little difference between the groups. Because of political reasons, Puerto Rico is highly influenced by the American culture. Even more relevant to this research, the media and advertisements in Puerto Rico are highly influenced by the market in the United States. The same advertisements shown in American television are shown in Puerto Rican television. American magazines and newspapers are sold in Puerto Rico as well. Puerto Ricans are highly exposed to American advertisements, therefore many Puerto Ricans might have adapted to the American style of advertising. Han and Shavitt (1994) classification of personal vs. shared products might not have been the most effective to distinguish between individualists vs. collectivistic audiences. Han and Shavitt mention that personal products can be targeted to individuals, while shared products can be advertised to individuals and groups. The selected products for this research were products that fell into the category of shared products so they could be targeted to both audiences. However, only the hotel product choice demonstrated a difference between collectivists and individualists. This could serve as an indication that products that are enjoyed in groups, such as public facilities, might show a difference in consumer behavior as opposed to products that are enjoyed individually (e.g. telephone, air conditioner, sofa, detergent). Thus instead of using the classification of personal vs. shared products, a classification of personal vs. collectively enjoyed products might have been more relevant to the individualism vs. collectivism differentiation. Another reason could be related to the individualism dimensions. Lee (2000) mentions that there are different dimensions of individualism, and not all of them affect consumer behavior. There are four dimensions of individualism which are (a) interdependent vs. independent self-concept, (b) priority of personal goals vs. group goals, (c) focus on norms, obligations, and duties, vs. personal needs, rights, and contracts and (d) emphasis on maintaining relationship vs. cost-benefit analyses of relationship. However, only two dimensions affect consumer behavior, independent self-concept and the need to sacrifice for the in-group and for acceptance of inequality. Unfortunately, the COS scale does not measure the individualism dimensions separately. Therefore comparisons of the participants along the dimensions would be impossible. In addition, there was a possible threat to the internal validity to this research. Campbell and Stanley (1963) and Martin (2000) discuss that there are extraneous variables that can affect the outcome of a research. One of these variables is history. History is when some event occurs between measurements of the dependent variable. The second part of the research was conducted after the month of October. The World Trade Center tragedy that occurred September 11, 2001 could have affected the behavior of Anglo-American participants. This event could have increased their need for closeness to family and friends, and this might have been reflected in the data collected. If the data had revealed a pattern across cultural groups pertaining to preference for information, an interface design aid for culturally sensitive information would have been designed. The design aid would have increased awareness of cultural issues of interface design. Data obtained from the participants' responses to the post-task questionnaire would have been used to develop the design aid. The design aid would have been a checklist that contains the type of information preferred by individualistic and collectivistic groups. Designers would use the design aid to determine if the interface design would be more appropriate for an individualistic or a collectivistic culture. In conclusion, this research completed one of the objectives, the validation of Hofstedes's Individualism vs. Collectivism dimension classifications of the two groups involved – Anglo- Americans and Hispanic-Americans. In regards to the second objective, it can be concluded that culture had an effect on information preference, but not at the level of culture and types of products that was theorized. There was a difference in preference between high and low acculturated Hispanics regarding selection of all products. High-acculturated Hispanic- Americans preferred more individualistic designs, and low acculturated Hispanic-Americans preferred more collectivistic designs. Therefore, it can be concluded that there is a relation between acculturation level of Hispanics and preference for information- the higher the acculturation, the more the preference for individualistic design of information. For the hotel product there was a difference between the groups- Anglo-Americans preferred individualistic descriptions and Hispanic-Americans preferred collectivistic descriptions. The conclusion based on this finding is that products that are shared should have an individualistic description for Anglo-American audiences and collectivistic descriptions for Hispanic audiences. Finally, there was a correlation between the acculturation level and preference for explicit conclusions and benefit interpretation. High-acculturated Hispanics preferred facts while low acculturated Hispanics preferred explicit conclusions and interpretation of benefits. There were some findings but not enough to demonstrate the necessity of an interface design aid for culturally sensitive

information. The biggest contribution of this study is the identification of weaknesses that were found in the process, so further studies can consider them and benefit by not repeating the same mistakes.

Design Recommendations

E-commerce sites should take advantage of the conclusions and differences found in this study when designing interfaces for Anglo-Americans, and for high and low acculturated Hispanics. It was demonstrated that Hispanic-American participants preferred a more collectivistic description than Anglo-Americans. For e-commerce this implies that if the site is about a shared product, (e.g. hotel, theater, restaurant, parks, etc), it should be considered which audience is targeted. If the audience is Hispanic, the product description should have features preferred by collectivistic societies. If the audience is Anglo-American, the description should be individualistic. Table 28 contains the listing of features that had an effect on the audience of this study. E-commerce sites should consider the conclusions made for high and low acculturated Hispanic-American audiences when designing e-commerce sites for audiences in their native country vs. in the United States. The data gathered from the product selection demonstrates that there was a tendency of low acculturated Hispanic-Americans to prefer more collectivistic descriptions than high-acculturated Hispanic-Americans and Anglo-American participants. Therefore, e-commerce interface designers should consider the features listed in Table 28 under collectivistic descriptions for a Hispanic-American audience living in their country of origin, and the features under individualistic descriptions for Hispanic-Americans in the United States. In addition, it was demonstrated that the higher the acculturation the more the preferences for plain facts and no explicit conclusions. These results imply that e-commerce sites should not provide explicit conclusions and benefit interpretations to a Hispanic audience that is highly acculturated to the Anglo-American culture. E-commerce sites should provide facts of the products to high-acculturated Hispanic-American audiences. On the other hand, e-commerce sites should provide explicit conclusions and benefit interpretation to low acculturated Hispanic-Americans. It is not possible to make more conclusions or design recommendations based on the results of this experiment. However more recommendations can be made based on the literature review of this research. Table 28 is a listing of guidelines for the design of interface information that could be used when trying to address audiences from individualistic societies or collectivistic societies. It lists different aspects of information design that should be considered and how they should be addressed when designing for individualistic or collectivistic audiences.

Future Research Implications

The following suggestions for future research are based on the findings of this study. When comparing the individualism dimension and consumer behavior, the measure of individualism should be one that separates the individualism subscales so those subscales that are relevant to the consumer behavior can be considered. INDCOL95 scale from Triandis (1995) measures the different dimensions of individualism separately. In particular, the subscales that produce difference in consumer behavior are familism (or vertical allocentrism) and independence (or horizontal idiocentrism). The scores for the familism and the independence subscales can be combined to form a single scale for the comparison of idiocentrism vs. allocentrism or individualism vs. collectivism (Lee, 200). The products selected for future research should be product types that show a difference in consumer behavior related to the individualism dimension. The findings of this research suggest that products that are enjoyed in groups, such as public facilities, might show a difference in consumer behavior as opposed to products that are enjoyed individually (e.g. telephone, air conditioner, sofa, detergent). For future research, the type of product should be a controlled variable; one of the levels should be collectively enjoyed products that can be targeted to individuals and to groups. To make the consumer experience more intense, future research should also consider using products that are unfamiliar to the audience. Using unfamiliar products, participants would have to learn about the product from the information offered and make decision solely based on the information provided. Since the consumer is learning about the product for the first time, the different perspectives of the products (individualistic or collectivistic) would create different attitudes from the consumer; thus affecting their decision-making. In addition to decision-making or product selection, future research should consider the measurement of other variables that would demonstrate the effort, involvement, and attitudes that the participant had towards the product selection. Such variables could be time spent viewing screen, rating of interest towards products, and rating of attitudes towards product. Differences between acculturation levels were found more often than differences between individualism vs. collectivism. Future research should consider studying acculturation difference by itself. For example, consider a culture in their native country vs. a cultural group established in the USA (e.g. Mexicans in Mexico vs. Mexicans in Arizona).