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Intercultural Implications in Website Design: An Examination of Cross-Cultural Aesthetics and Organization Online

David Paschke Keppel
Indiana University of Pennsylvania

INTERCULTURAL IMPLICATIONS IN WEBSITE DESIGN: AN EXAMINATION OF CROSS-CULTURAL AESTHETICS AND ORGANIZATION ONLINE

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David Paschke Keppel

Indiana University of Pennsylvania

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Indiana University of Pennsylvania
School of Graduate Studies and Research
Department of Communications Media

We hereby approve the dissertation of

David Paschke Keppel

Candidate for the degree of Doctor of Philosophy

_____ _____
Zachary Stiegler, Ph.D.
Associate Professor of Communications Media,
Advisor

_____ _____
Mary Beth Leidman, Ed.D.
Professor of Communications Media

_____ _____
Nurhaya Muchtar, Ph.D.
Associate Professor of Communications Media

ACCEPTED

_____ _____
Randy Martin, Ph.D.
Dean
School of Graduate Studies and Research

Title: Intercultural Implications in Website Design: An Examination of Cross-Cultural Aesthetics and Organization Online

Author: David Paschke Keppel

Dissertation Committee Chair: Dr. Zachary Stiegler

Dissertation Committee Members: Dr. Mary Beth Leidman
Dr. Nurhaya Muchtar

This study examines the influence of culture on website design and aesthetics. Utilization of a content analysis allowed for an analysis of the websites for recommended restaurants from five different countries including The United States of America, Belgium, Japan, Mexico, and The United Arab Emirates. Examination of the data suggests that the aesthetic and organization differences between these cultural groups are almost non-existent. Possible explanations of the observed similarity of designs include cultural homogenization; however, a collection of ancillary observations and the identification of several limitations do indicate the existence of potential differences suggestive of cultural preferences for certain design and aesthetic features. A summary and analysis of the implications of the results and suggestions for future research conclude this study.

DEDICATION

To my grandfather, Richard Renner, who's belief in my education helped to make this accomplishment possible; to my beautiful star, who stood behind me through every step with the encouragements I needed to continue; to my son, my greatest accomplishment; and to my parents, who's careful guidance are at the core of everything I am.

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There is something strangely poetic about an acknowledgements section. It is presented at the beginning but written at the end, and it references the experience but speaks on none of it. For all intents and purposes, with regard to you the reader, this section is of the least importance, but for me there is an almost crippling sense of significance to each and every word I write. In the end, this dissertation is only a snapshot examination of what I found while this section is an elucidation of what I know. This dissertation, despite bearing my name and containing my work, came only from the help and encouragement of the following individuals.

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CHAPTER ONE

INTRODUCTION TO THE STUDY

The advent of new Internet technologies redefines the way we as a collective society perceive the World Wide Web on an almost daily basis. Over the last several decades, the Internet has evolved from a fledgling form of communication, little more than an academic toy, to a medium of mass communication that has very nearly become a collection of the sum of human knowledge, ideology, and innovation. Furthermore, this collection of digital content increases with each new connection created by societies emerging from behind the digital divide. While each of these new advances pushes us together into the shrinking global village identified by McLuhan (1962), a question exists as to the level of influence this medium has on cultural identity and expression.

The question of culture as it relates to the Internet is increasingly important, since the explosion of international markets has necessitated the need for intercultural communication. It is important, however, to realize from an historical perspective that the majority of the advancements made in the creation and subsequent commercialization of the Internet and the World Wide Web came about with little consideration for culture.

Many scholars believe that the impetus of the World Wide Web's development is rooted within a 1945 article published in the *Atlantic Monthly* by Vannevar Bush, entitled "As We May Think." In it, he described a personal analog computer built around a storage device based on microfilm, and the ability to link any information to additional pages containing related material (Bush, 1945). However, at the time of Bush's publication, the digital age was already upon us with the start of the Electronic Numerical and Integrator Computer (ENIAC) project at the University of Pennsylvania. From here the development of the modern Internet can be traced

through the development of the United States Advanced Research Projects Agency's Network (ARPANET and later DARPANET), which by 1970 extended a connecting wire, which would serve as the backbone of the Internet across the length of the United States. Finally, in 1989, British researcher Tim Berners-Lee (1989) at the European Organization for Nuclear Research (CERN) in Switzerland began circulating a paper for a sharing system he described as a "web of notes with links" (para. 9). He would come to call this system the World Wide Web.

From this point, the Internet and the World Wide Web evolved quickly. By 1991, a piece of United States legislation known as the High Performance Computing and Communication Act (HPCA) not only authorized the building of the 'information superhighway,' but also allowed for its commercialization. By 1998, the Internet had grown to such a point that the United States created the Internet Corporation for Assigned Names and Numbers (ICANN) to perform a number of tasks related to controlling the growth of the Internet directly on the United States government's behalf.

What is most important to realize from this history is that the majority of the advancements made in the creation and subsequent commercialization of the Internet and the World Wide Web came not out of a cooperative global effort, but out of work done primarily in the United States and secondarily in Europe. Due to this singular cultural domination, ideas such as globalization and culture developed as an afterthought. The Internet has since struggled to accommodate variances in the cultural expectations of information presentation related to the different ways in which differing cultures process information.

For example, Fernandes (1995) identified a belief among web designers that adaptation of a webpage for outside cultures needed to extend no further than merely translating the language. Such an approach, however, fails to consider usability parameters such as language

directionality, cultural color association, and from a development perspective the basic Internet infrastructure available with the target culture. Barber and Badre (1998), equate this belief to visiting a foreign country with a pocket translation dictionary and the proper currency. While the dictionary and currency may aid you in simple verbal or monitary transactions, frustration is likely to occur when one needs to accomplish tasks that are more complex. Graphic design is another area in which a failure to make alterations can cause significant problems. For example, the silhouette of the female form would not seem out of place in most Western countries, but could elicit the perception of indecency in several Middle Eastern countries. Finally, color often creates problems or unforeseen benefits as colors have certain cultural connotations. When an American company wanted to bring their chewing gum to a Chinese market, they decided to stay with the packaging that had been successful in America. After several months of poor sales, the company changed their packaging color to pink and sales began to increase steadily. As they would later discover, the color green is sacred in China, while the color pink is associated with luck and success (The Futurist, 1997).

While the previous examples would seem to support abandoning a one-design-fits-all mentality, the majority of individual's worldwide surf the Internet on browsers utilizing interfaces developed in America with the primary alteration being to their display language. Additionally, the very infrastructure they are browsing utilizes the English based hypertext markup language (HTML) and a range of other English based computer languages. There are however, some advances aimed at facilitating a more culturally accommodating Internet. In 2009, ICANN announced that it would begin to offer support for web addresses in a variety of languages, not just those addresses based on the American Standard (i.e. Latin) alphabet. Additionally, an increasing number of international companies are altering the design of their

websites based on the location of the user. For example, McDonalds maintains a variety of designs all tailored to specific regions. The Chinese version of the site over-stresses the traditional red and yellow of the company, while the various European versions offer more muted colors and overall a more elegant approach to the graphic design. The question becomes whether or not these advances in cultural accommodation have come soon enough to stop the trends identified by several researchers towards a homogenization of design based on an amalgamation of global cultures manifesting as one single cultural identity (Barnett & Eunjung, 2005; Zhao, Massey, Murphy, & Fang, 2003).

The argument for cultural homogenization on the Internet centers on the idea that while the World Wide Web represents a cornucopia of languages and culture, its early development made little effort to accommodate such diversity. While the argument that it was at the time unnecessary to do so is valid, it is the purpose of this dissertation to question and add to the current knowledge of how culture manifests itself online despite the mono-cultural creation history of the Internet and the World Wide Web. As such, this first chapter will focus stating the problem and outlining a purpose for this study, noting the implications of language and translation, providing a rationale and the theoretical perspectives, defining key terms, and giving an overview of the research questions and methodology.

Statement of the Problem

Population is not the only contributing factor to the world's rapid growth, as one must also consider the implications associated with global interconnectedness and dependence. The process of tapping into these culturally diverse markets and mindsets utilizing the power of the World Wide Web however creates a dichotomy concerning the nature of the approach to foreign cultures. Research on one hand of the contrasting viewpoints suggests that cultures present complex and diverse expectations concerning the specifics of their unique communicative

predispositions, which designers must address in order to ensure that a website appeals to a specific cultural group (Kim, 2006; Kim, Coyle, & Gould, 2009). Conversely, research also suggests globalization could ultimately lead to cultural homogenization, reducing cultural differences in an online environment resulting from exposure to and assimilation of foreign cultural expectations (Barnett & Eunjung, 2005; Zhao, Massey, Murphy, & Fang, 2003). Unfortunately, targeting specific cultural expectations with Web content can require a large investment of time and money. These expenses extend from having to develop unique versions of a webpage, one for each culture that is likely to access the information. Therefore, a need exists to develop a better understanding of how culture manifests itself in an online environment.

While this need to augment our understanding of cultural expectations in this digital age may seem relatively straightforward, it is actually indicative of a much greater research problem. First, there is no commonly accepted definition of culture as it relates to the Internet or otherwise, despite more than a century of continuous study within a variety of disciplines. Second, there are very few studies on the implications of cultural expectation in an online environment. Furthermore, the majority of these studies are products of the early days of the Internet and are of limited applicability given the modern advances of the World Wide Web, specifically those concerning design. Third, the theoretical underpinnings of cultural manifestation online are predominately limited to a single theoretical model. While this model greatly augments our understanding of the differences that exist between cultures, its purpose was never the study of the Internet.

Given these problems, this study seeks to develop a working definition of culture acceptable for application to a wide variety of disciplines, and to study the Internet as it exists through the application of a set of theoretical perspectives. As such, it aims to provide an

effective means of gauging the extent of cultural homogenization that exists between cultures. This in turn would not only aid corporations in making informed decisions concerning the dissemination of their messages effectively across cultures and cultural groups, but would also aid academics looking to study the effects of culture on the Internet as well as the Internet's effect on culture.

Purpose of the Study

The purpose of this dissertation is to examine two very important and related phenomena. The first relates to how culture manifests itself in an online environment through Web page aesthetics and organization. The second is the effect of globalization on cultural homogenization within the online environments as suggested by Barnett & Eunjung (2005) and Zhao et al. (2003). By analyzing website design decisions to better understand how culture manifests itself online, an established means of determining the current level of cultural homogenization with the cultures utilized for this study can occur. Depending on the findings, the data may aid in the development of best practices for Web developers in targeting the communication styles of the cultures studied.

A Note on Language and Translation

There is no denying that language is often a defining factor in cultural research. A formulation of the Sapir-Whorf hypothesis (often referred to as "Whorfianism") for example states that similarity in conclusion is unachievable unless the linguistic backgrounds of the observers are similar or are in some way open to calibration (Whorf, 1956; Fishman, 1980; Hofstede, 2001). However, the inclusion of language as a variable to any study adds a variety of complications such as the inclusion of translations and the creation of contextual equivalency. Given this level of complexity, studies of culture often become studies of language, semantics, or translation. As a result, this study will not focus on the language of the cultures being studied in

a traditional sense, but will instead focus on the language of design, thereby mitigating the problematic nature of language presented by Whorfianism. This is not to say that the study of language (given the focus of this study) is unimportant, rather it is merely an attempt to provide a strong and defined focus as to what this study can reasonably achieve.

Rationale for the Study

The general line of inquiry in this study – how the Internet affects culture and how culture affects the Internet – is a topic on which our knowledge is somewhat limited. The specific line of inquiry this study seeks to pursue however concerns how culture manifests itself in an online environment. This represents an area of focus on which there is a limited amount of research, further hampered by the speed of the Internet's evolution.

Academic Rationale

The field of communication focuses on the study of message development, transmission, and reception across an audience (Baran & Davis, 2006). With the advent of the Internet and the subsequent rise of globalization facilitated through connection, cross-cultural communication is increasingly commonplace (Trenholm, 2004). However, despite the ease with which we cross international borders online, cultural boundaries still influence our perception of this global medium (Hanna & De Nooy, 2004; Hanjun, Roberts, & Chang-Hoan, 2006; Kim, Coyle, & Gould, 2009). This study seeks to add to the knowledge of cultural expectations as they relate to Web site design, while illuminating the effect of globalization on culture, specifically as it relates to cultural homogenization in an online environment. Furthermore, this study seeks to provide a baseline measure of cultural homogenization, albeit limited by the scope of the study, and a methodological means of tracking the phenomenon through future studies. Finally, a discussion as to the implications of the results found in this study as well as ideas for future avenues of research will conclude this dissertation.

Corporate Rationale

The creation of websites to target a specific culture is a particularly challenging proposal as research suggests that mere language adaptation is in most cases unacceptable (Fernandes, 1995). Considerations of website creation such as learnability, efficiency, and satisfaction take on a much larger meaning within the international market and require detailed audience analysis (Barber & Badre, 1998). While research has found some support for the idea of cultural homogenization in an online environment (Barnett & Eunjung, 2005), research has also found support in the idea that globalization does not negate the cultural bonds of an individual. These cultural bonds must therefore be accounted for in the design of graphical user interfaces (GUI) targeted to said culture (Burgmann, Kitchen, & Williams, 2006). This study seeks to create a guide of research-based best practices in cultural targeting based on the design specification of native Web pages. While this initial research base would be small, the research design will offer the potential for expansion and augmentation from which to add additional data and build Web design profiles for other cultures.

Social Rationale

Everyday new cultures emerge from behind the digital divide to embrace the Internet's collected knowledge. If the idea of technological determinism is accurate, then this connection will be the facilitator of powerful social, political, economic, and cultural change (Baran & Davis, 2006; McLuhan, 1962; McLuhan & Fiore, 1967). From the perspective of the emerging culture into this global society, this study seeks to understand the extent and cultural impact of embracing digital connection. For those already connected, global communication brings us into contact with unfamiliar cultures even without explicitly seeking to do so. As such, this study also seeks to create profiles of how differing cultures design their websites to aid Internet citizens (netizens), citizen journalists, bloggers, and budding entrepreneurs in the creation of

targeted messages to new markets and mindsets. Additionally, these design profiles could help to decipher the design intentions of other cultures, thereby increasing cultural understanding and global citizenship.

Theoretical Perspective

This study combines three theoretical approaches to gain the greatest possible understanding of culture. The first provides a methodological justification for the constructed definition of culture; the second provides a means of understanding and categorizing culture; and the third provides a means of understanding the cognitive processes unique to each culture. Together the limited-capacity information-processing model, the cultural dimensions model, and cultural cognition theory address key aspects of the study while supplementing each other's strengths and diminishing their individual weaknesses.

Role of the Limited-Capacity Information-Processing Model

Among the problems associated with this area of study is the lack of an accepted definition for the term culture. While this study will construct a definition from the available literature, it will lack the immediate support provided by research-based evidence on its applicability. The limited-capacity information-processing model represents an attempt to understand how the human brain works regardless of culture. As such, it will provide a methodological justification for the constructed definition of culture through an explanation of how it might find support using an established theory of cognition.

Role of the Cultural Dimensions Model

Hofstede's (2001; 2010) cultural dimensions model divides cultural values along six separate dimensions: power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity, long/short term orientation or pragmatism, and indulgence/restraint. Although collection of the data that serves as the foundation of Hofstede's study occurred

between 1968 and 1973, his work continues to have relevance in the landscape of cultural research. Among those concepts he identified power distance deals with the distribution of social power and the effect this has on individual relationships. Uncertainty avoidance considers the extent to which one takes active measures to avoid a particular situation. Individualism/Collectivism is a measure of the degree to which individuals from a culture form and participate in groups. Masculinity/Femininity is the distribution of emotional gender roles within a culture. Pragmatism or long/short term orientation relates to how cultures deal with time. Finally, indulgence/restraint represents a cultures likelihood of acting upon the desires they may experience. These cultural dimensions have been adapted to the Internet by attaching a series of five Web design concepts to each of the dimensions identified by Hofstede. These concepts include metaphor, mental models, navigation, appearance, and interaction (Honold, 2000; Marcus & Gould, 2000). Given the scope of supporting research for the cultural dimensions model, it will primarily function as a means to compare and differentiate individual cultures.

Role of Cultural Cognition Theory

Cultural cognition theory allows for the study of culture through that culture's unique cognitive processes (Ess & Sudweeks, 2006). Specifically, it describes the process of using cognitive skills developed historically and contextually from which to create the cultural specifications of websites designed within that culture (Faiola & MacDorman, 2008; Faiola & Matei, 2005; Faiola & Matei, 2006). Cultural cognition theory represents a new idea concerning the differentiation of culture and features a design that accounts for the unique nature of the Internet. For this reason, it will serve primarily as a means of hypothesizing results and their subsequent explanation.

Definition of Terms

Many terms presented in this dissertation could be either interpreted in different ways, of may simply be unfamiliar to the reader. To diminish any potential confusion a list of these terms and their definitions follows:

Culture, as defined for the purposes of this study, refers to the acquired mental models of a group; these models exist in unique combinations and directly influence an internal and/or external response.

Cultural Cognition Theory is a framework designed to study cross-cultural communication online using the cognitive processes and styles, which are a product of culture (Ess & Sudweeks, 2006).

Cultural Dimensions Model is an exploration of the mental programming that develops within all people through a lifetime (Hofstede, Hofstede, & Minkov, 2010; Hofstede, 2001). This mental programming can be broken down into cultural values, which include power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity, and long/short term orientation.

Cultural Homogenization refers to the idea that globalization will reduce cultural differences due to the exposure to and the assimilation of outside cultural expectations (Barnett & Eunjung, 2005; Zhao, Massey, Murphy, & Fang, 2003).

The Digital Divide refers to the lack of access to digital communication technology among the disenfranchised (Barmann as cited by Baran & Davis, 2006).

Globalization refers both to global compression and to an intensification of consciousness throughout the world as a whole (Robertson, 1992).

Intercultural Communication is the exchange of information on culture between two significantly different cultural groups. The type of communication results in uncertainty reduction between the groups regarding future behavior through an increased understanding of the other social group (Barnett & Eunjung, 2005).

Technological Determinism is the idea that the creation and dissemination of technology results in all social, political, economic, and cultural change (Baran & Davis, 2006).

Website Design refers to the aesthetic arrangement of website content and the visual cues used to enhance the message (Cyr, Head, & Larios, 2010).

Website Usability refers to the ease of accessing and assimilating the information on a website.

Research Questions

This study focuses on how culture manifests itself in an online environment and utilizes both Cultural Cognition Theory and Hofstede's Cultural Dimensions Model as a lens of observation. Given this focus, the hypotheses (presented in Chapter Three) stem from the following research questions:

RQ1: In what ways do similarities and differences in cultures manifest in aesthetic and digital design?

RQ2: To what extent is how a culture organizes and designs content in an online environment affected by cultural homogenization?

RQ3: To what extent are current theories on the digital manifestation of culture suggestive of observable differences in website design?

Overview of the Methodology

The method this study employs contains a sequence of two distinct phases. Phase one deals with the collection of data, and will use country specific travel guides to populate a database of restaurants from four distinct and diverse cultures in addition to those from the United States, which will serve as a control. Phase two consists of a quantitative content analysis, which will attempt to identify, categorize, and enumerate the design aesthetics and organizational structure of each of the websites within the phase one database. The quantitative content analysis will utilize a codebook and will focus specifically on elements of design such as colors, number and position of images, number of ads, and font styles rather than on page content.

Organization of the Study

The organization of the remainder of this manuscript will adhere to the following structure:

Chapter Two contains a review of the available literature as it deals with the development of a definition for the concept of culture, the models and theories associated with its study, and the intercultural implications and expectations of website design. Additionally, this chapter presents a justification for the inclusion of the selected cultures and the employed methodology.

Chapter Three outlines the procedure of the study's method and will focus on the establishment of the hypotheses, the methodological procedure, the conduction of data analysis, and any issues and limitations.

Chapter Four contains a presentation and analysis of the data collected through the methodological procedure outlined in Chapter Three. The analysis of the data consists primarily of descriptive and inferential statistics from which conclusions as to the statistical significance of the hypotheses are drawn.

Chapter Five presents an interpretation of the results outlined in Chapter Four, as well as a discussion on any identifiable conclusions that can be drawn from this analysis as they relate to the findings of previous studies. This manuscript will conclude with an analysis of the study's limitations, implications of the results, and questions relevant to future research within this area of study.

Conclusion

The focus of this chapter centers on an introduction to this manuscript's overarching concepts. For example, the societies, corporations, and academics of this global village we consider ourselves to be a part of know very little about how or even if culture manifests in online environments. While this study seeks to provide answers to these questions, it is important to note that this is not a study of the language characteristics of a given society, but rather a study of culture through the language of design. This examination of the proposed research questions draws guidance from several different theories to gain the greatest possible understanding of this complex topic. Chapter Two further expands upon these ideas through a thorough examination of the relevant literature.

CHAPTER TWO

REVIEW OF THE LITERATURE

To borrow from the seemingly immortal words of Marshall McLuhan (1967), the Internet has "reconstituted dialogue on a global scale (p. 16)" and as a result, created an "environment [in which] minority groups can no longer be contained [or] ignored (p. 24)." In many cases, these minority groups bring with them a culture as unique as their mindset. As these diverse groups grow and establish footholds in marketplaces of commerce and ideas, it becomes increasingly important to view these diverse groups in terms of not only their language, but perhaps more importantly, the thing that makes them truly unique – their culture.

Culture is a nebulous concept at best. As a term, it is just over 200 years old yet it has as many accepted definitions. The result is a concept that acts as a descriptor for a variety of different ideas depending on context. Given this fractured state of current understanding, culture poses a particular challenge to research. However, through categorization of these definitions, patterns of consistency begin to emerge pointing to potential foundational constructs from which to construct a definition of culture.

Given a definition of culture, accepted models and theories create a strong avenue from which to create a foundation to build the proposed research. While many disciplines draw from a variety of research-based approaches in studying culture, communication research relies primarily on the cultural dimensions model. This model provides clear index and ranking data for dozens of cultures across a variety of metrics. However, the cultural dimensions model's strength is in the development of verbal communication strategies, kinesthetic communication strategies, and even intellectual strategies for interacting with a target culture, it does little to illuminate design strategies useful for communication via the largest global communication

network, the World Wide Web. Cultural cognition theory focuses on differentiating cultures not through their behaviors, but through their cognitive patterns as evidenced in how they interact with and design websites. By utilizing the individual strengths of each construct as a means of offsetting the weaknesses of the other, this study benefits from a more complete understanding of culture from which to base methodological decisions.

Using both the cultural dimensions model and cultural cognition theory also allows greater insight into the implications inherent to website design as well as the expectations held by the end user. These important considerations range from the starting position of the users eyes, to the positive and negative meanings a culture places on color. This level of understanding is important when considering the constant advances in the underlying technology behind the Internet allow for increasing levels of expressive freedom in terms of design.

While recent advances in the technology of the Internet allow individuals to more accurately express their culture, it also allows researchers to better study how culture manifests itself online. These cultural implications and expectations coupled with the cultural dimensions model and cultural cognition theory inform the selection of cultures that this study examines. Additionally, similar veins of research form a foundation for the creation of the methodology employed by the study.

Developing a Definition of Culture

Culture is among the most difficult concepts in communication research to define. It exists in different forms, across a diverse set of disciplines, with definitions of immense variability (Barber & Badre, 1998). In addition to the difficulty inherent in the development of a definition of culture, there exists a much larger question as to where culture as a human construct comes from. According to Innis (1951), "it is perhaps a unique characteristic of civilization that each civilization believes in its uniqueness and its superiority to other civilizations […] indeed

this may be the meaning of culture - i.e., something which we have that others do not" (p. 132). However, research suggests that the creation, application, and study of culture is an environmental response (Gevorgyan & Manucharova, 2009). Ultimately, the study of the differences and similarities that exist between groups and individuals hinges on views of culture that change with differing perspectives.

In an attempt to resolve this ever changing understanding, Hofstede (2010) suggested that culture was an evolution from a group view of past events. This extends from a definition of culture by Bogardus (as cited in Kroeber & Kluckhohn, 1952), which states that "culture is the sum total of the ways of doing and thinking, past and present, of a social group. It is the sum of the traditions, or handed down beliefs, and or customs, or handed-down procedures" (p. 95). In other words, the past events of a particular group influences said group's reactions to future events. Hofstede (as cited in Pfeil, 2006), also believed that as a culture is rooted in the past, researchers can consider it as being a stable constant into the future. More recently, however, a belief has emerged that the driving force behind societal structure and cultural values stems from the development and diffusion of technology (Baran & Davis, 2006). This concept, known as technological determinism, suggests that culture is inherently reactive and unstable.

While these two views represent the outer extremes of the collected views on culture, they are not mutually exclusive. Historical determinists, those who believe culture is rooted in the past, cannot deny the blurring of cultures that occurs due to exposure to technology. Conversely, technological determinists cannot deny the effect that experience seemingly has on a culture's future actions. Either way, the need to study the world's cultures is increasing as the shrinking global village brings us into more frequent and easier communication (Trenholm, 2004).

For the purposes of this study, an analysis of the general definitions of culture as well as cultural issues that relate to technology will serve as a basis for the construction of a definition of culture intrinsically linked to this study's context.

Contemporary and General Definitions Related to Culture

As both a word and a concept, culture first began to appear in manuscripts during the Age of Enlightenment (1700 – 1800 AD). Klemm (as cited in Kroeber & Kluckhohn, 1952), suggests "it was Voltaire who first put aside dynasties, king lists, and battles, and sought what is essential in history, namely culture, as it is manifest in customs, in beliefs, and in forms of government" (p. 14). While the word traces its etymology from the Latin word *colere* meaning to cultivate, culture at the time of Voltaire was merely another word for civilization, and not one in wide use outside of certain academic circles.

The work of Tylor (1871) fundamentally changed the study and understanding of culture, bringing it into the modern era. From here, great thinkers such as T.S. Eliot tackled the problem of defining exactly what constituted culture by compiling some of the first notes towards its definition. Eliot (1949) believed that speaking the same language meant that a cultural group would think, feel, and emote differently from a cultural group speaking a different language. He even went so far as to suggest that "culture is not merely the sum of several activities, but [is] a way of life" (p. 40) and that it "may even be described as that which makes life worth living" (p. 26). Eliot's is just one name in the hundreds of writers and scholars who have tackled the problematic definition of culture over the last century.

Such a broad scope of research has brought about almost no consensus on a unifying definition, and perhaps such a definition cannot exist given the expansiveness of research on the subject of culture. Furthermore, to group the existing definitions for a thorough analysis would require an unmanageable number of categories (Kroeber & Kluckhohn, 1952). However, the

purpose of this study in regards to a definition of culture is not to present, categorize, and interpret all existing definitions of culture. Rather it is to construct a definition from which to give this study focus. As a result, the definitions related to this study fall into three distinct categories: Culture as a collection of beliefs/behaviors, culture as a manifestation of variables, and culture as a system.

Culture as a collection of beliefs/behaviors. Definitions falling into this category view culture as a complex amalgamation of beliefs (that which we think) and behaviors (that which we do), but in no way suggest these actions are related. These definitions trace their heritage to Tylor (1871), who defined culture as "that complex whole which includes knowledge, belief, art, law, morals, custom, and any other capabilities and habits acquired by man as a member of society" (p. 1). While credited as the definition that lit the torch of cultural research, little happened in the field for nearly fifty years following Tylor's attempt to define culture (Kroeber & Kluckhohn, 1952).

The 1920s brought a new spark to issues of culture, perhaps due to the confrontation of cultural ideals brought about by World War I. In 1924, Sapir (1949) defined culture as being a "socially inherited assemblage of [behaviors] and beliefs that determines the texture of our lives" (pp. 308-309). Sapir's definition melded the idea of a complex whole put forth by Tylor with a broad social element, suggesting culture is a learned behavior possessing a generational influence. Hart and Pantzer (as cited by Kroeber & Kluckhohn, 1952) presented the logical conclusion drawn from Sapir in a two-part definition that links culture to behavior patterns both "socially acquired and socially transmitted … by imitation or intuition" (p. 111). Mead (as cited by Kroeber & Kluckhohn, 1952) further summarized these ideas by defining culture as "The

whole complex of traditional behavior, which has been developed by the human race and is successively learned by each generation" (p. 90)

The 1940s brought a new idea in the definition of culture, perhaps due to another World War. From Tylor to Mead, the existing definitions revolved around culture being merely a development of the human race as a whole. This changed with a definition by Angyal (1941), which states that culture is "an organized body of behavior patterns which is transmitted by social inheritance, that is, by tradition, and which is characteristic of a given area or group of people" (p. 187). The inclusion of cultural boundaries such as geography or groups of individuals solidified the definition of culture as a collection of beliefs/behaviors to the present day. Among the most recent definitions is a succinct reformulation of the Angyal definition by Gevorgyan and Manucharova (2009), which states that culture is "a set of learned knowledge, behaviors, and beliefs, which are collectively shared by a group of individuals" (p. 395).

Summarizing the idea of culture as a collection of beliefs/behaviors is best accomplished by Bose (as cited by Kroeber and Kluckhohn, 1952), who suggested that, "beneath the outer framework of culture, there lies a body of beliefs and sentiments which are responsible for the particular manifestation of culture. They do not form part of any specific trait, but working beneath many traits, they give to each culture a character of its own" (p. 191). This evokes an idea that culture is a visceral swirl of chaotic, unconnected, yet preprogrammed behavioral reactions. What is important to realize is that this group of definitions commonly lent itself to the study of what those in the 1900s considered primitive man, and inform this study only in there identification of the elements of culture, as there are other sets of definitions more suited to a modern day focus.

Culture as a manifestation of variables. In the 1930s, one particular view of culture considered culture as being not merely a collection of unrelated behaviors, but rather a complex manifestation of variables. These variables included both beliefs and behaviors, but added in other potential influencing factors. Winston (as cited in Kroeber & Kluckhohn, 1952) suggested that culture "may be considered as the totality of material and non-material traits, together with their associated behavior patterns, plus language uses, which a society possesses" (p. 82).

Despite being a new line of thought, it is possible to see the strong influence of Tylor, specifically with the inclusion of material and non-material traits, which links well with Tylor's inclusion of art, law, and morals. Linton (as cited in Kroeber & Kluckhohn, 1952), however, seemingly both embraces Winston and abandons Tylor in defining culture as "the sum total of ideas, conditioned emotional responses, and patterns of habitual behavior which the members of that society have acquired through instruction or imitation and which they share to greater or less[er] degree" (p. 82). What is most interesting about the Linton definition is the inclusion of conditional emotional responses and patterns of habitual behavior, suggesting that culture is an ingrained feature that is in some ways both a predictable and unavoidable reaction. This idea is a significant evolution from the stance that culture is little more than a chaotic collection of unconnected behavioral reactions.

To this point, Goodenough (1964) defined culture as consisting not of "things, people, behavior, or emotions," but instead "the forms of things that people have in mind, their models of perceiving, relating, and otherwise interpreting them" (p. 36). Unlike Tylor, who included material objects within his definition of culture, Goodenough abandons this idea. Instead, he suggests that objects are merely the visual representation or product of a cultural process, which can be either mental or physical. Similarly, Borgman (1992) defines culture as including "race

and ethnicity as well as other variables and is manifested in customary behaviors, assumptions and values, patterns of thinking, and communicative style" (p. 31). The most important piece of the Borgman definition is the view of culture as a collection of variables. The use of the term variables suggests that culture is a collection of individual reference points rather than the unwieldy concepts of cultural reference used in previous definitions.

Unlike the view of culture as a collection of beliefs/behaviors, the view of culture as a manifestation of variables suggests some degree of inherent logic at work. The notion that culture can be broken down into a collection of variables suggests that prediction of cultural responses, at least on some level, is possible.

Culture as an ordered system. The view of culture as an ordered system borrows heavily from the ideas surrounding culture as a manifestation of variables, but includes the suggestion that the variables possess some underlying order, which could result in consistent behavior patterns. Lasswell (1948) for example, suggests that culture is a "term used to refer to the way that the members of a group act in relation to one another and to other groups" (p. 203). Similarly, after analyzing and categorizing 164 different definitions of culture, Kroeber and Kluckhohn (1952) concluded as part of their own definition that culture, "may on one hand be considered as products of actions, on the other, as conditional elements of future action" (p. 357). These early definitions focused on the most basic of responses, namely action/reaction, but do not represent a true system.

Geertz (1973) removed the idea of culture from a response pattern when he defined it as "a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and attitudes toward life" (p. 89). In the Geertz definition, we can see at least a passing influence by Goodenough, but with a focus

on a system of symbols in which social interaction occurs and develops. This idea also suggests that an understanding of the symbols influencing the system would allow for some level of prediction or anticipation within the system to occur. This approach makes sense when one considers that members of a culture generally exhibit the ability to predict how other members of their culture will react to a given stimulus.

Despite the applicability of Geertz's work to the field of communication, communication scholars taking an approach to culture as a system have in some cases chosen to create their own definitions of culture. Perhaps one of the most important definitions given this study's theoretical construct is that of Hofstede (2010), who described culture as "the collective programming of the mind which distinguishes the members of one human group from another" (p. 25). Similarly, Barnett and Eunjung (2005) defined culture as "a group's collective meaning system [that] includes its values, attitudes, beliefs, customs, and thoughts" (p. 217). Both of these definitions focus on culture as a means of distinguishing between groups of like-minded individuals rather than culture being the wellspring of communication suggested by Geertz. However, considering the focus of Hofstede's work as being to distinguish what makes groups different, such an approach to the concept of culture is understandable.

While the view of culture as a neat, tidy, and predicable system is appealing, given the sheer variability of human existence it seems somewhat unlikely. However, just because the inner workings of variable interaction within a system are not immediately apparent, it does not mean that the system does not exist, merely that we lack the faculties to perceive it.

From the idea that culture is a collection of beliefs and behaviors to that of culture as an ordered system, even this limited selection of definitions presents a plethora of differing and intersecting viewpoints. Unfortunately, no one definition presented here represents an

appropriate lens through which to frame culture for the purposes of this study. As a result, a view of culture as a system of variables is the more appealing of the two views from which to construct a definition of culture.

The Influence of Technology on Culture

In our society, a global reliance on digital technology is continually increasing. From cell phones and computers to bathroom scales and kitchen appliances, technology represents both a driving force in our lives and a medium with high potentials for influence. As a result, an examination of technology's effect on global culture, especially given this study's dual focus on both culture and technology, is of considerable importance. The purpose of this examination is to create a better understanding of what culture means in a modern era, which will in turn act as an influencing factor in the construction of a definition for culture. As a result, this examination will focus on two aspects of the interrelationship between culture and technology, specifically globalization and cultural homogenization.

Globalization. Despite its recognition as a product of the mid to late 1980s, contemporary notion of globalization form the roots for the concept of the global village posited by McLuhan (1962). One modern definition suggests that the concept refers to both global time-space compression and to an intensification of consciousness throughout the world as a whole (Robertson, 1992; Morley, 2006). Based on this definition, globalization is both a catalyst and a consequence as it is a consequence of an increasing interconnected world. However, it is also a catalyst for decreasing the relative proximity between otherwise disconnected individuals, groups, or cultures and increasing global interdependency between said individuals and groups. Additionally, Featherstone (1990) sees it as a catalyst for the processes of cultural integration and disintegration, which Appadurai (1990) links to five dimensions of global culture flow namely ethnoscapes, financescapes, technoscapes, mediascapes, and ideoscapes.

The concept of *ethnoscapes* is related to the flow of individuals such as tourists, immigrants, and guest workers (Appadurai, 1990; Featherstone, 1990; Appadurai, 1996). These flows can exist at all levels of global society from individuals traveling between countries to individuals traveling between neighborhoods. Regardless, we must consider the permeability that exists in the interaction between individuals, which could result in culture sharing in the form of language, customs, food, or traditions otherwise confined to a specific, and perhaps insular cultural group (Leidman & Wiggins, 2010). The American idea of Chinese food is a good example of this permeability that exists between two interacting cultures as the resulting ethno-blend shares traits of both cultures yet it is not a product of either specifically.

The *financescapes* dimension deals with the flow of money through currency markets and stock exchanges on a global scale. In this digital age, the power of money is not restricted merely to the local economy, but is also reliant on and affected by the global economy (Appadurai, 1996). In this way the cultural expectations of business trickle-up and trickle-down through transactions both locally and globally.

The flows produced as a result of the global configuration of technology, and in some cases the multinational and national organizations and government agencies that control those technologies, are what Appadurai (1996) referred to as *technoscapes*. These flows can include both mechanical and information technology, but are ultimately about the transfer of culture through technology more than the technology itself. From the tangled information of the World Wide Web to the products of an American based corporation selling Japanese made components assembled into products in China and sold in Saudi Arabia, these transfers occur at high speeds across previously impermeable boundaries (Appadurai, 1996).

The *mediascape* and *ideoscape* dimensions are similar in terms of medium, but are vastly different in terms of message. Mediascapes deal with the flow of the production and dissemination of information, and the depiction of said information. This depiction is usually image-based, but can consist of either static graphic or motion video, and influence culture through either stories or news (Appadurai, 1996). Conversely, ideoscapes deal with the flow of a state's ideologies or the counter-ideologies of movements (Appadurai, 1996).

These five dimensions illustrate the concept of globalization as a flowing system in which cultural boundaries are constantly in flux. In reality however, the observable limits of a culture's absolute boundaries is indeterminate (Callahan, 2007). In terms of this study, globalization is an important concept because it suggests that individual cultures can be both influential to and influenced by others.

Cultural Homogenization. Among the suggested potential consequences of globalization is cultural homogenization. Cultural homogenization refers to the idea that globalization will reduce cultural differences due to exposure to and assimilation of outside cultural expectations (Barnett & Eunjung, 2005; Zhao, Massey, Murphy, & Fang, 2003). In other words, the process of global culture's 'flow' slowly dilutes individual cultures through their contact with and acquisitions of the ideals of foreign cultures. It is also a concept with seemingly direct ties to the Internet, which is perhaps among the most globalizing forces the world has ever known. As a result, it is perhaps easy to understand that the "The major advances in civilization are processes that all but wreck the societies in which they occur" (Whitehead as cited by McLuhan & Fiore, 1967, pp. 6-7).

The process of cultural homogenization begins with the creation of third-cultures. Third-cultures are the product of the exchanges between two cultures (Featherstone, 1990). As one

culture acquires traits otherwise foreign to them, the result is a third culture, which has unique characteristic of both influencing cultures, yet in itself is different from the parent cultures. Additionally, these third cultures themselves become conduits of cultural flows, in a sense becoming the catalyst for additional third-cultures (Featherstone, 1990). For example, the fortune cookie is not a product of Chinese culture, nor is it (despite its American roots) a product of American culture. Instead, it is representative of a third-culture having distinct roots in both, but representative of neither.

Despite the connotation of impartiality associated with the word homogenization, some research suggests an aggressive or imperialistic connotation to the concept of cultural homogenization. According to Appadurai (1996), "most often, the homogenization argument subspeciates into either an argument about Americanization or an argument about commoditization, and very often the two arguments are closely linked" (p. 32). Cultural homogenization is a concept in many ways tied to cultural imperialism, the leadership of and/or dominance over a social group, and indigenization, the forcing of a local culture to adopt another (Morley, 2006). For an example of this argument, we need look no further than the Internet. Despite global use, the Internet is a product of Western and more specifically American culture. The design of its input/output structure is for an American user who speaks English and exhibits American expectations of design and content (Callahan, 2007).

Opponents to the concept of cultural homogenization are not as convinced that the fear of a single global culture is legitimate, at least not at this time. According to Appadurai (1996), "globalization is not the story of cultural homogenization" (p. 11). A counter-argument against cultural homogenization is that cultures adopt certain aspects of others constantly in the forms of music, architecture, science, and even forms of government, yet retain their cultural

individuality. In this sense, culture is a concept that has the ability to evolve naturally over time. For example, historically, the Chinese form of government was a dynastic system, yet presently, it is a communist system. This evolution of governance begs the question, has an aspect of Chinese culture been destroyed or has it simply evolved?

The idea of the natural evolution of culture also presents a counter argument to the idea of cultural homogenization as a form of cultural imperialism (i.e. commoditization or Americanization). Appandurai (1996) believes that there is always a fear of the absorption of smaller culture groups by larger ones, especially when the two exist in close proximity. However, this concept should not relate specifically to American cultural dominance, as Americanization does not represent nearly as great a concern to the natives of Tibet as Chinatization does, to cite just one of the many examples in the current global context.

Among the consequences of a globalized world is the intersection of cultures. Some would argue that this process of intersection is leading to a state of cultural homogenization, in which cultural diversity could cease to exist. Still others argue that the ebb and flow of culture globally leads to a natural evolution of culture whereby a culture simply acquires those traits it finds appealing. However, research on the topic is limited and inconclusive at best.

Ultimately, the intersection between culture and technology reduces to the concepts of globalization and cultural homogenization. Despite strong acceptance for the concept of globalization, cultural homogenization represents little more than a theoretical construct.

Constructed Definition of Culture

As the literature demonstrates, culture is a difficult concept to define, with accepted definitions ranging in complexity across a variety of categories and disciplines. Despite a variety of differing definitions related to culture, none account for the unique influence of technology. As a result, this study will utilize a constructed definition of culture.

Generally, definitions of culture exist as a combination of two parts. The first of these deals the wellspring or source of culture, while the second focuses on the resolution, which usually results in a response such as a behavior (that which we do) and/or a belief (that which we think).

The Definition's Wellspring. For Tylor (1871), culture came from behavior or belief, for Goodenough (1964) culture's basis lay in mental models, and for Geertz (1973) culture's source was a system of inherited conceptions. Of these three views, only Goodenough and Geertz further the development of a constructed definition. While seemingly different, these two ideas are nearly identical when one considers that mental models are essentially systems of conception. However, despite the similarities in their individual approaches there is a significant difference in the ideas behind each, namely Geertz's idea of culture being an inherited construct.

The idea of inheritance is important to the process of constructing a definition of culture. However, the term inheritance is highly suggestive of a generational component. While such a connection undoubtedly exists – as parents we teach our children our values for example – the constant evolution of one's mental model is also suggestive of an inherent experiential component (Kroeber & Kluckhohn, 1952). Thus, the idea that culture is an acquired mental model, which is to say a system of acquired conceptions is more fitting when considering the concept of inheritance as it relates to culture.

The constructed definition's wellspring of culture takes into account the idea of group culture being a product of a set of mental models passed down generationally or derived through experience. Therefore, this study defines the source of culture as the acquired mental models of a group. This piece of the definition is suggestive of a set of experientially defined variables¬ –

accessed individually or in concert – for the expressed purpose of facilitating a resolution to a response-triggering stimulus (see Figure 1).

The Definition's Resolution. The studied definitions of culture suggest that the resolution to the presentation of stimulus is a response. The Linton definition suggests that this response can be internal, such as a belief or a thought pattern and/or external, such as a behavior or a physical response (as cited in Kroeber & Kluckhohn, 1952). This idea of cultural manifestation is important to this study for several reasons. First, it suggests that the creation of the visual and textual elements of a website, an amalgam of internal and external responses, is a manifestation of culture. Second, it suggests that the resolution ultimately serves as a test, which generates positive and negative outcomes and from which one acquires new or confirming variables the mental model assimilates for determining future resolution action. Together these two ideas exist at the heart of the constructed definition's resolution.

The constructed definition borrows heavily from the Linton idea of resolution. As a result, this study defines the resolution as being internal and/or external responses directly influenced by and influencing of the acquired mental models of a group. This aspect of the definition suggests that culture manifests as a situational encompassment of internal and external responses, which influence the acquisition of new or confirming variables for inclusion in the mental model (see Figure 1).

The Connecting Concept. The wellspring and the resolution of the constructed definition represent two sides of culture, but it is the connecting concept that ultimately allows for the differentiation between, or the categorization of individual cultures. Of the definitions studied, a constant undertone suggests culture is ultimately about categorization, but only the Hofstede definition goes so far as to say that culture is a means of distinguishing one group from

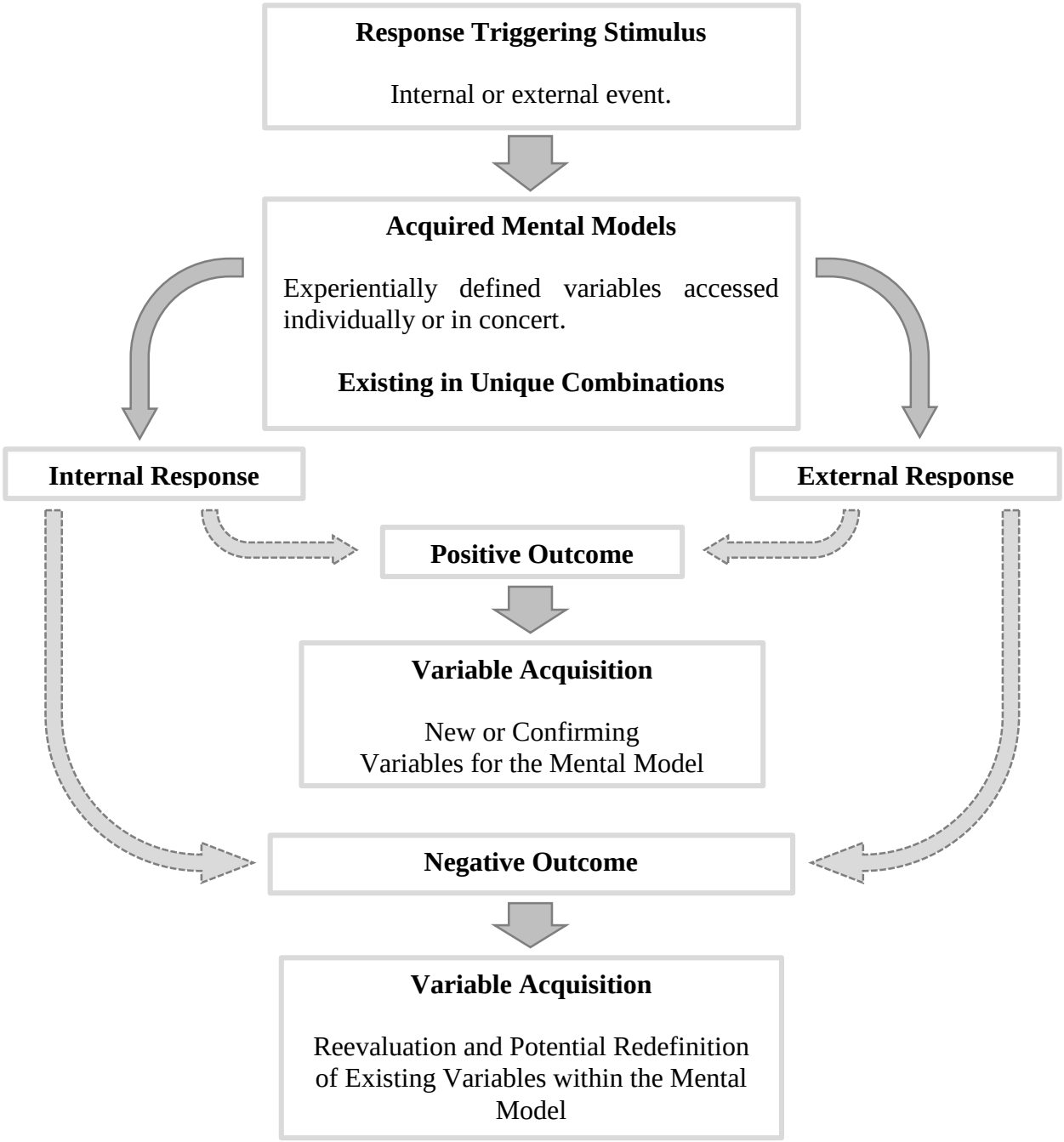


Figure 1. Constructed definition of culture visualization.

another (2010). As a result, the basis for how to distinguish individual cultures is a product of interpretation, thereby weakening the applicability and veracity of any definition failing to account for cultural categorization.

With cultural categorization being largely open to interpretation, the result is an attempt to distinguish individual cultures through their differences and similarities with other cultures. However, a system of categorization by mere difference or similarity seems weak given not only the sheer number of variables within any cultural system, but also the presence of unique interactions that undoubtedly exist between variable groups. Therefore, this definition attempts to categorize culture not by similarity or difference alone, but through the differences within unique combinations of similarity. This is important because the identification of potential cultural homogenization requires one to identify differences within a system of limited potential outcomes.

The Constructed Definition of Culture. It is from these preceding ideas that a technology influenced modern definition of culture was constructed. For the purposes of this study culture is the acquired mental models of a group, which exist in unique combinations and directly influence an internal and/or external response.

The Models and Theories Associated with the Study of Culture

The study of culture utilizes a variety of models and theories to provide a framework for this research. Among the most influential of recent theories on cognition, the limited capacity information-processing model provides further context for the constructed definition of culture and implications to the method employed by this study. To address the specifics of examining culture, we turn to the most prominent of the presented models, Hofstede's cultural dimensions. This model categorizes culture across six consistent dimensions to show how any one culture varies in behavior, perception, or attitude from any other. However, the cultural dimensions model focuses solely on behavior without taking into account the unique cognitive processes behind the behavior. To address this shortcoming, cultural cognition theory draws from the idea

that culture shapes thought and perception and ultimately the way individuals within a culture acquire information (Faiola & MacDorman, 2008).

Cognition Theory and the Constructed Definition of Culture

The primary shortcoming related to the construction of a definition for a term such as culture is that it enters the conversation without the immediate support provided by research-based evidence on its applicability as a definition and is required to compete against the plethora of other available definitions. While the definition of culture constructed for the purposes of this study has roots in a range of definitions across several disciplines, it also draws from current models associated with cognitive theory in order to achieve a more robust foundation not found in many other definitions of culture.

The limited-capacity information-processing model deals specifically with how the brain processes incoming information. As a cognitive model, Harris (2004) considers it highly influential because it is, as Lang (2000) describes her theory, an "amalgam of the many information-processing models developed over the past 30 years" (p. 47). This data driven model allows researchers to observe the human information processing system by observing how messages flow through it (Lang, Borse, Wise, & David, 2002) by drawing upon two major assumptions. The first assumption is that people are inherently processors of information; the second is that the mental resources required to process information are limited (Lang, 2000; Harris, 2004). Because these mental resources are limited, the brain allocates only the minimum amount required to process incoming information and cannot allocate more mental resources to a task than a brain possesses.

To process a message or incoming stimuli the brain must first encode and store the information. Both of these processes draw upon the limited mental resources of the brain. Lang (2000) argues that only by allocating enough resources to encode and store the information can

complete processing occur. An allocation of too few resources or a task larger than the allocated resources will result in incomplete processing (Keppel, McKeague, & Leidman, 2011). In order to maximize these limited resources, the brain draws upon mental models. This is a foundational concept in the constructed definition of culture, as it requires fewer mental resources to retrieve stored data than to individually process incoming stimuli (Lang, 2000). Provided the presented stimulus corresponds to information stored in the mental model, the brain can quickly shift the limited resources to the internal or external response warranted by the situation and move onto the next piece of information requiring processing. The further removed a stimuli is from one's mental model, the greater the number of mental resources are required to process it and formulate a response. A prime example of this phenomenon is culture shock, which is a "sense of confusion and uncertainty […] that may affect people exposed to an alien culture or environment without adequate preparation" (Culture Shock). Whether it is the loud volume at which Americans speak, the cheek kissing greeting of parts of Europe, or a violation to the expectation of personal space in Asia, these realities force the brain to formulate new mental models, which in turn tax the brain's limited mental resources.

In addition to the creation of a foundation from which to build the constructed definition of culture, the inclusion of the limited capacity information-processing model also points out the existence of a methodological problem. As this study looks at how culture manifests itself in an online environment, the potential for capacity overload leading to improper coding on the part of the researcher and research assistants cannot be overlooked. The section on intervening variables in Chapter Three will address this problem in detail.

In conclusion, the limited capacity information-processing model applies not only to the constructed definition of culture, but also points to a need to account for exposure to culture as

an intervening variable in this study. With this in mind, we move on to the actual study of culture through the application of other models and theories.

Cultural Dimensions Model

Hofstede's (2010) cultural dimensions model represents some of the most extensive research ever conducted on culture. A core tenet of this research is a belief that all individuals' mental states are composed of complex patterns of thinking or mental models much like the programs of a computer, which result from universal cognitive processes (Hofstede, Hofstede, & Minkov, 2010; Faiola & MacDorman, 2008). However, unlike a computer, humans have the unique ability to deviate from these patterns of action to react in new and unexpected ways. According to Hofstede (2010), "a customary term for such mental software is *culture*" (loc. 156). As a result, he believes it is possible to trace human behavior through three levels of mental programming, namely the universal level, the collective level, and the individualistic level (see *Figure 2*).

It is important to recognize that our current understanding of these levels of mental programming extends only as far as the research on the subject has been able to indicate. However, current thought on the subject holds that universal level mental programming serves as the base biological operating system for all humankind. This programming includes culturally neutral emotional and behavioral responses inherent to every individual and serves as a structure for supporting one's cultural identity (Hofstede, Hofstede, & Minkov, 2010). Collective level mental programming accounts for commonalities such as language, mores, and norms within a cultural group. Hofstede describes the collective level as the "unwritten rules of the social game [which] distinguishes the members of one group or category of people from others" (loc. 168). Finally, individual level mental programming is responsible for the inherent uniqueness of every

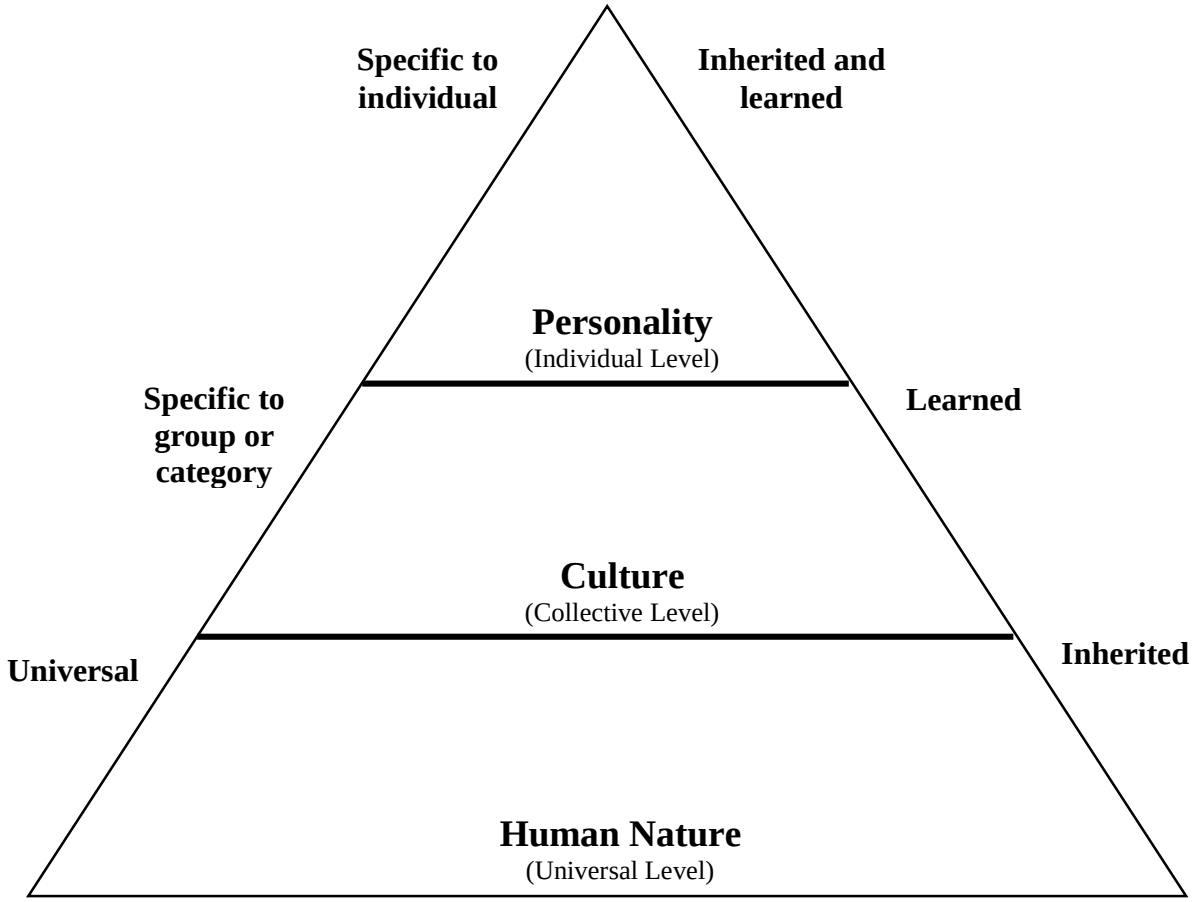


Figure 2: Three levels of uniqueness in human mental programming (Hofstede, Hofstede, & Minkov, 2010).

human being. It forms from both inherited traits (from the culture) and learned traits (resulting from personal experience).

Extending from these basic ethnological ideals, Hofstede began looking at global differences in collective level mental programming. He conducted his research by collecting interview and survey data from IBM employees in 40 (later expanded to 93) countries with a primary goal of better understanding the work attitudes of international employees. His questions fall into four categories: satisfaction in terms of performance evaluation and

environmental situations; perception of problems and solutions experienced; personal/individual goals and beliefs; and basic demographic information (Callahan, 2005).

A review of the survey data showed a strong level of correlation between the responses for related question set within individual countries as well as notable differences in the responses between countries. Hofstede organized the patterns he observed in his research data into a series of cultural dimensions, categorized as follows:

Power Distance deals with the distribution of power, its effect on individual relationships, and its level of acceptance with a society (Hofstede, 2001). In a low power distance society (e.g. Austria[11], Israel[13], and Denmark[18]), individuals regard each other as equals regardless of formal title. In a high power distance society (e.g. Malaysia [104], Panama [95], and Guatemala [95]), individuals acknowledge the power of others and act according to the interplay between their own power and those above and below them. For example, the perception of children in low power distance societies is that they are equals and their education/instruction teaches them to be independent. Conversely, in high power distance societies, there exists a reverence for the oldest living members, while individuals in positions of authority such as parents and teachers demand respect.

Uncertainty Avoidance measures the extent to which an individual actively attempts to avoid unstructured/uncertain situations (Hofstede, 2001). Individuals and societies cope with uncertainty by using technology, laws, or religion. In a low uncertainty avoidance society (e.g. Singapore [8], Jamaica [13], and Denmark [21]), people are at ease in situations they find unfamiliar and tend to approach life more pragmatically, making them more inclined to change. In a high uncertainty avoidance society (e.g. Greece [112], Portugal [104], and Guatemala [101]), people tend to become more emotional about future events planning and prefer a strong

set of formal rules and regulations/laws to reduce the uncertainty of future events. For example, making dinner plans between two families in a high uncertainty avoidance society will generally focus on setting a time for the dinner to occur. In a low uncertainty avoidance society, making dinner plans may involve discussing a time, but that time is arbitrary, as dinner will begin when the dinner party has assembled.

Individualism/Collectivism deals with the degree to which individuals from a culture form and participate in groups. Within individualist societies (e.g. United States [91], Australia [90], and Great Britain [89]), stress is placed on individual achievement and as a result the rate at which individuals form themselves into groups is low. Within a collectivist society (e.g. Guatemala [6], Ecuador [8], and Panama [11]) emphasis on working together, establishing bonds, and loyalty exists; as a result, the rate at which individuals form themselves into groups is high. For example, within an individualistic society the generally accepted meaning of family is restricted to the nuclear family, while in a collectivist society the meaning of family extends to all relatives whether through blood or marriage.

Masculinity/Femininity measures the distribution of emotional gender roles (Hofstede, Culture's Consequences, 2001). In societies with a high masculine index (e.g. Japan [105], Austria [79], and Venezuela [73]), value placement is on competitiveness, assertiveness, and ambition, and there is a strict adherence to traditional gender roles. In societies with a high feminine index (e.g. Sweden [5], Norway [8], and Netherlands [14]), societal values are placed on relationships, security, and quality of life, and there is a dissolution of gender differences.

Long-/Short Term Orientation or *Pragmatism* measures how a culture deals with and perceives time (Hofstede, Culture's Consequences, 2001). It is important to note that the long-short-term orientation dimension specifically categorizes far eastern societies using a question

set centered around concepts which would be foreign in western society (e.g. filial piety - a respect for ones ancestors) (Bond, 1988). A long-term orientation society (e.g. Pakistan [0], West Africa [16], and Philippines [19]), sees the future as being of primary importance and as a result places value on persistence, thrift, and a capacity for adaptation. Such societies generally exhibit a forward thinking attitude, caring little for what happened yesterday and looking only at how they can make tomorrow better. A short-term orientation society (e.g. China [118], Hong Kong [96], and Taiwan [87]) sees the present as being of primary importance and value placement is on reciprocation, respect for tradition, and the fulfillment of societal obligations.

Indulgence/Restraint is the most recent addition to the dimensions and measures a society's tendency to gratify or curb the basic and natural desire to enjoy life or adhere to the regulation of social norms (Hofstede, Hofstede, & Minkov, 2010). An indulgent society (Venezuela [100], Mexico [97], and Puerto Rico [90]) places value on an individual's overall happiness and personal life control even at the expense of societal and social norms. Conversely, a restrained society (Pakistan [0], Egypt [4], and Latvia [13]) places value on a society's overall happiness through the individual's strict adherence to societal and social norms.

Of the six current dimensions, Hofstede identified power distance first. Using the observation of strongly correlated results between similar question sets within countries, Hofstede used the data to calculate an index score based on the related questions for each country. While Hofstede's initial method of computing index score could theoretically create a range from -90 to 210, most index scores exist in a range from 0 to 100 and allow a ranking for each country relative to each other country (see Table 1). Hofstede then moved on to find other question sets that illuminated what would become the remaining dimensions.

Table 1

Intercultural Dimensions Index Scores and Ranks

	Power Distance		Uncertainty Avoidance		Individualism/ Collectivism		Masculinity/ Femininity		Pragmatism		Indulgence/ Restraint	
Country	**Index**	**Rank**	**Index**	**Rank**	**Index**	**Rank**	**Index**	**Rank**	**Index**	**Rank**	**Index**	**Rank**
Argentina	49	35-36	86	10-15	46	22-23	56	20-21			62	
Australia	36	41	51	37	90	2	61	16	31	22-24	71	12
Austria	11	53	70	24-25	55	18	79	2	31[a]	22-24	63	25-26
Belgium	65	20	94	5-6	75	8	54	22	38[a]	18	57	29-31
Brazil	69	14	76	21-22	38	26-27	49	27	65	6	59	28
Canada	39	39	48	41-42	80	4-5	52	24	23	30	68	19-19
Chile	63	24-25	86	10-15	23	38	28	46			68	16-19
Columbia	67	17	80	20	13	49	64	11-12			83	6
Costa Rica	35	42-44	86	10-15	15	46	21	48-49				
Denmark	18	51	23	51	74	9	16	50	46[a]	10	70	13-14
Ecuador	78	8-9	67	28	8	52	63	13-14				
Finland	33	46	59	31-32	63	17	26	47	41[a]	14	57	29-31
France	68	15-16	86	10-15	71	10-11	43	35-36	39[a]	17	48	41-42
Germany	35	42-44	65	29	67	15	66	9-10	31	22-24	40	53-55
Great Britain	35	42-44	35	47-48	89	3	66	9-10	25	28-29	69	15
Greece	60	27-28	112	1	35	30	57	18-19			50	38
Guatemala	95	2-3	101	3	6	53	37	43				
Hong Kong	68	15-16	29	49-50	25	37	57	18-19	96	2	17	86-87
Indonesia	78	8-9	48	41-42	14	47-48	46	30-31			38	57-58
India	77	10-11	40	45	48	21	56	20-21	61	7	26	76
Iran	58	29-30	59	31-32	41	24	43	35-36			40	53-55
Ireland	28	49	35	47-48	70	12	68	7-8	43[a]	13	65	23-24
Israel	13	52	81	19	54	19	47	29				
Italy	50	34	75	23	76	7	70	4-5	34[a]	19	30	69
Jamaica	45	37	13	52	39	25	68	7-8				
Japan	54	33	92	7	46	22-23	95	1	80	4	42	50-52
South Korea	60	27-28	85	16-17	18	43	39	41	75	5	29	70-72
Malaysia	104	1	36	46	26	36	50	25-26			57	29-31
Mexico	81	5-6	82	18	30	32	69	6			97	2
Netherlands	38	40	53	35	80	4-5	14	51	44	11-12	68	16-19
Norway	31	47-48	50	38	69	13	8	52	44[a]	11-12	55	33
New Zealand	22	50	49	39-40	79	6	58	17	30	25-26	75	10
Pakistan	55	32	70	24-25	14	47-48	50	25-26	0	34	0	96
Panama	95	2-3	86	10-15	11	51	44	34				
Peru	64	21-23	87	9	16	45	42	37-38			46	43-44
Philippines	94	4	44	44	32	31	64	11-12	19	31-32	42	50-52
Portugal	63	24-25	104	2	27	33-35	31	45	30[a]	25-26	33	64-65
South Africa	49	35-36	49	39-40	65	16	63	13-14			63	25-26
Salvador	66	18-19	94	5-6	19	42	40	40			89	4
Singapore	74	13	8	53	20	39-41	48	28	48	9	46	43-44
Spain	57	31	86	10-15	51	20	42	37-38	19[a]	31-32	44	46-47
Sweden	31	47-48	29	49-50	71	10-11	5	53	33	20	78	8-9
Switzerland	34	45	58	33	68	14	70	4-5	40[a]	15-16	66	21-22
Taiwan	58	29-30	69	26	17	44	45	32-33	87	3	49	39-40
Thailand	64	21-23	64	30	20	39-41	34	44	56	8	45	45
Turkey	66	18-19	85	16-17	37	28	45	32-33			49	39-40
Uruguay	61	26	100	4	36	29	38	42			53	35
United States	40	38	46	43	91	1	62	15	29	27	68	16-19
Venezuela	81	5-6	76	21-22	12	50	73	3			100	1
Yugoslavia	76	12	88	8	27	33-35	21	48-49				
Regions:												
Arab Countries	50	7	68	27	38	26-27	53	23			34	62-63
East Africa	64	21-23	52	36	27	33-35	41	39	25	28-29	40	25-26
West Africa	77	10-11	54	34	20	39-41	46	30-31	16	33	78	8-9

NOTES:

1 = highest rank whereas the lowest rank is based on the number of countries survived for the given metric.

Pragmatism and Indulgence/Restraint ranks drawn from the extended data set found at http://geerthofstede.eu/research--vsm

a: Based on EMS consumer survey (see Hofstede, 2001, Exhibit 7.3)

At its most basic level, Hofstede's model reduces the complexities of culture by breaking them down into specific fundamental dimensions (Ess & Sudweeks, 2006). In turn, these cultural dimensions can aid researchers in the determination of communication styles, views toward authority, openness to adopting new technologies, and a tendency toward indulgence or restraint to name only a few (Hermeking, 2005; Hofstede, Hofstede, & Minkov, 2010). However, Hofstede (2013) notes that these dimensions do not exist in a tangible sense; rather, they are merely a construct much like the concept of culture itself. As a construct, direct observation is impossible but is inferable from behaviors and through verbal statements (Levitin as cited by Hofstede, 2013).

Criticisms of the Cultural Dimensions Model

The insistence by Hofstede that the cultural dimensions model is merely a construct is just one instance of his many responses to critics of his work. In fact, several scholars have voiced concerns over the years as to the validity and applicability of Hofstede's work. These critics generally focus on Hofstede's methods of sampling, the survey methods employed in the study, and the validity of the collected data (Sondergaard, 1994).

The first common criticism of Hofstede's work deals with the methods of sampling utilized in the study. The broadest of these criticisms deals with the use of nations as a means of studying culture (Baskerville, 2003). This criticism stems from the idea that culture as a construct does not necessarily conform to the established borders of a nation. For example, a study of culture using the whole of Canada from which to draw a sample would not adequately account for the unique culture of largely French Quebec or the various aboriginal tribes of the Northwest Territories and Nunavut. It is for this reason that we must consider Hofstede's study to be one of national identity and not of culture (Baskerville, 2003). Hofstede's (2001; 2010; 2013) response to this criticism is that using the borders of nations, while an inelegant solution to

an acknowledged problem, is at the very least a solution whose application can be both universal and consistent on a global scale.

One of the most persistent critiques against the cultural dimensions model deals with its age. As the basis that the model is data collected between 1968 and 1973, some researchers contend that the data itself is an artifact of its collection period and is therefore not applicable for use in modern interpretation and analysis (Sondergaard, 1994). While study replication consistently finds results consistent with Hofstede's original findings (Punnett and Withaney as cited in Sondergaard, 1994; Shackleton and Ali; & Hoppe as cited in Sondergaard, 1994), questions have arisen concerning the model's ability to analyze intercultural communication given the current state of technological advancement (Ess & Sudweeks, 2006). These questions stem primarily from the conduction of the original study on pre-Internet cultures, and the application of the result to post-Internet cultures, without considering the fundamental ways in which the technology may have altered how communication occurs.

Application of the Cultural Dimensions Model

While Hofstede's model is a powerful means of studying culture, it is not without its limitations. Given the concern raised by Songergaard (1994), dealing with the applicability of the cultural dimensions model to the study of modern communication, researchers have attempted to adapt the model. One of the most widely used of these adaptations grafts concepts of web design onto the existing cultural dimensions. These web design concepts include metaphor, mental models, navigation, interaction, and appearance, which can be categorized as follows:

> *Metaphor* addresses those concepts communicated by words, images, sounds and tactile experiences. Examples can include the representation of concepts with icons (ex. shopping carts, padlocks, and gears), audio cues (ex. Facebook "pop" and Xbox

achievement notification), and stand-ins for physical interaction (ex. chat rooms as a replacement for conversation). According to Marcus (2001), the growth of the web and the ability to deploy new metaphors and buzzwords will drastically increase their creation.

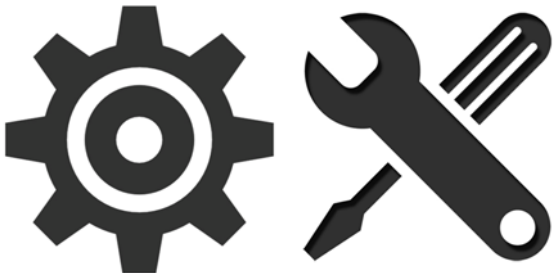
Mental Models deal with the way data and information are structured and how tasks, roles, and groups of people are organized. Examples include content organization (ex. news sites place information based on importance) and task hierarchies (ex. access email, view email, and reply to email) (Ackerman, 2002).

Navigation, according to Marcus (2001), addresses movement through the structure and organization employed by the mental models. Examples include various dialogue techniques including menus and control panels.

Interaction deals with input and feedback. At a basic level, this deals with the keyboard and more importantly the character set utilized by the user. However, it extends from interface options such as queries, forms, and drag-and-drop regions to feedback and notification elements such as live chats and interaction 'updates' which inform the user when they have interacted with the interface in a way that violates the programmed expectations (Marcus, 2001).

Appearance relates to the overall look, sound, and feel of an interaction. In terms of design, this includes the use of colors, fonts, gestalt, and overall layout. However, it can also extend to the use of specific verbal styles (e.g. verbose, terse, formal, and informal) and image content and composition.

It is important to note that these web design concepts do not merely correspond to individual cultural dimensions; rather, they are an application of each concept to each dimension. In this way, we can note how culture manifests in an online environment across each of the cultural dimensions. For example, according to Ackerman (2002), when considering the design concept of metaphor in a strongly masculine society, we would expect to see icons that are strongly competition or work oriented. However, in a strongly feminine society, we would expect those same icons to be more family oriented (see Figure 3). Additionally, in a culture with a high power distance we would expect to see interactions featuring severe error messages such as "ACCESS DENIED," whereas in low power distance cultures we would expect to see more supportive interactions such as "uh oh, looks like something went wrong - why don't you try again."



Examples of a masculine society metaphor for computer program settings or a control panel.

Examples of a feminine society metaphor for computer program settings or a control panel.

Figure 3: Example of metaphor differences between masculine and feminine societies.

By attaching these web design concepts onto Hofstede's cultural dimensions, researchers have not only created a means for the model to apply to the digital age, but also give it practical application to the real world (Honold, 2000; Marcus & Gould, 2000). While Marcus (2001)

considers the method of grafting to be stable enough to predict a relationship between culture and web design, it has yet to be universally accepted. However, it does serve as a means of better understanding the complex connections between the cultural dimensions and web design.

This study will utilize both the cultural dimensions model and the grafted design concepts to inform the decisions behind this study's methodology. The cultural dimensions model will inform the selection of the cultures that will make up the basis for analysis, while the ideas outlined in the grafted design concepts will comprise a basis for the methodology used in the study's content analysis. However, neither of these ideas can fully explain how culture influences the cognitive processes, which serves as the foundation for design.

Cultural Cognition Theory

While the cultural dimensions model provides a theoretical base from which to study culture, the theoretical underpinnings allowing for the study of digital culture –specifically culture as manifested on web pages – has yet to gain a strong level of acceptance. Faiola and Matei (2005) argue that this is because the cultural dimensions model ignores cognition as a process existing between stimuli and response. In this way, the behaviors explained by the model are "seen as puzzle-like arrangements of recombinant patterns of actions" (Faiola & Matei, 2006, p. 378). While behavior as it relates to culture is directly observable, studies on cognition from both psychological anthropology and information science continually suggest that culture links directly to cognition (Nisbett & Norenzayan, 2002; Faiola & Matei, 2006; Faiola & MacDorman, 2008). Considering these ideas, cultural cognition theory proposes using historically and contextually developed cognitive skills in the process of strategizing web design (Faiola & Matei, 2005; Faiola & Matei, 2006; Faiola & MacDorman, 2008).

These historically and contextually developed cognitive skills represent a research foundation spanning disciplines from cultural psychology through cross-cultural and computer-

mediated communication to form the foundation of cultural cognition theory. These ideas expound on culture and behavior from a cognitive perspective. The early work of Vygotsky (1978; 2012) in cultural-historical psychology suggests that the psychological makeup of an individual is a product of that individual's culture and that the establishment of cognitive processes comes through activities that are inhibited by society and history. With these ideas, Vygotsky's work extends through "a wide range of contemporary research on culture and cognition, [standing] as a stark contrast to the prevailing assumption of experimental psychology that there are unitary, unchanging, universal cognitive processes that operate across contexts, cultures, and historical periods" (Nisbett & Norenzayan, 2002, p. 8). Using this theoretical grounding, cultural psychology as developed by Nisbett represents "an examination of the ways in which cultural traditions and social practices create differences in how people think and feel" (Faiola & Matei, 2006, p. 378). Nisbett and Norenzaya (2002) illustrate this understanding in their finding that "cultures differ markedly in the sort of inferential procedures they typically use for a given problem" (p. 2). As a result, cultural psychology strongly relates to the theoretical underpinning for cultural cognition when one considers the main tenets of the formalist theory as outlined by Nisbett and Norenzayan (2002) in four propositions:

1. At their most basic level, all cognitive processes are universal forming the same basis for attention, memory, learning, and inferential processes for every human being.
2. Regardless of the content being processed, all basic cognitive processes function in similar ways.
3. Because these basic cognitive processes (specifically the learning and inferential processes) evaluate environmental stimuli all normal human children grow up with the ability to learn all they need to about the world.

4. Since the environment (social, political, and economic) in which all individuals exist is different, the human mind is indefinitely variable in terms of its prescribed theories, beliefs, values, and norms.

In other words, the primary idea behind cultural cognition theory is that individuals and groups construct their identities from a collection of stored experiences infused with cultural values and norms, and the cognitive patterns of thought, interaction, and response (Faiola & Matei, 2006).

While identity construction is a foundational concept on which cultural cognition theory is constructed, it is the idea of cognitive style that informs research using this theoretical construct. Riding and Rayner (as cited by Faiola & Matei, 2006) broadly define cognitive style as one's preferred method of information organization and representation. Connecting this concept with the four propositions outlined above suggests that an individual's preferences as they relate to how information is organized and represented are based in cultural identity. Goldstein and Blackman (as cited by Faiola & Matei, 2006), further define cognitive style as being the distinct methods people utilize to organize their environments based on concepts of their own construction and to create psychological meaning in their environments though spontaneous filtering and processing of stimuli. From these ideas, cultural cognition theory focuses on web page layout, format, imagery, color, information architecture, and system interactions to study the effects of "culturally aware design" (Ess & Sudweeks, 2006, p. 187).

This approach's focus on layout, design, and information architecture distinguish it from the cultural dimensions model because the nature of the proposed inquiry uses both cross-cultural communication and computer-mediated communication. According to Faiola and Matei (2006), the explorations of these culturally shaped cognitive styles extend from two premises.

The first premise is that cultural factors influence web site design (see Intercultural Implications and Expectations in Website Design). The second premise deals with the development of a greater understanding of the theoretical issues surrounding cultural cognition as a means of enriching aspects of Web usability research. By accounting for these foundational principles, the researchers suggest that variations in content design mirror variations in the cognitive style of that content's designer. This mirroring between cognitive styles and resulting design may create cultural biases, which allows for both detection and measurement by studying the degree of efficiency and comfort with which cross-cultural users engage said content. As a result, cultural cognition theory suggests that culturally produced cognition and cognitive styles shape web design and structure, which in turn facilitate interactions shaped by the process of cognition and cognitive styles, which are themselves a product of culture (Ess & Sudweeks, 2006).

If culture shapes thought (which in turn shapes design), then any observable differences in design manifest as an extension of culture. Faiola and Matei (2005) suggest that these variations may affect online performance, creating an impact to overall Web usability due to the cultural bias of the designer, which may manifest into three observable phenomena:

1. Subjects using Websites created by designers with whom they share a cultural identity will experience an increased ability to perform assigned tasks;
2. Subjects who share in a cultural identity will utilize similar patterns when navigating the same Website; and
3. Subjects will self-report a stronger preference for using Websites created by designers with whom they share a cultural identity.

These phenomena extend from research done by Graff, Davies, and McNorton (2004), which suggests that nationality or culture account for variation in cognitive styles while

individual differences in the thought processing styles affect the formation of habits, perceptions, and values. For example, we might directly observe these phenomena in Saudi Arabian Web users, who, because they read their written language from right to left, start their scan of a website in the upper right hand corner of the page (phenomenon 2). As a result, a Saudi Arabian Web designer would likely utilize a design that accounts for this cultural pattern thereby creating an increased ability for Saudi Arabian users to perform assigned tasks (phenomenon 1). In turn, these users would likely report a stronger preference for the design put forth by their fellow Saudi Arabian over the design featuring the same content created by a French Web designer (phenomenon 3). Research into cultural cognition theory supports this idea, suggesting that that information seeking tasks are accomplished faster and with more precision when using web content created by designers from the user's culture of origin (Faiola & Matei, 2005; Faiola & Matei, 2006; Faiola & MacDorman, 2008).

Cultural cognition theory draws from a strong research-based foundation to elucidate the relationship between cognition, cognitive styles, web design, and web structure. Related research, particularly related to the foundational concepts, suggest strong support for cultural cognition theory's validity as a construct related to culture. It is, however, not without some issues related to a lack of research specifically related to the topic, as well as some methodological concerns.

Criticisms of Cultural Cognition Theory

By its very nature, criticism is generally a product of both the object of the criticism's longevity and relative exposure. Unlike Hofstede's work, which totals 47 years of continuous study to date by hundreds of different researchers, cultural cognition theory represents a new formulation of the ideas related to the manifestation of culture despite a strong basis on ideas

dating back to work by Vygotsky in the 1930s. For this reason, literature critical of cultural cognition theory does not currently exist.

This overall lack of criticism does not suggest that cultural cognition theory is without fault, but that it has yet to receive a level of adoption conducive to warranting robust and widespread academic vetting. This in itself is an issue of some concern as the establishment of true theory results only from extensive study and a reported consistency between disparate result sets. However, there is some basis for mitigating this concern in part as a literature-based perspective with strong support forms a foundation for the construct, but this basis is minor.

An issue of far more concern extends from the construction of the model itself. Faiola and Matei (2005; 2006) tout cultural cognition theory as being an expansion past the "Confucian" polarity – the implied relationship between two events, of which each constitutes a necessary condition of the other (Tian, 2005) - of the cultural dimension model's strong adherence to behaviorism, to focus instead on the cognitive perspective (Ess & Sudweeks, 2006; Faiola & MacDorman, 2008). However, while behavior as a focus of study allows for direct observation and quantification, cognition generally does not. As a result, cultural cognition theory represents a construct that is difficult to observe naturally, as it requires the research to focus on creating a method to establish the subject's thought process rather than directly observing a resulting behavior (Faiola & Matei, 2005; Faiola & Matei, 2006; Faiola & MacDorman, 2008).

In conclusion, cultural cognition theory presents a number of potential areas of concern from a research perspective. However, from the relative infancy of the construct to the inherent difficulty in measuring observable results, these issues are minor given the context of this study.

Application of Cultural Cognition Theory

The basis of scientific inquiry is not merely the observation of a reaction, but the observation of a reaction from a variety of differing points of view. For example, scientists have determined that ice represents the solid state of water not only because when exposed to freezing temperatures crystallization occurs, but also because when exposed to heat, those crystals revert to a liquid state. Similarly, rather than looking at how culture, website structure, and website design affect the speed at which an individual can accomplish a variety of tasks, this study seeks to analyze the elements of structure and design to find if consistencies exist within and between cultures. This method provides a new perspective on the application of cultural cognition theory and eliminates the methodological issues associated with the study of human performance and the self-report aspect of previous inquiries.

Just as application of the cultural cognition theory mitigates the weaknesses inherent to the cultural dimensions model, the reverse is also true. However, while the cultural dimensions model will form a basis for many methodological decisions, cultural cognition theory will serve primarily as a means of analyzing the resulting data. This analysis will also benefit from a greater understanding of how an individual's culture leads them to perceive design decisions.

The Intercultural Implications and Expectations of Website Design

When the Internet was born out of CERN laboratories in Switzerland, the primary cultural concern related to the system extended no further than the page's display language. This decision does not represent a lack of cultural sensitivity, but rather the extent to which the technology of that time could, or even needed to accommodate cultural identity. Given the status of Web communication at the time, accommodating written languages equated to accommodating cultures as the Internet could do little else. However, despite the fact that the technology that powers the Web has grown to become infinitely more accommodating to

differences in communication style and even culture, for many organizations the prevailing design mindset is still stuck in a past in which changing the language is all that targeting a new culture requires (Fernandes, 1995). Unfortunately, the single design for multiple languages mentality does not take into account the implications that culture represents to both visual and structural design. Additionally, a failure to account for these cultural design implications has the potential to produce designs that violate the end user's culturally constructed expectations as to the form that the Web page they are viewing will take. Color represents a prime example of this interdependent state as single colors elicit differing emotions depending on cultural identity (Culture Shock). As a result, Web designers should take into account the implications to design that culture represents as well as the expectations the end user holds for that design.

The Intercultural Implications of Website Design

Just as the visual and organizational design for a personal Web page is different from that of a networking or e-commerce site, so too should design differences exist between the Web pages of differing cultures. Unfortunately, while the single design with translations for every language mentality succeeds in winning support from those interested in consistency or cost, it fails to address to the complex norm and expectations of the various viewing cultures. While language does represent one very important cultural targeting consideration, typography, scanning patterns, and interface design represent additional areas that require attention.

While the Internet's inception was primarily an endeavor of the Western world, its unique ability to form far-reaching connections has quickly made it a global form of communication. As a result, research suggests that upon creation websites lack cultural specificity, or are "born global," and therefore require adaptation to address the wide variety of cultures and languages having access (Gevorgyan & Porter, 2008, p. 34). This is a point further emphasized by the rate at which Internet use is growing among non-English speakers (Gandal, 2006). As of the time of

this writing, English language websites account for just over 55% of the Internet (Q-Success, 2014), yet data collected in 2011 suggests that only 27% of Internet users speak English (Miniwatts Marketing Group, 2014). As a result, targeting the 73% of users on the Internet speaking the various other languages and representing the various other cultures must become a top priority.

While the statistics regarding language and Internet use make a clear case for translating display languages, translation by itself is not without design implications. The Oxford English Dictionary defines typography as the art or practice of printing (Typography, 2014). However, in a design sense, this often means the artful arrangement of characters or letters to convey meaning as well as beauty. Typography represents a variety of cultural implications because it is not always obvious how a culture will interpret the text. One such example occurred in the early 2000s when the Coca-Cola Company sought to establish a market for their signature beverage in the Kingdom of Saudi Arabia by prominently advertising the flowing cursive text of their logo. It is important to note that written Arabic is an art form, with highly stylized calligraphy being very common. When the Coca Cola logo is reversed, as if viewed in a mirror, and read backwards, the direction in which Arabic text is read, it has the appearance of reading “there is no prophet, no Mecca” (Hawley, 2000; Banerjee, 2001). While this is an extreme example of the cultural implications of typography, text size issues are much more common. For example, English language websites frequently choose the smallest legible font size for disclaimers or any other form of legalese. However, when translating this text to a language like Korean, which consists of an alphabetic language in which the individual characters are stacked together into syllabic groups containing between two and five characters, these small font sizes can make the text impossible to decipher (see Figure 4). As a result, while translation of textual content on a

website is necessary, it must be reflective of the communicative expectations and norms of the target culture.

While page language is an important aspect of cultural targeting, so too is the layout of

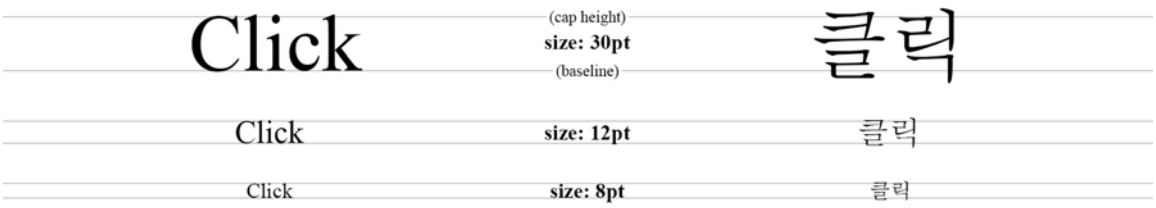


Figure 4: Font size implications to English and Korean type.

the various elements that make up the user interface in part due to how the users move their eyes over the content. According to Nielsen (1990), these scanning patterns differ based on cultural background because how an individual writes in their native language corresponds to the expectation of how information should be absorbed. For example, for a language read from left-to-right and top-to-bottom such as English, the eye's starting location is in the upper left and they will move to the left and down. Conversely, for a language read from right-to-left and top-to-bottom, such as Arabic, the eye's starting location is the upper right and they will move to the right and down (see Figure 5). Given these expectations, Nielsen (1990), believes that an individual's mental models for the absorption of information may be inadequate when it comes to handling the direct translation of interfaces. Additionally, Würtz (2005) suggests that the cultural customizations of websites should not stop merely at the translation of text.

Culturally specific iterations of user-interface design can often alleviate the problems associated with language, typography, and scanning patterns. In fact, evidence suggests that well-designed user-interfaces and the use of interactive features often enhances the quality and

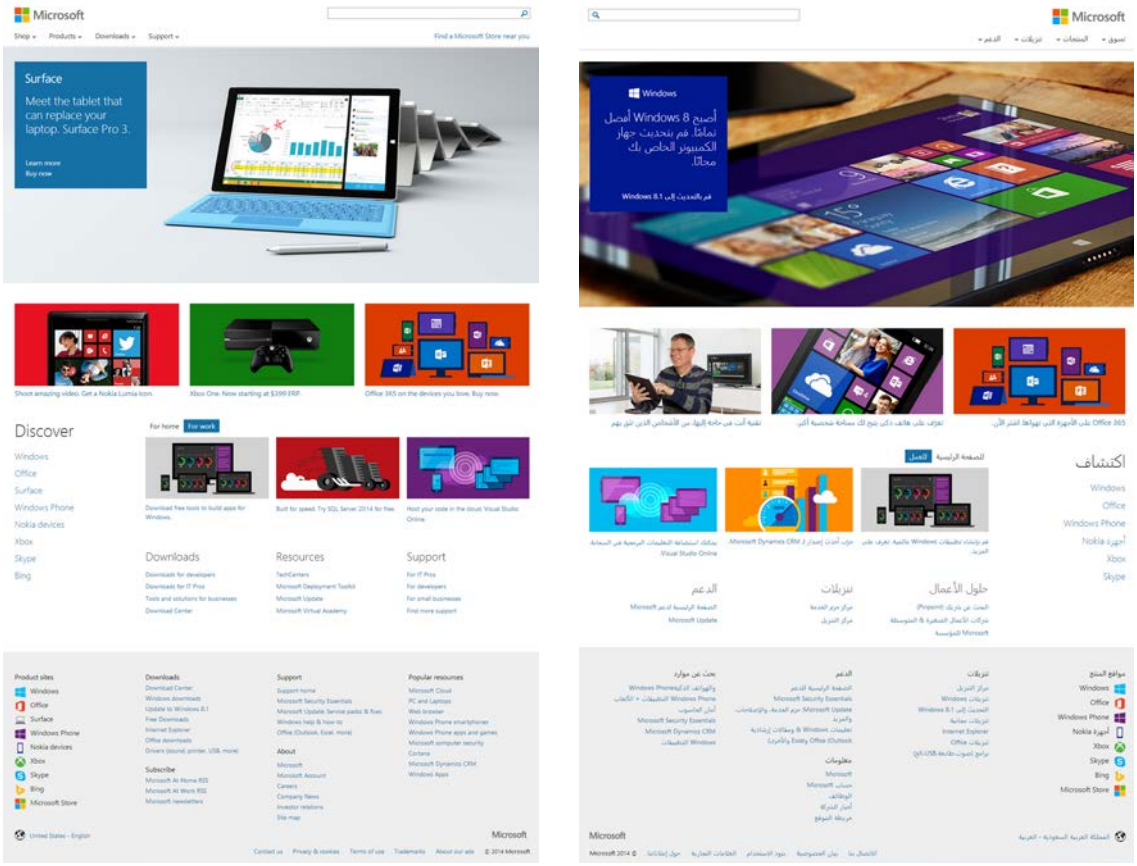


Figure 5: User scanning differences between English and Arabic websites.

appeal of online messages. However, these messages are subjective and vary across demographics and cultures (Gevorgyan & Porter, 2008). As a result, how "user friendly" a website is depends on the preferences, biases, and context of a target culture regarding colors, text, and graphic design to name only a few (Barber & Badre, 1998).

Unfortunately, the idea that an interface can be "user friendly," or perhaps more accurately given the context of this research "culture friendly," stands in contrasts to the Internet being a global form of communication. Despite the difficulties associated with putting users in their correct cultural boxes, the culturally encompassing nature of the Internet should not negate a user's cultural bonds (Burgmann, Kitchen, & Williams, 2006). As a result, the design ideas associated with human computer interaction, audience analysis, learnability, efficiency, and

satisfaction become more important when considering an international market (Barber & Badre, 1998). To ensure that websites are appealing to the target culture, a culture's predisposition regarding communication preferences should influence the designer's thinking process (Kim, Coyle, & Gould, 2009), because as Shih and Goonetilleke (1998) point out, the Western dominance in the development of early user interface guidelines failed to incorporate aspects related to the accommodation of a non-universal culture.

This lack of particularity regarding culture means the creation of effective website designs requires information organization with attention to specific color connotation, layout preferences, animations and sounds, and the various other effects that define modern websites. According to Würtz (2005), each of these pieces of information has the ability to elicit positive or negative reactions among users because cultural differences in computer-mediated communication can lead to misunderstanding. An example of this phenomenon is the symbol of the swastika, which creates positive feelings in the East where it has strong ties to Buddhism and provokes negative feelings in the West where it is associated with the atrocities of the Nazis. While this is a rather extreme associative disparity, differences in culture manifest in numbers, date/time, symbol-sets, page format, imagery, color, information architecture, and system interaction (Faiola & Matei, 2006). What's more, research has found examples of these differences as well. By comparing Chinese and Western homepages, Schmid-Isler (2000) found that the structure of Chinese homepages created a group of independent spaces (ex. the classified section of a newspaper), while the structure of Western homepages extended from a focus point. Goldstein & Blackman (as cited by Faiola & Matei, 2005), suggests that these differences in design are a result of "contextually influenced processes of learning develop[ed] over time, [which allows the mind to form] particular styles of planning, strategizing, and problem-solving

based on inherent patterns of organized information" (p. 10). Research on these cognitive styles by Faiola and Matei (2005; 2006) suggest that in order to minimize the cultural implications associated with the global reach of the Internet, culture should directly influence interface design, content creation, and how the user interacts with this material.

This minimization of the cultural implications associated with the Internet should stand at the heart of all website design discussions. In turn, these discussions should extend beyond targeted translation of content to typography, scanning patterns, and any required accommodations regarding interface design. Unfortunately, research in these areas is very limited and largely focuses on methods considered effective or ineffective rather than the unique expectations of individual cultures.

The Intercultural Expectations of Website Design

Creating a greater understanding of the implications of website design begins at understanding the expectations held by individual cultures. These expectations vary depending on the culture and influence how individuals process messages, which suggests that they should guide website construction. Among these aspects of website construction are cultural targeting, content design, and communicative style.

The problem with cultural targeting in an online environment is the lack of delineations that exist on the Internet. In the global economy, researchers can point to geographical boundaries as being points of demarcation between cultures. Despite the absence of these geographic boundaries, cultural boundaries still exist on the Internet (Hanna & De Nooy, 2004). While the technologies employed by the World-Wide Web lack content sensitive to the complexity of cross-cultural communication, websites designed to address the subtle psychological aspects of culture are in development (Faiola & Matei, 2005; Faiola & Matei, 2006). This is important because information, communication, and learning systems as well as

their management are areas that show a definite and strong influence from culture (Wild, 1999). Additionally, culture was among the most influential facets in marketing as identified in research by Hanjun, Roberts, and Chang-Hoan (2006), as it affects a consumer's motivations, attitudes, intentions, and purchases. For this reason, cultural differences in design have spawned studies in transnational marketing research in order to determine the best advertising means of targeting outside cultures (Callahan, 2005).

The connection between website design and advertising as they relate to culture is particularly strong. Given the interconnected nature of the two fields, designers should address advertising research where it exists to validate how website design may adhere to or violate the expectations of a target culture (Kim, Coyle, & Gould, 2009). This is because the differences that exist between cultures extend beyond language, collective symbols, images, colors, and the formatting of dates and times, but also in terms of emotions, personalities, perception, cognition, and thinking styles, which are driving forces in the advertising industry (Noiwan & Norcio, 2006).

In addition to analyzing the cultural expectations related to design, we must also consider expectations as they relate to communicative style. Drawing from the idea that culture differs in terms of emotions and perceptions, we find even stronger evidence against the belief that all language is directly translatable, as the meanings behind language are not (Trenholm, 2004). For this reason, communication between cultures is highly dependent on context, with high-context communication being abstract and low-context communication being very literal (Hofstede, 2001). This difference in the context of communication creates drastically different interpretations in meaning (Pan & Xu, 2007; Hanjun, Roberts, & Chang-Hoan, 2006; Kim, Coyle, & Gould, 2009). For example, in low-context cultures, politeness extends from verbal

expression such as formal or informal speech, while high-context cultures depend on contextual information such as vocal tonality, gestures, appearances, and facial expressions (Kim, Coyle, & Gould, 2009). Given the predominately textual nature of the Internet, these context expectations translate into differences in how information is organized and presented. When comparing American (high-context culture) and Chinese (low-context culture) corporate websites, Pan and Xu (2007) found a strong focus on the corporation's social responsibility with an incorporation of marketing and public relations on the American website, whereas the Chinese website displayed a strong focus on corporate history with an integrated means of facilitating consumer-consumer interactions.

Unlike the intercultural implications of website design, which boil down to positive or negative reception of several key components, the diversity among global cultures makes the topic of expectations far more nebulous. While research on cultural expectations regarding web design exists to a limited extent, it is either out-of-date given the technological progression of the Internet, focused to the point of being inapplicable to any other culture, or so broad that there is a very limited depth to the findings. The design of this study will address these problems by creating a structure through which to study a culture in depth, while allowing for replication across cultures to achieve breadth and time to maintain pace with the technology powering the World Wide Web.

The Intercultural Implications and Expectations of Color in Website Design

Among the more studied aspects concerning the intercultural implications and expectations in website design is color. While this research is still in relative infancy, it draws from related studies spanning more than a century of inquiry and straddling several disciplines (Valdez & Mehrabian, 1994). As an avenue of investigation, color is extremely important because it exhibits the potential to influence the emotional appeal of a website (Cyr, Head,

Larios, & Pan, 2009). As a result, the categorization of available research as it relates to the influence of emotion is limited to cultural color psychology and cultural color symbolism.

It is important to note that the study of color is not without a unique set of problems of both methodology and findings. As pointed out by Valdez and Mehrabian (1994), modern definitions of individual colors rely on coordinate systems to specify color as a set of values, which represents a level of precision not found in older studies of color. While invention of the first mathematical color system occurred prior to 1930 (Smith & Guild, 1932), much of the research on color outside the hard sciences utilized inexact verbal descriptions such as red, blue, and green (Valdez & Mehrabian, 1994). This is not to say that these lines of inquiry are without merit, merely that they are imprecise and difficult to replicate in a manner consistent with the intentions of the original research.

Color psychology is a topic on which there exists an extensive body of literature covering a wide range of related interests. It extends from the premise that color information such as hue, brightness, and saturation has the potential to affect our emotions, behavioral intentions, psychological state, and perceptions (Valdez & Mehrabian, 1994; Cyr, Head, Larios, & Pan, 2009). Unfortunately, much of this research seeks to clarify the effect color seemingly has on an individual's emotional, psychological, or behavioral state with little attention paid to the effects of color on the individuals within any specific or even non-specific cultural grouping (Callahan, 2005; Callahan, 2007; Cyr, Head, Larios, & Pan, 2009; Cyr, Head, & Larios, 2010). Additionally, generalizing the available research to cultural groups can conflict with the reality of cultural perceptions. For example, research on the relationship between colors and emotions suggests that long-wavelength colors such as red and yellow are more negatively arousing than short-wavelength colors such as blue and green (Jacobs and Hustmyer as cited by Cyr et al.,

2009). This finding is consistent with the perceptions of American audiences who generally associate the color red with danger, but inconsistent with the perceptions of Chinese audiences who associate red with happiness and good fortune (Russo & Boor, 1993) (see Table 2).

Table 2

Color Symbolism by Culture

	China	Japan	Egypt	France	United States
Red	Happiness	Anger Danger	Death	Aristocracy	Danger Stop
Blue	Heavens Clouds	Villainy	Virtue Faith Truth	Freedom Peace	Masculine
Green	Ming Dynasty Heavens	Future Youth Energy	Fertility Strength	Criminality	Safety Go
Yellow	Birth Wealth Power	Grace Nobility	Happiness Prosperity	Temporary	Cowardice Temporary
White	Death Purity	Death	Joy	Neutrality	Purity

(Russo & Boor, 1993)

Unfortunately, while the differences between cultures regarding their own unique perception of colors are quite expansive in documentation, a design often becomes a question of adherence to a brand's identity or cultural consideration. While there exists ample evidence concerning the psychological power of brand identity, research by Cyr, Head, and Larious (2010) suggests that distracting colors or those contrary to cultural expectations may cause users to lock visual attention while processing the unusual visual stimuli, which may increase negative reactions. For example, consider a drive though a gated community in which all the houses are of the same architectural design with siding painted light blue and shutters painted white. However, at the end of the second block of houses, you notice one that while adhering the architectural norms of this community is a slightly darker shade of blue and the shutters are black

rather than white. While the fact that this house is different may not be worrisome, it would likely stand out or seem out of place, which can be regarded negatively. In other words, the distracting element (object, color, etc.) becomes the focus of our attention and as this violates our preconceived expectations, we view it as being undesirable, objectionable, or even abhorrent (see Figure 6).

Figure 6: A violation of expectations.

It is this negative perception that designers can avoid by utilizing colors chosen to target a specific culture or cultures. To understand these cultural perceptions we turn to the study of color symbolism, which according to Callahan (2005), makes up the bulk of research related to the intersection between color and culture. This study attempts not only to understand color preferences among cultures, but also to identify the culturally constructed meanings individual cultures place on different colors.

Of these two avenues of inquiry, the study of color preference represents the more widely discussed aspect of color symbolism (del Galdo, 1990; Russo & Boor, 1993). For example, Barber and Badre (1998) discovered a cultural preference for designing websites using the colors embodied by the representative national flag, particularly on official or governmental websites. The lone exception in their sample was Brazil whose websites tended towards bright colors. While objects such as flags can help determine color preferences of cultural groups, some studies focus on eliciting results through experimentation or other forms of research. For example, Duncker, Theng, and Mohd-Nasir (2000) tasked students from a variety of cultures with no prior education in the field of human-computer interaction with designing an educational technology module. They found that British students tended toward low-contrast designs featuring pastel colors, Scandinavian students tended toward low-contrast designs featuring dark colors,

Jamaican students tended toward high-contrast designs featuring bright colors combined into colorful arrangements, African students tended toward dark backgrounds interspersed with brighter colors, and American students tended toward bright backgrounds with black text and some colorful objects. Interestingly, the only group in which no pattern of color preference seemed to emerge was among Asian students (Duncker, Theng, & Mohd-Nasir, 2000).

The second aspect of studies on color symbolism deals with the levels of meaning that cultures attach to individual colors and the inherent differences between those meanings. For example, happiness is associated with the color yellow in western societies, green in Hindi societies, and red in many Asian societies such as China (Russo & Boor, 1993; McCandless & AlwaysWithHonor.com, 2009) (see Table 3). Understanding these color meanings could influence how designers create culturally targeted websites. For example, a banking website may want to avoid the color green if the target audience is French investors, as this color may be associated with criminality (Barber & Badre, 1998). While this color choice could exhibit a positive effect on Middle Eastern investors who relate it good fortune, or American investors who might view it as an allusion to money or wealth, it is important to realize that while commonalities between different cultures may exist, so may drastic differences within a culture. These differences within cultures, such as between the elders of a given society and the youth, suggest that while charts representing color symbolism within society are helpful, they should be used as practical guides rather than steadfast rules of design. Another example of this phenomenon occurs when viewing different colors in combination with other colors (Callahan, 2007).

Table 3

Color Symbolism by Culture (extended)

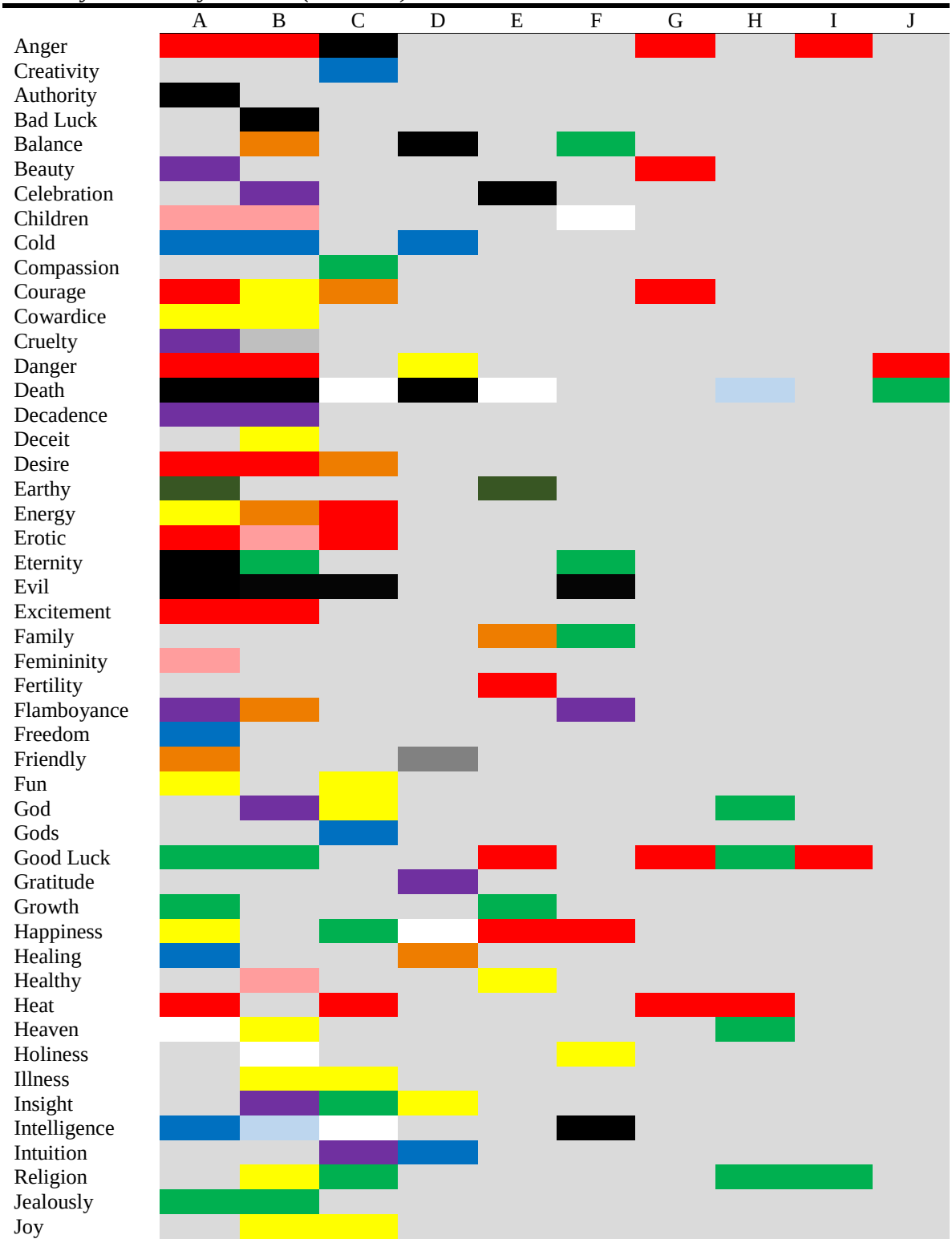
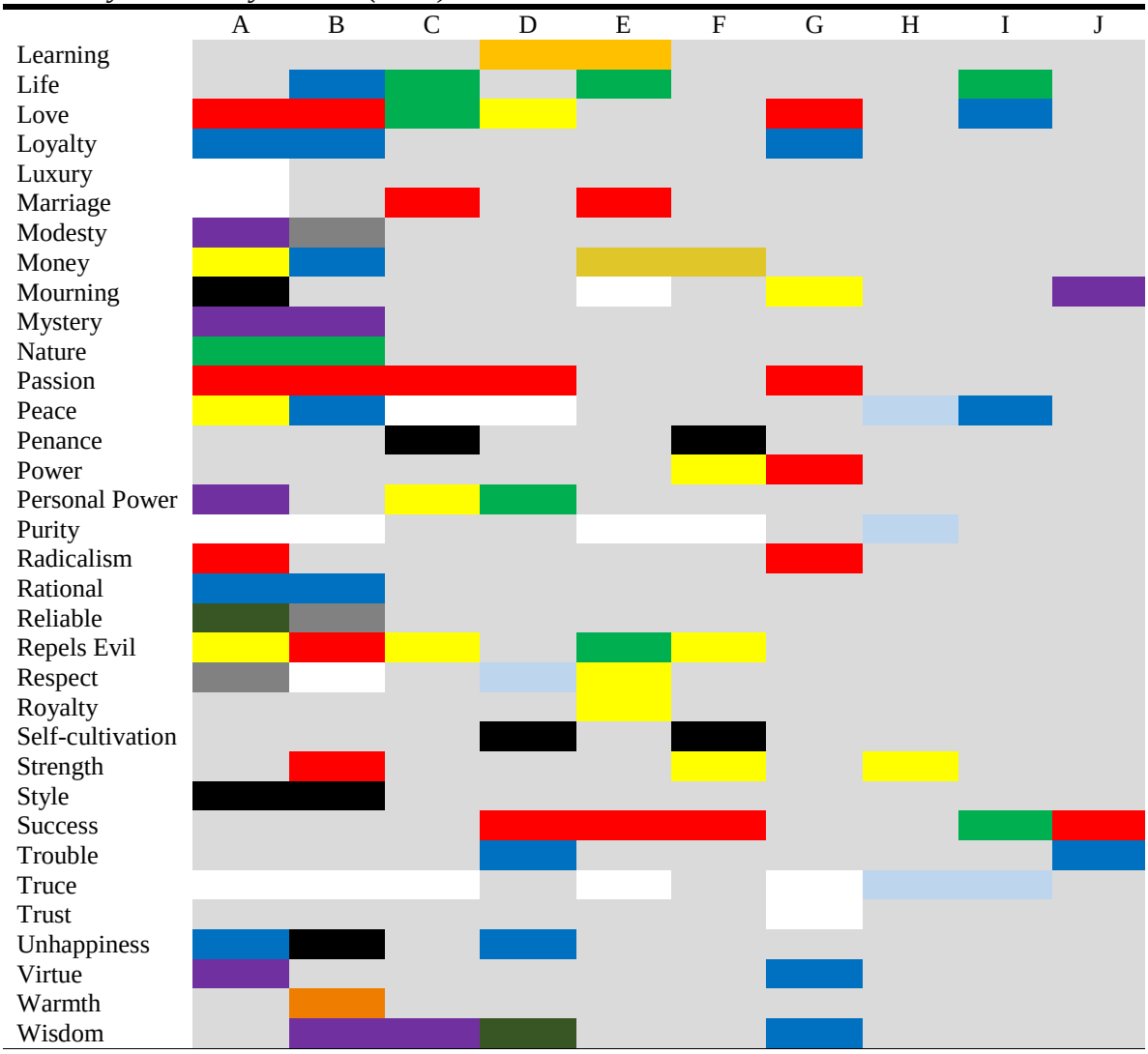


Table 3

Color symbolism by culture (cont.)



Legend:

A. Western/America
B. Japanese
C. Hindu
D. Native American
E. Chinese
F. Asian
G. Eastern European
H. Muslim
I. African
J. South American

Unknown
Yellow
Gold
Grey
Silver

(McCandless & AlwaysWithHonor.com, 2009)

Unfortunately, while research on the topic of the intercultural implications of website design is suggestive of a growing need for active consideration, real world evidence as to the ramifications of doing so or not is largely anecdotal. We do know, for example, than cultures exhibit preferences related to the design of websites, but research on the topic of website effectiveness given targeted and non-targeted design environments is very limited due in part to the inherent difficultly of conducting such inquiries. Still, there exists a growing consensus among researchers that by understanding the expectations of a culture, designers can take a considerable step forward in the process of producing effective culturally targeted websites. This study seeks examine the phenomenon of cultural design trends while addressing the fundamental question of the value of further inquiry given the state of cultural influence on the Internet.

Culture Selection Justification

This study analyzed restaurant websites from a selection of five separate cultures. The purpose of this study is to determine current levels of cultural homogenization as evidenced in website similarities and differences in addition to observing how culture manifests in design decisions. As mentioned previously, this study will utilize geographical boundaries as surrogates for cultural boundaries. While this method lacks a certain amount of precision, it is typical of most culture studies focusing on more than one cultural group (Hofstede, 2001; Hofstede, Hofstede, & Minkov, 2010; Hofstede, 2013; Callahan, 2005; Callahan, 2007). In order to minimize any potential effects associated with sample pollution, included cultures represent differing geographical regions to diminish cultural overlap. These cultural groups include the following:

Websites for restaurants in *The United States of America* will serve as the control population for this study. As the argument espousing the existence of homogenization across the World Wide Web draws from the idea of American/Western dominance of the medium from its

inception to the present day, there exists the possibility of finding similarities in design across all cultures. However, given the United States' strong adherence to the individualist dimension (Hofstede, 2001; Hofstede, 2013) (see Table 4), we would expect to see more links, a greater number of images, and simple easy to use navigation systems (Ackerman, 2002).

The United Arab Emirates will represent the "Arab Countries" identified by Hofstede (2001; 2013) due to its current state of development and relative level of peace. According to Hofstede's research, the Arab countries exhibit a high level of power distance (see Table 4), which Ackerman (2002) suggests should manifest in clear examples of hierarchy and images of featuring leaders or other individuals of importance.

Japan adheres strongly to the masculine dimension outlined by Hofstede (2001; 2013) (see Table 4), which Ackerman (2002) suggests may influence design in the direction of a business or work orientation. The design may also feature strong or bold color choices with a high level of contrast.

Belgium represents a country with a high level of uncertainty avoidance (Hofstede, 2001; Hofstede, 2013) (see Table 4). Ackerman (2002) suggests that designs from this cultural group may feature familiar and clear references and avoid the abstract with any related imagery being simple, clear, and consistent. Additionally, navigation structures should be simple and straightforward with a limited number of options.

Mexico is an indulgent culture according to Hofstede (2001; 2013). Unfortunately, this dimension is a new formulation not referenced in Ackerman's (2002) attempt to map web design concepts to the cultural dimensions model. As a result, it is largely unknown how this dimension would manifest in web design.

Table 4

Intercultural Dimensions Index Scores and Ranks (abridged)

	Power Distance		Uncertainty Avoidance		Individualism/ Collectivism		Masculinity/ Femininity		Pragmatism		Indulgence/ Restraint	
Country	**Index**	**Rank**	**Index**	**Rank**	**Index**	**Rank**	**Index**	**Rank**	**Index**	**Rank**	**Index**	**Rank**
Belgium	65	20	94	5-6	75	8	54	22	38[a]	18	57	29-31
Japan	54	33	92	7	46	22-23	95	1	80	4	42	50-52
Mexico	81	5-6	82	18	30	32	69	6			97	2
United States	40	38	46	43	91	1	62	15	29	27	68	16-19
Regions:												
Arab Countries	50	7	68	27	38	26-27	53	23			34	62-63

NOTES:
1 = highest rank whereas the lowest rank is based on the number of countries survived for the given metric.
Pragmatism and Indulgence/Restraint ranks drawn from the extended data set found at http://geerthofstede.eu/research--vsm

a: Based on EMS consumer survey (see Hofstede, 2001, Exhibit 7.3)

(Hofstede, 2001; Hofstede, 2013)

In addition to each of these primary cultural dimensions, each selected cultural group exhibits a high index score and ranking along at least one additional dimension. In this way, the data will be able to shed more light on similarities that may exist between countries as they relate to specific dimensions. For example, data similarities between the United States of America and Belgium may be a result of cultural homogenization, or they may simply be the result of both countries' strong adherence to the individualism dimension. By understanding where these overlaps exist, we will gain a more complete understanding of the data we gather.

Of the six intercultural dimensions identified by Hofstede's research, pragmatism is the only dimension not addressed by this study. This is due in part to the lack of research on this dimension but also because it represents a premise that only sporadically applies to cultures. Evidence of this lack of study and applicability is apparent in the fact that two of the five selected cultures do not have an index score associated with pragmatism. This absence of applicable data would only serve to hinder statistical analysis and place limits on the amount of information apparent from the collected data.

In the conclusion, this study will draw data from a collection of websites spread across five different countries. These countries include the United States of America, Saudi Arabia,

Japan, Belgium, and Mexico. The basis of their selection was a combination of locality and the index scores from Hofstede's cultural dimensions.

Methodological Justification

Research of any sort is a process whereby we rely on the methods employed by the researchers who tackled similar questions in the past. The methodological procedure this study utilizes is a variation of a study conducted by Callahan (2005; 2007). Callahan collected a sample of university websites from a selection of global cultures and utilized quantitative content analysis to identify if design trends existed between cultures. This study will change two aspects of the Callahan study. First, it will look at the websites of restaurants rather than universities. By focusing on restaurants, this study will be observing the design trends of a production industry that must account for the implications and expectations of a greater cross-section of a given cultures demographic makeup. Additionally, as the food service industry functions in much the same manner globally, conduction of this content analysis can occur across several different cultures. Second, an emphasis on restaurants allows for greater possibilities of generalization not just across food services, but also other service industries such as hotels and retailers. Finally, while this study will retain certain metrics of Callahan's original content analysis, most require significant updates to better account for the current evolutionary state of website's design. Given these two changes, this study will be both applicable across cultures and replicable into the future. Discussion on the methods employed by this study occurs in Chapter Three.

CHAPTER THREE

OVERVIEW OF THE METHODS

As introduced in Chapter One and expanded upon in Chapter Two, this study focused on the aesthetic and organizational differences between webpages from a diverse range of cultures. Recall that for the purposes of this dissertation, I use "culture" to mean the acquired mental models of a group, which exist in unique combinations and directly influence an internal and/or external response. Additionally, it is important to note that this study looked at the manifestation of culture as interpreted through the language of website design. In order to examine these differences, this study employed a methodological procedure utilizing quantitative content analysis. Riffe, Lacy, and Fico (2005) define quantitative content analysis as the "systematic and replicable examination of the symbols of communication, which have been assigned numeric values according to valid measurement rules, and the analysis of relationships involving those values using statistical methods, in order to describe communication, draw inferences about its meaning, or infer from the communication to its context both of production and consumption" (p. 25). In other words, content analysis represents a means of studying the symbols of communication, which largely represent qualitative data, quantitatively using counts of frequency. According to Krippendorf (1980), this method of inquiry allows researchers to describe the nature of communication and provides several advantages over questionnaires or interviews. First, content analysis represents an unobtrusive technique as it focuses on recorded communication rather than the elicitation of a response potentially influenced by the moment. Second, content analysis focuses on categorization, which means that unstructured material will still provide meaningful results. Third, content analysis allows for a study of content that is context-based. Fourth, content analysis allows for the study of massive amounts of data.

Given the focus of this study, a methodological procedure based on the research technique of quantitative content analysis will yield the best possible data as well as the most accurate inferences. The remainder of this chapter will focus on research questions and hypotheses, the methodological procedure, the analysis of the data, and the expected study limitations or methodological issues.

Research Questions and Hypotheses

While it is the purpose of a review of relevant literature to draw together even information loosely connected to the topic, it is from the research questions and associated hypotheses that the research draws focus. While the literature may inform our expectations as to the outcome of a study, the hypotheses shape the procedure employed to make the required observations. Based on the literature presented in Chapter Two, this study posited a set of three research questions the first of which is as follows:

RQ_1: In what ways do similarities and differences in cultures manifest in aesthetic and digital design?

From this research question, the study draws focus from the following hypotheses:

H_1: There will be a significant difference between cultural groups in terms of page length.

H_2: There will be a significant difference between cultural groups in terms of navigation structure.

H_3: There will be a significant difference between cultural groups in terms of navigation orientation.

H_4: There will be a significant difference between cultural groups in terms of the number of navigation elements.

H_5: There will be a significant difference between cultural groups in terms of the number of images.

H_6: There will be a significant difference between cultural groups in terms of primary text font size.

H_7: There will be a significant difference between cultural groups in terms of number of available language options.

Each of these hypotheses address a key area of observable website design, or the aesthetic arrangement of website content and the visual cues used to enhance the message (Cyr, Head, & Larios, 2010). These methods employed by cultures to address the aesthetics and organization of web content should show levels of variance between cultures. This idea of variance in website design leads to the second research question, stated as follows:

RQ_2: To what extent is how a culture organizes and designs content in an online environment affected by cultural homogenization?

This secondary research question permits no associated hypotheses, as systematic studies of cultural homogenization – the idea that globalization will reduce cultural differences due to the exposure to and assimilation of outside cultural expectations (Barnett & Eunjung, 2005; Zhao, Massey, Murphy, & Fang, 2003) – do not currently exist. While the current belief is that it is an amalgamation of a variety of related design ideals, there is no indication of where research should focus. However, the process of accepting or rejecting the hypotheses listed above may provide valuable insights into how future research should progress.

RQ_3: To what extent are current theories on the digital manifestation of culture suggestive of observable differences in website design?

The final research question represents an attempt to validate or invalidate the theoretical constructs under which we study digital culture as it manifests with an Internet environment. As such, the data garnered in the course of this study will illuminate the degree to which the current reality of the Internet adheres to the expectations of the models and theories laid out in Chapter Two (see The Models and Theories Associated with the Study of Culture). Utilization of this method of analysis ensures that the foundational concepts used in support of this research serve not merely as a means to a new idea of theory without first determining their contributory applicability to future studies. However, findings garnered from the hypotheses associated with RQ1 and addressing RQ2 contrary to the predictions of the cultural dimensions model (see Cultural Dimensions Model) or cultural cognition theory (see Cultural Cognition Theory) will warrant the creation of a theoretical construct that better accounts for the observed nature of the Internet.

Methodological Procedures

Given the complexity of the methodological procedure employed by this study, it is best to view it in terms of three distinct yet interrelated phases. The first of these phases was the identification of websites representing the selected countries and being of an established consistent type. The second of these phases was the actual procedure for analyzing the aesthetics and organizational components of the websites identified in the first phase. The final phase borrows from both previous phases and consisted of a pretest designed to ensure the study is examining the data as intended.

Website Selection

The first phase of the procedure utilized by this study is the identification of population of websites that are representative of the selected countries and of an established and consistent type. This process of website selection consisted of a three-step process, which included the

identification of a consistent website type, the identification of the population of websites, and the preparation of the selected webpages for study.

The first step in the process of website selection was the identification of a consistent website type. The type of website selected for a study of this nature must represent an aspect of everyday society that functions in a consistent manner globally yet also offers a strong potentiality for cultural expression. Additionally, the societal aspect should not be restricted to any specific gender, age group, or socioeconomic status, and there must be an ample number of examples of this website type in each culture. In the case of Callahan's (2005; 2007) study, this consistent type was university websites. However, as this study seeks to expand upon Callahan's findings and not merely attempt to replicate them, a shift in focus may allow for a greater understanding of culture's role in the design process. Therefore, websites for restaurants will serve as this study's website type as they represent a non-restricted aspect of society, function in a consistent manner globally, allow for cultural expression in design, and exist in numbers sufficient for study.

Given the identification of a consistent website type, the second step was the identification of representative restaurant websites by culture. The utilization of travel guides for each of the selected countries allowed for the rapid and consistent identification of restaurants within a culture. All consulted travel guides were a part of the *Eyewitness Travel Series* (DK Publishing, 2012; DK Publishing, 2013a; DK Publishing, 2013b; DK Publishing, 2014a; DK Publishing, 2014b) and featured extensive lists of popular eateries for each of the countries selected for this study further categorized by price range. A focus on specific geographical regions (see Table 5) within each country allowed for a refinement of the results selected for study inclusion. Unfortunately, the lists of restaurants featured in the travel guides did not

Table 5

Selected Geographical Regions by Country

Country	Geographic Region
Belgium	Brussels
Japan	Tokyo
Mexico	Mexico City
United Arab Emirates	Dubai
United States of America	New York City

indicate the availability of an associated website, so each was the focus of a Google search based on name and location to identify those with a web presence. The basis for study inclusion in the case of each restaurant was the presence of a verifiable homepage

With a population of restaurant websites identified for each target culture, the final step was preparation of the selected websites for study. Prior to beginning this process the resolution of a test monitor was set to a vertical dimension of 768px (see Issues and Limitations). Next, the Google Chrome web browser running at full screen width and height accessed each restaurant homepage and utilized a browser extension called Webpage Screenshot (Stein, 2009) or Fireshot (Fireshot, 2015) to capture a full-page image. The extension then saved a copy of the image to a folder associated with the webpage's corresponding culture. Unfortunately, the Webpage Screenshot extension added a watermark to each captured image, resulting in the addition of bars across the top and bottom of each image. Upon the completion of saving the images of each restaurant homepage, an automated batch process – the consistent application of a sequence of pre-recorded actions to occur on a large collection of files without the need for direct user input - in Adobe Photoshop removed the extraneous watermark from each image and saved the resulting clean files to a new folder group.

This first phase dealt specifically with website selection. At the conclusion of this phase, a set of four databases existed. The first of these databases contained a collection of all the

restaurants identified using the travel guides. The second database contained the web addresses of only those websites having verified homepages. The third database contained the web address of only those websites with verified homepages with a captured image. The third database constituted a population of potential websites for study (see Table 6). Upon completion of this phase, the second phase of the procedure may begin.

Table 6

Identification of Population Websites

	Belgium	Japan	Mexico	UAE	USA
Database 1: Identified Restaurants	45	88	47	60	163
Database 2: Verified Homepages	42	63	34	40	150
Database 3: Verified Homepages with Captured Image	39	54	31	20	139

Procedure

In research, the employed methodological procedure represents the consistent means of assigning each data point a documented and replicable value. This study's procedure allows for the analysis of the webpages identified for inclusion based on organization and design. To achieve this goal a Ph.D. in the field of Communications Media and Instructional Design, in addition to the researcher served as the coders for this study. The outlined procedure consists of the following six-step process.

Step One. Upon reporting for participation in this study, each coder received a digital excel file containing a list of restaurants with matching web addresses and images as well as space to code all the variables for each country group. Each coder verified that there were 15 restaurant websites with matching images in each country group. Each coder also verified the existence of an equal number of restaurants from each of the three indicated price points (five websites for each of the three price points)

Step Two. Starting with the first on the list, the coders opened the linked webpage. Using the open webpage, the coder verified that the restaurant name matched that which appeared on the Excel document. The coder also verified that the open webpage matches the provided image. A website failing to match the provided image warranted substitution from a list of backups.

Step Three. The coder then utilized the provided codebook to record each aspect of the design and content in the Excel document (see Appendix A: Content Analysis Code Book)

Step Four. The coder then double-checked all coded metrics to ensure accuracy.

Step Five. The coder took a short break prior to moving on to the next restaurant on the list.

Step Six. The coder selected the next restaurant on the list and repeated steps two through six taking a longer break after every fifth restaurant until the entirety of the list was complete.

Trial Run and Pretest

In order to ensure the feasibility of the procedure, this study employed both a trial run and a pretest. The trial run consisted of an outside evaluation of the codebook to ensure that it was clear and did not require any additional modification. The primary purpose of the pretest was to familiarize the coders with the outlined procedure and the codebook they were to use. Given both coders experience with conducting content analyses a short training session centered primarily around gaining an understanding of the codebook and the codes. After the training session each of the coders worked through the process of coding a small subset of three restaurant web pages chosen at random for each of the five countries. The results garnered during this pretest informed how the procedure and codebook required modification to method or clarity. In the event that significant changes altered the procedure or codebook, the coders sat through an updated training session and worked through a secondary pretest. The results drawn

from the pretest data informed an assessment of intercoder reliability. The rate of agreement between the coders must be .70 or greater in order to establish reliability.

Methodological Updates

The trial run and pretest of the codebook revealed a number of small flaws to the construction of the codebook, which warranted correction prior to continuing on to the study. First, a number of minor updates to the coding descriptions ensured greater clarity as to how to correctly code given a variety of different scenarios encountered during the pretest. For example, one website had a Facebook widget that displayed the restaurants "friends" using their user image. As such, widgets (such as Facebook, Twitter, Google Maps, etc) were excluded with the exception of Instagram, which as a photo sharing application better fit the overall theme of the restaurant website. Second, the coding of the vertical page height, page orientation, and dominant interface color were removed from the hands of the coders and made an automated process. Following the pre-test it was determined that pre-recording these values would drastically reduce errors and simplify an already complex process resulting in a decrease in coder fatigue. Additionally, as these values were already being coded by the computer (in the case of vertical page height and page orientation) and by an application by the name of Color Thief (Dhakar, 2011) (in the case of dominant interface color) there was no need to recode these values.

Data Analysis

The data collected for this study consisted primarily of ordinal and interval level data. A comparison of these descriptive statistics across the range of independent variables required a combination of chi-square analyses and type I analyses of variance (ANOVA) as dictated by the specific data collected by each hypothesis. The acceptable alpha level for this research was $\leq .05$, as this is the conventional level required for establishing significance in communication research.

Issues and Limitations

Research is never free of methodological issues or study limitations. For this study, the primary limitation was one of scope as it was impossible to study the entirety of the Internet with any rigor or depth over the course of a single study. For this reason, the results and conclusions drawn from the collected data are limited and incomplete. Additionally, while research studies of this type do exist, the methods they employ to study culture as manifested in an Internet environment are highly experimental leading to some concern for the potentiality of type I and type II errors.

In addition to the presented limitations of this study, there are also some minor methodological issues of note. The first of these deals with the concept of the digital divide or the lack of access to digital communication technology among the disenfranchised (Barmann as cited by Baran & Davis, 2006). While the countries targeted by this study either innovated Internet technology (the United States of America), or emerged from behind the digital divide in the wave of first world adoption, there still exists a technological divide between them. Consider the following, two men go and buy a router that allows them access to the Internet. Both men take their routers home and connect them successfully, but the first man further modifies his router's settings to better utilize his limited bandwidth. Both men now have a connection to the Internet but the first man's additional modifications create a technological divide between their abilities. Unlike the digital divide which specifies a binary state of has or has not, the technological divide elucidates a quantum state of capabilities and capacities. Thus, a potential limitation is a difference in the Internet connections within a set cultural group or country. At this time, these differences are indeterminable.

The second of these deals with the dynamic nature of the Internet. Unlike the study of textual (e.g. newspapers) or visual (e.g. television commercials) materials, the Internet constantly

changes at a rate that cannot be easily predicted. Given this potentiality for change, it is possible that the data as collected is not representative of the website into the future. As a result, one should approach this research as a snapshot in time rather than a representation of future realities. The third of the identified issues deals with inclusionary/exclusionary practices facilitated by web technology. By using readily available and easily implemented snippets of code, web developers can make educated guesses as to which content to present to any given user based on their location or their browser's default language. Unfortunately, the extent to which this practice exists on the Internet is unknown as the visiting user is in most cases unaware any profiling occurred. As the ability to negate this issue is limited, the data will indicate websites suspected of utilizing this technique.

The final identified issue deals with set height minimums for the studied web pages. The height of a webpage is the measurement from the top to the bottom of the content. However, in the event that the height of the webpage is less than the vertical measurement of the viewer (ex. a standard desktop computer monitor), the height of the webpage is set equal to the viewer's vertical measure. In order to minimize the impact that this set minimum measure may have on the data the vertical measure of the viewer used to collect this height information will be set to 768px. This vertical measure represents both the most common vertical measure for desktop monitors globally at 41% (StatCounter, 2014a), and the smallest vertical measure of the most popular desktop monitors. Additionally, it is representative of the most common vertical measures in each of the countries targeted by this study (see Table 7). These three issues are representative only of expectations prior to conduction of the study and analysis of the results. Any additional issues discovered over the course of this study will necessitate further discussion in Chapter Five.

Table 7

Most Popular Vertical Monitor Resolution by Country

Country	Most popular vertical monitor resolution
Belgium	768px (26.93%)
Japan	768px (28.74%)
Mexico	768px (48.89%)
United Arab Emirates	768px (53.72%)
United States of America	768px (31.16%)

(StatCounter, 2014b)

Study limitations and methodological issues are a facet of any research endeavor. While the limitations are unavoidable in most cases, the implementation of adjustments or minimization can often address the methodological issues. While those issues presented for this study in many ways represent the inescapable reality of Internet based research of this scope, each has undergone a process of minimization to limit the impact they may have on the collected data.

Conclusion

Through the careful and consistent utilization of the outlined methodological procedure, this study seeks to address each of the specified research questions and their associated hypotheses. While study limitations and methodological issues do exist, their potential to influence the collected data is minimal. Finally, the analysis of all collected data will meet the standards of consistency and rigor required of communications research. Chapter Four presents a thorough analysis of all data collected using the methodological procedures outlined in this chapter.

CHAPTER FOUR

ANALYSIS OF THE DATA

As discussed in the previous three chapters, this study focuses on the aesthetic and organizational differences in the design of webpages from a variety of different cultures. This chapter features an analysis of the data collected through the course of this study as it relates only to the first research question and associated hypotheses. A discussion of the results relating to the second and third research questions will be addressed in Chapter Five. Analysis of all the collected data required the following set of software packages:

Microsoft Excel served as the primary data collection tool for the content analysis portion of this study. Additionally, it aided in data collation and statistics validation to ensure that the data ported to SPSS was correct and complete.

IBM SPSS (v. 22) assisted in the calculation and analysis of all statistics.

Google Chrome allowed for an analysis of webpage code and assisted in the determination of values existing within the web page style sheets such as font-size.

Color Thief is the application that assisted in the analysis of dominant web page colors (Dhakar, 2011). Using an image, the tool captures the pixel data to evaluate color composition producing a red, green, and blue color value of the dominant color.

Cinema 4D is a 3D modeling and animation program that assisted in the visual analysis of complex color data. As the representation of color is a three-dimensional variable consisting of red, green, and blue color values, the most effective means of analysis is within a three-dimensional space.

In order to ensure the accuracy of all analyzed data each value was not only double checked for accuracy during transfer between programs, but mirrored analysis between applications ensured proper analysis. Upon importation of all data and the completion of all checks, a series of analyses assessed intercoder reliability and performed hypothesis testing as discussed throughout the remainder of this chapter.

Assessing Intercoder Reliability

In research utilizing a content analysis methodology and more than one coder, the degree of agreement in coded responses between the coders evaluates the "internal consistency of a measure" (Reinard, Introduction to communication research, 2008, p. 119). In the case of intercoder reliability, this internal consistency deals with the frequency with which two different people code the same item in the same way. In this study, an assessment of intercoder reliability occurred following both the pretest and the study.

Pretest

The pretest consisted of coding a small subset of three restaurant web pages chosen at random for each of the five countries. In total, the examination of these 15 restaurant websites resulted in 120 ratings across eight separate categories. Using a counting method to determine the number of agreements and disagreements between the individual coders produces and overall reliability of 0.85 (see Table 8). This method of assessing reliability, however, fails to provide categorical and frequency adjustments producing an imprecise estimation of agreement (Reinard, 2006). Cohen's Kappa allows for a more precise indication of intercoder reliability and when applied to the data generated by the coders produced a measure of agreement value of 0.77 (see Table 9). Reinard (2006) considers this value to be of "fair reliability" and is a level acceptable for this study (see Chapter Three) (p. 121).

Table 8

Pretest Intercoder Reliability by Country

	Agreement	Disagreement	Total	Agreement
Belgium	20	4	24	0.83
Japan	23	1	24	0.96
Mexico	21	3	24	0.88
UAE	17	7	24	0.71
USA	21	3	24	0.88
Total	102	18	120	**0.85**

Table 9

Cohen's Kappa for Pretest Intercoder Reliability

	Value	Asymp. Std. Error	Approx. Sig.
Measure of Agreement	0.77	0.05	.000
Valid Cases	120		

Study

The study consisted of coding a subset of 15 restaurant web pages chosen at random for each of the five countries. In total, the examination of these 75 restaurant websites resulted in 600 ratings across eight separate categories. The counting method utilized in assessing the intercoder reliability in the pretest produced an overall reliability of 0.87 (see Table 10).Utilization of Cohen's Kappa generated a measure of agreement value of 0.82 (see Table 11). Reinard (2006) considers this value to be of "good reliability" (p. 121). Given the acceptable level of reliability suggested in the results generated by Cohen's Kappa, the coders worked together to come to a consensus on all values over which there was disagreement as suggested by Frey, Botan, and Kreps (2000).

Table 10

Study Intercoder Reliability by Country

	Agreement	Disagreement	Total	Agreement
Belgium	104	16	120	0.87
Japan	99	21	102	0.82
Mexico	108	12	120	0.9
UAE	106	14	120	0.88
USA	103	14	120	0.88
Total	523	77	600	**0.87**

Table 11

Cohen's Kappa for Study Intercoder Reliability

	Value	Asymp. Std. Error	Approx. Sig.
Measure of Agreement	0.82	0.02	.000
Valid Cases	600		

Hypothesis Testing

At the heart of all quantitative and qualitative research are the statistical trends supporting or refuting research questions and the acceptance or rejection of null hypotheses. This study advances a set of seven hypotheses in order to support or refute a series of three research questions (see Chapter Three). Using associated data, each of these hypotheses underwent a battery of accepted statistical tests to determine a measure of the level of significance between dependent and independent variables. As previously discussed, the acceptable alpha level for this research is $\leq .05$, as this is the conventional level required for establishing significance in communication research.

Hypothesis One

The first hypothesis posited the existence of a difference between cultural groups in terms of total webpage length. Images of each webpage provided a vertical page measurement in

pixels (see Chapter Three). The mean values for page height exist in a range between 1285.07px (UAE) and 1656.67 (Belgium) (see Table 12). A one-way analysis of variance suggested that no statistical significance exists between country group and webpage height ($F_{[4, 70]} = 0.174$, $p > .05$) leading to an acceptance of the null hypothesis (see Table 13). As such, stating the first hypothesis should take the following form:

H0: There is no difference among cultural groups in terms of webpage length.

Table 12

Descriptive Statistics for Page Height by Country

Country	**N**	$\bar{x}$	σ	**Range**		**SE**
				Min.	**Max.**	
Belgium	15	1656.67	2578.94	667	10883	665.88
Japan	15	1636	707.9	667	3382	182.78
Mexico	15	1362.53	1452.14	667	6346	374.94
UAE	15	1285.07	667.19	667	3174	174.85
USA	15	1462.87	1359.39	667	5683	350.99
Total	75	1480.63	1486.68	667	10883	171.67

Table 13

One-way ANOVA for Page Height by Country

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1614541.81	4	403635.45	0.174	.951
Within Groups	161942455.7	70	2313464.65		
Total	163556997.5	74			

Hypothesis Two

The existence of a difference between cultural groups in terms of navigation structure formed the basis of hypothesis two. To determine menu structure the coder identified the primary navigation element. Complex navigations featured drop-down or slide out menus, whereas simple navigations contained only links to other pages. In the event that a web page did

not have a navigation, the coder made note of its absence. A cross tabulation indicates the difference between the observed and expected frequency for each navigation structure by country (see Table 14). Using the collected data, a Chi Squared Analysis suggests that no statistical significance exists between cultural group and navigation structure ($\chi^2_{[8]}$= 11.25, p > .05) leading to an acceptance of the null hypothesis (see Table 15). As such, the second hypothesis should take the following form:

H0: There is no difference among cultural groups in terms of navigation structure.

Table 14

Cross Tabulation for Navigation Structure by Country

		Navigation Structure			
		Complex	Simple	None	Total
Belgium	Observed	1	13	1	15
	Expected	3	11.8	0.2	15
Japan	Observed	1	14	0	15
	Expected	3	11.8	0.2	15
Mexico	Observed	3	12	0	15
	Expected	3	11.8	0.2	15
UAE	Observed	4	11	0	15
	Expected	3	11.8	0.2	15
USA	Observed	6	9	0	15
	Expected	3	11.8	0.2	15
Total	Observed	15	59	1	75

Table 15

Chi-Square Analysis for Navigation Structure by Country

	Value	df	Asymp. Sig (2-sided)
Pearson Chi-Square	11.25	8	.188
Likelihood Ratio	10.73	8	.217
Valid Cases	75		

Hypothesis Three

The third hypothesis advanced the idea that a difference would exist between cultural groups in terms of menu orientation. To determine menu orientation, the coder identified the primary navigation element (as in the case of hypothesis two). Values of horizontal and vertical indicated menus that spanned the width of length of the screen respectively while hybrid described any navigation that did not fall into either of the other categories. In the event that a web page did not have a navigation, the coder made note of its absence. A cross tabulation indicates the difference between the observed and expected frequency for each navigation orientation by country (see Table 16). Using the collected data, a Chi Squared Analysis suggests that no statistical significance exists between cultural group and navigation orientation ($\chi^2_{[12]}$ = 18.61, p > .05), leading to an acceptance of the null hypothesis (see Table 17). As such, the third hypothesis should take the following form:

H0: There is no difference among cultural groups in terms of navigation orientation.

Table 16

Cross tabulation for Navigation Orientation by Country

		Navigation Orientation				
		Horizontal	Vertical	Hybrid	None	Total
Belgium	Observed	4	9	1	1	15
	Expected	9	4.8	1	0.2	15
Japan	Observed	9	5	1	0	15
	Expected	9	4.8	1	0.2	15
Mexico	Observed	10	4	1	0	15
	Expected	9	4.8	1	0.2	15
UAE	Observed	14	1	0	0	15
	Expected	9	4.8	1	0.2	15
USA	Observed	8	5	2	0	15
	Expected	9	4.8	1	0.2	15
Total	Observed	45	24	5	1	75

Table 17

Chi-Square Analysis for Navigation Orientation by Country

	Value	df	Asymp. Sig (2-sided)
Pearson Chi-Square	18.61	12	.098
Likelihood Ratio	19.63	12	.074
Valid Cases	75		

Hypothesis Four

The existence of a difference between cultural groups in terms of the number of navigation elements formed the basis of hypothesis four. To determine the number of navigation elements, the coder identified the primary navigation element (as in the case of hypotheses two and three) and counted the number of available links. In the cases involving navigation structures that were complex or hybridized, all menu items including those within the dropdown menus constituted the total count. The mean recorded number of navigation elements fell in range between 7.4 options (Mexico) and 9.4 options (USA) (see Table 18). A one-way analysis of variance suggested that no statistical significance existed between the values of cultural group and number of navigation elements ($F_{[4, 70]} = 0.456$, $p > .05$), leading to an acceptance of the null hypothesis (see Table 19). Therefore, the fourth hypothesis should take the following form:

H0: There is no difference among cultural groups in terms of the number of menu navigation elements.

Table 18

Descriptive Statistics for Number of Navigation Elements by Country

Country	**N**	$\overline{x}$	σ	**SE**
Belgium	15	7.47	5.07	1.31
Japan	15	8.8	6.51	1.68
Mexico	15	7.4	4.2	1.14
UAE	15	7.93	4.8	1.24
USA	15	9.4	3.85	0.99
Total	75	7.91	4.27	0.49

Table 19

One-way ANOVA for Number of Navigation Elements by Country

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	45.733	4	11.433	0.456	.768
Within Groups	1756.27	70	25.09		
Total	1802	74			

Hypothesis Five

The fifth hypothesis presented the idea that a difference would exist between cultural groups in terms of number of images. While counting the number of images on a page may seem to be a relatively simple task, the pre-test pointed out a number of small flaws in the prescribed process, namely the identification of what is an image and what is not. A number of clarifications to this metric ensured the assessment of the number of images on a page without over or under inflating the recorded value (see Chapter Three). The mean recorded values for number of images existed in a range between 5.33 (Belgium) and 10.87 (Mexico) (see Table 20). A one-way analysis of variance suggested that no statistical significance existed between the values ($F_{[4, 70]} = 0.737$, $p > .05$) leading to an acceptance of the null hypothesis (see Table 21). Given the lack of significant results, the fifth hypothesis should take the following form:

H0: There is no difference between cultural groups in terms of the number of images.

Table 20

Descriptive Statistics for Number of Images by Country

Country	**N**	$\overline{x}$	σ	**SE**
Belgium	15	5.33	11.38	2.94
Japan	15	9.27	8.01	2.07
Mexico	15	10.87	10.15	2.62
UAE	15	7.13	6.44	1.66
USA	15	10	13.38	3.46
Total	75	8.52	10.10	1.17

Table 21

One-way ANOVA for Number of Images by Country

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	304.99	4	76.25	0.737	.570
Within Groups	7241	70	103.45		
Total	7546.72	74			

While the recorded values failed to produce a significant result, an analysis of the standard deviation (σ) suggests that some of the collected data may lay far outside the normal distribution resulting in a skew to the data. Winsoring data is a method of addressing non-normal distributions by removing the highest and lowest values and recalculating with only those values that remain. While this method can "overcome the problem of heterogeneous variances" (Reinard, 2006, p. 154), it can suggest misleading results due to the fact that the dismissed values do actually account for a variability that simply cannot be explained given the sample. It is for these reasons that as a means of statistical analysis the general perception is that it lacks power. Given these limitations, the removal of the highest and lowest values for number of images across each cultural group does have an interesting result on the descriptive data as it drastically changes the mean number of images to a range between 2.54 (Belgium) and 9 (Mexico), and reduces the variability in the standard deviations between cultural groups (σ) (see Table 22). A

one-way analysis of variance suggested that a statistically significant result exists between the winsorized values ($F_{[4, 60]} = 3.31$, $p < .05$) (see Table 23). A Bonferroni multiple comparisons test revealed significant differences in the number of images between Belgium and Japan ($\overline{\chi}_{diff} = 6.078$, $p < .05$) and Belgium and Mexico $\overline{\chi}_{diff} = 6.46$, $p < .05$) which would normally allow for a rejection of the null hypothesis were it not for the winsorization of the data (see Table 24). This finding will warrant further discussion in Chapter Five.

Table 22

Descriptive Statistics for Winsorized Number of Images by Country

Country	**N**	$\overline{x}$	σ	**SE**
Belgium	15	2.54	1.81	0.5
Japan	15	8.62	6.74	1.87
Mexico	15	9	5.02	1.39
UAE	15	6.62	5.58	1.55
USA	15	7.23	5.02	1.39
Total	75	6.69	5.4	0.67

Table 23

One-way ANOVA for Winsorized Number of Images by Country

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	344.71	4	86.18	3.311*	.016
Within Groups	1561.69	60	26.03		
Total	1906.4	64			

Table 24

Bonferroni Test for Winsorized Number of Images by Country

Country[a]	Country[b]	Mean Difference	SE	Sig.
Belgium	Japan	-6.08*	2	.035
	Mexico	-6.46*	2	.02
	UAE	-4.08	2	.460
	USA	-4.69	2	.224
Japan	Belgium	6.08*	2	.035
	Mexico	-0.39	2	1.000
	UAE	2	2	1.000
	USA	1.39	2	1.000
Mexico	Belgium	6.46*	2	.02
	Japan	0.39	2	1.000
	UAE	2.39	2	1.000
	USA	1.77	2	1.000
UAE	Belgium	4.08	2	.460
	Japan	-2	2	1.000
	Mexico	-2.39	2	1.000
	USA	-0.62	2	1.000
USA	Belgium	4.69	2	.224
	Japan	-1.39	2	1.000
	Mexico	-1.77	2	1.000
	UAE	.62	2	1.000

Hypothesis Six

The sixth hypothesis postulated that a difference would exist between cultural groups in terms of primary text size. To determine primary text size the coder identified a full paragraph of text, then, using the "inspect element" tool to view the underlying code found the cascading style sheet entry corresponding to "font-size". The mean recorded values for font-size existed in a range between 12.64 (USA) and 15.4 (Belgium) (see Table 25). A one-way analysis of variance suggested that no statistical significance existed between the values ($F_{[4, 44]} = 1.249$, $p > .05$), leading to an acceptance of the null hypothesis (see Table 26). Given the lack of significant results, the sixth hypothesis should take the following form:

H0: There is no difference among cultural groups in terms of primary text font size.

Table 25

Descriptive Statistics for Font Size by Country

Country	**N**	$\overline{x}$	σ	**SE**
Belgium	10	15.4	3.1	.98
Japan	9	13.67	2.74	.91
Mexico	6	14.17	.753	0.31
UAE	13	14.65	4.46	1.24
USA	11	12.64	1.36	0.41
Total	49	14.11	3.07	0.44

Table 26

One-way ANOVA for Font Size by Country

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	46.16	4	11.54	1.25	.304
Within Groups	406.47	44	9.24		
Total	452.63	48			

While the data does not suggest a significant difference in font size between countries, it is interesting to note that 35% of the sampled webpages did not feature a paragraph of text. Given this observation, a cross tabulation indicated the differences between the observed and expected frequency with which paragraphs of text were present or absent from the webpages in the sample by cultural group (see Table 27). Using the data, a Chi-Squared analysis suggests that no statistical significance exists between cultural group and paragraph presence ($\chi^2_{[4]}$ = 7.89, p > .05) (see Table 28). These findings will warrant further discussion in Chapter Five.

Table 27

Cross Tabulation for Paragraph Presence by Country

		Paragraph Presence		
		Present	Absent	Total
Belgium	Observed	10	5	15
	Expected	9.8	5.2	15
Japan	Observed	9	6	15
	Expected	9.8	5.2	15
Mexico	Observed	6	9	15
	Expected	9.8	5.2	15
UAE	Observed	13	2	15
	Expected	9.8	5.2	15
USA	Observed	11	4	15
	Expected	9.8	5.2	15
Total	Observed	49	26	75

Table 28

Chi-Square Analysis for Paragraph Presence by Country

	Value	df	Asymp. Sig (2-sided)
Pearson Chi-Square	7.89	4	.096
Likelihood Ratio	8.15	4	.086
Valid Cases	75		

Hypothesis Seven

The final hypothesis posited that there would be a difference among cultural groups in terms of number of available language options. As the webpages must have at least one display language, the mean number of language options existed in a range between 1 (USA) and 2.4 (Belgium) (see Table 29). A one-way analysis of variance suggests that a statistically significant difference exists within the evaluated groups ($F_{[4, 70]} = 9.957$, $p < .001$) (see Table 30). A Bonferroni multiple comparisons test revealed significant differences in the number of available language options between Belgium and Mexico ($\overline{\chi}_{diff} = 1.33$, $p < .001$), Belgium and the UAE ($\overline{\chi}_{diff} = 1.4$, $p < .001$), Belgium and the USA ($\overline{\chi}_{diff} = 1.53$, $p < .001$), Japan and the UAE

($\overline{\chi}_{diff}$= 0.8, p < .05), and Japan and the USA ($\overline{\chi}_{diff}$= 0.93, p < .01), thus allowing for a rejection of the null hypothesis (see Table 31). Given these findings, the seventh hypothesis should take the following form:

H7: There will be a significant difference between cultural groups in terms of the number of available language options.

Table 29

Descriptive Statistics for Number of Languages by Country

Country	**N**	$\overline{x}$	σ	**SE**
Belgium	15	2.53	.92	0.24
Japan	15	1.93	1.22	0.11
Mexico	15	1.2	0.41	0.11
UAE	15	1.13	0.35	0.09
USA	15	1	0	0
Total	75	1.56	0.92	0.11

Table 30

One-way ANOVA for Number of Languages by Country

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25.68	4	6.42	12.212*	.000
Within Groups	36.8	70	.53		
Total	62.480	74			

Table 31

Bonferroni Test for Number of Languages by Country

Country[a]	Country[b]	Mean Difference	SE	Sig.
Belgium	Japan	0.6	0.265	.265
	Mexico	1.33*	0.265	.000
	UAE	1.4*	0.265	.000
	USA	1.53*	0.265	.000
Japan	Belgium	-0.6	0.265	.265
	Mexico	0.73	0.265	.072
	UAE	0.8*	0.265	.035
	USA	0.93*	0.265	.008
Mexico	Belgium	-1.33*	0.265	.000
	Japan	-0.73	0.265	.072
	UAE	0.07	0.265	1.000
	USA	0.2	0.265	1.000
UAE	Belgium	-1.4*	0.265	.000
	Japan	-0.8*	0.265	.035
	Mexico	-0.07	0.265	1.000
	USA	0.13	0.265	1.000
USA	Belgium	-1.53*	0.265	.000
	Japan	-0.93*	0.265	.008
	Mexico	-0.2	0.265	1.000
	UAE	-0.13	0.265	1.000

Conclusion

The analysis of data serves as a logical conclusion to the collection of data. The analysis of the data garnered through the methodology discussed in Chapter Three fell into the categories of intercoder reliability assessment and hypothesis testing. Overall reliability between coders exceeded the minimum set standard and the hypothesis testing generated results that suggest a variety of implications. Chapter Five presents a summary of these implications and conclusions that extend from these statistical values as well as an evaluation of limitations and suggestions for future research.

CHAPTER FIVE

SUMMARY IMPLICATIONS AND CONCLUSIONS

This study represents a focus on the aesthetic and organizational differences in the design of webpages from a variety of different cultures. To this end, the focus of Chapter Four related to the analysis of the data collected through the course of the study, while the present chapter seeks to expand upon this analysis by considering the implications of the findings and presenting a discussion on how they fit into the broader literature. Additionally, this chapter discusses the limitations inherent to this study and suggestions for future research with the intention of propelling the conversation and study of this topic in a forward direction.

Summary Discussion and Implications

At the heart of this study sits a singular question as to the role of culture on the design of the World Wide Web. For the purposes of this study, the definition of culture is the acquired mental models of a group, which exist in unique combinations and directly influence an internal and/or external response. The literature on this topic as it relates to webpage design (as discussed in Chapter Two) paints two very different pictures concerning the manifestation of culture. On one side is the argument that webpages represent societal norms and therefore their individual cultures. However, on the other side, is the idea that the Internet is a globalizing medium and therefore represents a globalized idea of culture. The interesting aspect of this argument is that both sides agree that culture exists on the World Wide Web and disagree only on the level of variability, making the answer a matter of perception. To answer this question, this study used a content analysis, a method of study rooted in the utilization of perception, to identify elements of webpage design (see Chapter Three). The data garnered in pursuit of addressing the hypotheses drawn from the research questions (see Chapter Four) suggest a mixed view as to the role of culture in an Internet environment. A discussion as to the implications of

these findings follows from each of the three research questions presented as the foundational ideas of this study.

Research Question One

The first research question of this study explores the existence of variability between cultures as evidenced in the design of the websites they produce. The choice to examine design over the other aspects of webpage creation (i.e. language utilization or code construction) represents two realities of conducting research of this type. First, the study of language in any capacity is particularly difficult and is made more so when performing a comparison analysis. Like trying to explain color to an individual without the ability to see, understanding language requires an innate understanding of context, connotation, and denotation that may simply not translate outside of that language. For example, there is a concept in Korean culture called 'nunchi' (눈치), which translates to "eye-measure," but for which there is no simple English explanation as it draws together a myriad of different culturally charged ideas. Second, while culture garners significant attention from researchers, very few studies look at the manifestation of culture as seen through a lens focused solely on elements of design. Given these realities, the first research question is as follows:

> RQ1: In what ways do similarities and differences in cultures manifest in aesthetic and digital design?

This research question is perhaps the most important in this study because it questions the extent to which cultural homogenization exists (Barnett & Eunjung, 2005; Zhao, Massey, Murphy, & Fang, 2003). A number of hypotheses focus this research question by measuring the degree of difference between that exists cultural groups. By themselves, each hypothesis targets

a specific aspect of aesthetics or design, and together present a response based in evidence to the first research question.

The first hypothesis. This hypothesis posited the existence of a difference between cultural groups in terms of page length. While page length is not a standard aspect of webpage design, it is representative of canvas size. The idea of canvas size is significant because adding content to a webpage by default increases page length. As such, greater page length generally equates to more page content. However, the collected data suggests that there is no statistically significant difference between cultural groups and page length ($F_{[4, 70]} = 0.174$, $p > .05$).

While the data does not allow for the rejection of the null hypothesis in this case, several of the data points are very interesting. For example, while the mean page length for each country is similar, the range in values varies considerably (see Chapter Four Table 13 and Figure 7). This variability in page length within cultures points to a number of fundamental problems with the first hypothesis. The first of these problems is that page length does not account for page construction. Consider an assignment to write papers on five separate topics. An individual completing this assignment could write five separate papers or they could write a single paper with five separate sections. The majority of the websites included in this study opted to use separate pages for different types of information (i.e. menus, locations, and news), whereas the outliers in the data opted to utilize a single page with sections devoted to different types of information. Interestingly, if the outliers utilizing the single page design are removed from the data (Belgium [1], Mexico [1], and USA [2]), then the difference in page lengths between cultures is significant ($F_{[4, 66]} = 3.805$, $p > .01$). A Bonferroni multiple comparisons test suggests this difference exists between Belgium and Mexico ($\overline{\chi}_{diff} = 638.36$, $p < .05$), Mexico and Japan ($\overline{\chi}_{diff} = 629.43$, $p < .05$), and Mexico and the USA ($\overline{\chi}_{diff} = 641.62$, $p < .05$). While this finding

is interesting, it still represents an incomplete understanding of the issues surrounding the first hypothesis. A second fundamental problem with the first hypothesis is, quite simply, that the assumption that page length is proportional to page content is erroneous, as it does not consider the impact of information density. For example, one coder indicated that the Japanese websites were particularly difficult to code simply because there was so much information on each page.

Given the identified issues, the implications surrounding this hypothesis are difficult to assess. While the lack of significant findings garnered from the data as collected would suggest

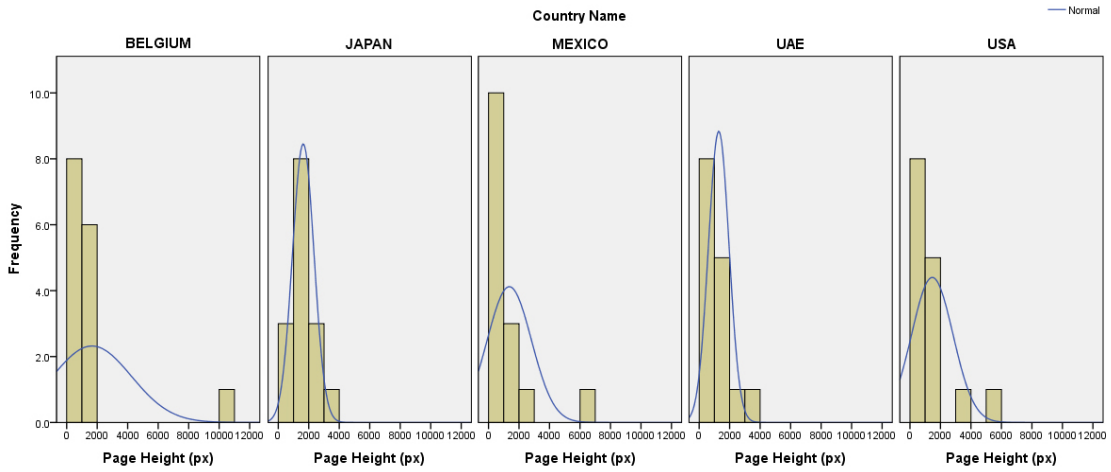


Figure 7: Comparison histograms of page length by cultural group.

that each cultural group tends toward a similar average page length, the variability in the rage of page lengths suggests the presence of extraneous variables too potentially important to ignore. Furthermore, while the removal of pages featuring a differing design does speak to a potential for significant difference, it is methodologically unreasonable to remove data simply because it features an unforeseen design philosophy. However, the implications of two differing designs does raise some interesting implications for page design, namely, the potential for an emerging design type and a population within which to assess its longitudinal penetration into wide use across cultures (see Suggestions for Future Research).

The second hypothesis. This hypothesis posited the existence of a difference between cultural groups in terms of navigation structure (referred to as navigation complexity in the codebook). For the purposes of this study, the primary navigation represents a group of navigation elements consisting of options related to the restaurant. As a metric of evaluation, the primary navigation structure fell into three categories:

Complex navigation structures consisted of elements arranged within multiple levels typified by the presence of dropdown or slide out menus.

Simple navigation structure consisted of elements arranged within a single level.

None was a category that indicated the absence of any primary navigation elements.

The design of these three categories draws inspiration from Songergaard (1994) and Ackerman's (2002) work attempting to graft concepts of web design onto the cultural dimensions model (see Application of the Cultural Dimensions Model). For example, according to Ackerman, societies exhibiting a high degree of uncertainty avoidance will tend toward simple navigation structures featuring a limited number of options while societies exhibiting a low degree of uncertainty avoidance will tend toward complex navigation structures with multiple choices. Despite supporting the literature, the collected data suggests that there is no statistically significant difference between cultural groups and navigation structure ($\overline{\chi}^2_{[8]} = 11.25$, $p > .05$).

While the results of the statistical analysis suggest all the cultural groups studied tend to have a similar navigation structure, there are a number of interesting implications to the collected data. For example, a comparison of the recorded values garnered by this study (see Table 14) and Ackerman's (2002) predictions concerning cultural manifestations related to navigation considering level of cultural uncertainty avoidance does present evidence suggestive of a potential connection (see Table 32). However, given the small sample size of this study and lack of statistical significance this connection may merely be a coincidence (see Suggestions for Future Research).

Table 32

Uncertainty Avoidance and Navigation Structure by Country

	Uncertainty Avoidance		Navigation Structure		
	Index	Rank	Simple	Complex	None
Belgium	94	5-6	13	1	1
Japan	92	7	14	1	0
Mexico	82	18	12	3	0
UAE	68	27	11	4	0
USA	46	43	9	6	0

The third hypothesis. Expanding upon the second hypothesis, this posits the existence of a difference between cultural groups in terms of navigation orientation. As a metric of evaluation, the primary navigation orientation fell into four categories:

Horizontal navigation orientations were those in which the arrangement of the primary navigation elements extended from left or right across the interface.

Vertical navigation orientations were those in which the arrangement of the primary navigation elements extended up or down the interface.

Hybrid navigation orientations were those that were of an atypical configuration that was neither horizontal nor vertical or represented some combination of the two.

None was a category that indicated the absence of any primary navigation elements.

Inclusion of an evaluation of primary navigation orientation is on the surface a measure of cultural preference. As such, the collected data suggests that there is no statistically significant difference between cultural groups and navigation orientation ($\overline{\chi}^2_{[12]}$ = 18.61, p > .05). However, if we consider this hypothesis as an illumination of cultural preference and narrow the focus to one of partiality to vertical or horizontal navigation orientations, we find that there is a statistically significant difference between cultural groups ($\overline{\chi}^2_{[4]}$ = 12.349, p < .05). In this narrowing of the data, we see that Belgium tends toward vertical navigations while each other country tends toward horizontal navigations to varying degrees (see Figure 8). While this finding does represent an interesting analysis of the data, it is important to note that it also cuts 8% of the collected sample simply because it does not conform. Since no data collected in the course of an investigation, particularly one of an exploratory nature such as this one, is without merit this should enter consideration only as an ancillary observation.

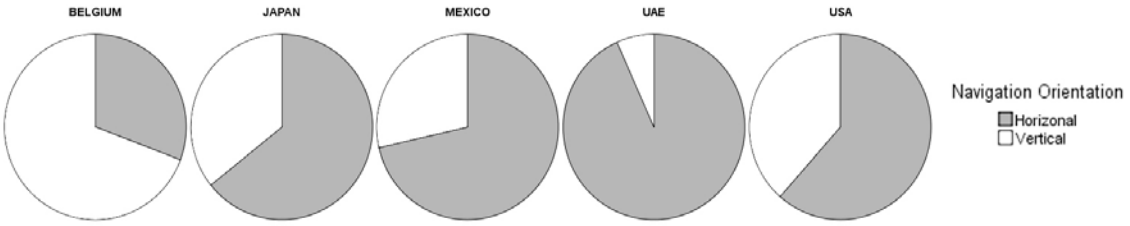


Figure 8: Comparison charts for navigation orientation by cultural group.

The implications of the findings of this hypothesis are two-sided. On one hand, the presence of a non-significant result suggests that there is no real difference between cultures in terms of navigation orientation. Given that this is the focus of the hypothesis, all other manipulations to the data represent mere speculation. On the other hand, the preferences

illuminated by the data are difficult to overlook. For example, 99% of the sample prefers some form of navigation, and 92% prefers that navigation be oriented horizontally or vertically. While this finding may not encapsulate the rigors of scholarly data analysis, it is at the very least, a finding that could influence the web design industry as a metric related to culturally targeted design. As such, the dichotomous nature of this finding may simply be an exploration of the differences between the ideals of academia and industry regarding data analysis.

The fourth hypothesis. Another expansion upon the second hypothesis, this posits the existence of a difference between cultural groups in terms of the number of navigation options. This hypothesis extends from the idea that the number of presented navigational options may be a component of culture. According to Ackerman (2002), masculine societies will tend toward synchronic navigation options featuring few choices, while feminine societies will favor polychromic navigation options featuring multiple choices. Despite supporting the literature, the collected data suggests that there is no statistically significant difference between cultural groups and number of navigation options ($F_{[4, 70]} = 0.456$, $p > .05$).

Much like the implications presented for the third hypothesis, the collected data for this hypothesis has applications to both academia and the web design industry. In terms of the academic applications for the data, the lack of significant results does make a case for some level of cultural homogenization. Furthermore, an analysis of the mean number of navigation options as compared to the masculinity/femininity index for each country does not support the assertion by Ackerman (2002) concerning the existence of a difference in this metric between cultural groups (see Table 33). The implications for industry in this case provide a degree of clarity. While there are outliers in the data, the mean number of navigation options in all cases rests between 7.4 (Mexico) and 9.4 (USA) suggesting that the optimal number of navigation elements

for each of the cultures included in this study is 8±1 (see Figure 9). However, an accepted range of navigation options without an indication as to the similarities or differences in the destination information encapsulated by said options is of limited value (see Suggestions for Future Research).

Table 33

Masculinity/Femininity and Navigation Options by Country

	Masculinity / Femininity		$\overline{x}$ Navigation Options
	Index	Rank	
Japan	95	1	8.8
Mexico	69	6	7.4
UAE	62	15	7.93
Belgium	54	22	7.47
USA	53	23	9.4

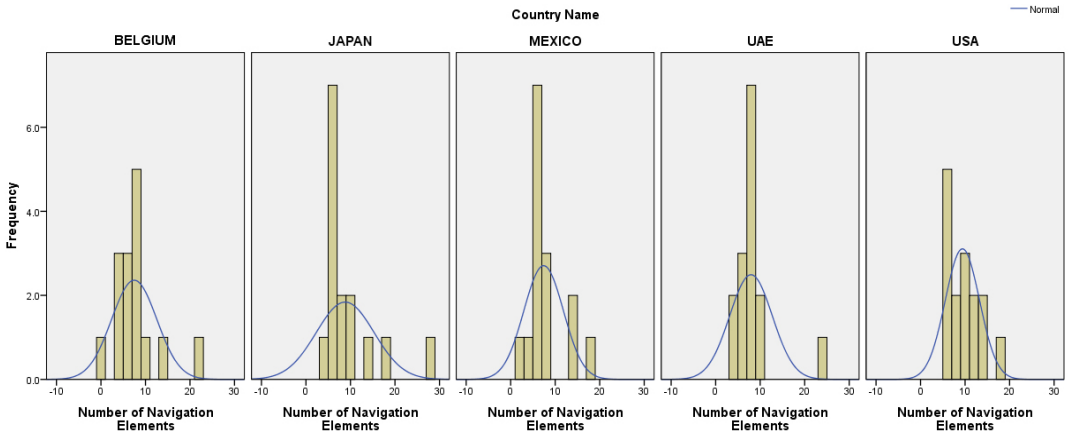


Figure 9: Comparison histograms for navigation elements by cultural group.

The fifth hypothesis. This hypothesis posited the existence of a difference between cultural groups in terms of the number of images. This hypothesis extends from the idea that the utilization of images in terms of quantity may be a component of culture. While the collected data suggests that there is no statistically significant difference between cultural groups in terms of the number of images ($F_{[4, 70]} = 0.737$, $p > .05$), a sampling of extreme values for each of the

cultures may have resulted in an artificial inflation of the means leading to a potential instance of type II error (see Figure 10). A winsorization of the data (the removal of the highest and lowest values to better control for excessive variance), did produce a significant result ($F_{[4, 60]} = 3.31$, $p < .05$) with a Bonferroni multiple comparisons test suggesting the significant difference lay between Belgium and Japan ($\overline{\chi}_{diff} = 6.078$, $p < .05$) and Belgium and Mexico ($\overline{\chi}_{diff} = 6.46$, $p < .05$) (see Figure 11). However, disregarding over 13% of the total sample could lead to a potential instance of type I error.

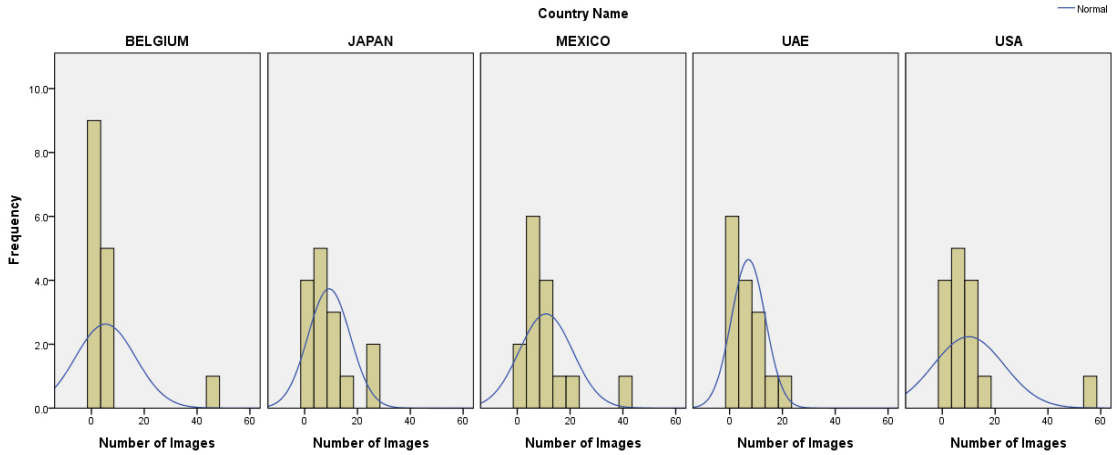


Figure 10: Comparison histograms for number of images by cultural group.

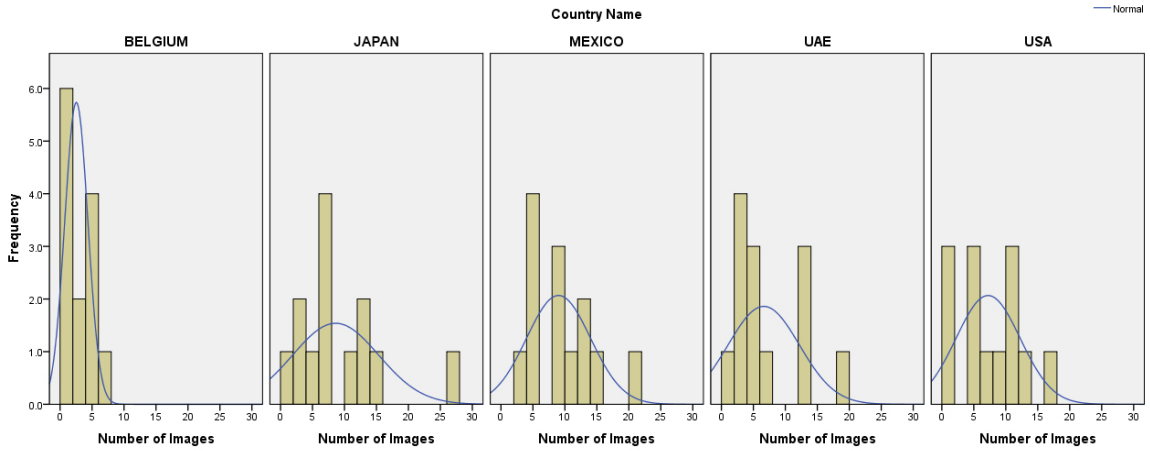


Figure 11: Comparison histograms for winsorized number of images by cultural group.

The implications of these findings are largely unknowable without further research (see Suggestions for Future Research). This general inability to make inferences from the data is due in large part to the size of the sample as it simply is not large enough to adjust for the extreme variability within the results as collected. From an academic standpoint, the competing potential for both type I and type II errors makes the findings statistically invalid. From the standpoint of the web design industry, the values do present some interesting implications. For example, if we consider that two factors of image inclusion (in terms of quantity) on a web page are cultural and bandwidth restrictions, then both sets of data are equally important. The presence of extreme values suggests that bandwidth may not be an issue within that culture, while variability between cultures in the absence of the extreme values suggests that there may be a cultural component at work. Using these two pieces of information and drawing upon the winsorized data may allow for the establishment of a framework of cultural preference for number of images by country (see Table 34).

Table 34

Winsorized Mean Number of Images with Confidence Interval by Country

	$\overline{x}$ Number of Images	Confidence Interval for $\overline{x}$
Belgium	2.54	±1.09
Japan	8.62	±4.08
Mexico	9	±3.03
UAE	6.62	±3.37
USA	7.23	±3.03

The sixth hypothesis. This hypothesis posited the existence of a difference between cultural groups in terms of paragraph font size. This hypothesis extends from the idea that language difference may necessitate an adjustment to font size. For the purposes of this study, obtaining a value for font size required an identification of a paragraph element. A failure to identify a paragraph of text resulted in the recording of a blank value. While the collected data

suggest that there is no statistically significant difference between cultural groups in terms of the size of the font ($F_{[4, 44]} = 1.249$, $p > .05$), it is important to note that 35% of the population sampled presented an absence of paragraph text. An examination of paragraph presence between cultural groups using a chi-square (χ^2) analysis suggests that there is no statistical significance to this observation ($\chi^2_{[4]} = 7.89$, $p > .05$).

The data presented for this hypothesis has a number of implications. Failure to reject the null hypothesis in this case represents another potential area of cultural homogenization. While the potential for type II error exists in this case given the severely diminished sample size, the clustering of the data around the mean values suggests that rejection of the null hypothesis was valid (see Figure 12). While the findings regarding font size may not be significant they do show a certain degree of preference with the majority of the results centered on font sizes of 12px (a default value) and 14px with a variability in preference between cultural groups. A larger sample of websites from these cultures would provide further insight on this observation (see Suggestions for Future Research). The secondary observation facilitated by this hypothesis deals with sporadic paragraph presence on the examined homepages (see Figure 13). Significance aside, it is difficult to determine if this observation warrants future study. On one hand, the lack of paragraph text could be a significant factor in a larger study designed to compare it to other variables. On the other hand, it may simply be that the presence of paragraph simply does not garner very much attention on a website attempting to attract diners.

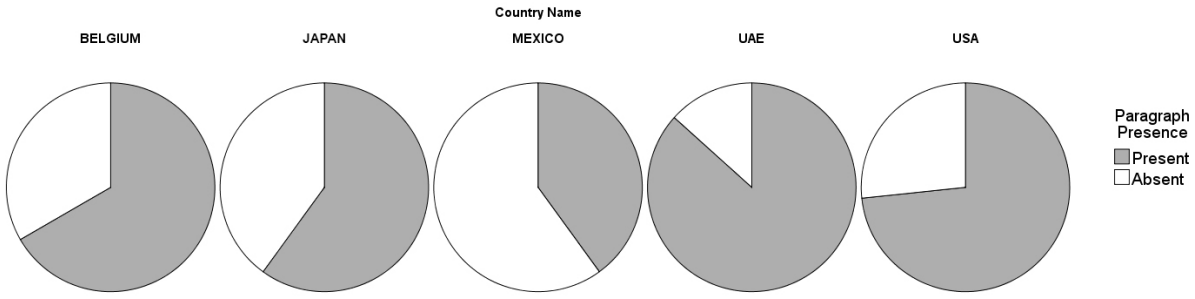


Figure 12: Comparison charts for paragraph presence by cultural group.

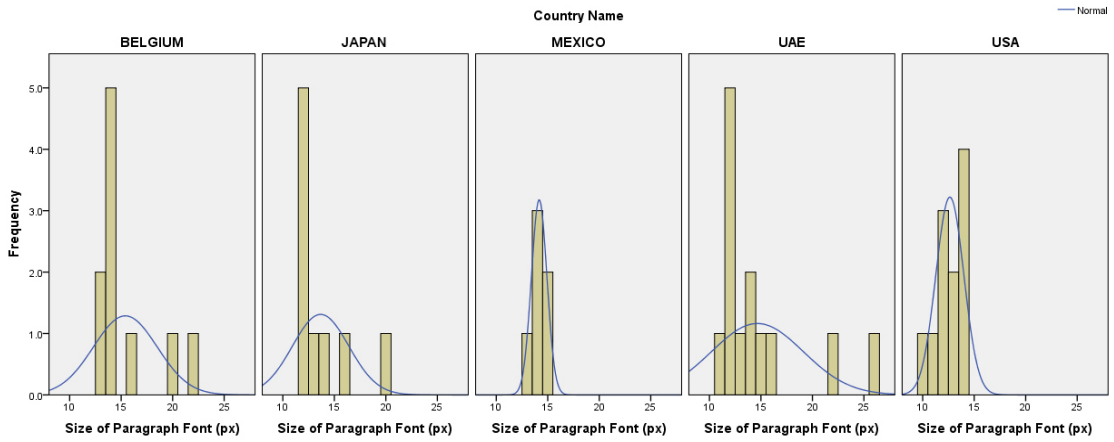


Figure 13: Comparison histograms for paragraph font (px) by cultural group.

The seventh hypothesis. This hypothesis posited the existence of a difference between cultural groups in terms of number of available language options. While number of available language options is not an element of design, it could facilitate cultural targeting or represent an attempt at cultural accommodation. An analysis of the data suggests that there is a significant difference between the evaluated groups ($F_{[4, 70]} = 9.957$, $p < .001$). A Bonferroni multiple comparisons test suggests these significant differences exist between Belgium and Mexico ($\overline{\chi}_{diff} = 1.33$, $p < .001$), Belgium and the UAE ($\overline{\chi}_{diff} = 1.4$, $p < .001$), Belgium and the USA ($\overline{\chi}_{diff} = 1.53$, $p < .001$), Japan and the UAE ($\overline{\chi}_{diff} = 0.8$, $p < .05$), and Japan and the USA ($\overline{\chi}_{diff} = 0.93$, $p < .01$).

The implications of this finding are varied. To begin, an analysis of the data does point to varying degrees of language adoption between the five cultures studied. The United States presented only a single language option in all the analyzed restaurants whereas the majority of Belgian websites present at least three different language options (see Figure 14). However, despite the value of this information, it is also incomplete, as it does not give any indication as to language availability. While it is easy to assume that language availability in the United States of America is exclusively English, an assumption that primary language availability in the United Arab Emirates is Arabic would be incorrect. While the official language for the UAE is Arabic, the most commonly spoken language, and the language of 93% of all sampled webpages was English (see Table 35). In fact, English was among the language options offered on 57% or all non-United States of America websites.

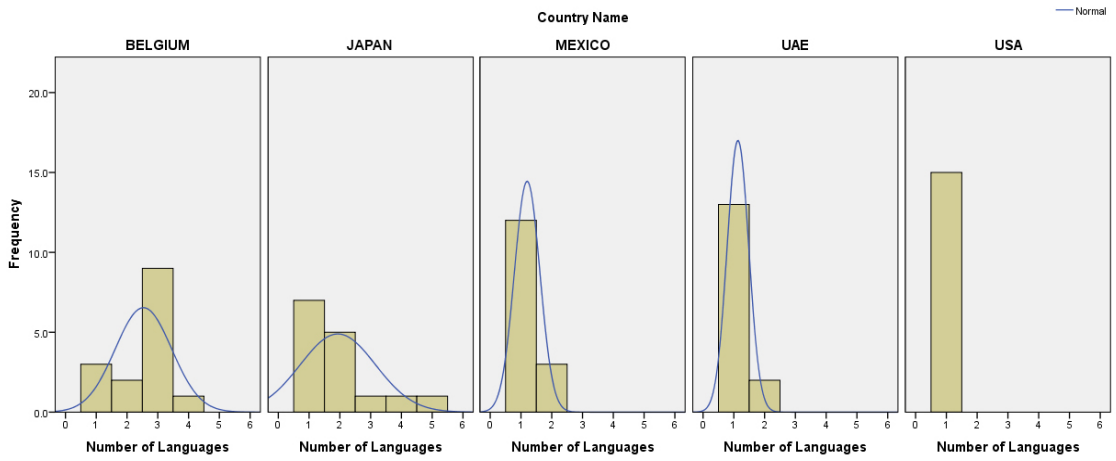


Figure 14: Comparison histograms for number of languages by cultural group.

Table 35

Language Options by Country

	Language Options	Percentage of Cases
Belgium	French	93%
	Dutch	87%
	English	67%
	German	7%
Japan	Japanese	100%
	English	47%
	Chinese (China)	13%
	Chinese (Taiwan)	7%
	Korean	13%
Mexico	Spanish	100%
	English	20%
UAE	English	93%
	Arabic	7%
	French	7%
USA	English	100%

Application of the hypotheses to the research question. The primary purpose of this research question was to study the extent to which cultural homogenization exists. To this end, each of the presented hypotheses analyzed some aspect of observable design. The results garnered from the collected data found little if any evidence of statistically significant variability in website design between cultures. Of the seven presented hypotheses, only one offered a statistically significant result. However, even a statistically significant difference in number of language options is difficult to hold up as evidence against cultural homogenization when 57% of the websites for countries other than the United States of America featured English as a language choice. The reality this data alludes to is that by the measures employed by academia, cultural homogenization exists in the population of this study to a rather strong degree insofar as the metrics employed herein can determine. An analysis of the implications of research question two will expand upon these findings.

Research Question Two

The second research question of this study deals with the extent to which cultural homogenization affects how cultures organize and design content in an online environment. Put simply, given an established degree of similarity or difference (facilitated by the first research question), the second research question represents an attempt to understand the extent to which cultural homogenization impacts design. For example, if there is little evidence of cultural homogenization then we should see strong evidence of variability in design along all metrics analyzed. However, if there is overwhelming evidence of cultural homogenization then we should see little evidence of variability in design. The presented research question draws upon this discrepancy in a literature split between arguments for and against both the presence and impact of cultural homogenization. Given this split between potential outcomes, the design of this research question benefits from findings suggestive of both extremes more so than the high prevalence of cultural homogenization suggested by an analysis of this study's data. Despite this limitation, the findings of the first research question and associated hypotheses will facilitate discussions as they relate to this research question from the perspectives of the academic, societal, and corporate interests identified by this study (see Rationale for the Study).

Academic. The findings of this study suggest that cultural homogenization, at least in terms of the metrics studied, may strongly influence how cultures organize and design content in an online environment. The implication of this finding applies to a number of different aspects of the literature related to the manifestation of culture in online environments. First, the data suggests that cultural homogenization is not merely a threat to the manifestation of culture in an online environment, but a reality. Of the seven hypotheses advanced by this study predicting differences between cultural groups, six produced non-significant results suggesting that no difference exists. While this finding does not prove the existence of cultural homogenization, it

does present a strong case for its existence. Second, past studies suggesting that culture manifests in the design of online environments may no longer represent valid conclusions. Unfortunately, the reality of a constantly evolving Internet, particularly in terms of design, means that the ideas surrounding design must always be advancing. Finally, this study did find a significant difference between countries in terms of the number of languages they offered users. Similar findings are largely absent from the literature and future studies should focus not only on number of languages offered, but also the languages being offered as compared to a breakdown of the languages spoken within said country (see Suggestions for Future Research).

Societal. Expanding upon the implications of these findings from academia, societal interests on this subject are far more difficult to gauge given the context of this study. While the data suggests that users can expect similar browsing experiences across the cultural groups serving as the focus of the study, it does not offer any evidence as to how this degree of similarity affects the users regardless of cultural identity. As such, the societal implications to this information are largely unknown as they fail to address whether or not these similar designs meet cultural expectations.

Corporate. The implications of this research question with regard to corporate interests are compelling as they provide a framework for understanding how to design across cultures. While the ancillary findings presented throughout the analysis of the first research question represent a means of acquiring data deemed unacceptable for academic scrutiny, they do present some interesting ramifications to a corporate interest less concerned with hard figures and more interested in observable trends. However, it is important to note that the trends discussed in relation to the presented hypotheses may not fully represent the expectations of the associated culture, but may serve as an indication as to what the culture has come to expect.

While an initial analysis of the data revealed no difference between cultures with regard to page length (H_1), further examination of the data following the removal of the outliers generated by restaurants utilizing a single page design does suggest the existence of a cultural differences in terms of page length. This difference may indicate a level of cultural willingness to scroll through page content. In addition to scrolling, moving through website material generally requires some form of navigational element. An analysis of the data related to navigation structure (H_2), orientation (H_3), and number of elements (H_4) suggests that cultural homogenization may have an impact on navigation design. However, an ancillary analysis suggests that there may be preferences in both navigation structure related to a culture's uncertainty avoidance index score and in navigation orientation attributable simply to cultural identity. The available data on the number of navigation points represents a consistent number between cultures, but fails to account for differences in navigation content. Similarly, an analysis of the data related to the number of images on each web page (H_5) suggests no difference exists between countries, but the sample size utilized by the study may be too small to correct for some extreme outlier data. However, an analysis following the removal of these extreme values using a winsorizing technique does suggest that a difference exists between cultures. An analysis of paragraph text size (H_6) also produced results suggestive of the influence of cultural homogenization, but a lack of recorded data due to a lack of paragraphs of text may account for this lack of difference. The recorded data concerning text size does indicate that there may be preferences for paragraphs composed of a 12px or 14px sized font that vary depending on the cultural group. Finally, an analysis of the data concerning number of offered language options (H_7) did produce a significant result, but the implications here may be minimal

as it suggests only that some of the sampled cultural groups may have secondary and tertiary languages to accommodate.

While these ancillary observations are particularly interesting in the context of corporate interest, there is an additional finding of note. In addition to the data collected as a means to address each of the hypotheses, a concerted effort was made to record the dominant colors of each of the evaluated webpages. Utilization of the Color Thief Tool (Dhakar, 2011) facilitated the collection of this data, while Cinema 4D allowed for a visual analysis (see Appendix D). Unfortunately, there is no established means of analyzing three-dimensional color data with any degree of statistical accuracy (see Chapter Two – The Intercultural Implications and Expectations of Color in Website Design). However, as the color values represent a combination of red, green, and blue (RGB) they exist within a bounded cube (each having values between 0 and 255), and it is acceptable to view the cube as a collection of individual quadrants (see Figure 15). This method of analysis creates a count for the number of instances of a recorded dominant color within each category that is both precise and replicable. As an added benefit, increasing the precision of the output is achievable by breaking the cube into a greater number of quadrants.

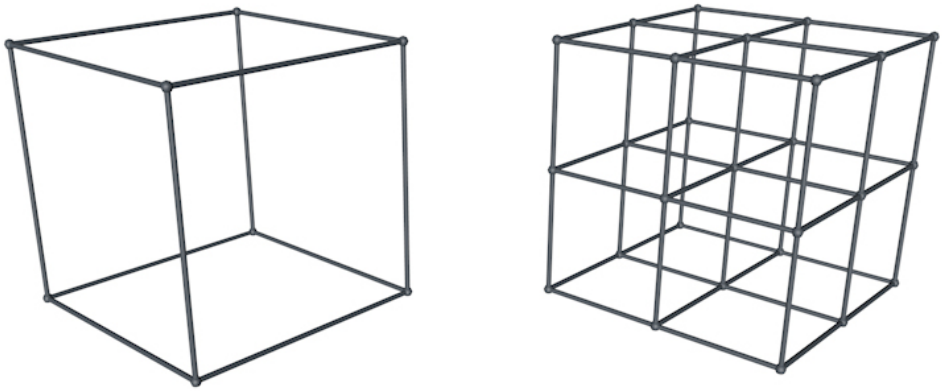


Figure 15: Dominate color sets method of analysis.

A cross tabulation of the data collected using 2x2x2 quadrant division[1] indicates the difference between the observed and expected frequency of colors within each quadrant by country (see Table 36). Using the collected data a chi-squared analysis suggests that no statistical significance exists between cultural groups and the frequency with which colors appear in the established quadrants ($\chi^2_{[16]}$= 15.569, p > .05) (see Table 37). While the results produced by this analysis do not suggest a significant difference between the values, it is important to note the preponderance of data that exists within both the black and white quadrants. This suggests that the majority of websites sampled consisted of color palettes tending toward light or dark colors. Unfortunately, while this analysis of color is interesting it is also flawed. While these colors are representative of the dominant color for each site, it is impossible to determine if these color choices represent cultural identity or brand identity.

Table 36
Cross Tabulation for Dominant Color by Country

		Dominant Color					
		Black	White	Red	Blue	Yellow	Total
Belgium	Observed	10	4	1	0	0	15
	Expected	7	6.2	0.8	0.2	0.8	15
Japan	Observed	7	8	0	0	0	15
	Expected	7	6.2	0.8	0.2	0.8	15
Mexico	Observed	3	9	1	1	1	15
	Expected	7	6.2	0.8	0.2	0.8	15
UAE	Observed	8	4	1	0	2	15
	Expected	7	6.2	0.8	0.2	0.8	15
USA	Observed	7	6	1	0	1	15
	Expected	7	6.2	0.8	0.2	0.8	15
Total	Observed	35	31	4	1	4	75

[1] A 2^3 division of the bounded cube produces eight separate quadrants. The colors represented by each of the outside corners serve as names for each quadrant. As such, the following corner coordinates describe each color: Black (0,0,0), White (255,255,255), Red (255,0,0), Green (0,255,0), Blue (0,0,255), Cyan (0,255,255), Magenta (255,0,255), and Yellow (255, 255, 0).

Table 37

Chi-Square Analysis for Dominant Color by Country

	Value	df	Asymp. Sig (2-sided)
Pearson Chi-Square	15.569	16	.483
Likelihood Ratio	17.129	16	.377
Valid Cases	75		

The implications of this second research question to each of the discussed interests is remarkably diverse. This degree of diversity suggests that the findings produced by this study may have a wide range of potential applications concerning the intersection of culture, cultural homogenization, and design. However, what this research question best illuminates is the need for future studies on this topic.

Research Question Three

The first research question examined the extent to which cultural homogenization exists, while the second questioned the extent to which cultural homogenization impacts design. The third research question this study explores the extent to which the current theories on the digital manifestation of culture suggest observable differences in website design. This study utilizes two separate theoretical approaches as a means of categorizing cultures and understanding the cognitive processes unique to each. These two theories are the cultural dimensions model and cultural cognition theory. The cultural dimensions model represents an exploration of the mental programming that develops within all people through a lifetime (Hofstede, Hofstede, & Minkov, 2010; Hofstede, 2001). While cultural cognition theory has proven a popular means of analyzing culture, its adaptation to an increasingly digital world has never attained wide usage. In an attempt to address the weaknesses of the cultural dimensions model, cultural cognition theory represents a framework designed to study cross-cultural communication online using the cognitive processes and styles, which are a product of culture (Ess & Sudweeks, 2006).

The problem with the utilization of either of these theoretical constructs is that neither derives any support from the findings of this study. While Hofstede's cultural dimensions model presents too much supporting evidence to dismiss, the concept of grafting web design concepts onto the individual dimensions (Sondergaard, 1994; Ackerman, 2002) received almost no backing to the limited extent this study addressed the predicted design implications. Additionally, cultural cognition theory could really only apply if findings were to suggest that connections exist between culture and the communication potential of design. This is not to say that the cultural dimensions model or cultural cognition theory are without merit as theoretical constructs, merely that they have limited application to this study. As such, the findings of this study may be more representative of social learning theory – the idea information evaluation and retention represents a cognitive process learned observationally (Bandura, 1971). As an example of this phenomenon, a web designer must create a restaurant website, so he or she runs a search to determine what constitutes 'the best restaurant website designs' and then this observation of the results serves as a foundation for creation. The interesting thing about an application of this theory is that it does not rule out of the influence of culture completely, it is merely an additional cognitive process. This may suggest the potential for using both social learning theory and cultural cognition theory to understand future findings. Unfortunately, without further research studies an application of social learning theory to the phenomenon of culture manifestations on website design is largely theoretical.

Insofar as the data from this study would suggest, cultural homogenization is highly prevalent and an application of the initial theories presented in relation to this study are severely limited. It is for this reason that social learning theory, possibly coupled with cultural cognition theory, may find better application to the findings of future studies.

Limitations and Implications to Future Research

Even the best planned research can never be free of limitations. In addition, studies of an exploratory nature present an increased concern for the potentiality of type I and type II errors. Despite attempts at minimization, identified limitations of this study include the utilization of countries as proxies for cultures, language, generalizability, image types, intentional multicultural accommodation, cuisine types, symbiotic and hive websites, sample population degradation, and the digital and technological divide. Despite these limitations, this research presents a variety of implications for future research.

Country as a Proxy for Culture

Among the most persistent complaints against cultural research of this type is the use of geographical boundaries as a proxy for cultural boundaries. While the use of city boundaries as a proxy for culture is an attempt to mitigate this complaint, it failed to consider the variability that exists even within cities. The implications of this finding in itself are particularly astonishing as it suggests that digital cultural homogenization may simply be an extension of the real-life melding of cultures. As a result, this study may be looking at a reflection of an amalgamation of an indeterminate number of cultural or subcultural groups in the designs of the websites of any one culture. This idea calls into question whether the idea of cultural identity can be studied without taking into account outside contamination. However, given this limitation and the ramifications there in the method of using country or even city as a proxy for culture still represents the most consistent means of gathering this type of data.

Language

In extending from the issues specific to the study of culture it is important to note the limitations presented by language. While language was in no way a focus of this research (see Chapter One: A Note on Language and Translation), a more complete understanding of the

languages presented through the course of this study may have had some impact on the results. The sample population consisted of websites in English, Spanish, French, German, Dutch, Japanese, and Arabic. Of these languages Spanish, French, German, and Dutch share a structure similar to English, whereas Japanese and Arabic share very little. This structural difference created some confusion in the identification of design elements such as navigations and paragraphs. Additionally, this study did find a prevalence in using English as the default language in three of the five countries studied. Interestingly, there did seem to be a correlation between number of official (and unofficial) languages and the use of English as a default means of communication.

Images, Graphics, and Advertisements

Much like the analysis of language based elements, it is important to note the limitations presented by the study of images. For ease of coding, the codebook contained a single category for the recording of images. However, through the course of the study the identification of four separate image types created a degree of confusion. These four identified image types consisted of images, collages, graphics, and advertisements. This could be a source of a larger implication related to how cultures present visual information. For the purposes of this study, images were regarded merely as images, but categorizing by image type could suggest interesting cultural phenomena. In terms of this study, while the degree of inconsistency among coders was minor with regard to this metric, the data is an incomplete representation of the variation identified in image type.

Generalizability

There are several issues pertaining to the generalizability of the results garnered from this study. In many ways, each of these issues extend from the sample population of websites. First, given the relatively small sample of websites taken from each cultural group it would be

problematic to suggest that they are in any way representative of restaurants within the culture as a whole. While this myopic observation of each cultural group does allow for greater comparison between a number of different cultures, it may not paint an entirely accurate picture of the web design techniques employed by restaurants within any culture. Second, the population of restaurants for each culture is geographically limited to a pre-selected primary city. Although this creates replicable consistency between the cultural groups, it is unlikely to be representative of the culture as a whole. Finally, the composition of the sample population consists entirely of websites for restaurants and cafés. This allowed for some limited generalizability (i.e. the websites of bars, coffee shops, and delis), but the results are not representative of websites from within a culture as a whole.

Intentional Multicultural Accommodation and Cultural Profiling

Extending from the issues inherent to the sample population there exists another potential limitation. While drawing the restaurant population from travel guides creates an easily identifiable and consistent sample across cultural groups, it may also incorporate a degree of bias into the study with regards to intentional multicultural accommodation. If we consider that the restaurants listed in any guidebook know of their inclusion, then there exists the possibility that various aspects of the restaurant experience (i.e. websites, and menus) may feature elements of cultural accommodation. Furthermore, widely available and easily implemented web technologies may augment these accommodations through the implementation of inclusionary and exclusionary practices. For example, using readily available information such as location of the browser, localization settings (i.e. time zone information), or simply the browser's default language could allow a snippet of code to make educated guesses as to which content to present to any given user. For the average user or researcher, the ability to negate this cultural profiling is limited, and in most cases, there is little evidence any profiling has occurred.

Cuisine Types

As they attempt to provide possibilities for a wide range of potential readers, travel guides generally feature a wide variety of cuisine types for the restaurants they recommend. As cuisine type did not factor into the restaurant population inclusionary process it may represent a limitation. For example, while Chinese food in America is not generally authentic, the website for a Chinese restaurant may feature Chinese design ideals in order to reinforce the illusion of authenticity. As such, there are serious questions and implications related to whether this study is analyzing the target culture (as intended), the culture of the cuisine, or the target culture's idealized view of the cuisine's culture.

Symbiotic and Hive Websites

The identification of the symbiotic and hive website types presented a number of issues concerning their inclusion during the data collection phase. The primary difference between symbiotic and hive websites rests in their relationship between the child(ren) and the parent entity. Symbiotic websites utilize the webpage template of an unrelated parent organization. This type of relationship was most common among restaurants set up within hotels. Hive websites utilize a webpage template shared among the children. This type of relationship was most common among restaurants within a conglomerate group. The implications of this type of website rest in the determination as to where the design decisions with regard to culture are being drawn from. In the case of both symbiotic and hive websites design decisions are not made by the restaurant (in this case the child) but by the host (the parent). Additionally, this creates a limitation with regard to data mirroring, which given their degree of prevalence within a sample could skew the data. This study made every attempt to minimize this risk given the potential severity within an already small sample population. However, the prevalence of these website

types within the already small sample presented by the United Arab Emirates necessitated a degree of inclusion relegated almost exclusively to the pretest.

Sample Population Degradation

The world is constantly changing and the Internet assimilates and adapts to these changes. As such, the sample population of this study is particularly susceptible to degradation over time. The primary source of this degradation is restaurant closure, while a secondary source is website design overhauls. For example, between the identification of the sample population and the post-collection analysis of the data (less than a week) at least one of the restaurants utilized in the study closed for business (United Arab Emirates – Table 9). The implications of this finding are wide ranging but may speak to cultural preference (the restaurant was not popular so it closed), but given the data determining causality is impossible. While this degradation does not affect this study or the data collected herein, it could influence replicability potential.

The Digital and Technological Divide

The limitation set inherent to the digital and technological divide are the most esoteric of those discussed through the course of this section. For the purposes of this study, the digital divide refers to the lack of access to digital communication technology among the disenfranchised (Barmann as cited by Baran & Davis, 2006). Similarly, the technological divide refers to a difference in the capabilities and capacities of the technologies utilized among and between groups of individuals. While the impact of the digital divide, as a limitation to this study is non-existent (see Issues and Limitations) the technological divide may represent a pervasive limitation. For example, consider that two different cultures are creating restaurant websites. The first culture has the ability to include nine different images in their design but is satisfied with the inclusion of only three. Conversely, the second culture only has the ability to

include three different images but prefers to include more than it is capable. Both cultures create websites with three images suggesting that they are culturally similar, yet this difference is one of capability rather than culture. The findings of this research suggest that, in the case of the cultures studied, the technological divide may be minor to non-existant. A lack of significant findings in this study may only suggest that design within cultures is pushing the limits of what can be done more than designing based on cultural manifestations. Unfortunately, as an intervening variable differences in technological capability and capacity are nearly impossible to assess with any degree of accuracy.

Limitations represent an unavoidable facet of any research of this scope. Fortunately, many of this study's limitations represent an inevitable reality of conducting research into something as variable as the Internet and those that do not extend from the collection of a sample that may have been impossible to collect through other means. While the potential impact for type I and type II errors related to these limitations are present, the methods employed by this study should minimize their potential for influencing the presented conclusions and implications of the research.

Suggestions for Future Research

A hallmark of good research is that it generates findings to the questions it presents whereas the mark of great research is that it generates questions from the findings it presents. The following collection of suggestions for furthering research on this topic draws upon the findings of this study and presents new avenues for inquiry. Among these suggestions are longitudinal replication, methodological streamlining, the expansion of incomplete design metrics, the addition of supplementary design metrics, and additional avenues for data analysis.

Longitudinal Replication

It is impossible to know the true validity of the findings presented by this study without replicating the study itself. Future studies borrowing from the methodology utilized by this study could not only correct for the identified issues and limitations but also open additional avenues of study and analysis. These additional avenues of study could both increase the pool of data to include additional countries and additional metrics, but also incorporate a longitudinal component that could help track the penetration of the cultural homogenization phenomenon. For example, a future study could determine if the metrics analyzed by this study remain constant into the future or if there is fluctuation.

Methodological Streamlining

Through the course of this study, a small number of methodological issues factored into the collection and analysis of the collected data. The identification of each of these issues as well as their potential impact on the study represent a well-documented aspect of this study (see Chapter Three: Methodological Updates, Chapter Three: Issues and Limitations, and Chapter Five: Limitations). While future research should address these concerns, it should also focus on the analysis of fewer variables across fewer cultures while utilizing larger sample populations. Additionally, future studies may draw sample populations not from primary cities more likely to cater to tourism, but from secondary and/or tertiary cities.

Expansion of Incomplete Design Metrics

Several of the metrics established in this study did not go far enough in the collection of data. Future studies should augment the collection of data on images by breaking the analysis down into categories for photographs, collages, graphics, and advertisements. Additionally, further analysis as to the content of the images may provide further insights as to the categories into which these images fall. Finally, while the collection of data on the number of navigation

elements is important, it is also important to establish if there are cultural differences between content each navigation element represents.

Addition of Supplementary Design Metrics

Based on the findings of this study, the addition of several supplementary design metrics could enhance the analysis of data. First, the establishment of a metric to track website design type (single page or multipage) would allow for more analysis options. Second, inclusion of a metric to categorize the density of the content could illuminate an area of cultural difference. Third, in addition to collecting a dominant color for each website, collecting a color palette of the dominant interface colors could allow for a more complete analysis of the use of color by cultures in website design.

Additional Avenues for Data Analysis

This study identified several additional avenues of data analysis, which could offer a better understanding of the collected data. Given the potential for extreme variability in design, there is some risk of type II errors due to the influence of lower scoring categories. Creation of hypotheses that examine both the data as a whole and subsets to the data establishes the possibility of a more complete analysis of the data. For example, analyzing a subset of navigation orientation focusing on cultural preference in terms of only horizontal and vertical navigation type, or a subset of font size focusing on cultural preference in terms of 12px or 14px paragraph text. Finally, this study identified an interesting finding concerning Ackerman's (2002) prediction dealing with uncertainty avoidance and navigation structure. While the finding may have been a coincidence due to a small sample size, it does warrant additional investigation.

Conclusion

The focus of this study was on the aesthetic and organizational variances between cultures in the design of webpages. Using homepages for restaurants in five separate countries

(Belgium, Japan, Mexico, the United Arab Emirates, and the United States of America), a content analysis allowed for the collection of data revealing the similarities and differences in design which exists between cultures. An analysis of the data in line with a variety of research questions and hypotheses revealed that observable cultural variations to design are almost non-existent.

The lack of significant findings presents a challenge to the theoretical constructs used to analyze the data. Both the cultural dimensions model and cultural cognition theory suggest that differences between cultures should manifest in an online environment. However, a more likely explanation of the observed similarities across the studied cultures in terms of design is cultural homogenization. Given the theoretical perspective's inability to predict or support these findings and the nature of the interaction between the variables, social learning theory may allow for a greater understanding of future studies on this topic.

While the primary hypotheses were largely non-significant, a number of ancillary observations and the identification of several limitations do indicate the existence of potential differences between cultures. Expansions upon these observations and findings present avenues of future research that could indicate the existence of cultural preferences in aesthetic and organizational design. Furthermore, addressing the limitations this study presents such as employing a larger sample size could allow for a more complete analysis of each culture's preferences.

As a means of studying how culture manifests in an online environment, this method of content analysis proved to be highly efficient and effective. As the analysis of the findings suggests, there are applications in this research not only to academia, but also to the interests of both industry and society. Furthermore, as an avenue of study, the similarities and differences in

aesthetic design between cultures is increasingly important given the rate at which our proximity to other cultures is collapsing. Given these observations, the interesting implications of longitudinal study on this topic, and the implications of these findings on communication research and our understanding of culture this line of inquiry represents an important facet in our understanding of the World Wide Web.

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Appendix A

Content Analysis Code Book

Category	Description	Code
Restaurant Name	The full name of the restaurant. This value should be prerecorded.	Full Restaurant Name *prerecorded*
Website Address	The website address exactly as it appears in the browser's address bar. This value should be prerecorded.	Full Web Address *prerecorded*
Presence of Language Options	If the website offers additional language display options, use the dropdown menu and select "Yes". If the website does not offer additional language options, use the dropdown menu and select "No".	Yes / No
Number of Language Options	If the website offers additional language options code the total number of display languages offered by using whole numbers. If the website does not offer additional language options indicate so using the number 1. *Note: When coding additional laguages make sure you code the default display language in addition to all other language options.*	Language Offering Count (whole number)
Navigation Orientation	The primary navigation is a group of navigation elements having options related to the restaurant and only to the restaurant. Ignore all links to other restaurants owned by the parent company. If the primary navigation extends the width of the interface, select "Horizontal" from the dropdown menu. If the primary navigation extends the length of the interface, select "Vertical" from the dropdown menu. For all other navigation configurations, select "Hybrid" from the dropdown menu. If there is no primary navigation, select "None" from the dropdown menu.	Horizontal / Vertical / Hybrid / None

Category	Description	Code
Navigation Complexity	If the primary navigation consists of multiple levels (such as dropdown or slide out menus) select "Complex" from the dropdown menu. If the primary navigation consists of a single level, select "Simple" from the dropdown menu. If there is no primary navigation, select "None" from the dropdown menu. *Note: DO NOT count language options as part of the navigation.*	Simple / Complex / None
Number of Navigation Elements	Count the number of options presented within the primary navigation and record it using a whole number. In the case of a complex navigation, include all navigation elements (including but not limited to the initial navigation state and all additional navigation states) in your total. If there is no primary navigation, indicate so using the number 0. *Note: DO NOT count language options as part of the navigation.*	Navigation Element Count (whole number)
Number of Images	Count the number of images that appear on the page. *Note: Be sure to count each of the images that appear as part of a slideshow or gallery. DO NOT count videos. DO NOT count logos (either image based or text based) as an image. DO NOT count maps. DO NOT code images within widgets (ex. Facebook, Twitter, etc.) unless that widget is for a photo sharing site (ex. Instagram).*	Image Count (whole number)

Category	Description	Code
Primary Content Text Size	Right click on the primary content/paragraph text (the text that is not a logo, header, caption, or navigation) and choose "inspect element" from the menu. Scroll down through the styles tab or the computed tab in the right hand panel, find the entry for “font-size”, and record the first value. If there is no primary content/paragraph text leave the space blank. **Example: In the case of "**font-size: 12px**" code 12. In the case of "**font-size: 0.9em**" code 0.9em.** *Note: Values with lines through them are invalid. Look for a value without a line through it.*	Text Size in Pixels (ex. 12px)
Primary Content Text Color	Right click on the primary content/paragraph text (the text that is not a logo, header, caption, or navigation) and choose "inspect element" from the menu. Scroll down through the styles tab or the computed tab in the right hand panel, find the entry for “color”, and record the value. If there is no primary content/paragraph text leave the space blank. **Example: In the case of "**color: #333;**" code #333. In the case of "**color: rgb(51,48,65)**" code 51,48,65. In the case of "**color: white**;" code white.** *Note: Values with lines through them are invalid. Look for a value without a line through it.*	Color Value in Hexidecimal (ex. #ffffff)

Category	Description	Code
Vertical Page Height	Using the provided image of the webpage determine the vertical height from the image properties. Indicate that height value without an indication as to the measurement type (pixels are assumed). This value will be at least 667px. **Example: 667**	Height in Pixels *prerecorded* (ex. 667)
Page Orientation	If the website can be scrolled up and down but not left and right, select "Vertical" from the dropdown menu. If the website can be scrolled, right and left but not up and down select "Horizontal" from the dropdown menu. If the website can be scrolled both up and down and left and right, select "Hybrid" from the dropdown menu. If the website cannot be scrolled, either up, down, left or right selected "Fitted" from the dropdown menu.	Vertical / Horizontal / Hybrid / Fitted *prerecorded*
Dominant Page Color	Using the "Color Thief Application" found at: http://lokeshdhakar.com/projects/color-thief/ Upload the provided image of the website by dragging and dropping it in the box labeled “Drag and Image Here.” Processing of the image will occur automatically. (Dhakar, 2011) Processing the image will identify a dominant color. Right click on the dominant color and choose “inspect element” and record the rgb values from the highlighted style “background-color”. **Example: 45,60,33**	Color Value in RGB format *prerecorded* (ex. 45,60,33)

Appendix B

List of Evaluated Restaurants (Pre-test)

Country	Restaurant Name
Belgium	Café Belga
	Ventre St Gris
	La Stelle
Japan	Kanda Yabu Soba
	Vietnam Alice
	Fonda de la Madrugada
Mexico	Churreria El Moro
	Casa Merlos
	Les Moustaches
UAE	Kan Zaman
	Medzo
	Zheng He's
USA	Café Fiorello
	Pure Food and Wine
	Tocqueville

Appendix C

List of Evaluated Restaurants (Study)

Country	Restaurant Name
Belgium	Colmar
	A la Mort Subite
	Chez Moeder Lambic
	Au Vieux Bruxelles
	Chez Oki
	Restaurant MIM
	Le Delire Parisien
	Le Falstaff
	La Belga Queen
	Rouge Tomate
	Sea Grill
	Comme Chez Soi
	la Quincaillerio
	L'Ecailler du Palais Royal
	Villa Lorraine
Japan	Aroyna Tabeta
	Otafuku
	Heirokuzushi
	Meal Muji
	Bosphorus Hassan
	Gempin fugu
	Bangkok Kitchen
	Kanda Sinpachi
	chinese café eight
	Sushi Zanmai
	Union Square Café
	Bird Land
	Isegen
	Brasserie Paul Bocuse le Musee
	Fukuzushi
Mexico	Café Tacuba
	Hosteria Santo Domingo
	El Cardenal
	Fonda Mexicana
	Café El Popular
	Thai Garden
	Centro Castellano
	Matisse

	Bar La Opera
Mexico *(cont)*	La Bottiglia
	Au Pied de Cochon
	Contramar
	Restaurante Lago de Chapultepec
	Hacienda de los Morales
	Rincon Argentino
UAE	Maria Bonita's Taco Shop
	Café Habana
	Lime Tree Café
	Basta Art Café
	Noodle House
	Lemongrass
	Jamie's Italian
	Magnolia
	Butcher Shop & Grill
	Kiku
	Table 9
	Maya
	Mumtaz Mahal
	Asha's
	Reflects par Pierre Gagnaire
USA	Sylvia's Restaurant
	Empellon Cocina
	Sammy's Roumanian
	Carnegie Deli
	Corner Bistro
	Quest
	Tertulia
	Public
	Blue Hill
	Pearl Oyster Bar
	Sasabune
	Aquavit
	Daniel
	Marea
	Le Bernardin

Appendix D

Color Distributions on Restaurant Websites (Study)

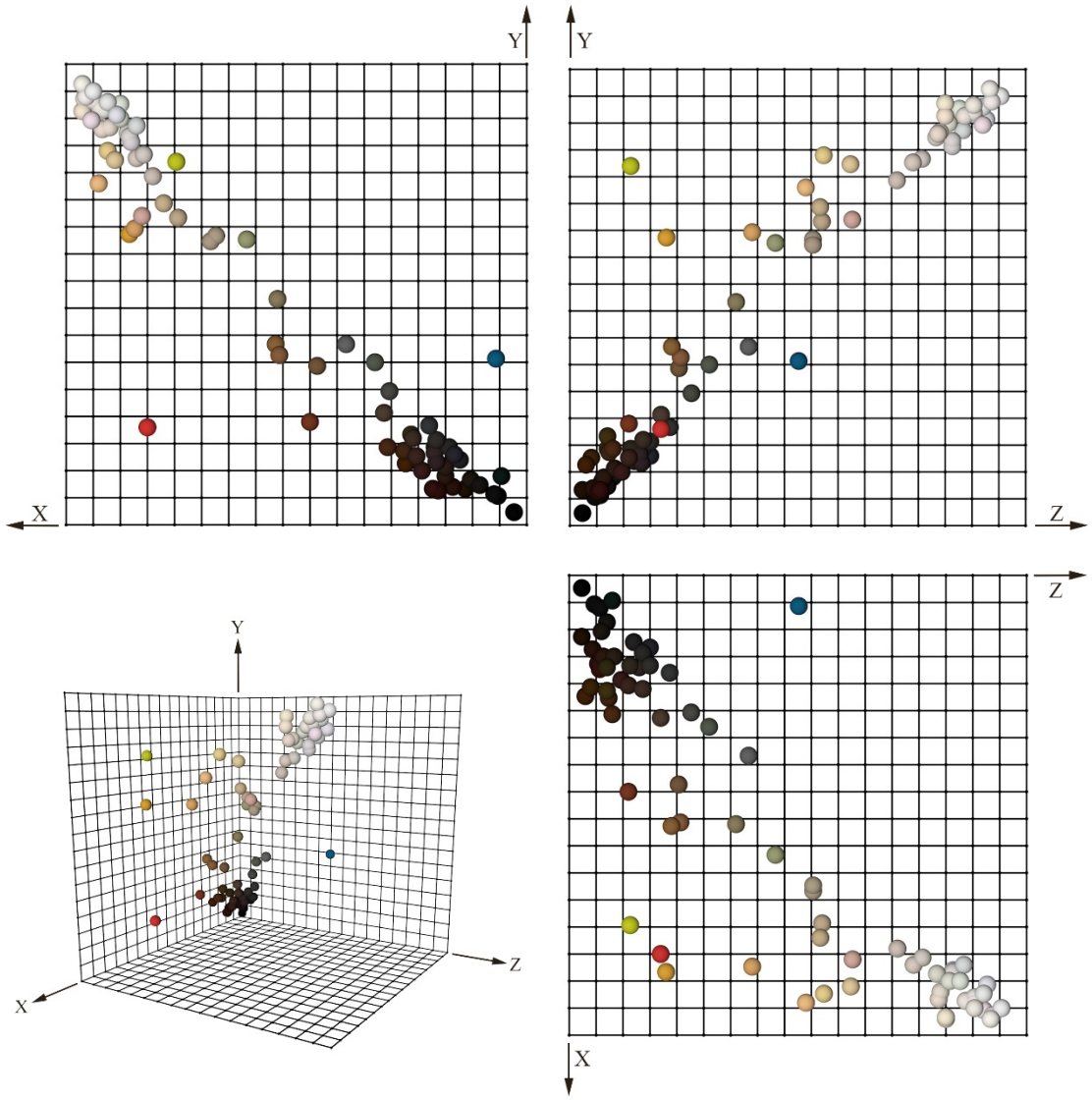

Figure 16: Color distribution for all websites.

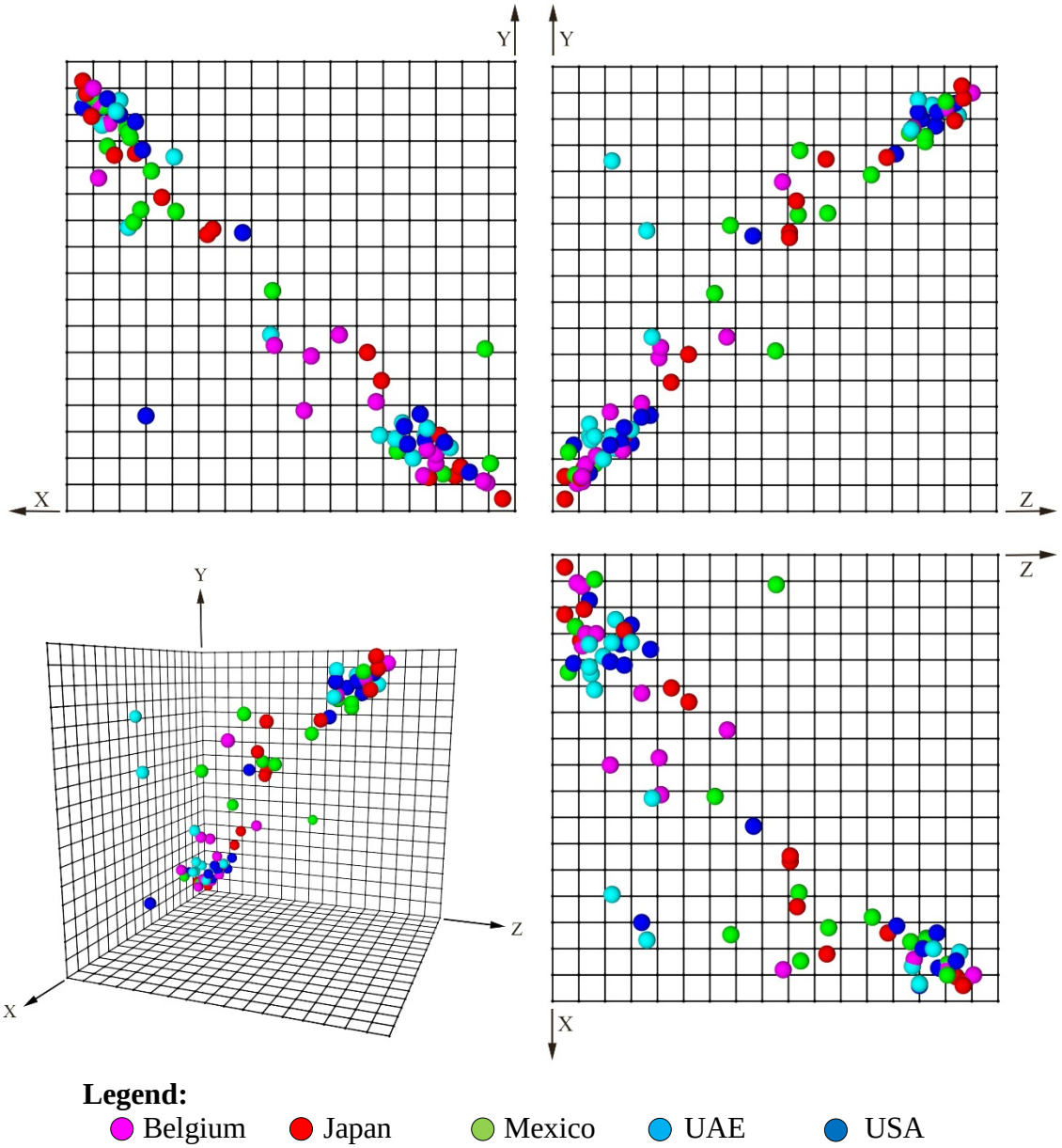

Figure 17: Color distribution for all websites by country.

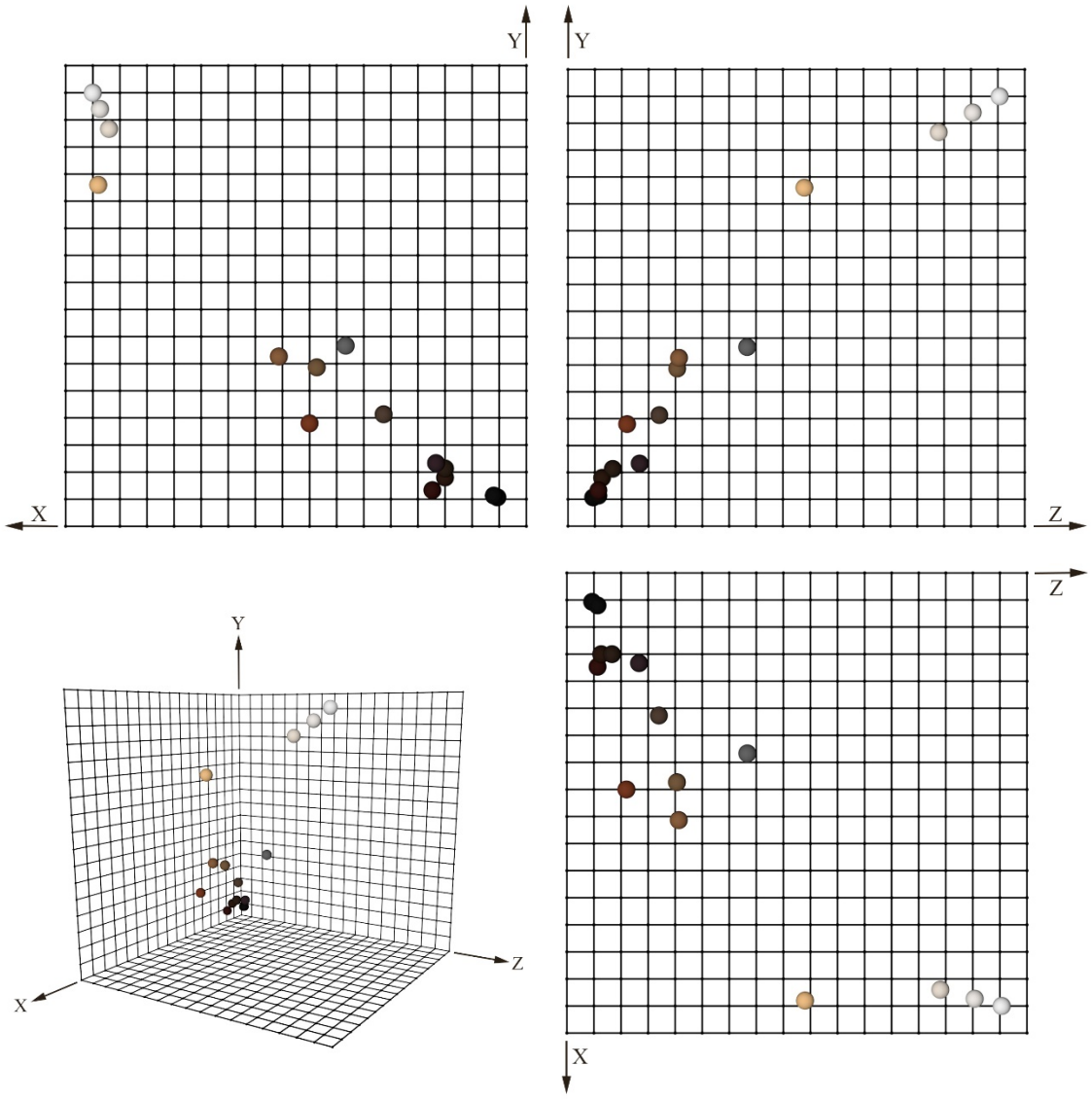

Figure 18: Color distribution for Belgium.

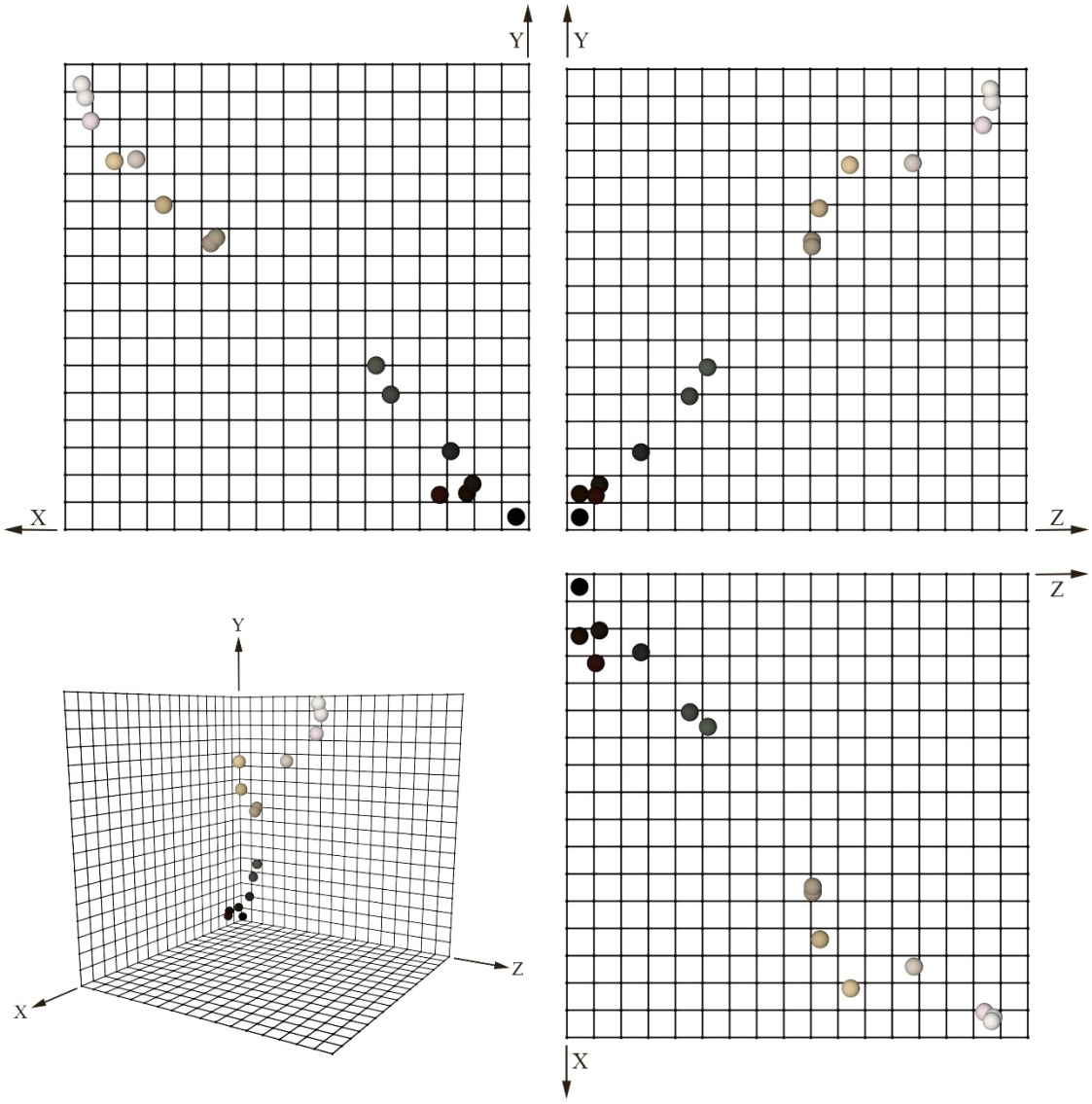

Figure 19: Color distribution for Japan.

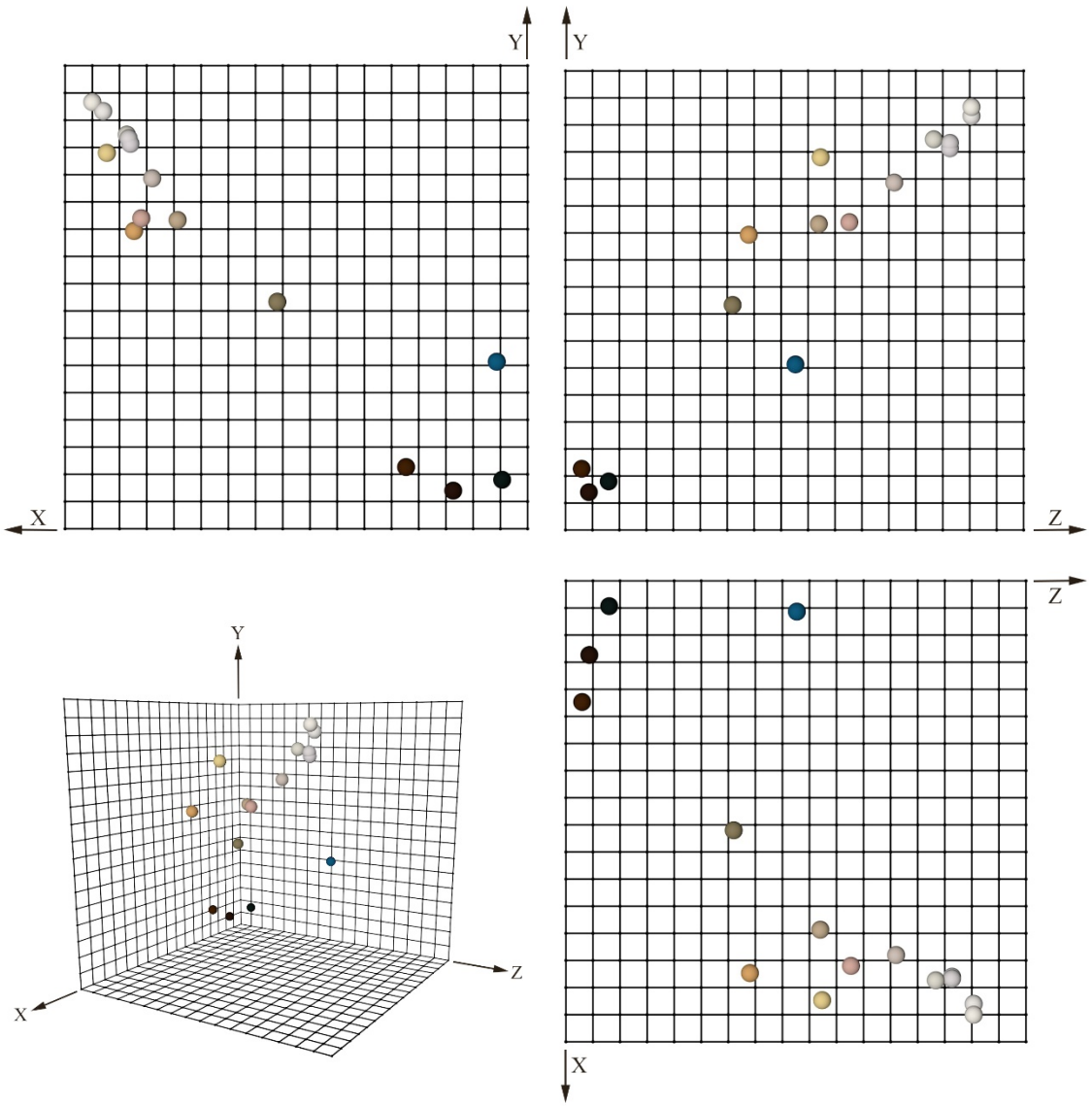

Figure 20: Color distribution for Mexico.

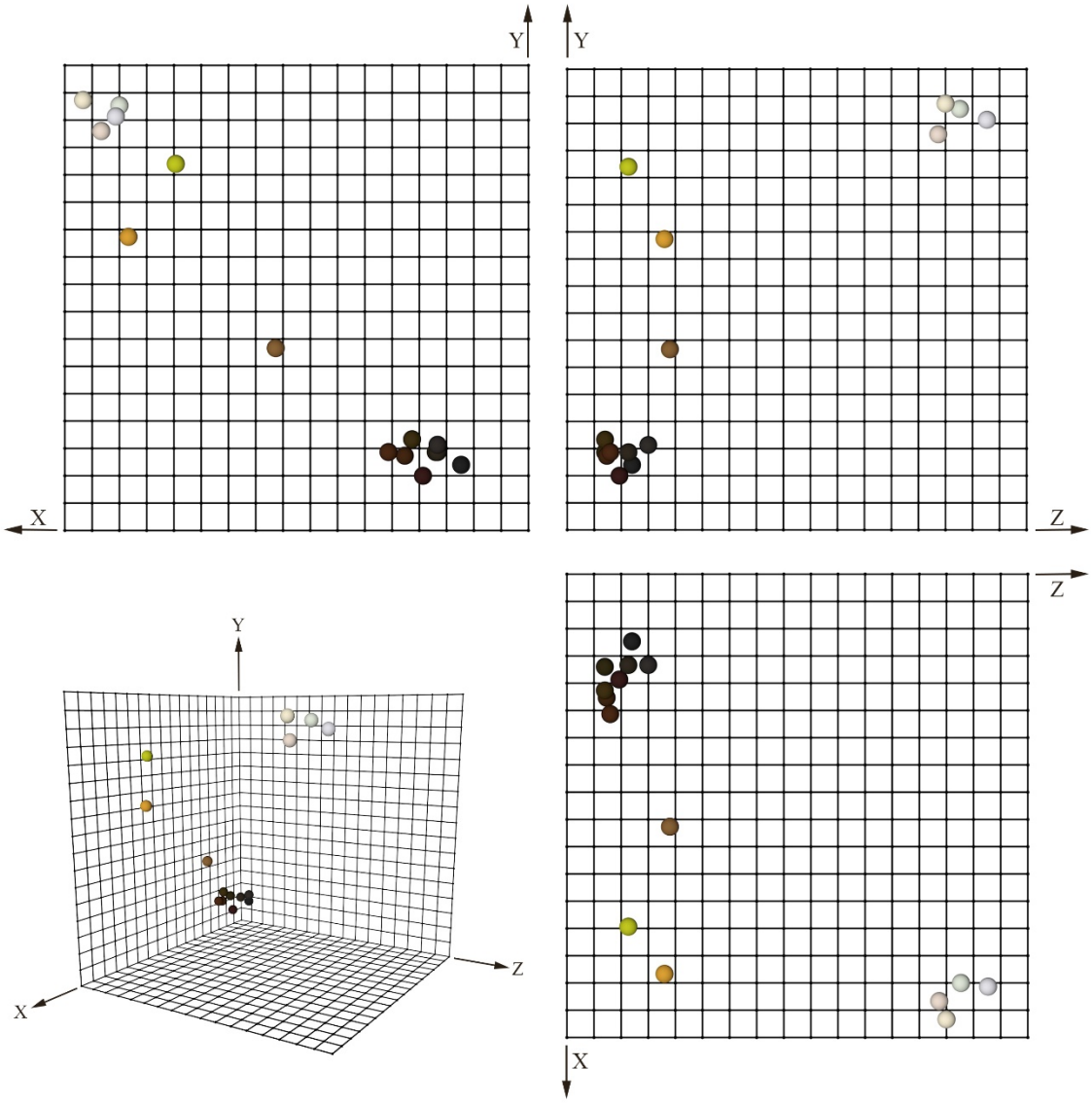

Figure 21: Color distribution for the United Arab Emirates.

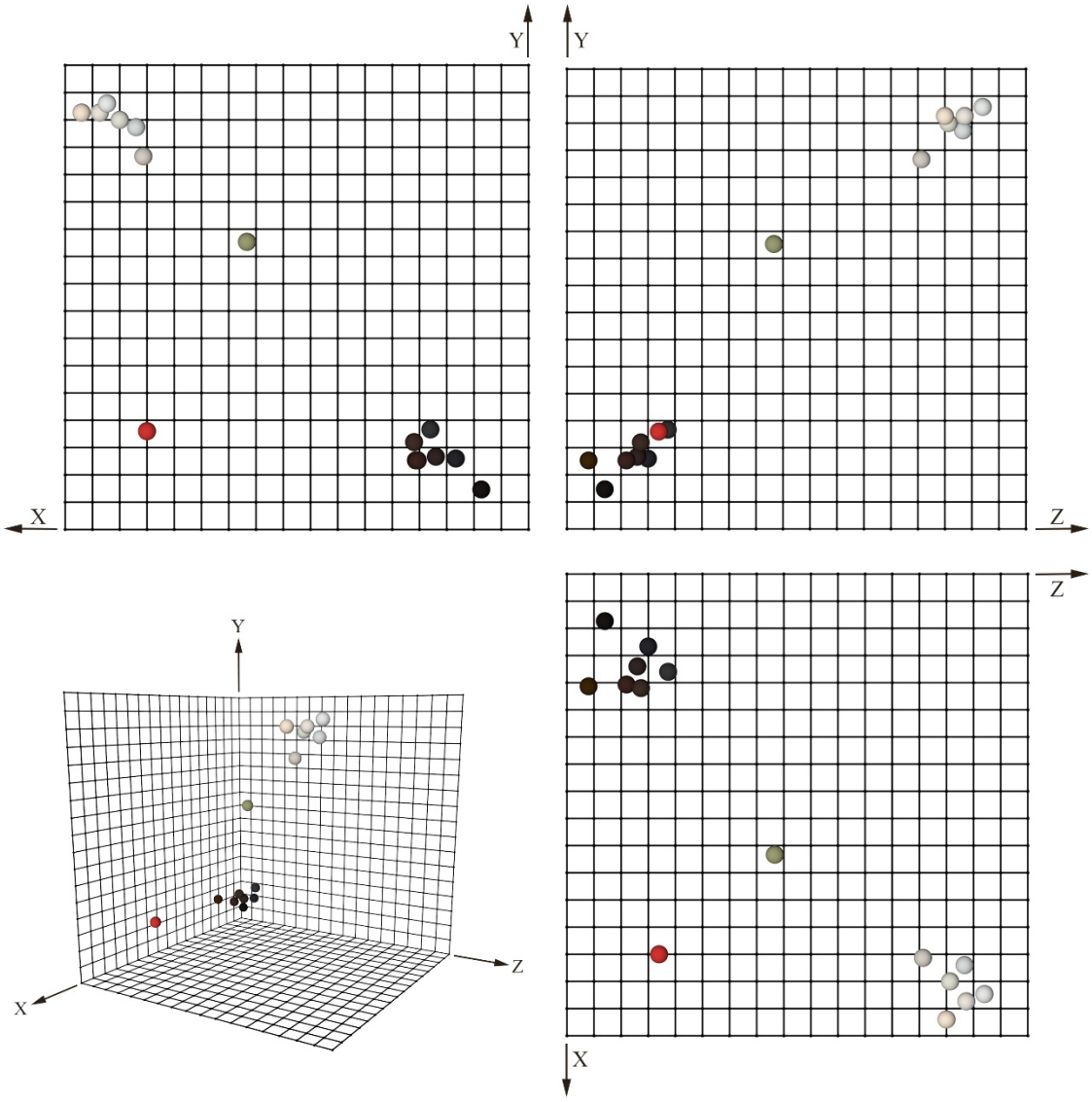

Figure 22: Color distribution for the United States of America.