

Intersections of Culture and Well-Being in the Workplace Environment

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## **Dedication**

For Allen, Micah, and Nikko...you are the reason. The sacrifices I've made are and always have been about you and your future. I love you with all my heart! To my husband, you have been my rock. Your support in doing things I just could not finish this work is beyond words. You are an amazing man, father, and husband. I love you and am excited to see what this next chapter in life brings us!

## **Abstract**

This study is an investigation of how culture affects employee well-being in the workplace environment. It is also an attempt at constructing an instrument that measures the relationship between culture and well-being in such settings. Correlation and logistic regression tests were conducted to understand the relationships of the independent variables culture (operationalized by ethnicity), physical environment, social characteristics, and visual characteristics and their effect on well-being. Hofstede's (1984) cultural dimensions and Travis' (2010) 10 principles of Black cultural design were used as theoretical frameworks to ground the concepts. Hypotheses statements were developed for this study and include: culture influences employees' well-being in the workplace; the overall physical environment influences well-being in the workplace; social characteristics influence well-being in the workplace; and visual characteristics influence well-being in the workplace.

Findings resulted in no significance for the hypotheses tested nor the logistic regression model. However, it is suggested that further testing of the model is conducted due to the small sample size and skewed variables. It is also highly recommended that more qualitative studies are conducted around the concepts of culture and well-being to have a better understanding of the complex aspects of culture and well-being in the workplace. Culture is important in the workplace environment, therefore studies such as this one are important. Designing spaces that increase connectivity and relationships is not only beneficial to employee well-being, but it also has the advantage of increasing an organization's bottom line.

## Table of Contents

<b>Acknowledgements .....</b>	<b>i</b>
<b>Dedication .....</b>	<b>ii</b>
<b>Abstract.....</b>	<b>iii</b>
<b>List of Tables .....</b>	<b>x</b>
<b>List of Figures.....</b>	<b>xii</b>
<b>Chapter 1: Introduction .....</b>	<b>1</b>
<b>Background of Problem .....</b>	<b>1</b>
<b>Statement of Problem .....</b>	<b>3</b>
<b>Purpose of Research .....</b>	<b>4</b>
<b>Research Significance .....</b>	<b>4</b>
<b>Research Question .....</b>	<b>5</b>
<b>Definitions.....</b>	<b>5</b>
<b>Chapter 2: Literature Review.....</b>	<b>7</b>
<b>Overview.....</b>	<b>7</b>
<b>Culture .....</b>	<b>7</b>
<b>Culture and Interior Design .....</b>	<b>10</b>

Culture and Workplace Environments.....	13
<b>Well-being.....</b>	<b>16</b>
Well-being and Interior Design .....	17
Well-being and Workplace Environments.....	19
<b>Theoretical Framework.....</b>	<b>23</b>
<b>Culture and Social Characteristics.....</b>	<b>23</b>
<b>Culture and Visual Characteristics.....</b>	<b>30</b>
Nature.....	32
Color.....	34
<b>Hypotheses.....</b>	<b>35</b>
<b>Chapter 3: Methodology.....</b>	<b>37</b>
<b>Procedure.....</b>	<b>37</b>
Sustainable Post-Occupancy Evaluation Survey (SPOES).....	37
Culture Module Instrument.....	40
Variables .....	41
Culture.....	41
Physical environment.....	41
Social characteristics.....	41
Visual characteristics.....	42

Well-being.....	42
Pilot Study.....	42
<b>Data Collection .....</b>	<b>43</b>
Setting.....	43
Population and Sample .....	46
Data Screening.....	48
Code book.....	48
Missing data.....	48
Outliers.....	49
Sample Description.....	49
<b>Variable Transformations.....</b>	<b>49</b>
Transformation of Well-being Variable.....	51
Culture and well-being in the workplace environment.....	53
Transformation of Culture Variable.....	56
Transformation of Physical Environment Variable .....	59
Transformation of Social Characteristics Variable.....	61
Transformation of Visual Characteristics Variable .....	62
Multicollinearity .....	64
<b>Data Analysis.....</b>	<b>66</b>



<b>Statistical Analysis .....</b>	<b>66</b>
Non-parametric Tests.....	66
Chi-squared Tests of Independents.....	67
Bivariate Correlations .....	67
Logistic Regression.....	67
Qualitative Analysis.....	68
<b>Chapter 4: Findings and Discussion.....</b>	<b>69</b>
Overview.....	69
<b>Hypotheses Analysis.....</b>	<b>69</b>
Hypothesis 1: Culture Influences Employees’ Well-being in the Workplace Environment .....	69
Hypothesis 2: Well-being is Mediated by Employees’ Satisfaction with the Overall Physical Environment.....	71
Hypothesis 3: Well-being is Mediated by Social Characteristics in the Workplace Environment.....	72
Hypothesis 4: Well-being is Mediated by Visual Characteristics in the Work place Environment.....	72
<b>Logistic Regression Model .....</b>	<b>73</b>
<b>Bivariate Cross Tabulations .....</b>	<b>74</b>
<b>Qualitative Analysis.....</b>	<b>81</b>

Nature.....	82
Windows.....	82
Color.....	82
Personalization.....	82
Space.....	83
Discussion.....	83
<b>Chapter 5: Conclusion and Implications for Further Study .....</b>	<b>84</b>
Overview.....	84
<b>Review of Findings.....</b>	<b>84</b>
<b>Implications .....</b>	<b>86</b>
Measuring Culture .....	86
Impact of Social Characteristics on Well-being in the Workplace Environment.....	86
Effects of Culture and Well-being Design on Organizations .....	87
SPOES Instrument Revision.....	88
<b>Limitations.....</b>	<b>88</b>
Sample Size and Statistical Significance .....	88
Cultural Diversity.....	89
<b>Future Research .....</b>	<b>90</b>
Measurement of Culture in the Workplace Environment.....	90

Mixed Methods Investigation of Culture and Well-being in the Workplace Environment .....	92
Social Characteristics .....	93
Visual Characteristics .....	94
<b>Conclusion .....</b>	<b>95</b>
<b>References .....</b>	<b>97</b>
<b>Appendix A .....</b>	<b>107</b>
<b>Folwell Hall SPOES Workplace Survey + Culture Module .....</b>	<b>108</b>
<b>Culture Module Code Book .....</b>	<b>119</b>
<b>SPOES Project Initiation Form .....</b>	<b>127</b>
<b>SPOES Building Coordinator Initial Contact Letter .....</b>	<b>129</b>

## List of Tables

Table 1. Cultural dimensions & workplace characteristics (Hofstede, 1984; Knoll, 2010a; Plijter et al, 2014).....	28
Table 2. 10 Black principles of cultural design (Travis, 2010) .....	31
Table 3. Culture module questions by type .....	42
<i>Table 4.</i> Subject areas taught in Folwell Hall Spring 2015 .....	1
Table 5. Descriptive statistics for well-being variable (Q27).....	51
Table 6. Frequencies for transformed categorical well-being variable (Q27).....	53
Table 7. Correlations for well-being and culture measure (Q26, Q27) .....	54
Table 8. Descriptive statistics for collapsed well-being variable (Q26, Q27) .....	54
Table 9. Descriptive statistics and correlations of nationality, ethnicity, and well-being variables .....	55
Table 10. Descriptive statistics of nationality variable.....	56
Table 11. Descriptive Statistics of transformed nationality categorical variable .....	57
Table 12. Descriptive statistics for ethnicity variable.....	58
Table 13. Descriptive statistics for transformed culture variable .....	59
Table 14. Correlations of physical environment variable.....	60
Table 15. Descriptive statistics for collapsed physical environment variable .....	60
Table 16. Correlations for social characteristics variable.....	62
Table 17. Descriptive statistics for collapsed social characteristics variable .....	62
Table 18. Correlations for visual characteristics variable.....	63
Table 19. Descriptive statistics for collapsed visual characteristics variable .....	64

Table 20. Multicollinearity analysis of visual, social, and physical variables.....	64
Table 21. Relationship between culture and influence on well-being in the workplace environment .....	70
Table 22. Correlation for physical environment mediating well-being in the workplace environment .....	71
Table 23. Correlation for social characteristics mediating well-being in the workplace environment .....	72
Table 24. Correlations for visual characteristics mediating well-being in the workplace environment .....	73
Table 25. Summary of logistic regression predicting influence of culture on well-being in the workplace environment.....	74
Table 26. Relationship of color temperature and culture in the workplace environment.	75
Table 27. Relationship of color temperature and nationality in the workplace environment .....	77

## List of Figures

Figure 1. Three levels of uniqueness in mental programming model (Hofstede, 1981)...	24
Figure 2. The stabilizing of culture patterns (Hofstede, 1981).....	25
Figure 3. Integrated work model (Knoll, 2010b).....	30
Figure 4. Proposed empirical model with hypothesized relationships.....	36
Figure 5. SPOES IEQ Framework Model.....	39
Figure 6. Exterior and map of University of Minnesota Folwell Hall (Google Maps)....	44
Figure 7. Folwell Hall restored main floor corridor.....	45
Figure 8. Folwell Hall offices and public work areas.....	45
Figure 9. Variable Transformation Process.....	50
Figure 10. Well-being variable frequencies.....	52
Figure 11. Frequencies for transformed categorical well-being variable (Q27).....	53
Figure 12. Frequencies for new collapsed well-being variable.....	54
Figure 13. Frequencies for nationality variable.....	57
Figure 14. Frequencies for transformed nationality categorical variable .....	58
Figure 15. Frequencies for ethnicity variable.....	58
Figure 16. Frequencies for transformed categorical culture variable.....	59
Figure 17. Parsimonious model with updated measures.....	65
Figure 18. Data analysis process overview.....	66
Figure 19. Relationship of cultural diversity importance and well-being by culture.....	70
Figure 20. Color temperature preference by culture.....	76
Figure 21. Color temperature preference by nationality.....	78

Figure 22. Kelvin color temperature preference by culture.....	79
Figure 23. Kelvin color temperature preference by nationality.....	79
Figure 24. Response to color temperature importance by nationality.....	80
Figure 25. Response to color temperature importance by culture.....	81

## **Chapter 1: Introduction**

### **Background of Problem**

Current statistics show that one in three Americans is a minority (United States Census Bureau, 2010), and that Americans spend the majority of the 24-hour day at work (Bureau of Labor Statistics, 2013). This implies that a large portion of their workday is spent with people of diverse backgrounds. As the United States continues to become more diverse (United States Census Bureau, 2011), it is important to understand and address people's well-being in their physical workplace environment from a cultural lens. Diversity is not only applicable to the United States, but also globally. Burke (2010) states, "More organizations are working with business partners in other countries. Thus there is a greater need to operate in other countries and cultures and appreciate local cultures and customs," (p.5). The researcher calls for more cross-cultural studies, stating that research conducted in the United States may be appropriate for other countries.

The interior design profession is in a unique position to further this research and make contributions that improve the human condition and people's well-being through design of interior environments that serve as the backdrop to people's lives. Interior designers are charged with the responsibility of protecting human health, safety, and well-being in the built environment (American Society of Interior Designers, 2013). Furthermore, the Council For Interior Design Accreditation (CIDA) (2009) under Standard 2 requires that all "entry level interior designers have a global view and weigh design decisions within the parameters of ecological, socio-economic, and cultural contexts" (p.13). Scholars have made the connection to culture and well-being in the



interior design profession. Guerin (2014) states that a factor shaping well-being is designing for people's cultural identity, cultural aesthetics, and/or cultural norms. This study will address culture in the workplace environment as these concepts have been found to be directly related to well-being (Diener, Oishi, & Lucas, 2003; Diener, 2009a; Tov & Diener, 2013).

An appreciation of cultures different than one's own has the opportunity to bring employees together, enhancing individual and collective well-being as they feel valued in their work environment (Stevens, Plaut, & Sanchez-Burks, 2008). However, employees' well-being is often overlooked in the physical environment of places we work (Bitner, 1992; Plijter, van der Voordt, & Rocco, 2014). Scholars posit that different cultures have differing concepts of well-being, which influence an individual's desirable feelings (Diener, 2009a, Oishi, 2006). Diener (2009a) states this concept "speaks to the fundamental nature of well-being, and therefore understanding in this field cannot proceed without acknowledging the influence of culture" (p.1). As organizations are moving toward addressing employees' well-being (Bakker, van der Voordt, de Boon, & Vink, 2013; Shafer, 2012; Veitch, 2011), they should also understand that employees who feel valued by their companies create a deeper connection with the organization. Ultimately, the connection is reflected in employees' satisfaction and loyalty to the company, which may result in less turnover and a higher return on investment (Guerin, Brigham, Kim, Choi, & Scott, 2013; Hunt, Layton, & Prince, 2015; Steelcase, 2012).

Finally, culture and well-being can be supported by the design of the physical workplace in ways that shows an understanding and therefore satisfaction with cultural

factors in the workplace environment. Knowledge about other cultures celebrates everyone. The internationally known architecture firm 3XN, embraces this concept. Nielson (2010) states “3XN aims to adopt and take advantage of cultural differences to create architectural perspective; to emphasize in our own minds and other people’s that globalization is about learning from diversity and not about creating a homogenous world” (p.171).

Satisfaction with the physical environment in workplaces is also found to be a measure of well-being (Guerin, Brigham, Kim, Choi, & Scott, 2013; Plijter, van der Voordt, & Rocco, 2014). Cheng et al. (2011) states that satisfaction is a cognitive factor of well-being, while negative and positive affect are major indicators of satisfaction. Additionally, Diener (2009) and Oishi (2006) found that culture is also correlated with satisfaction. Therefore, as this study seeks to support culture and well-being in the workplace environment, employees’ levels of satisfaction will be investigated (Guerin, Brigham, Kim, Choi, & Scott, 2013).

### **Statement of Problem**

Culture is an ingrained part of our identities (Diener, 2009b; Hofstede, 1981, 1984); however, it is rarely used to understand the effects of employees’ well-being in the physical workplace environment. Though studies are emerging (Plijter, van der Voordt, & Rocco, 2014; Shafer, 2012; Steelcase, 2012), there are gaps in the literature that assess the correlation between culture and employees’ well-being in the physical work environment. For example, how satisfied are employees with their physical work environments as mediated by their culture. Research such as this study will begin to

move towards filling the gap in the intersections of culture and well-being in the workplace environment.

### **Purpose of Research**

The primary purpose of this study is to investigate the relationship between employees' culture and well-being in the workplace environment. The secondary purpose is to develop an instrument to measure impacts of culture on workplace well-being.

### **Research Significance**

Organizations that value culture and diversity authentically create stronger employee connections to the organization's mission and values (Stevens, Plaut, & Sanchez-Burks, 2008). Gaining insights from cultural perspectives can provide important information and directions to create culturally inclusive work environments. In doing so, it also creates a deeper level of satisfaction and well-being for employees. Conducting research based on culture and workplace environments is important for the following reasons:

1. As our world is becoming more global and we spend the majority of time indoors, it is important for the interior environment to enhance employees' well-being by creating inclusive work environments. Such environments will not only enhance satisfaction, but are also useful in attracting and retaining a diverse workforce.
2. Culture is a significant part of people's lives. Having a connection to one's culture reinforces identity, therefore enhancing satisfaction and ultimately well-being.

3. There is limited literature on culture and its influence in interior environments; therefore there is little direction on how to use and incorporate culture in the design of spaces.
4. Culturally diverse workforces financially out-perform companies without a diverse workforce (Hunt, Layton, & Prince, 2015; Stevens, Plaut, & Sanchez-Burks, 2008). Making a case for studies such as these, which can indirectly impact an organization's bottom line.

### **Research Question**

1. Does culture influence employee well-being in the overall physical work environment?
2. Does culture mediated by satisfaction with the physical workplace environment influence well-being?
3. Does culture mediated by workplace social characteristics influence well-being?
4. Does culture mediated by visual characteristics influence well-being?

### **Definitions**

Culture: The collective programming of mind distinguishing the members of one group or category of people from another. The category can refer to nations, regions, ethnicities, religions, occupations, organizations, or genders (Hofstede, 1984).

Ethnicity: Aspects of relationships between groups which consider themselves, and are regarded by others, as being culturally distinctive (Eriksen, 2002).

Nationality: A sociocultural category describing forms of community, and the “state” which relates to forms of governance (Mongia, 1999).

Well-being: People’s evaluations of their lives, including pleasant affect, infrequent unpleasant affect, and life satisfaction influenced by one’s culture (Tov & Diener, 2009).

Workplace Environment: Physical environments in which work or employment of any kind is carried out (Kopec, 2012).

In summary, creating interior spaces in the workplace environment that celebrate culture is one way interior designers can bring about social change. In doing so employees may feel valued, attracting a more diverse workforce. As employees are exposed to cultures outside of their own, there is a greater awareness and appreciation of their similarities and differences, ultimately exposing one’s humanness.

## **Chapter 2: Literature Review**

### **Overview**

This chapter focuses on a review of literature discussing culture and well-being and how they relate to the workplace environment. The chapter reviews current literature on culture, culture and the profession of interior design, and culture and workplace environments. The discussion moves on to well-being, well-being and the profession of interior design, and well-being and workplace environments. A theoretical framework grounded in social and visual characteristics reflected in the interior environment follows, concluding with a set of hypotheses and a supporting conceptual model presented to guide this study.

### **Culture**

Culture is a term that is used broadly therefore it is important to operationalize how it will be used in this study. This investigation will use Hofstede's (1984) definition when referring to culture which is operationalized in this study by nationality and ethnicity. Globalization is a major force impacting workplace diversity which has led to multinational workforces (Burke, 2010; Nielsen, 2010; Stevens, Plaut, & Sanchez-Burks, 2008). Companies realize that if they do not incorporate global practices into their organizations, they will not be able to compete in today's market (Nielsen, 2010). Nielsen (2010) states, "the many facets of our multi-cultural society is an important factor in our understanding of the world. In our opinion it is important to view cultural differences as a

benefit in order to be able to work competently within any culture with its special values and traditions,” (p.171).

It is important to note that when many consider cultural diversity in the United States, individuals typically think of those outside of European decent (Unzueta & Binning, 2010). The researchers conducted a study to understand which racial groups are associated with diversity in the workplace. Findings showed certain ethnic groups may view other groups as being less “diverse.” To further explore this concept the researchers administered surveys to N=109 university students (66 women and 43 men). The participants were made up of 46 Whites, 34 Asians, 14 African Americans, and 11 Latinos who were given the survey along with unrelated surveys. Participants were asked: When you think about the concept of diversity, to what extent do you think about the following groups? Their choices were Whites, Blacks, Latinos, and Asians. Results found Blacks (M=5.7) and Latinos (M=5.75) were more associated with diversity by all participants. Asians were less associated with diversity by other groups than themselves, while Whites were overall not associated with diversity.

Stevens, Plaut, and Sanchez-Burks (2008) state that sometimes diversity is seen negatively by White employees as it feels exclusive to certain groups of people. To the contrary, the researchers state diversity includes minorities and non-minorities. The scholars introduce the all-inclusive multicultural (AIM) approach where multiculturalism and cultural diversity is acknowledged and recognized as a strength. This is a result of race and ethnicity being acknowledged and not exclusionary to European cultures.

Stevens, Plaut, and Sanchez-Burks, (2008) state that “companies that applied the AIM

approach experienced revenue growth based on innovation from diversity efforts, retention of employees, and deeper knowledge of markets” (p. 127). This study considers diversity to be an inclusive term as the AIM approach outlines.

A study conducted by Hunt, Layton, and Prince (2015) supports the findings of Stevens, Plaut, and Sanchez-Burks (2008) AIM approach. The researchers investigated diversity (operationalized as women and a more mixed ethical/racial composition in the leadership of large companies) and a company’s financial performance in the United Kingdom, Canada, Latin America, and the United States (N=5,000). Using financial and demographic records, the researchers found in the United States, 35% of ethnically diverse companies on average have higher returns than those that do not. Though this study showed higher returns in diverse companies within the United States, there continues to be less intent in hiring employees considered to be ethnically diverse; instead it appears that women hires are increasing in number. It is recommended that “dedicated effort to achieve diversity in leadership that reflects the demographic composition of the country’s labor force and population [be made],” (p.4).

In a review of literature, many researchers identify culture by nationality and/or ethnicity (Hofstede, 1984; Simon & Piche, 2012; Steelcase, 2012; Stevens, Plaut, and Sanchez-Burks, 2008; Plijter, van der Voordt, & Rocco, 2014; Ting-Toomey & Chung, 2012). Nationality describes country of origin and has been used as a factor to study the concept of culture in numerous investigations. A seminal study conducted by Hofstede (1984) operationalizes culture through nationality. However, nationality may not be an accurate representation of culture alone. Many subgroups within their countries



experience life differently, often based on cultural norms grounded in their ethnicities (Ting-Toomey & Chung, 2012). Gannon (2011) posits that nationality becomes less important as globalization increases. Ethnicity as a factor of culture may be of more importance in countries like the United States, where individuals of vast nationalities reside and work (Morning, 2008). In addition, many organizations such as the US Census Bureau collect demographic data pertaining to nationality and ethnicity among other factors to identify culture (Morning, 2008). The literature in this chapter cites studies that use culture in contexts of nationality and ethnicity (Asojo, 2011; Eglash, 1999; Guerin, Park, & Yang, 1994; Hadjiyanni, 2014; Ham & Guerin, 2004; Hofstede, 1984; Plijter, van der Voordt, & Rocco, 2014) specifically as the studies are framed within the interior physical environment. It is therefore appropriate to discuss how culture and well-being impact the interior environment, especially the workplace.

### **Culture and Interior Design**

Interior designers are charged with the responsibility of promoting human health, safety, and well-being in the built environment (American Society of Interior Designers, 2013). Understanding this responsibility and applying it to practice can create spaces that improve people's quality of life (Andrade, Lima, Devlin, & Hernández, 2014; Bakker, van der Voordt, de Boon, & Vink, 2013; Burton, Mitchell, & Stride, 2011; Klatte, Hellbruck, Seidel, & Leistner, 2010; Petermans & Pohlmeier, 2014; Shafer, 2012; Ulrich, 1984; Veitch, 2011). An indicator of one's quality of life or well-being is the level of satisfaction (Tov & Diener, 2009). Culture is an area of well-being that is directly tied to quality of life, as it is innately part of an individual's identity (Diener, 2009b; Kopec, 2012). In the next 50 years, minorities will make up 90% of the United States population

(Alabanza-Akers, 2007). This group will be made up of a variety of cultures. According to Hofstede (1981), our cultures are a part of our value system, therefore it is engrained in all life decisions it is important to address in the interior design profession.

In interior design, researchers have disseminated a body of work on culture. Asojo (2007, 2011, and 2013) has focused mainly on cross-cultural issues, African architecture and design to enhance learning from multicultural and global perspectives in the profession. In a study about cultural transformative instruction, Asojo (2013) used the ACT-R theory (Anderson, 1995) and Grant's (1991) cultural pedagogy approach of inclusion, contribution, and transformation to create a framework for teaching culture and design to students. Hadjiyanni (2002, 2007, 2008, 2009, 2013, 2014) has also been prominent in advancing cultural research. The researcher conducted many studies that explore the cultures of Somali, Ojibwa, Greek, Mexican, and Hmong people in housing and residential design. By integrating culture in pedagogy, scholars are able to provide awareness of other cultural realities to students who otherwise may not be aware of experiences outside of their own. Other scholars such as Park and Guerin (2002), Guerin and Martin (2010), Jani (2011), Elleh (1997), and Grant (1991) have also conducted studies and work to advance culture in the field of interior design and architecture.

Asojo (2015) conducted case studies on indigenous forms, art, and symbols in two religious settings in Nigeria. The study adds to the literature and advances the conversation around African interior design. Ethnography was used to investigate the merging of Roman Catholic and Nigerian cultures into unified designs and architecture. Case studies of two Catholic churches used multiple data collection methods such as

photography, observation, and interviews. A detailed history of Nigerian architecture and design is given noting the hierarchal systems and elaborate decoration towns were designed in pre-dating colonial occupation. The narrative moves through the integration of colonial design in the region. The article goes on to describe ways in which Nigerian and Catholic styles were brought together with reference to Nigerian culture, community, and reverence for nature. Many of the design solutions what would be called innovative sustainable features today (i.e. screens that provide ventilation, and low levels of natural light to reduce heating), are traditional Nigerian solutions born out of necessity due to the tropical climate. The study adds to the interior design and architecture history literature as the researcher posits “it presents precedent and multicultural design perspectives for those who will practice in the shrinking village,” (p.16). Many of the natural and social features are in common with Travis’ (2010) 10 principles of Black cultural design, in addition social issues are present which are reflected in Hofstede’s (1984) research. These works will be discussed later.

As Asojo (2015) referenced, Grant’s (1991) inclusion approach offers a framework for discourse and awareness of designers and their work as they have traditionally been omitted from historical contexts. Culture is therefore an important factor in the profession of interior design and should be a consideration when designing spaces. In addition, continued research on topics focusing on culture can decrease the gap in the literature.

## **Culture and Workplace Environments**

Our world has become much smaller through globalization (Egge, 1999; Herman Miller, 2010; Plijter, van der Voordt, & Rocco, 2014; Steelcase, 2011; Steelcase, 2012), as such the impact of culture on workplace design cannot be ignored. Organizations that embrace and value their multicultural workforce make more business sense from a revenue standpoint (Hofstede, 1984; Stevens, Plaut, & Sanchez-Burks, 2008; Steelcase, 2011). In discussing workplace environments and occupancy behavior; Plijter, van der Voordt, and Rocco (2014) state “a misfit between the design of workplaces and user’s preferences and needs might have impact on organizational performance” (p.745). Thus, the design can indirectly affect a company’s return on investment. Steelcase (2011) explored culture in workplace environments gathering data from organizations that have incorporated visual characteristics in their workplaces by including finishes and fixtures that were reflective of various national cultures. For instance, the study noted that McDonalds incorporated glass partitions, avant-garde graphics, and modern chairs into their design strategy reflective of the contemporary aesthetic associated with France and Europe. As a result they report an increase in revenue from \$7.1 billion to \$9.3 billion Steelcase, 2011). In response to this success, they now employ a design leader for all of their regions that incorporate local cultural strategies into their designs. Other retail and marketing groups have incorporated this approach to enhance the shopping experience for consumers by including visual characteristics such as ambient lighting, color, and space layout called atmospherics (Bonn, Joseph-Mathews, Dai, Hayes, & Cave, 2007; Elliot, Cherian & Casakin, 2010).

Bitner (1992) created a framework for understanding environment-user relationships in service organizations that includes a cultural component. The framework posits that behavior is highly associated with culture and is determined by internal responses, moderators, the holistic environment, and environmental dimensions (sensory attributes). External and internal information from these variables result in consumers and employees wanting to either approach or avoid a space. The researcher found that including environmental dimensions that are pleasurable and connect with the occupant increased consumer spending and increased levels of satisfaction with consumers and employees. These investigations make the connection between culture and satisfaction of occupants in the physical workplace environment. Therefore, it is important to consider such visual characteristics which mediate cultural connections.

Steelcase (2012) used Hofstede's (1984) cultural dimensions framework and Hall's (1981) theory of proxemics to investigate the intersections between culture and space in workplace environments. Hofstede's dimensions include power distance, individualism, uncertainty, long-term avoidance, and masculinity. The qualitative study used secondary research and observation in Germany, China, India, Great Britain, Spain, Netherlands, France, Morocco, Italy, Russia, and the United States. The responses were analyzed by creating a continuous scale of cultural dimensions, which resulted in the following dichotomous constructs: autocratic/consultative, individualist/collectivist, masculine/feminine, uncertainty/security, short-term/long-term, and low context/high context. The responses interpreted the differing countries used space from a socio-cultural view. The United States was low in the power distance scale and high in individualism. The respondents identified as more masculine, uncertainty tolerant, short-

term oriented, and were a low context culture. These findings support that Americans are more relaxed in their communication and behavior, are more flexible, but still need different types of workspaces for individual and collaborative work that support their technological needs. China was high on the power distance scale as a very autocratic culture. They scored high as collectivists and in masculinity. They identified as tolerant about uncertainty, are long-term oriented, and are considered a high context culture. These findings reveal that Chinese individuals embrace hierarchy, not minding dense workstation planning, appreciating formal and informal collaborative spaces, and desire workplaces that reflect modern values. The Steelcase (2012) study promotes an “interconnected workplace, supporting how people work now, but also anticipates how they will work in the future” (p. 126). The interconnected workplace leverages complexities; understands the need for technology, relationships, and space that supports them; offers choice in how employees work; considers culture; and creates a palate of place, posture, and presence.

Herman Miller (2010) conducted a study on Brazilian, Russian, Indian, and Chinese (BRIC) cultures that explored their values and how they are integrated into the design of their workplace environments. The study found that much of the space design is dictated by cultural norms. For instance, there was more hierarchy in offices and space layout in China because respect and position is held in high regard. In Brazil, there were more open offices, the management was integrated with the staff, and they offered more workplace campus amenities. The study also found that 25% of the other countries had more organic spaces with curvilinear lines compared to only 3% of American workplaces, who were more minimalist in their design. Key findings showed that there

are more human similarities across cultures such as an affinity for nature and open spaces that support the use of polygenic design centering on biophilic and prospect-refuge theories. BRIC countries have the fastest growing economies; therefore understanding their cultural norms, work styles, and their work environments can be beneficial in conducting international business (Herman Miller, 2010). The researchers discuss how cultural attributes can be translated into the work environment that may also support its organizational culture. Key trends were the relevance of office standardization, the prevalent use of technology, private offices founded in hierarchies, decreased workstation size, panel heights being lowered, and access to nature. Implications stated that the workplace can be a tool used to attract and retain employees in a global world, thus creating a dynamic innovative, and productive workforce (Herman Miller, 2010).

### **Well-being**

In recent years, the topic of well-being has emerged as an important aspect of how individuals thrive, and flourish in life (Diener, 2012; Seligman, 2012; Soto, 2015). When people have a good sense of well-being societies are positively affected (Clifton, 2013). Well-being is a difficult phenomenon to measure, so it is typically measured by factors of satisfaction (Tov & Diener, 2009; Morrison, Tay, & Diener, 2011; Wood, Van Veldhoven, Croon, & De Menezes, 2012). Researchers state that well-being is not just the absence of illness, but moving beyond a neutral position of health to flourishing (Becker et al., 2010; New Economics Foundation, 2010; Seligman, 2012). It has been found to influence people's positive and negative feelings towards life (Guerin and Martin, 2010). Kiefer (2008) defines well-being as an individual's physical, mental,

social, and environmental status. Each aspect interacts with the other, each having differing levels of importance and impact according to the individual. Kreitzer (2014) states that well-being is a complex concept that is made up of aspects of community, relationships, environment, security, purpose, and health. In Kreitzer's (2014) Whole Systems Healing Model of Well-being, culture is a factor. Tov & Diener (2009) state that people's evaluations of their lives, including pleasant affect, infrequent unpleasant affect, and life satisfaction, are influenced by culture. Tov & Diener's (2009) definition will be used to operationalize well-being in this study and will investigate feelings of satisfaction to understand well-being in the workplace environment.

### **Well-being and Interior Design**

In recent years, well-being has become an emerging topic in interior design. Researchers have focused on well-being in the areas of healthcare design (Andrade, Lima, Devlin, & Hernández, 2014; Cama, 2009; Rashid & Zimring, 2008; Ulrich, 1984), learning environments (Klatte, Hellbruck, Seidel, & Leistner, 2010), residential (Burton, Mitchell, & Stride, 2011; Petermans, & Pohlmeier, 2014), and workplace environments (Bakker, van der Voordt, de Boon, & Vink, 2013; Shafer, 2012; Veitch, 2011). Guerin and Kwon (2010) identified constructs that are outcomes of well-being and are part of the interior design profession's body of knowledge. They include adaptation, coherence, identity, cultural identity, personal space, arousal, comfort, harmony, meaning, sense of security, territory, beauty/aesthetics, hierarchy, performance, stimulation, and wayfinding.

In addition to psychological effects, well-being has physiological implications.



Well-being is greatly affected by the presence of stress or lack thereof (Evans and McCoy, 1998; Ulrich, 1991). The limbic system in the brain regulates stress levels and controls fight or flight responses. As this area of the brain is triggered, it releases more serotonin, a hormone found in all people that helps to focus and prepare our bodies for shock, pain, and fatigue (Sternberg, 2009). Serotonin also regulates mood. Low levels of this chemical can increase the onset of depression (Nedley, 2001). Along with serotonin, other neurochemicals can positively or negatively affect one's well-being (Kopec, 2012; Sternberg, 2009).

Ulrich's (1984) seminal quantitative study encouraged the investigation of well-being in the interior environment where observed patient's recovery was mediated by nature in a hospital recovery environment. Twenty-three participants were given views of nature outside their post-op recovery rooms, while a control group of 23 patients were given views of a brick wall. Results showed that the 23 participants with views of nature had shorter stays after surgery, had increased positive feedback on nurses' notes, and took less analgesic medicines than the 'brick wall' group. Nurses' notes from the patients without views of nature included negative comments such as "upset and crying" and "needs more encouragement" verses positive feedback statements from those with views of nature.

Understanding stress and how other biological imbalances impact humans can begin to aid interior designers in creating solutions that could potentially increase health and well-being. Thus, studies that investigate well-being aid interior designers in practice as they incorporate these important findings into real-life settings.

## **Well-being and Workplace Environments**

Clifton (2013) states “g[ross] domestic product follows g[ross] national well-being, leaders need to understand what well-being tells us, the impact it has on citizens, and most importantly, how to increase it” (n.p.). Researchers in the profession have taken notice of how well-being in the interior environments ultimately impacts the company’s bottom line (Guerin & Martin, 2010; Steelcase, 2013). Woo (2012) developed a quality of work life instrument to measure productivity in workplace environments. The researcher administered post occupancy evaluations in nine office buildings (five conventional, four green rated) and surveyed 341 employees in administrative support, technical positions, managerial, and sales & marketing. Factors of productivity were identified as work environment related, work performance, job stress & satisfaction, and organizational productivity.

Spaces that facilitate connectivity are valued in the workplace environment as they moderate impromptu interaction and conversation that are significant in spurring innovation (Hoskins, 2013). A study by Backhouse and Drew (1991) states:

Work' activities are no longer seen as an array, however systematic, of isolatable independent actions performed by individuals, but as a complex coalition of human behavior and environmental resources... Work space is hence no longer simply the site of collaborative activity but is actually an intrinsic part of this collaboration itself. In this sense, spatial layout may be understood as a major variable in any aspiration towards a productive and efficient marriage between work system and work space (p.573).

The company Mercy Corps has been successful at making their workplace site a collaborative component to achieving their organizational goals and creating a workplace culture of community. Their headquarters in Portland, Oregon incorporates an open floor plan and a diversity of meeting areas. A central circular stairway expressed the organization's interactive work style. This design feature increased opportunities for chance meetings while the egalitarian workstations reinforced collaboration (American Institute of Architects, 2012). It is important to note that an opposing argument to open floor plans and their support in collaboration, is that they do not support focus work when employees need concentration to complete their tasks (Hoskins, 2013; Silverman, 2013). To ensure that all types of works styles are satisfied, collaborative and spaces that enhance focus are needed for workplace well-being.

Steelcase (2013) discusses how organizational well-being is beneficial for companies and their employees, not only as a cost savings, but as a way to enhance employee work life, health, and performance. The company has set out to incorporate well-being into the culture of their organization, as well as being committed to creating products that enhance well-being. They state that moving to different workspaces is healthier than staying in one place and interaction from being in different environments enhances trust, team, and culture. In addition, they have saved money on health insurance by incorporating well-being into their organizational culture resulting in smaller increases in premiums for their employees.

There are not many quantitative studies that focus on well-being and the workplace environment. However, Heerwagen and Zagreus (2005) conducted a study for

the Center for the Built Environment, UC Berkeley. The mixed methods research used a post-occupancy evaluation, interviews, and focus groups to measure factors of indoor environment quality (IEQ) in the LEED certified Phillip Merrill Environmental Center in Annapolis, Maryland. This study was unique as it not only measured satisfaction with ambient features related to IEQ (i.e. daylighting, acoustics, thermal comfort, layout, and furnishings), but also measured psychosocial impacts (concentration and attention, information awareness and communication, interactive behaviors, acoustical functionality, sense of community, and morale and well-being). The survey was measured on a 7 point Likert scale ranging from -3 to 3 and administered by internet to  $N=92$  employees of which 71 completed. Descriptive statistics were used to analyze the responses, finding that the building was overall positive with a mean score of  $M = 2.0$ . In addition  $N=30$  face-to-face interviews and focus groups were conducted with executives and staff from all departments to collect subjective experiences and perceptions. Themes that came out of the qualitative investigation were social impacts (improved communication, sense of community, more egalitarian), emotional value and meaning (connection to mission and values, connection to nature, reduced stress, positive experience, inspirational, great place to work), and functional impacts (aids programmatic work, better overall support, increased work efficiency) noting that there were more comments about how the building made them feel, how it looks, and what it enables them to do. The researchers state, “The Merrill Center building is a social experiment as well as an environmental one. The center consolidated the entire workforce into an open plan setting, regardless of rank and position,” (p.3). They continue saying:

Designs that begin with a true focus on human health and well-being may, in the end, reap the biggest benefits from sustainable design. While many designs claim to do this, few actually realize the human potential of buildings. The findings from this research and other studies show that a close examination of the physical, psychological, and social experiences of space may lay the foundation for the development of a positive, sustainable architecture that is as good for people as it is for the environment (p.25).

In continued response to the lack of well-being measures present in POE's, the WELL Building Standard was developed grounded in medical research and the built environment (International Well Building Institute, 2015). This standard is similar to others such as LEED, however there is more concentrated and detailed focus on health and well-being factors that impact the occupant. Administered by the International WELL Building Institute (IWBI), the standard has seven concepts including air, water, nourishment, light, fitness, comfort, and mind. Each of these categories have features that support human health (i.e. cardiovascular, immune, and respiratory). Presently WELL is designed to measure office buildings, but other building types are in development. A pilot test using the standard resulted in high satisfaction for its occupants. In a case study conducted using this standard, findings revealed that 83% of occupants felt more productive, 92% said the new space created a positive effect on their health and well-being, 94% said the new space had a positive impact on their performance, and 93% said they were able to more easily collaborate with others (International Well Building Institute, 2015)

The unique building features mentioned in the Merrill Center (i.e. access to daylight and natural views for all, and egalitarian layouts) are now part of the mainstream in office space planning. Standards such as WELL are beginning to focus on human health issues and well-being, however studies or standards do not include a measurement that incorporates culture in the discourse of well-being. Therefore, further research and development of instruments to begin the measurement of culture in the built environment are needed. This study will seek to address that gap. The following theoretical framework discussion will demonstrate how this study ties these important concepts together.

### **Theoretical Framework**

Hofstede's (1984) cultural dimensions framework will guide social concepts explored in this investigation, while Travis (2010) principles of black cultural design will serve as a framework for visual characteristics. These theoretical frameworks will be used to understand workplace environments in the context of culture and well-being.

### **Culture and Social Characteristics**

Grounded in organizational culture, Hofstede (1981) set out to define culture as a reference to societies or nations. The researcher states that within societies there are subcultures in which "the degree of culture integration varies from one society to another" (p. 4). Hofstede continues saying "most subcultures within a nation, however, still share common traits that make their members recognizable to foreigners as belonging to their society" (p. 24). In explaining the researcher's mental programming model (see Figure 1), Hofstede illustrates a model consisting of one's mental programs that lie within social environments in which a person was raised. The mental programs

are collected from life experiences, positing that everyone’s mental programming is in part collective and unique. The base of the pyramid is the universal concept that is shared by all people where expressive behaviors are exhibited (i.e., laughter, crying, and aggressive behaviors). The next level is collective programming (the concept with the greatest impact) that is associated with culture usually learned from birth. The top of the model is represented as one’s individuality. Here programming is unique to each person to a degree, it explains for example why people in the same family have different personalities.

The main constructs of the model are values and culture. Hofstede defines values as “a broad tendency to prefer certain states of affairs over others” (p.19). He posits that “values are an attribute of individuals and collectivities, while culture presupposes a collectivity” (p.19). Culture in this model is associated with the collective, while personality is associated with the individual.

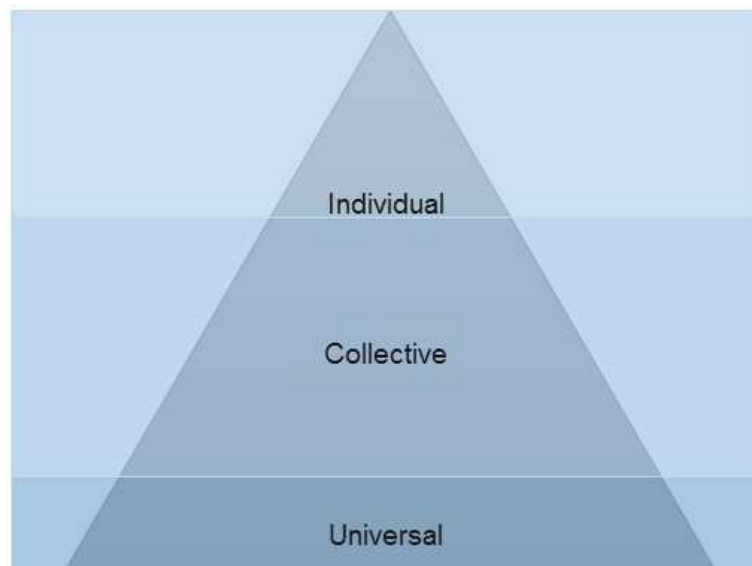


Figure 1. Three levels of uniqueness in mental programming model (Hofstede, 1981)

Hofstede (1981) believes that balances are in place that sustain the stability of culture throughout generations. The stabilizing of culture patterns (see Figure 2) states that societal norms, which are made up of value systems shared by the majority, are the core of stabilizing culture patterns. Consequences in the form of structure and functioning of institutions, reinforce the norms. Change to the system comes about from outside influences by shifting them through ecological conditions. This is usually a slow process unless the ecological conditions are violent in nature as norms are very difficult to change because they have typically been programmed at birth.

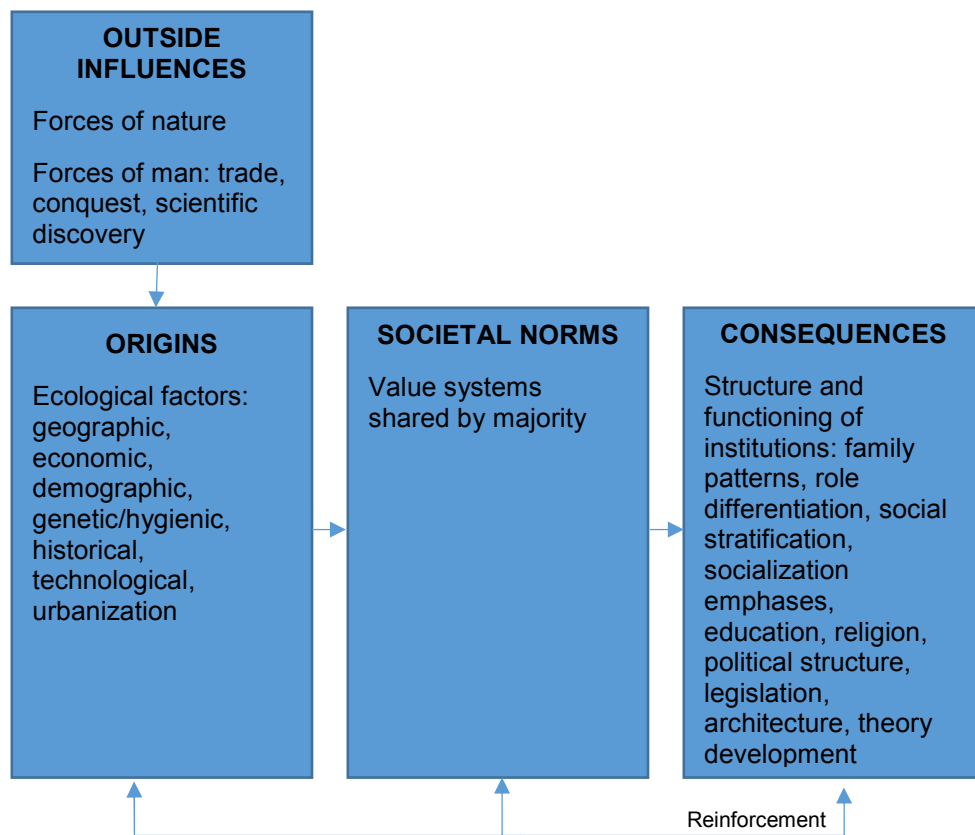


Figure 2. The stabilizing of culture patterns (Hofstede, 1981)



In a seminal study, Hofstede (1984) conducted cross-cultural analyses among 50 countries. Using a quantitative survey, the researcher asked employees to answer questions based on their value system. Using factor analysis, Hofstede was able to cluster the responses into four factors. The researcher later conducted qualitative studies that resulted in attributes for each factor calling them cultural dimensions. These dimensions include power distance, uncertainty avoidance, and individualism. Later additional dimensions were added, that of masculinity and long-term orientation.

The global leadership and organizational behavior effectiveness (GLOBE) project (House et al., 2002) is an ongoing study that was developed using Hofstede's (1984) cultural dimensions. The study focuses on cross-cultural issues of societal culture, organizational culture, and organizational leadership. Investigators from 61 cultures around the world collect quantitative and qualitative data. The purpose of GLOBE is to "develop theory, understand, and predict the impact of specific cultural variables on leadership and organizational processes," (p.4). The questionnaire scale developed by GLOBE has a high validity coefficient score of .85. The scale, scored on a 7-point Likert scale, uses cultural dimensions which consist of: uncertainty avoidance, power distance, societal collectivism (collectivism 1), in-group collectivism (collectivism 2), gender egalitarianism, assertiveness, future orientation, performance, and humane orientation. The first six originated from Hofstede's (1984) cultural dimensions.

Another study using Hofstede's (1984) culture dimensions is an investigation in workplace environments (Plijter, van der Voordt, & Rocco, 2014). The purpose of the

exploratory study was to understand whether workplace characteristics differ among national cultures. The researchers used a qualitative research method interviewing managers from multi-national corporations in the Netherlands, Germany, and Britain ( $N=10$ ). Case studies were also conducted ( $N=2$ ) in Germany and Great Britain. The researchers interpreted Hofstede's cultural dimensions into dichotomous groupings and developed workplace characteristics out of the interview responses and those found in the literature.

Findings were mixed as many of the managers expressed numerous reasons why workplace environments should be aligned with national cultures. However, their focus was on supporting the organization believing the workplace should meet the demands of the business and not the demands of national culture. This translated into supporting an organizational focus of corporate culture, believing that is what all employees have in common. There were however managers who supported national culture in the workplace environment. Those managers understood that supporting national culture also supported employees by empowering them. They believed that the value placed on their employees would likely increase satisfaction, productivity, and loyalty to the company. That belief supports the assumptions made in this investigation.

Though Knoll (2010a) did not use ethnic or national culture to determine their integrated work model, their model categorized work modes based on sociocultural norms in the workplace. The modes consisted of focus (individual work, concentration, individual spaces), team (group work, goal oriented, formal or informal group spaces), and shared work (collaborative work, knowledge exchange, individual group spaces)

styles that create social activity (unplanned interaction, connection, communal areas) in the workplace environment. In addition they identified horizontal (moving between locations to engage in different work modes) and vertical (shifting between work modes within the same location) modes that account for employees work style (see Figure 3). These modes align with the social characteristics of Hofstede’s (1984) cultural dimensions and were used to interpret them in this study. Table 1 shows the dichotomous cultural dimensions developed from Plijter et al. (2014) and Hofstede’s (1984) cultural dimensions. In conjunction, the Plijter et al. (2014) study and Knoll’s (2010a) integrated workplace characteristics were used to operationalize the cultural dimensions for this study. The following table was used in developing the theoretical constructs in this investigation.

*Table 1.* Cultural dimensions & workplace characteristics (Hofstede, 1984; Knoll, 2010a; Plijter et al, 2014)

Dimension	Content	Plijter et al. and Knoll Integrated Workplace Characteristics (used in study)
Small vs. large power distance (PDI)	The extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally.	<ul style="list-style-type: none"> <li>• Hierarchy of workstations</li> <li>• Workstation types</li> </ul>
Collectivism vs. individualism (INV)	Individualism represents societies in which the ties between individuals are loose; everyone is expected to look after him or herself and his or her immediate family. The opposite of individualism is collectivism, in which people from birth onward are integrated into strong, cohesive in groups, which continue to protect them in exchange for unquestioning loyalty throughout people’s	<ul style="list-style-type: none"> <li>• Communal areas</li> <li>• Individual workspaces</li> </ul>

Femininity vs. masculinity (MAS)	lifetimes. A society is called masculine when emotional gender roles are clearly distinct; men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender and concerned with quality of life. A society is called feminine when emotional gender roles overlap.	
Uncertainty avoidance vs. security oriented (UAI)	The extent to which the members of a culture feel threatened by ambiguous or unknown situations.	<ul style="list-style-type: none"> <li>• Formal gathering spaces</li> <li>• Informal gathering spaces</li> </ul>
Long-term vs. short-term orientation (LTO)	Long-term orientation is the fostering of virtues oriented towards future rewards, in particular perseverance and thrift. Short-term orientation is the fostering of virtues related to the past and present, in particular respect for tradition, preservation of face and fulfilling social obligations	

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# INTEGRATED WORK

A conceptual work model, which includes individual and group work modes and the easy of movement of people and flow of work between those modes.

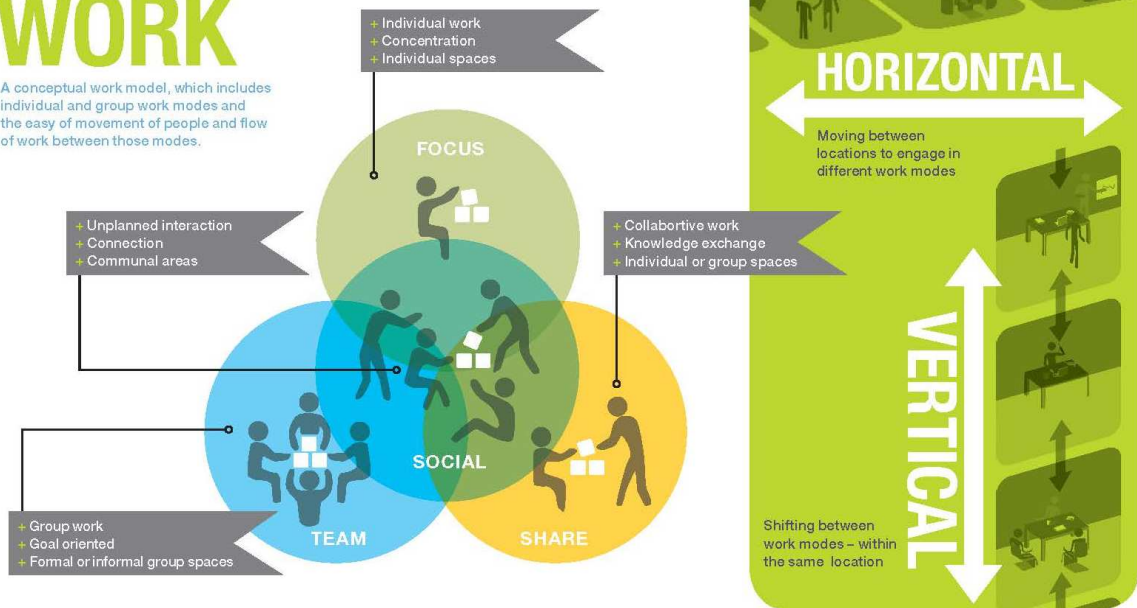


Figure 3. Integrated work model (Knoll, 2010b)

## Culture and Visual Characteristics

The studies above focused mainly on social investigations related to space planning in the built environment. In addition, visual characteristics are important to the space affecting occupant senses and emotions (Augustin, 2009; Kopec, 2012; Park & Guerin, 2002). People process sensory information differently, which is in part based on their culture (Park & Guerin, 2002; Ham, Guerin, & Scott, 2004; Travis, 2010). Augustin (2009) states “each person in a space processes the available information they perceive differently. How people interpret what they sense is determined by what their life has taught them is important, interesting, useful, and desirable” (p. 37).

United States architect Jack Travis focuses on culture in the built environment. Travis specializes in designing spaces with a black cultural aesthetic in mind. The architect developed 10 principles of black cultural design (Travis, 2010) that came out of the process and investigation of designing and constructing spaces that are “vital to a community” representing spaces of all scales (p. 322). Travis states that the principles should not be seen as criteria, but ones to consider in the design and construction process. The first four principles: economy, simplicity, ease of construction, and ease of maintenance, relate to infrastructure of resources and services necessary in communities of color that allow them to be self-sufficient. The next three principles: spirituality, heritage, and duality or irony of the condition identify and celebrate black culture. Lastly, earth centered/earth nurturing; strong indoor/outdoor relationship; and use of color, pattern, and texture relate to environmental and sustainable design principles (see Table 2).

*Table 2.* 10 Black principles of cultural design (Travis, 2010)

Principle	Context
Economy	Assures an ease of construction which may be taught. It makes sure that the community can be involved in the design, construction, and making of the environments where one lives, work, and raise families.
Simplicity	Ensures the design is easy to understand and provides clarity. This principle makes sure communities are able to ultimately participate in the design.
Ease of Construction	The opportunity for training unskilled labor in the design trades. Training will also allow communities to rebuild in times of disasters.
Ease of Maintenance	Promotes the use of materials and methods of construction and detailing that would require minimal upkeep. It is vital to maintaining positive aesthetic value and perception. Ease of maintenance would encourage longer lasting upkeep and reverence of property over extended periods of time which is a founding principle in sustainability.

Spirituality	A strong sense of what lies beyond this life which can manifest in living, working, learning, resting, and worship.
Heritage	Includes information, symbolism, and physical memory of past legacy and achievement of peoples, events, places, and dates. Heritage reminds of what has gone before which is critical to place making. This principle unifies and creates healthy growth.
Duality or Irony of the Condition	The reality of having to coexist within a dominant culture that may be in direct opposition to your own. Coexisting with a dual identity while still feeling unaccepted by the dominant culture is expressed as the irony of the condition. Environmental design is challenged to seek ways to reveal this condition and its manifestations.
Earth Centered/Earth Nurturing	Expresses the need for designers to relate what they made while staying true to its surroundings. Existing with/within opposed to on/over. This calls for respect for the ground or horizontal plan of which is being built upon.
Strong Indoor/Outdoor Relationship	Promotes indoor and outdoor spaces as inseparable and crucial to existence due to climatic and other environmental factors. Activities are hybrid in use therefore both kinds of spaces are often used for the same activities at different times.
Intense use of Color, Pattern, and Texture	Elements of design that are essential in expression of spatial/formal content elevating the aesthetic qualities of our lives. It is the intensity of the use of these three elements that differentiates the Western and non-Western approach.

Travis developed the above principles based on the African diaspora, however many if not all the principles may be applied cross-culturally. This study will use the visual characteristics of nature (earth centered/earth nurturing and indoor/outdoor relationship) and color from Travis' principles as a framework. These characteristics were selected because they directly apply to the interior environment, are supported in findings from other studies, and have strong cross-cultural applications. The following section will explain how the characteristics relate to universal cultural characteristics.

**Nature.** Nature is an element used in the built environment that is meaningful across all cultures. It is found to be one of the most significant factors of occupant well-

being (Kaplan, 1993; Kellert, 2012; Kreitzer, 2012; Ryan et al., 2014; Ulrich, 1991). Studies have shown that people experience reduced levels of stress and high levels of satisfaction when in and around nature (Kaplan, 1993; Kellert, 2012). This phenomena is explained by an affinity to nature, as it was man's first home (Kellert, 2012, Wilson, 1984). When designing for workplace environments, all cultures that will utilize the space must be considered. Dettling and Broin (2010) understand this and used nature as a culture strategy in their corporate environments for Medtronic when designing internationally. They found that all employees appreciate having access to daylight, views of nature, and access to nature. Pettipas (2010) a senior vice president for HOK worked on largely global projects. The InterContinental Aqaba Beach Resort in Aqaba, Jordan designed by his firm embodies the concept of earth centeredness described by Travis's principles of cultural design (2010). The exterior and interior utilized local materials and represents the land on which it is built.

Natural elements can also be seen spatially. Organic lines and forms that mimic nature can be found in space planning and furnishings. The use of biomimicry is quickly being adopted by the architectural and design community that looks to nature as a guide in constructing and designing spaces (Brownell & Swackhamer, 2015). Fractal patterns typically associated with geometry are innately found in nature and are used in architecture and interior design at varying scales (Asojo, 2011; Eglash et al., 2006; Leigh & Asojo, 1999; Ryan et al., 2014).

Geomancy is a system that ancient Chinese people used to plan and geographically locate their space. It is deeply entwined with nature and life's energy



force called Qi (Sui Pheng, Pheng, Xiaopeng, & Ting, 2012). Chinese people often plan their homes in a specific proximity to the mountains and water to take full advantage of the climate and Qi (Sui Pheng et al., 2012).

**Color.** Color is the visual attribute that has the most emotional attachment (Augustin, 2009; Elliot, Cherian, & Casakin, 2010; Park & Guerin, 2002). Laduex and Laduex (2010) state “color can be especially difficult because it can convey meaning in two different ways-natural associations and psychological symbolism” (p. 343). It is widely known that differing cultures interpret color differently (Bosch, Cama, Edelstein, & Malkin, 2012). Park and Guerin (2002) conducted a study investigating the effect a person’s culture has on preference and meaning of color. The researchers developed six color palettes of differing value, chroma, and hue showing them to four cultures: English ( $N=115$ ), Korean ( $N=103$ ), Japanese ( $N=99$ ), and American ( $N=108$ ). Participants were given a questionnaire and were asked to rate the degree of presence of descriptive words for each palette. Results showed significant differences among 60% of the palettes indicating culture does impact preference of color.

The literature reviewed has shown that culture is a part of one’s identity and value system, therefore it is a good predictor of one’s satisfaction and sense of well-being. In addition, culture can be a powerful tool in understanding best practices for planning the workplace environment. Grounded in Hofstede’s (1984) culture dimensions, we can look at space from a social and cultural perspective. Adapting concepts from Travis’ (2010) principles of cultural design to a set of characteristics that take into consideration nature and color may be a strategy that addresses culture in a more holistic manner. Therefore,

Hofstede's (1984) cultural dimensions and Travis' (2010) 10 black principles of cultural design are appropriate theoretical frameworks for use as mediating variables among culture and well-being in this investigation.

### **Hypotheses**

The following hypotheses have been developed grounded in this study's literature. The research model illustrates the hypotheses (see Figure 4).

H1: Culture influences employees' well-being in the workplace.

H2: The overall physical environment influences well-being in the workplace.

H3: Social characteristics influence well-being in the workplace.

H4: Visual characteristics influence well-being in the workplace.

The research model shows that the independent variable of employees' culture directly influences the dependent variable of well-being and indirectly influences well-being through the variables of the physical environment, social characteristics, and visual characteristics.

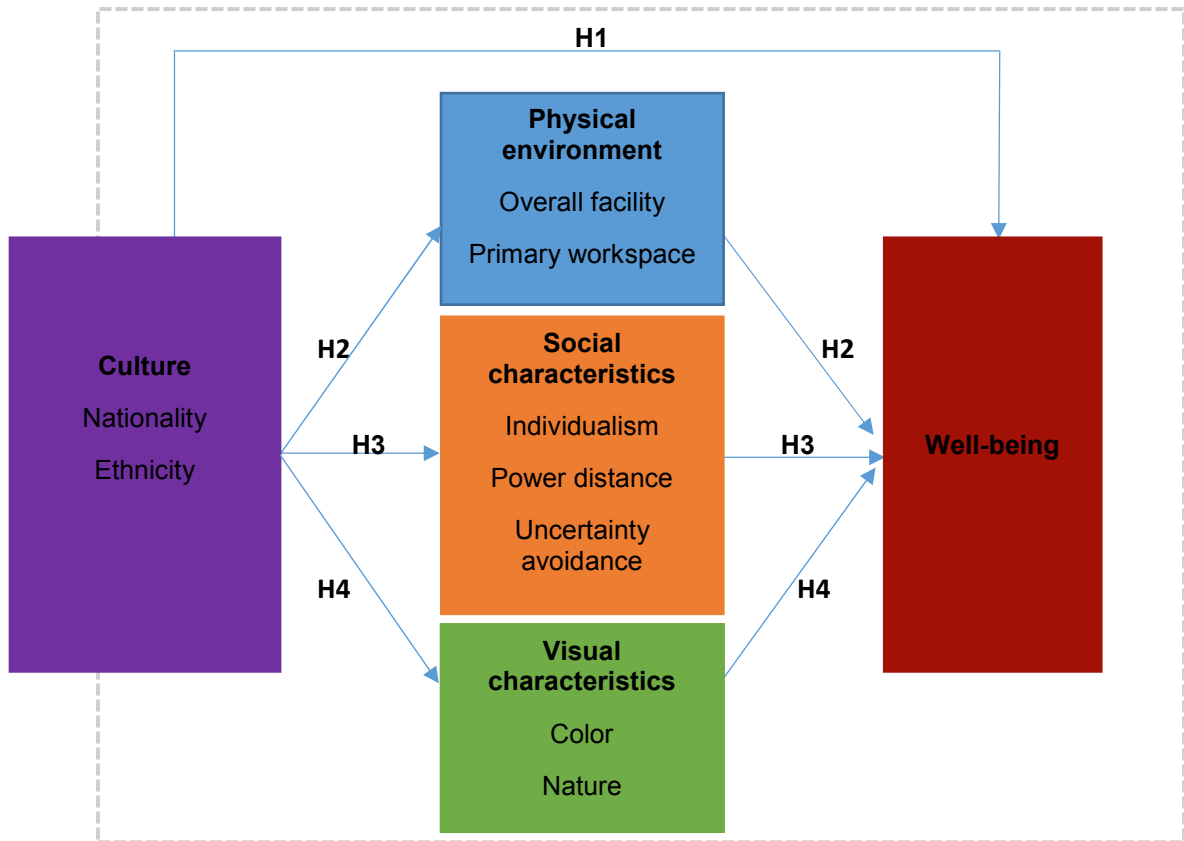


Figure 4. Proposed empirical model with hypothesized relationships

### **Chapter 3: Methodology**

This investigation is a quantitative study using a post-occupancy evaluation (POE) survey instrument to understand how culture impacts well-being in the workplace environment. Questions were taken using a self-administered online questionnaire. This chapter will discuss the setting, population and sample, the instrument, and procedure. It will begin with an overview of the instrument and how it was designed to be embedded within an existing post-occupancy evaluation survey.

#### **Procedure**

The culture portion of this survey is a series of questions, called a module that is embedded in an existing instrument called the sustainable post-occupancy evaluation survey (SPOES). The SPOES survey received approval from the University of Minnesota Institutional Review Board which included all modules developed for it. As the instrument for this study was developed for the purpose of being used as a module for the SPOES survey, it was exempt from full committee review.

#### **Sustainable Post-Occupancy Evaluation Survey (SPOES)**

The Sustainable Post-Occupancy Evaluation Survey (SPOES) is a large survey instrument developed for a research project to evaluate state funded buildings. For this study, a culture module consisting of questions measuring the relationship of culture and well-being was developed to be used with the SPOES survey.

The B3 (Buildings, Benchmarks, and Beyond Guidelines) guidelines are a State of Minnesota requirements that are required to be followed for all state funded buildings. They are compatible with national standards such as LEED with a focus on regional

values and priorities that may not be required in national building standards. Credits to meet B3 are available in Performance Management, Site & Water, Energy & Atmosphere, Materials & Waste, and Indoor Environmental Quality (IEQ). The State of Minnesota requires all buildings that receive state funding for design, building, remodeling, or reconstruction to carry out a post-occupancy evaluation using the B3 guidelines developed by the Center for Sustainable Building Research (CSBR) in the College of Design (CDes), at the University of Minnesota.

One of the requirements of the B3 guidelines is to complete a post-occupancy evaluation (POE) at 9 and 18 months after occupancy. Researchers in the interior design program at the CDes were contracted by the CSBR to develop the POE instrument for the IEQ criteria: thermal comfort; furnishings, adjustability, finishes, and privacy; personal control; lighting, day lighting, and views; indoor air quality; and acoustics and vibrations (see Figure 5) (Guerin, Kim, Brigham, Choi, & Scott, 2013). The SPOES survey instrument that resulted was piloted, refined, and currently consists of 42-questions (known as SCAN V.2). It was initially developed for use with state office buildings, higher education classroom buildings, training centers, and offices.

The SPOES SCAN V.2 survey uses an online questionnaire to collect data from occupants on their satisfaction with the indoor environmental quality of their physical workplace, the survey (see Appendix A) collects data about demographics, commuting, and sustainable beliefs and occupants' perceptions of the overall facility, primary workspace, satisfaction, work performance, health, and recycling. Participants are asked about their satisfaction in these areas using a 7-point Likert scale (1=very dissatisfied; 7=

very satisfied). It has been successfully tested for validity and reliability. Recently the SPOES SCAN V.2 survey has incorporated modules as supplements to the questionnaire. These are short questionnaires that delve deeper into specific IEQ issues appropriate to the building or research question. A module can be added to the SPOES Scan V.2 questionnaire, or it can stand alone.

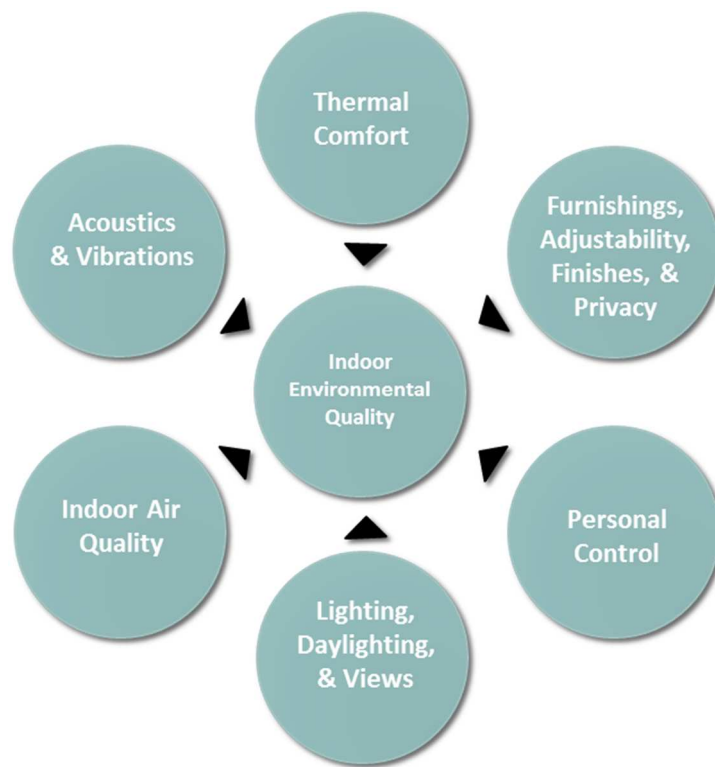


Figure 5. SPOES IEQ Framework Model

## **Culture Module Instrument**

The culture module developed for this study was a 23-question supplement to the SPOES SCAN V.2 questionnaire that can stand alone as a culture and well-being instrument for workplace environments.

Questions relate to culture, the physical environment, social characteristics, visual characteristics, and well-being in relation to their workplace environment. All of the questions were grounded in literature from theoretical frameworks. The culture module questions (see Appendix A) were developed from literature grounded in social workplace characteristics using Hofstede's (1984) cultural dimensions model (including two using the GLOBE questionnaire, (House, 2002)), and visual characteristics using Travis' (2010) cultural design guidelines supported by additional scholastic research. All of Travis' (2010) principles were not used, instead two (color and nature) were chosen for use in the instrument as they were grounded in the literature as universal characteristics that all cultures have an affinity for. In addition, three of the five cultural dimensions were used in this study as the remaining two (masculinity, and long-term orientation) did not easily transfer into the physical workplace environment and were not found to have a relationship in the literature (Plijter, van der Voordt, & Rocco, 2014).

The section of culture module questions was prefaced with directions to answer them based on the participants' individual culture. All questions were developed on a 7-point Likert scale, with 1 being equivalent to very dissatisfied/strongly disagree and 7 being equivalent to very satisfied/strongly agree. This follows the same semantic differential used in the existing SPOES SCAN V.2. The majority of the questions asked

about employee satisfaction or importance in the workplace environment. In addition a question was asked about well-being, an open ended question about desired visual characteristics, and demographic questions were included.

## **Variables**

There were six categories of variables included in this study named as culture, social, visual, physical environment, demographics and well-being. Each was measured by specific questions in the instrument.

**Culture.** Culture is the independent variable which is operationalized by an employees' nationality and ethnicity.

**Physical environment.** Physical environment is an independent intervening variable that mediates culture. This variable is made up of the overall facility (i.e., site, building, and interior public spaces within a facility) and the primary workspace (i.e., private office, workstation, or work area) of an employee.

**Social characteristics.** Social characteristics is an independent intervening variable that mediates culture composed of three of Hofstede's (1984) cultural dimensions. The first is individualism (INV) that measures one's preference for a loosely knit social framework. Second, is the power distance index (PDI) that measures employees' acceptance of unequally distributed power. Third, is the uncertainty avoidance index (UAI) is the degree an employee feels uncomfortable with uncertainty and ambiguity.



**Visual characteristics.** Visual characteristics is the final independent intervening variable mediating culture composed of nature and color. Both of these variables are grounded in Travis’s (2010) 10 black principles of cultural design.

**Well-being.** Well-being is the dependent variable operationalized by evaluation of culture in the workplace environment.

Table 3 shows which questions correspond to the variables used in the model (see Appendix A for the full schedule of questions).

Table 3. Culture module questions by type

Culture			Social			Visual		Physical Environment		Demographic	Well-being
Nationality	Ethnicity	Overall	INV	PDI	UAI	Color	Nature	Facility (site, building, interior)	Primary Workspace		
Q23	Q24	Q26	Q32	Q31	Q30	Q39	Q10i	Q2	Q6	Q16	Q27
		**Q46	Q37	Q35	Q33	Q41	Q10j	Q10v	Q7	Q17	
			Q38	Q36	Q34	Q42	Q10r	Q28	Q29	Q18	
						Q44	Q40			Q20	
							Q43			Q21	
							Q45			Q25	

Note: \*Culture dimensions: INV-individualism, PDI-power distance, UAI-uncertainty avoidance. \*\*Q46 is a qualitative question

### Pilot Study

Initially a pilot test was conducted. The culture module questionnaire was sent to 10 part or full-time employees of a non-profit organization in St. Paul, Minnesota. The pilot tested reliability of the instrument and validity. To test for validity, feedback about the clarity of questions including format, language, and bias were asked. In addition, participants were asked how much time it took to complete the survey. These responses were used to adjust questions before administering the full survey. The majority of the

feedback was positive with only one comment offering a suggestion on the semantics of the satisfaction Likert scale. However, to maintain consistency with the SPOES questionnaire, that scale was not changed.

The pilot study results were analyzed using the software SPSS version 22; reliability was tested using significance to ensure that there was internal consistency among the concepts and the instrument's amount of error was considered low (Tavakol & Dennick, 2011). Cronbach's  $\alpha$  states that values between 0 and 1 are considered internally consistent and reliable, however acceptable values are between .70 and .95. If the value is too low adjustments may need to be made to the instrument such as increasing the number of questions or revising them. If the value is too high, the number of questions may need to be reduced due to redundancy (Tavakol & Dennick, 2011). The pilot study showed an overall reliability of  $p = .726$  which is considered an acceptable value of reliability. The researcher added the questions for the culture module to the on-line SPOES SCAN V.2 questionnaire using Survey Monkey.

## **Data Collection**

### **Setting**

The building used in this study was Folwell Hall at the University of Minnesota Twin Cities Campus. Folwell Hall is located on the East Bank campus at the intersection of University Avenue SE and Pleasant Street SE in Minneapolis, MN (see Figure 6). It is in a walkable community that is in close proximity to other campus buildings, open green space, public transportation, restaurants, student housing, and retail stores.



Figure 6. Exterior and map of University of Minnesota Folwell Hall (Google Maps)

The English Renaissance Revival style building is 111,500 square feet containing five floors constructed of marble, granite, clay tile, and brick. Folwell Hall is listed on the National Register of Historic Places and was fully renovated in 2011. Extensive renovation was completed to the exterior and the majority of interior spaces, while the first level underwent historical preservation. Classrooms and offices were brought up to code and updated with a contemporary aesthetic and technological updates were incorporated into all the rooms and meeting spaces. In addition, new plumbing, HVAC, and electrical were included in the renovation. The main corridors and stairways were restored and are a combination of Elizabethan and Jacobean styles with stone trim, carved wrought iron railings, ornate wood door trim, dental ceiling moldings, and marble walls and flooring (see Figure 7).



*Figure 7.* Folwell Hall restored main floor corridor

There is a mixture of workstation types varying from closed offices made from demountable wall systems, to open office workstations for staff and graduate assistants. Workstation furnishings are contemporary using mid-tone values that are complimented with accents of saturated color in the upholstery (see Figure 8).

The building currently houses many of the College of Liberal Arts' language



*Figure 8.* Folwell Hall offices and public work areas

departments and includes office spaces, classrooms, and other supporting work spaces for students, faculty, and staff. Due to the cultural diversity of employees who work in Folwell Hall and the variety of courses taught in relation to culture, it was chosen as an appropriate setting for this study (see Table 4).

*Table 4.* Subject areas taught in Folwell Hall Spring 2015

<b>Subject Area</b>	
Asian American Studies	Japanese
Asian Languages and Literature	Kinesiology
Academic Professional and Personal Success	Korean
Arabic	Landscape Architecture
American Sign Language	Latin
Chicano Studies	Linguistics
Chinese	Manufacturing Operations Management
Classical and Near Eastern studies	Norwegian
Cultural Studies and Comparative Literature	Ojibwe
Dakota	Organizational Leadership, Policy and Development
Dutch	Office of Undergraduate Education
Education and Human Development	Public Affairs
English	Polish
English As a Second Language	Portuguese
Education	Postsecondary Teaching and Learning
Educational Psychology	Religious Studies
Finnish	Russian
French	Scandinavian
French and Italian	Sports Management
German	Spanish
German, Scandinavian, and Dutch	Swedish
Hmong	Translation and Interpreting
Hindu-Urdu	Writing Studies
Innovation Studies	
Italian	

### **Population and Sample**

This study used a purposive sample of full and part-time faculty and staff who teach and/or work in Folwell Hall at the University of Minnesota. Contact was made with a representative from the University of Minnesota, College of Liberal Arts Office of Planning and Facilities. A representative from this department served as the building

coordinator for the study and answered any questions in reference to the population that was surveyed. The building coordinator also was responsible for sending out the invitation and reminders for participation in the survey.

The researcher contacted the building coordinator to collect background information about the project (see Appendix A). After a conversation took place with the coordinator about start and end dates, the researcher created a letter to be distributed to the building occupants (see Appendix A) explaining the study and inviting the participants to take the survey using an included link. The letter was given to the coordinator who had access to emails of the population and sent it to them directly by email.

A consent form was on the first page of the questionnaire. Those who gave their consent by selecting yes allowed them to continue with the questionnaire. If participants selected no on the consent form, they were not prompted to answer additional questions and the questionnaire ended. The survey was open for participants to take for 10 business days. The researcher closed the survey on the end date and then prepared the data for analysis.

The survey was sent to 215 faculty and staff including graduate students who had offices in Folwell Hall during the 2015 spring semester. Among the 215 faculty and staff, 75 participated in the survey resulting in a 30% (75/215) response rate which is considered a good response rate for an online survey.

## Data Screening

**Code book.** Before data cleaning began a code book (see Appendix A) was developed to code questions used in the survey instrument. This process gave the researcher a reference for scoring responses that was often referred to during the analysis process (Creswell, 2008). The codebook breaks out the 7-point Likert scale scores as follows: 1 - 3.99 = dissatisfied; 4 - 4.49 = neither dissatisfied nor satisfied; and 4.5 - 7 = satisfied.

This coding convention was adapted from existing SPOES surveys. The scores were labeled in this manner because the SPOES researchers wanted the scale to be continuous, therefore there is a beginning (very dissatisfied) and an end (very satisfied). There was a belief that assigning 'labels' to each score would prompt participants to respond to the label, not move along a continuum. Using only numbers, suggests there is an equal interval between each number. In addition scores were broken out in this manner to provide a way to talk about scores in a language that was meaningful to the clients. The halfway point was determined with scores moving up and down from there.

**Missing data.** This study used multiple ways to handle missing data. Initially a frequency analysis was run to identify missing data. All cases with a majority of missing scores were not included in the analysis. Of the sample ( $n=75$ ) 10 cases were excluded for having less than five scores answered, the majority of which answered two or less questions. Next, cases that did not answer demographic questions were replaced with the code 999. Finally, remaining questions without scores were transformed and recoded to

the mean value. A frequency analysis was run a second time to ensure there were no missing values left in the data set besides those of 999.

**Outliers.** To determine if outliers were present in the data  $z$ -scores were used. Descriptive statistics were run on all of the scaled variables. Any  $z$ -score  $>3.29$  were considered outliers. This dataset did not find any outliers in the dataset, therefore no further action needed to be taken.

### **Sample Description**

A total of 65 participants' questionnaires were used for data analysis. Of the adjusted sample, 68% were female. Ages ranged from 18-74, with the majority of participants (29%) between 35-44 years of age. Seventy-eight percent of the participants worked in Folwell Hall more than 3 years, and the majority (33%) spend 25-50% of time per week in their primary workspace. Approximately 69% identified themselves as Caucasian while 31% were of non-Caucasian ethnicity. Lastly, the majority of participants identified themselves as American (67%). Participants born outside of the United States came from Argentina, China, France, Hungary, India, Italy, Japan, Mexico, Netherlands, Peru, Poland, and the United Kingdom.

### **Variable Transformations**

In preparation for data analysis, some variables needed to be transformed as they did not meet assumptions of normality. In these cases the variables were skewed and needed to be transformed into categorical dichotomous variables.

Correlation matrices from Pearson's correlation coefficient analysis were used to determine which variables could be combined to formulate composite variables. The



hypothesis model was used as a guide to determine what concepts will be included in each correlation analysis. To verify the correlations, factor analysis and Cronbach's  $\alpha$  (Cronbach, 1951) reliability analysis was used to ensure variables factored together. Testing for statistical significance is based on the chi-square statistic and  $p$ -value. The  $p$ -value should be small ( $\leq .05$ ) while the chi-square should be large ( $\geq 3.84$ ) to show that a relationship exists between variables rejecting the null hypothesis (Utts & Heckard, 2005). For this test a reliability coefficient of .50 or higher was set as an acceptable standard. Cronbach's  $\alpha$  analysis was also used to aid in reducing the number of variables in the model. In doing so variance was increased which is helpful when studies have a small sample size (Field, 2013). Figure 9 illustrates the process of transforming the variables.

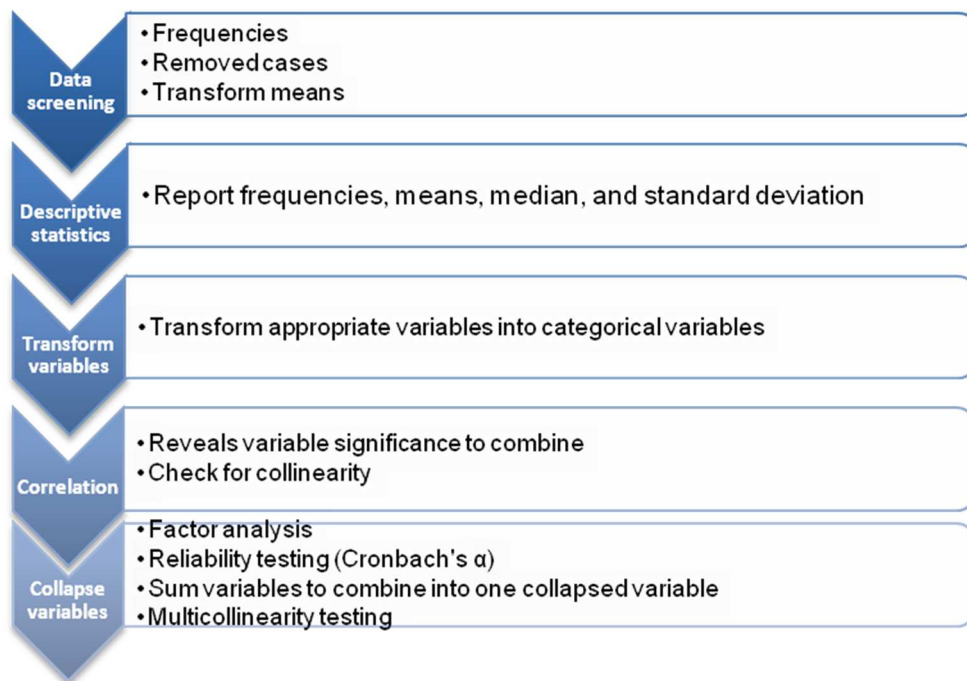


Figure 9. Variable Transformation Process

After running descriptive statistics for each of the variables it was determined that some were largely skewed. This section describes the process of transforming the independent categorical variable of culture (nationality and ethnicity), and dependent continuous variable of well-being in this study.

### Transformation of Well-being Variable

The measure for well-being ( $M = 5.8$ ,  $SD = 1.38$ ,  $n = 65$ ): Do you agree that your culture influences your well-being? was measured on a 7-point Likert scale (1-strongly disagree, 7-strongly agree). Responses for the measure were not normally distributed. After reviewing the frequencies and histogram, the well-being measure appeared to be answered in a dichotomous manner (see Table 5 and Figure 10).

Table 5. Descriptive statistics for well-being variable (Q27)

	Scale	Frequency	Percent
Valid	Strongly Disagree 1	1	1.5
	2	1	1.5
	3	1	1.5
	3.386	1	1.5
	4	8	12.3
	5	8	12.3
	5.335	1	1.5
	5.335	1	1.5
	5.992	1	1.5
	6	15	23.1
	Strongly Agree 7	27	41.5
	Total	65	100

Note:  $M = 5.8$ ,  $Mdn = 6$ ,  $SD = 1.38$ ,  $n = 65$

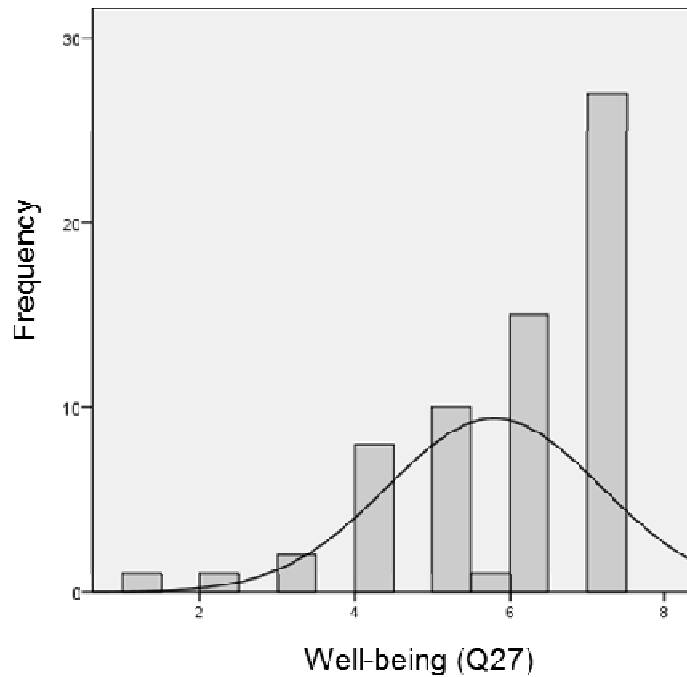


Figure 10. Well-being variable frequencies

Many respondents agreed/strongly agreed, while a considerably less number of respondents disagreed, resulting in a skewed curve. These characteristics do not meet the assumptions of normality (Nachmias & Nachmias, 2008), therefore it was decided to transform the measure into a dichotomous categorical variable that could be used in bivariate analysis. In doing so scores between 1 and 4.49 were separated into the new category of no, while scores between 4.5 and 7 were separated into the new category of yes. Because the frequencies of neither satisfied nor satisfied (4) was an even numeral, the responses were evenly distributed between yes and no (see Table 6 and Figure 11).

Table 6. Frequencies for transformed categorical well-being variable (Q27)

		Frequency	Valid Percent
Valid	No	12	18.5
	Yes	53	81.5
	Total	65	100.0

Note:  $M = .82$ ,  $Mdn = 1$ ,  $SD = .391$ ,  $n = 65$

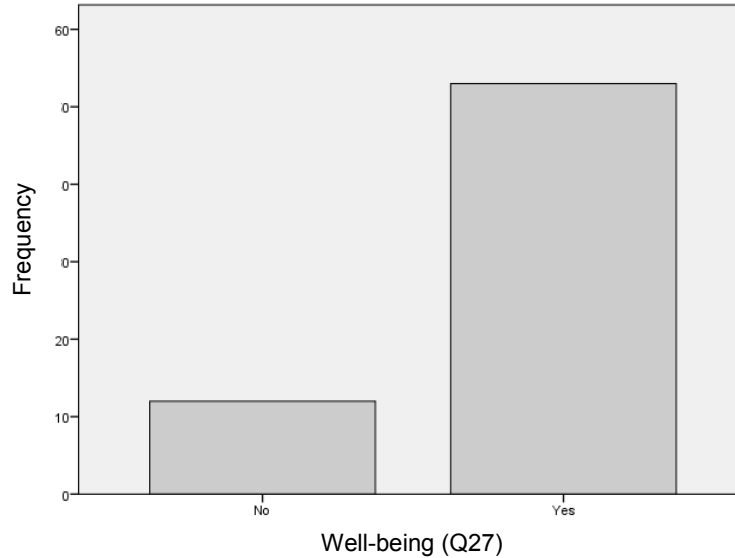


Figure 11. Frequencies for transformed categorical well-being variable (Q27)

**Culture and well-being in the workplace environment.** Respondents were asked two questions that measured culture and well-being in the workplace environment. The mean scores for each of these measures were  $M=6.23$ ,  $Mdn = 6.34$ ,  $SD = 1.889$  (Q26.) and  $M=5.80$ ,  $Mdn = 6.0$ ,  $SD = 1.38$  (Q27.). Both of these scores are considered positive.

For further analysis, a Spearman's rho correlation coefficient was used because scores for both questions were skewed and did not meet the assumptions of normality. The correlation revealed a significant relationship between the importance of cultural

diversity in the workplace environment and agreement that an individual's culture influences their well-being,  $r = .536, p = .000$  (see Table 7).

Table 7. Correlations for well-being and culture measure (Q26, Q27)

Variable	Q26	Q27
Q26 How important is cultural diversity to you?	-	
Q272 Do you agree that your culture influences your well-being?	.536**	-

Note:  $n = 65$ . \* $p < .05$  (2-tailed); \*\* $p < .01$  level (2-tailed)

As these variables were highly correlated, it was decided to collapse them into one variable called well-being. The following table and graph (see Table 8 and Figure 12) illustrate the frequencies of the new well-being variable.

Table 8. Descriptive statistics for collapsed well-being variable (Q26, Q27)

		Frequency	Percent
Valid	No	23	35.4
	Yes	42	64.6
	Total	65	100.0

Note:  $M = .65, Mdn = 1, SD = .482, n = 65$

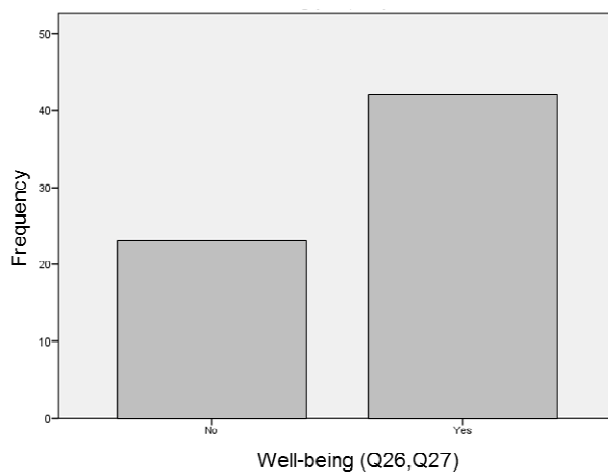


Figure 12. Frequencies for new collapsed well-being variable

In addition the independent variable of culture measured by nationality ( $M=1.08$ ,  $Mdn = 1.0$ ,  $SD = 311.8$ ) and ethnicity ( $M=2.56$ ,  $Mdn = 1.0$ ,  $SD = 2.92$ ) were analyzed with the well-being measure ( $M=.65$ ,  $Mdn = 1.0$ ,  $SD = .482$ ). Again Spearman's rho was used as scores were skewed based on frequencies. The correlation revealed nationality was significantly related to ethnicity,  $r = .640$ ,  $p = .000$ . However, there was no significant relationship between nationality and agreement that an individual's culture influences their well-being,  $r=.036$ ,  $p=.786$  and no significant relationship between ethnicity and agreement that an individual's culture influences their well-being,  $r = .069$ ,  $p = .605$  (see Table 9).

Table 9. Descriptive statistics and correlations of nationality, ethnicity, and well-being variables

Variable	Q23	Q24	Q27
Q23 Nationality	-		
Q24 Ethnicity	.640**	-	
Q27 Well-being	.036	.069	-

Note:  $n = 65$ . \* $p < .05$  (2-tailed); \*\* $p < .01$  level (2-tailed)

After examining the largely significant correlation between nationality and ethnicity, it was determined that ethnicity will be used to operationalize culture for the duration of the statistical analysis tests. This decision also makes logical sense as this study focuses on one country without much variance in nationalities within the sample, therefore ethnicity is a broader concept than nationality to identify culture.

## Transformation of Culture Variable

Similar to the well-being variable previously examined, nationality and ethnicity responses also appeared to be skewed (see Figures 13 and 15). After reviewing the frequencies the majority of the respondents identified their birth of origin as the United States ( $n=39$ , 60%), and ethnicity as Caucasian ( $n=45$ , 69%) (see Tables 10 and 11). Due to the unproportioned responses, it was decided to collapse the nationality and ethnicity variables into dichotomous categories. Within the variable of nationality, categories were collapsed into United States and other, while the ethnicity (now culture) variable was collapsed into Caucasian culture and other cultures. See Tables 10-13 and Figures 13-16 for the new variables relating to nationality, ethnicity, and culture.

Table 10. Descriptive statistics of nationality variable

	Country	Frequency	Percent	Valid Percent
Valid	U.S.	39	60	67.2
	Argentina	1	1.5	1.7
	China	2	3.1	3.4
	France	2	3.1	3.4
	Hungary	1	1.5	1.7
	India	2	3.1	3.4
	Italy	1	1.5	1.7
	Japan	4	6.2	6.9
	Mexico	1	1.5	1.7
	Netherlands (123)	1	1.5	1.7
	Peru (136)	2	3.1	3.4
	Poland (138)	1	1.5	1.7
	United Kingdom of Great Britain and Northern Ireland	1	1.5	1.7
	Total		58	89.2
Missing	999	7		10.8
Total		65	100.0	

Note:  $M = 30.07$ ,  $Mdn = 1$ ,  $SD = 48.17$ ,  $n = 58$

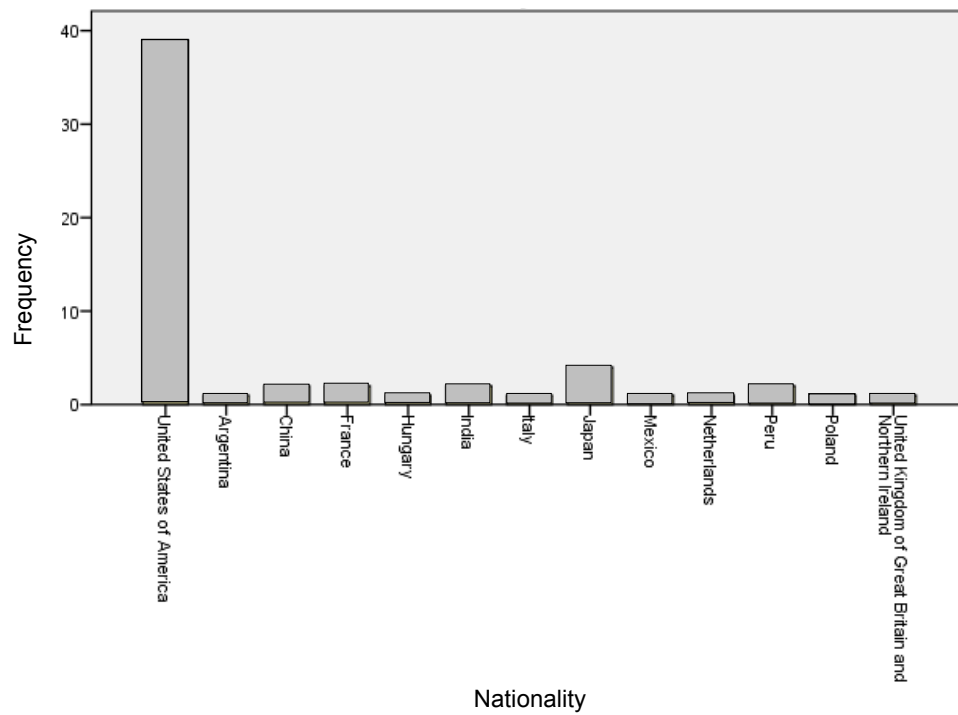


Figure 13. Frequencies for nationality variable

Table 11. Descriptive Statistics of transformed nationality categorical variable

Variable	Frequency	Valid Percent
Other	26	40.0
U.S.	39	60.0
Total	65	100.0

Note:  $M = 108.1$ ,  $Mdn = 1$ ,  $SD = 311.8$ ,  $n = 65$



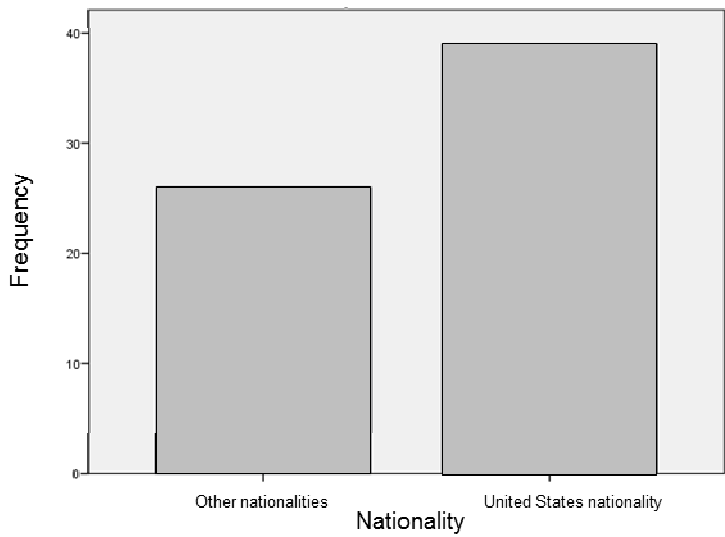


Figure 14. Frequencies for transformed nationality categorical variable

Table 12. Descriptive statistics for ethnicity variable

Variable	Frequency	Percent	Valid Percent
Caucasian	45	69.2	76.3
Asian Immigrant	6	9.2	10.2
Hispanic or Latino	5	7.7	8.5
Other	3	4.6	5.1
Total	59	90.8	100
Missing 999	6	9.2	
Total	65	100.0	

Note:  $M = 2.56$ ,  $Mdn = 1$ ,  $SD = 2.92$ ,  $n = 59$

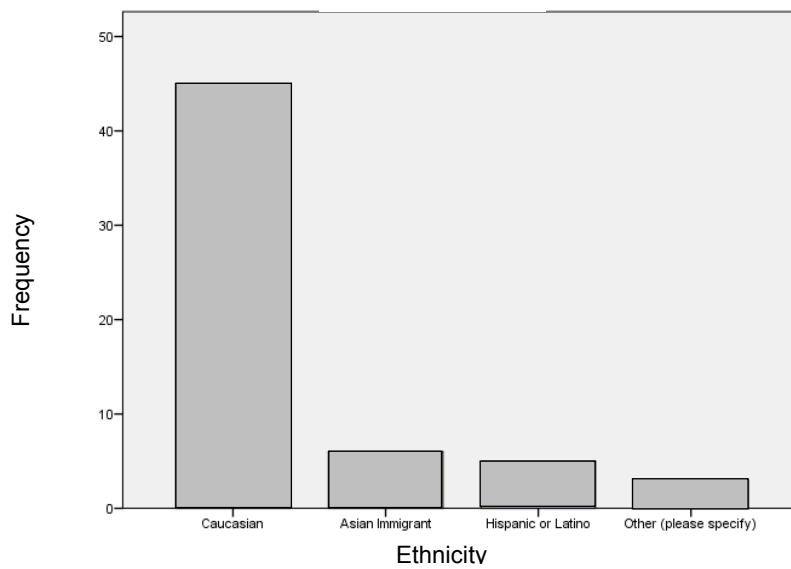


Figure 15. Frequencies for ethnicity variable

Table 13. Descriptive statistics for transformed culture variable

Variable	Frequency	Percent	Valid Percent
Caucasian culture	45	69.2	69.2
Other cultures	20	30.8	30.8
Total	65	100.0	100.0

Note:  $M = .69$ ,  $Mdn = 1$ ,  $SD = 311.8$ ,  $n = 65$

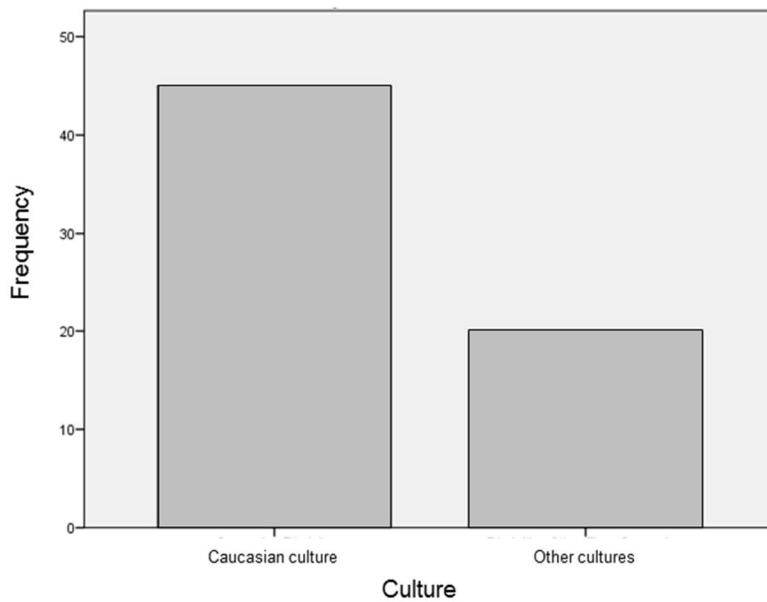


Figure 16. Frequencies for transformed categorical culture variable

### Transformation of Physical Environment Variable

Respondents were asked four questions that measured the physical environment in the overall workplace environment. Two questions measured the overall facility, while two measured the primary workspace (Q28 was not included as it was almost identical to question Q10v). The mean scores for each of these measures were  $M=4.89$ ,  $Mdn = 5.0$ ,  $SD = 1.65$  (Q2.),  $M=4.48$ ,  $Mdn = 5.0$ ,  $SD = 1.75$  (Q7.),  $M=4.62$ ,  $Mdn = 5.0$ ,  $SD = 1.89$  (Q10v.),  $M=4.96$ ,  $Mdn = 5.0$ ,  $SD = 1.63$  (Q29.). Each of the scores are considered

positive with Q29 (Overall, how satisfied are you with the visual appearance in your primary workspace?) carrying the highest mean, and Q7 (Overall, how satisfied are you with the physical environment of your primary workspace?) the lowest.

Further analysis was conducted using Pearson’s correlation coefficient to understand relationships between the variables within the physical environment construct. The correlation revealed a significant relationship between the measures within the physical environment subscale,  $r = .726, p = .000$ ;  $r = .672, p = .000$ ;  $r = .814, p = .000$ ;  $r = .585, p = .000$ ;  $r = .834, p = .000$  (see Table 14).

Table 14. Correlations of physical environment variable

Variable	Q2	Q7	Q10v	Q29
Q2 Overall satisfaction	-			
Q7 Overall satisfaction primary workspace	.726**	-		
Q10v Overall Appearance	.672**	.585**	-	
Q29 Appearance primary workspace	.814**	.725**	<b>.834**</b>	-

Note:  $n = 65$ . \* $p < .05$  (2-tailed); \*\* $p < .01$  level (2-tailed)

Factor analysis was run, and as an additional check, Cronbach’s  $\alpha$  was used to determine reliability. The physical environment subscale consisted of 4 items: Q2, Q7, Q10v, and Q29 ( $\alpha = .911$ ). Showing strong collinearity, it was decided to collapse the measures into one variable keeping the name physical environment. Frequencies for the new variable are shown in Table 15.

Table 15. Descriptive statistics for collapsed physical environment variable

Variable	<i>M</i>	<i>Mdn</i>	<i>SD</i>
Physical environment	18.9	20.0	6.178

Note:  $n = 65$

## Transformation of Social Characteristics Variable

Respondents were asked nine questions that measured social characteristics in the workplace environment. Three questions measured individualism (INV), three questions measured power distance (PDI), and three questions measured uncertainty avoidance (UAI). The mean scores for each of these measures were  $M=3.11$ ,  $Mdn = 3.0$ ,  $SD = 1.54$  (Q30.),  $M=1.87$ ,  $Mdn = 1.0$ ,  $SD = 1.36$  (Q31.),  $M=3.23$ ,  $M=3.89$ ,  $Mdn = 3.54$ ,  $SD = 1.35$  (Q32.),  $M=3.89$ ,  $Mdn = 4.0$ ,  $SD = 1.88$  (Q33.),  $M=4.39$ ,  $Mdn = 5.0$ ,  $SD = 1.68$  (Q34.),  $M=3.77$ ,  $Mdn = 4.0$ ,  $SD = 1.55$  (Q35.),  $M=3.80$ ,  $Mdn = 4.0$ ,  $SD = 1.53$  (Q36.),  $M=4.24$ ,  $Mdn = 4.0$ ,  $SD = 1.87$  (Q37.),  $M=4.13$ ,  $Mdn = 4.0$ ,  $SD = 1.58$  (Q38.). These scores are considered negative to neutral with Q34 (How satisfied are you with the formal gathering spaces in Folwell Hall?) as having the highest mean and Q31 (Do you agree people should obey authority without question?) with the lowest.

Further analysis was conducted using Pearson's correlation coefficient to understand relationships between the variables within the physical environment construct. The correlation revealed a significant relationship between the social characteristic variables (see Table 16).

Factor analysis was run, and as an additional check, Cronbach's  $\alpha$  was used to determine reliability. The social characteristics scale consisted of items 8 items, Q30, Q31, Q33, Q34, Q35, Q36, Q37, Q38 ( $\alpha = .876$ ). Frequencies for the new social characteristics variable are shown in Table 17.

Table 16. Correlations for social characteristics variable

Variable	Q30	Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38
Q30 Structured lives	-								
Q31 Obey authority	.575	-							
Q32 Group loyalty	.672	.531	-						
Q33 Informal spaces	.814	.725	<b>.834</b>	-					
Q34 Formal spaces				.747	-				
Q35 Workstation hierarchy						-			
Q36 Workstation types				.492	.525	.758	-		
Q37 Communal areas				.730	.781	.508	.631	-	
Q38 Spaces for concentration					.555	.539	.649	.607	-

Note:  $n = 65$ . \* $p < .05$  (2-tailed); \*\* $p < .01$  level (2-tailed)

Table 17. Descriptive statistics for collapsed social characteristics variable

Variable	<i>M</i>	<i>Mdn</i>	<i>SD</i>
Social characteristics	29.2	28.0	9.52

Note:  $n = 65$

### Transformation of Visual Characteristics Variable

Respondents were asked 7 (an additional three categorical questions were not used here) questions that measured visual characteristics in the workplace environment. Two questions measured color, five questions measured nature. The mean scores for each of these measures were  $M=4.29$ ,  $Mdn = 5.0$ ,  $SD = 2.13$  (Q10i),  $M=4.35$ ,  $Mdn = 5.0$ ,  $SD = 2.20$  (Q10j),  $M=4.48$ ,  $Mdn = 5.0$ ,  $SD = 2.23$  (Q10r),  $M=5.50$ ,  $Mdn = 5.0$ ,  $SD = 1.01$  (Q39),  $M=6.24$ ,  $Mdn = 7.0$ ,  $SD = .963$  (Q40),  $M=4.15$ ,  $Mdn = 4.0$ ,  $SD = 1.55$  (Q44),  $M=3.54$ ,  $Mdn = 4.0$ ,  $SD = 1.5$  (Q45). The highest mean score was Q40 (How important

is nature to you?), and the lowest was Q45 (How satisfied are you with the use of nature in Folwell Hall?). These scores are considered somewhat negative to positive.

Further analysis was conducted using Pearson’s correlation coefficient to understand relationships between the variables within the visual characteristics construct. The correlation revealed a significant relationship between the visual characteristic variables shown in Table 18.

Table 18. Correlations for visual characteristics variable

Variable	Q10i	Q10j	Q10r	Q39	Q40	Q44	Q45
Q10i Overall Daylighting	-						
Q10j Daylighting primary workspace	<b>.975</b>	-					
Q10r Overall view conditions	.745	.776	-				
Q39 Color importance				-			
Q40 Nature importance				.610	-		
Q44 Color satisfaction						-	
Q45 Nature satisfaction	.519	.501	.524			.696	-

Note:  $n = 65$ . \* $p < .05$  (2-tailed); \*\* $p < .01$  level (2-tailed)

Factor analysis was run, and as an additional check, Cronbach’s  $\alpha$  was used to determine reliability. The visual characteristics scale consisted of 3 items, Q45, Q10i, and Q10r ( $\alpha = .813$ ). Q10j was removed due to the significantly strong collinearity with Q10i, which means they may be measuring the same phenomena. This is highly likely as the questions are very similar. Q40 was also omitted from the subscale as its omission increased reliability. Frequencies for the new visual characteristics variable are shown in Table 19.

Table 19. Descriptive statistics for collapsed visual characteristics variable

Variable	<i>M</i>	<i>Mdn</i>	<i>SD</i>
Visual characteristics	12.31	13.0	5.07

Note: *n* = 65

### **Multicollinearity**

After the variables were collapsed into new variables, a check for multicollinearity was conducted. A linear regression was run to check that collinearity tolerance was greater than .10 and statistics variance inflation factors (VIF) did not exceed 10. If these values were present, they showed collinearity. The variable for visual (tolerance = .636, VIF = 1.572); physical (tolerance = .385, VIF = 2.596); and social (tolerance = .398, VIF = 2.514) fell within the above specified ranges (see Table 20)

Table 20. Multicollinearity analysis of visual, social, and physical variables

Observed variables	Multicollinearity	
	Tolerance	VIF
Visual	.636	1.572
Social	.398	2.510
Physical	.385	2.596

After transforming the variables a parsimonious model (see Figure 17) was created showing which collapsed questions are attributed to each variable. These variables were used in the statistical analysis for this study including the variables that were used to fit the logistic regression model.

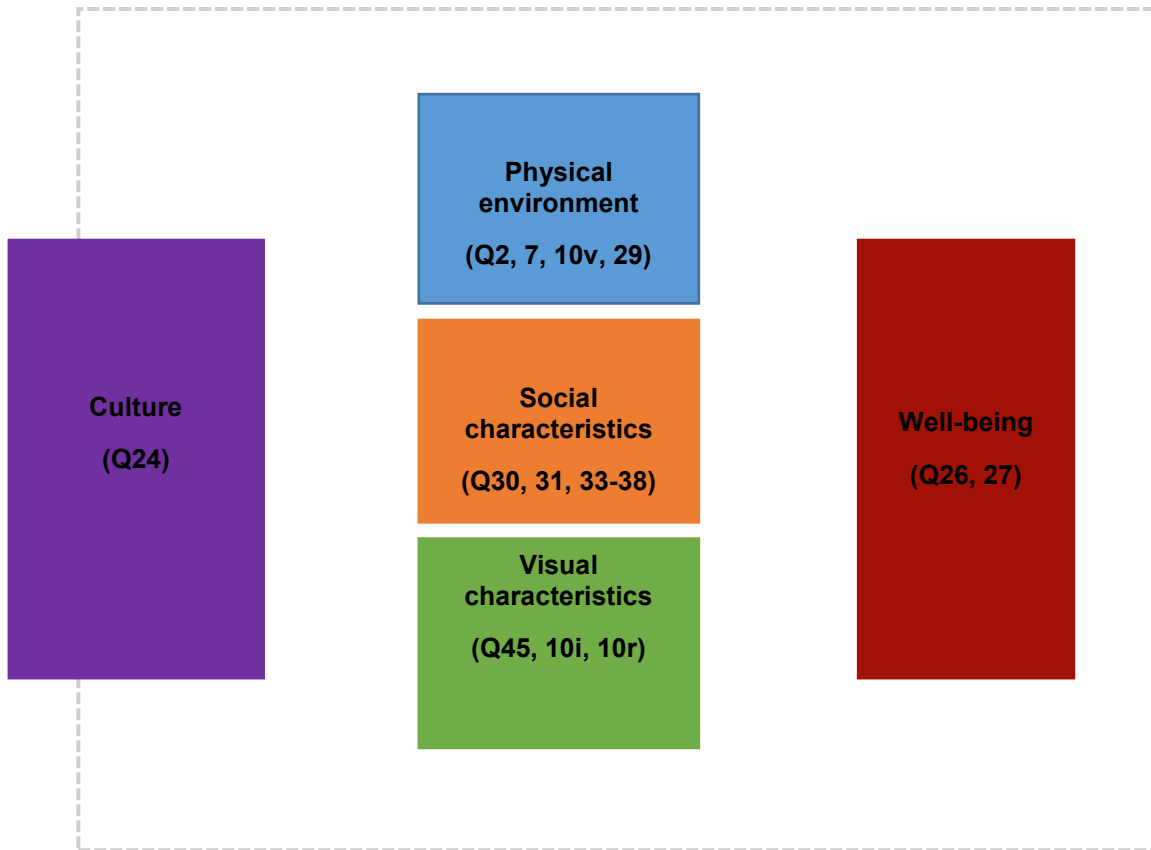


Figure 16. Parsimonious model with updated measures



## Data Analysis

This section will describe the data analysis used to test the model and hypotheses. Correlation, logistic regression, cross tabulations, and qualitative analysis are described stating how they will be applied to this study. The following graphic illustrates the data analysis process (see Figure 18).

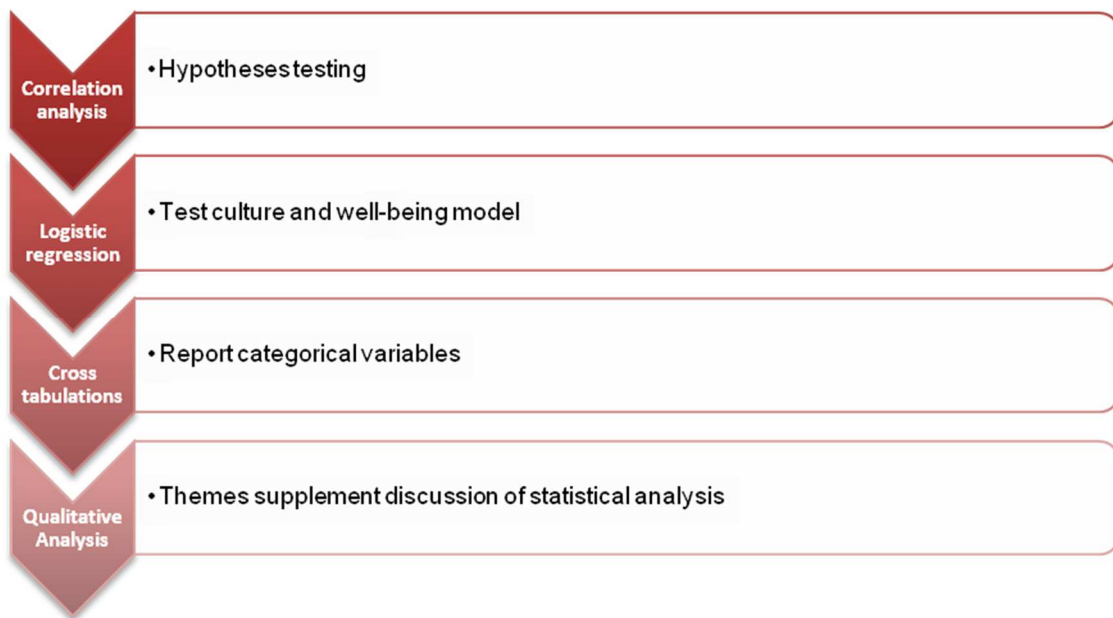


Figure 18. Data Analysis Process Overview

## Statistical Analysis

### Non-parametric Tests

To test the hypotheses in this study non-parametric analysis tests were used. In this study the data in some of the variables were skewed, and there was an issue of a

small sample size. Non-parametric tests are considered less restrictive than parametric tests and are commonly used when assumptions of normality are not met (Field, 2013).

### **Chi-squared Tests of Independents**

Cross tabulations were used to compare categorical data that were deemed important to the study, but were not used in the model. The findings report descriptive statistics of the sample and describes the strength of their relationships.

The Fisher's exact test was used to analyze independent and dependent categorical variables that violated the assumption of having an expected frequency of five or more per cell (Fisher, 2013). Fisher's exact test computes the chi-square statistic using the output of a cross tabulation. It is appropriate for datasets with smaller sample sizes (Field, 2013). When  $n > .05$  the null hypothesis is accepted, conversely when  $n < .05$  the null hypotheses is rejected.

### **Bivariate Correlations**

Spearman's rho coefficient is similar to Pearson's product-moment coefficient, however it is used when the data is not normally distributed and the sample is small (Field, 2013). In both cases a relationship between two variables are analyzed. The commonly used  $r$  measures of +/- .1 represent a small effect, +/- .3 represent a medium effect, and +/- .5 represent a large effect (Field, 2013).

### **Logistic Regression**

Logistic regression uses continuous predictors for categorical outcomes, ultimately "predicting which of two categories a person likely belongs to," (Field, 2013, p.761). Unlike linear regression, this type of analysis is used when assumptions of

normality are not met. The logistic regression predicts the probability of  $Y$ . Its predicted equation is as:  $P(Y) = 1 / (1 + e^{- (b_0 + b_1 X_1)})$ . Since assumptions of normality were not met with the dependent variable in this study, logistic regression was used for statistical analysis.

### **Qualitative Analysis**

In addition to quantitative analysis, qualitative responses were analyzed. Analysis was conducted by grouping them into categories and themes to determine deeper insights on what culture and visual characteristics were meaningful to employees. All participants did not respond to every open-ended question in the survey ( $n = 30$ ), therefore the qualitative responses were used mainly to support the statistical analysis.

This study moves forward the body of knowledge in interior design as the majority of what has been published in current literature is descriptive, while this study will not only report descriptive statistics, but also regression analysis where predictability is explored. The next chapter will report findings and synthesize them into a discussion to better understand the effects of culture on well-being in the workplace environment.

## **Chapter 4: Findings and Discussion**

### **Overview**

This chapter focuses on findings from data analysis and model testing to understand if culture was correlated with well-being in the workplace environment. First, hypotheses results are reported. Second, findings of logistic regression are reported. Third, bivariate cross tabulations are reported to better understand categorical variables. Qualitative findings are included in the statistical reports to support the quantitative findings. Finally, a discussion of the findings concludes this chapter.

### **Hypotheses Analysis**

#### **Hypothesis 1: Culture Influences Employees' Well-being in the Workplace**

##### **Environment**

A Chi-Square test of Independence was performed to examine the relationship of culture and employees' well-being in the workplace environment. Results from Fisher's Exact Test showed no statistical significance,  $p = .588$ . Frequencies in the cross tabulation (see Table 21) reveal that cultures other than Caucasian (70% vs. 62%) were more likely to believe that culture influences well-being in the workplace environment. Irrespective of culture, all participants agree more than disagree (64%) that culture influences well-being in the workplace environment (see Table 21 and Figure 19). This may support that the inclusion of design elements that support culture in the workplace environment may have a greater sense of well-being resulting in happier and healthier employees which also have implications on profits (Hunt, Layton, & Prince, 2015; Stevens, Plaut, & Sanchez-Burks, 2008).

Table 21. Relationship between culture and influence on well-being in the workplace environment

Culture	Other cultures		Well-being			
			No	Yes	Total	
		Count	6	14	20	
		% within culture	30%	70%	100%	
		% within well-being	26.1%	33.3%	30.8%	
		Caucasian culture	Count	17	28	45
			% within culture	37.8%	62.2%	100%
			% within well-being	73.9%	66.7%	69.2%
Total		% of Total	26.2%	43.1%	69.2%	
		Count	23	42	65	
		% within culture	35.4%	64.6%	100%	
		% within well-being	100%	100%	100%	
		% of Total	35.4%	64.6%	100%	

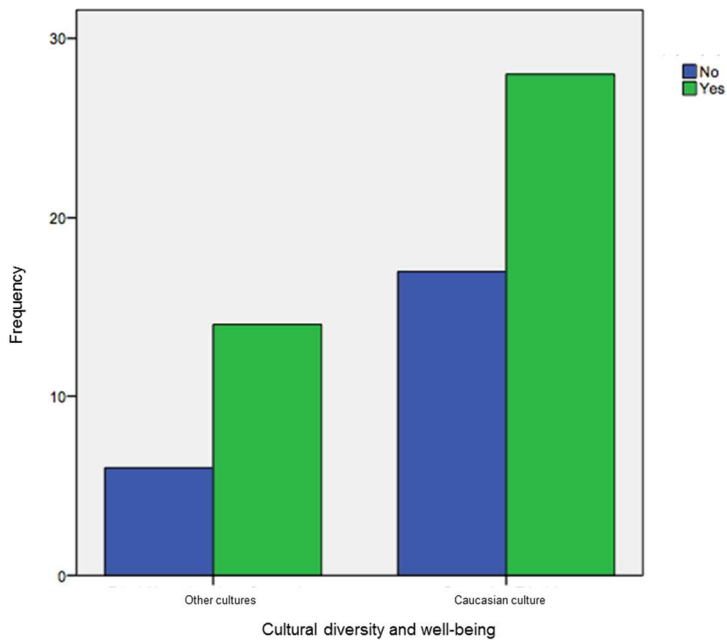


Figure 19. Relationship of cultural diversity importance and well-being by culture

This infers that a more balanced representation of cultures, may lead to statistical significance between the variables of culture and well-being. According to Kreitzer (2012) well-being has been studied for numerous years in over 100 countries, with

findings showing that well-being transcends culture. This notion of well-being transcending culture is supported in the percentages reported from the bivariate analysis.

**Hypothesis 2: Well-being is Mediated by Employees’ Satisfaction with the Overall Physical Environment**

Correlation analysis revealed well-being ( $M = .65, Mdn = 1.0, SD = .482, n = 65$ ) and physical environment ( $M = 18.9, Mdn = 5.0, SD = 6.17, n = 65$ ) as not statistically significant when considering the influence of the physical environment on well-being in the workplace environment ( $r = .061, p = .629$ ) (see Table 22).

Table 22. Correlation for physical environment mediating well-being in the workplace environment

Variable	Physical Env	Well-being
Physical Env	-	
Well-being	.061	-

Note:  $n = 65$ . \* $p < .05$  (2-tailed); \*\* $p < .01$  level (2-tailed)

In recent years, well-being supported by the built environment has become an emerging area of study in the profession of interior design (Cooper, 2014; Pable & Waxman, 2014; Power, 2014; Scott, 2014). Specifically in the workplace environment, studies have been conducted to understand how space planning and overall satisfaction of the physical environment can affect employees’ well-being (Bajjer et al., 2013; Gray & Birrell, 2014; Hsiao et al., 2013). Qualitative responses differ from these findings and are in support of literature as many participants commented on the impact the physical environment had on them both negatively and positively. One participant stated that the

designed elements stimulate creativity. While another participant stated they were satisfied with their workplace environment as they get their work done.

**Hypothesis 3: Well-being is Mediated by Social Characteristics in the Workplace Environment**

Correlation analysis revealed well-being ( $M = .65, Mdn = 1.0, SD = .482, n = 65$ ) and social characteristics ( $M = 29.2, Mdn = 28, SD = 9.52, n = 65$ ) as not statistically significant when considering the influence of social characteristics on well-being in the workplace environment ( $r = .149, p = .235$ ) (see Table 23).

Table 23. Correlation for social characteristics mediating well-being in the workplace environment

Variable	Social	Well-being
Social	-	
Well-being	.149	-

Note:  $n = 65$ . \* $p < .05$  (2-tailed); \*\* $p < .01$  level (2-tailed)

Qualitative responses stated that there was a need for more diverse spaces in Folwell Hall. Comments included a desire for space that supported interaction through informal gathering spaces, and space that enhanced focus and concentration. These comments support the finding that social characteristics were not significant in Folwell Hall which may have had an impact on the significance.

**Hypothesis 4: Well-being is Mediated by Visual Characteristics in the Work place Environment**

At the significance level of  $p < .05$ , findings showed the correlation of well-being ( $M = .65, Mdn = 1.0, SD = .482, n = 65$ ) and visual characteristics ( $M = 12.31, Mdn = 13,$

$SD = 5.07, n = 65$ ) as not statistically significant ( $r = .046, p = .713$ ) (see Table 24). This implies that there is no relationship with visual characteristics and well-being. Qualitative responses revealed that satisfaction for color in Folwell Hall was low, but important. In addition scores showed high satisfaction with nature and color in the workplace environment and its importance was stated in the qualitative findings. In addition, qualitative comments refute the statistical findings in this study and are more closely aligned with literature that states visual characteristics such as nature and color have significant impacts on individuals and their well-being (Gray & Birrell, 2014; Hsiao et al., 2015; Ryan et al. 2014).

Table 24. Correlations for visual characteristics mediating well-being in the workplace environment

Variable	Visual	Well-being
Visual	-	
Well-being	.046	-

Note:  $n = 65$ . \* $p < .05$  (2-tailed); \*\* $p < .01$  level (2-tailed)

### Logistic Regression Model

Logistic regression was used to assess the model's probability of predicting the influence of culture on well-being. In this study, the model correctly predicted well-being as having an influence on culture at a level of 60%. However, after running the regression, the model displayed no statistical significance in predicting well-being based on culture in the workplace environment,  $X^2(7) = 2.959, p = .889$ , Nagelkerke  $R^2 = .061$ . (see Table 25). Of all the predictor variables (culture, physical environment, social characteristics, and visual characteristics) none were significant when fitting the model. However, out of the predictor variables, social characteristics was the closest to



significance for predicting the influence of culture on well-being at  $p = .444$ , and had an odds ratio of .918. The odds ratio indicates on average, for increased levels of social characteristics, well-being for Caucasians increases by .918 times the well-being than other cultures (see Table 25).

*Table 25.* Summary of logistic regression predicting influence of culture on well-being in the workplace environment

	<i>B</i>	Odds ratio <i>Exp(B)</i>	95%CI		<i>p</i>
			Lower	Upper	
Culture by visual	.99	1.104	.705	1.726	.666
Culture by Social	-.086	.918	.737	1.143	.444
Culture by Physical	.015	1.015	.743	1.387	.926

*Note:*  $X^2(7) = 2.959$ ,  $p = .889$ , Nagelkerke  $R^2 = .061$

The individual predictor variables were also insignificant as displayed in the correlation and chi-square analysis discussed earlier. Though there was no statistical significance, the variables were grounded in theoretical concepts which also showed significant correlations within each concept while constructing the model. There may be several factors for the variables not fitting the model including sample size and/or the structure of questions. For instance, questions that followed the same sentence structure (i.e. How satisfied are you with..., How important is...) were more strongly correlated with each other when collapsing the variables. Perhaps, when applicable, similar questions should be grouped together with headers explaining that the section will ask about satisfaction, importance, agreement, etc.

### **Bivariate Cross Tabulations**

Findings for the categorical variables are reported in this section using bivariate cross tabulations. Analysis was run on culture and color preference. Findings showed that

regardless of culture, there was not a preference for warm or cool colors. The table shows no percentage changes between cultures other than Caucasian (22%) and Caucasian cultures (77%) between the categories of warm and cool colors (see Table 26).

Table 26. Relationship of color temperature and culture in the workplace environment

			Culture			
			Other cultures	Caucasian culture	Total	
Color preference	Warm	Count	5	17	22	
		% within color preference	22.7%	77.3%	100%	
		% within culture	27.8%	38.6%	35.5%	
		% of Total	8.1%	27.4%	35.5%	
		Cool	Count	4	14	18
			% within color preference	22.2%	77.8%	100%
	% within culture		22.2%	31.8%	29%	
	% of Total		6.5%	22.6%	29%	
	No preference	Count	9	13	22	
		% within color preference	40.9%	59.1%	100%	
		% within culture	50%	29.5%	35.5%	
		% of total	14.5%	21%	35.5%	
Total		Count	18	44	62	
		% within color preference	29%	71%	100%	
	% within culture	100%	100%	100%		
	% of Total	29%	71%	100%		

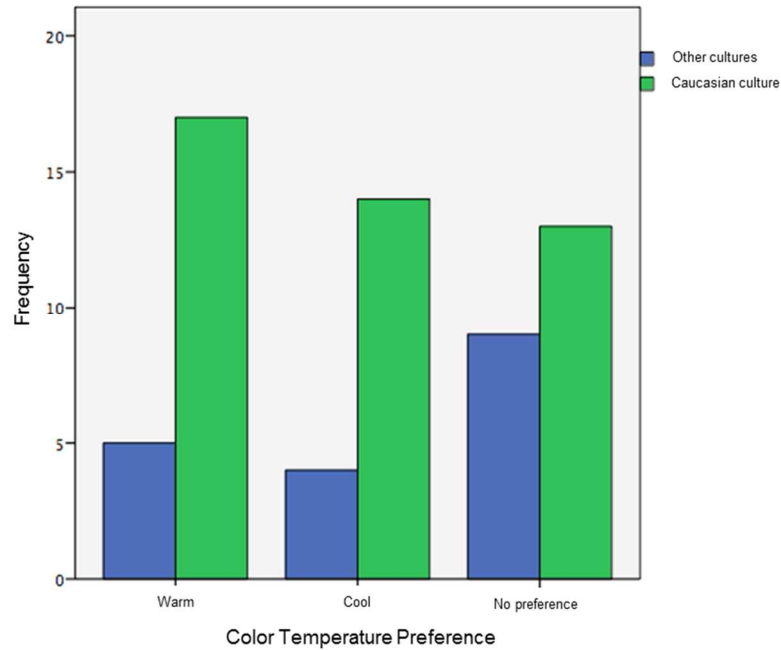
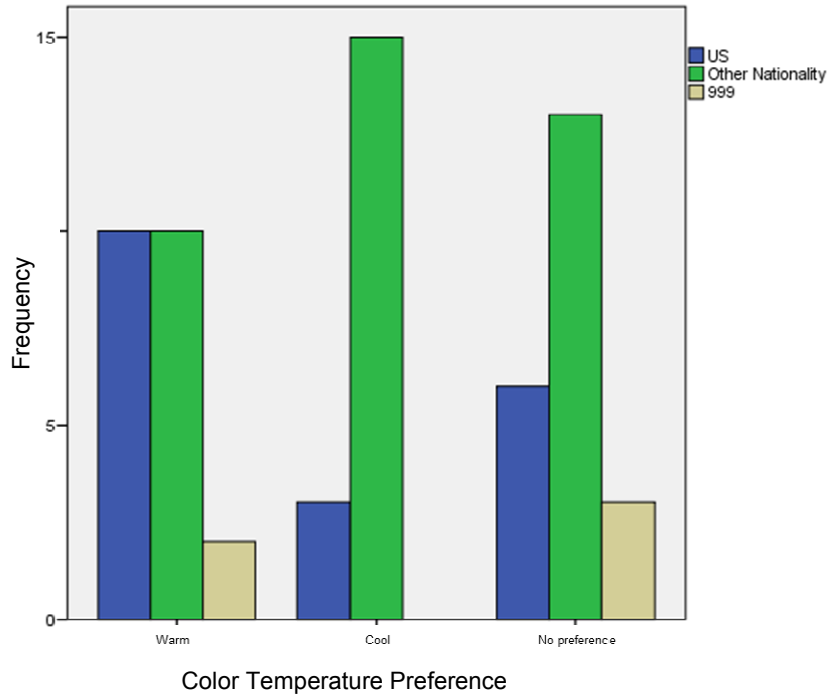


Figure 20. Color temperature preference by culture

Comparing color preference by nationality shows greater variance in responses (see Table 27 and Figure 21). Individuals born in the United States preferred warm colors about 30% more than individuals of other nationalities. Cool colors were preferred (39%) by individuals born in countries outside of the United States. There were also similar percentages by all the individuals who stated they did not have a preference (31% of those born in the United States, 34% of those born outside of the United States).

Table 27. Relationship of color temperature and nationality in the workplace environment

		Nationality			
		US	Other Nationality	999	Total
Color preference Warm	Count	10	10	2	22
	% within color preference	45.5%	45.5%	9.1%	100%
	% within nationality	52.6%	26.3%	40%	35.5%
	% of Total	16.1%	16.1%	3.2%	35.5%
Cool	Count	3	15	0	18
	% within color preference	16.7%	83.3%	0%	100%
	% within nationality	15.8%	39.5%	0%	29.0%
	% of Total	4.8%	24.2%	0%	29.0%
No preference	Count	6	13	3	22
	% within color preference	27.3%	59.1%	13.6%	100%
	% within nationality	31.6%	34.2%	60%	35.5%
	% of total	9.7%	21.0%	4.8%	35.5%
Total	Count	19	38	5	62
	% within color preference	30.6%	61.3%	8.1%	100%
	% within nationality	100.0%	100.0%	100%	100%
	% of Total	30.6%	61.3%	8.1%	100%



*Figure 21.* Color temperature preference by nationality

When asked more specifically to what color on the Kelvin scale individuals were more drawn, the majority of cultures other than Caucasian were in the 5,000 (midpoint between cool and warm) and 8,000 (warm) temperature range, both at 22%. The majority of Caucasian cultures were also around the midpoint of warm and cool as the majority (21%) selected the 4,000 temperature range (see Figure 22). Similar results were found when comparing nationality to the Kelvin scale (see Figure 23).

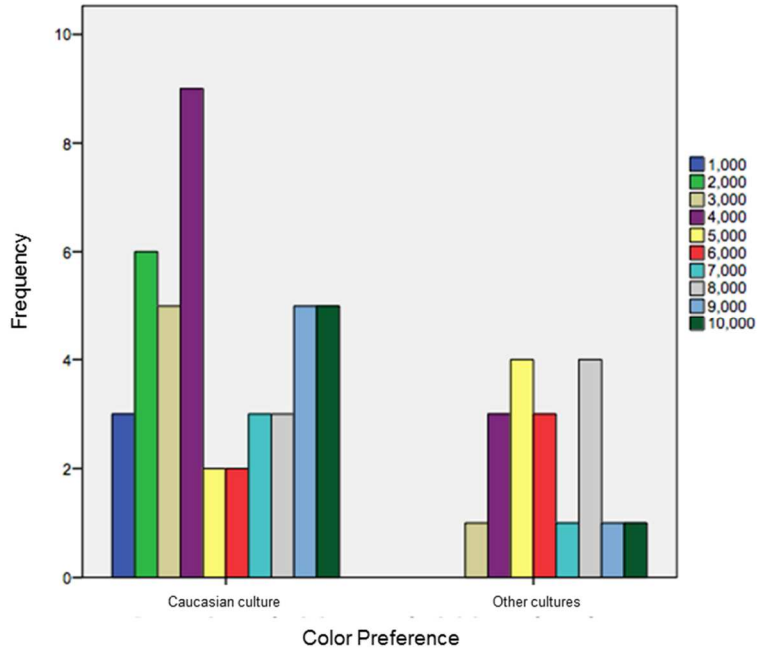


Figure 22. Kelvin color temperature preference by culture

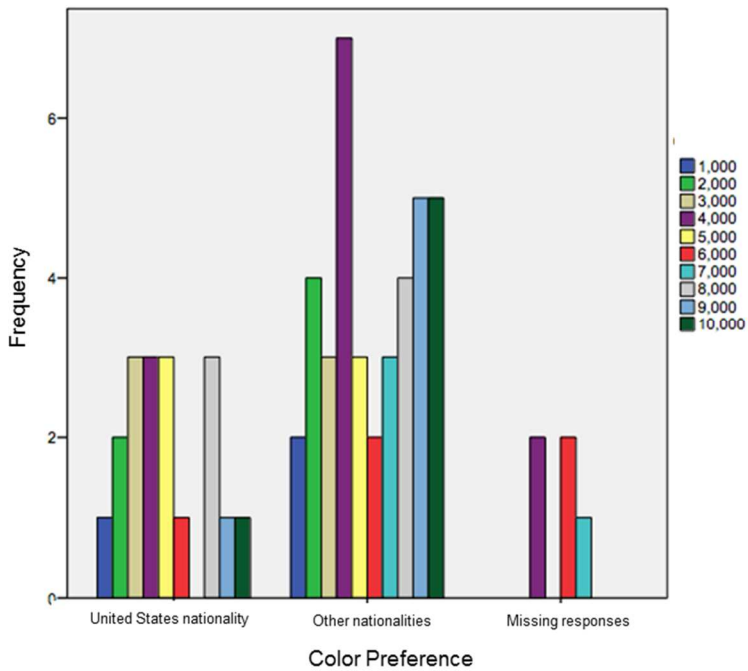


Figure 23. Kelvin color temperature preference by nationality

Research shows that color has a great psychological impact on individuals and is often influenced by culture (Augustin, 2009). This is supported by qualitative responses where color emerged as a theme. Many individuals stated they would prefer more color in their workplace environment and were displeased with what was chosen. The following is a comment from one of the participants: “I thought that with the renovation they would have used the colors present in the main floor: dark green and yellow. Instead they went with neutral, cold colors. Very disappointing.”

It is difficult to explain why there was no statistical significance with color when collapsing the visual characteristics variable, especially when the majority of all individuals by culture and nationality state that the concept is important (see Figures 24 and 25). In reference to preferences for color, it may be more beneficial to investigate nationality as there was more diversity in responses.

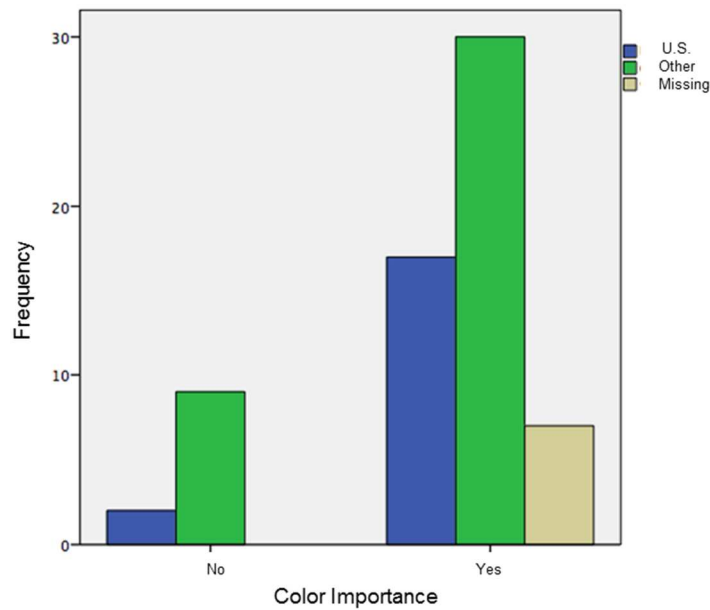


Figure 24. Response to color temperature importance by nationality

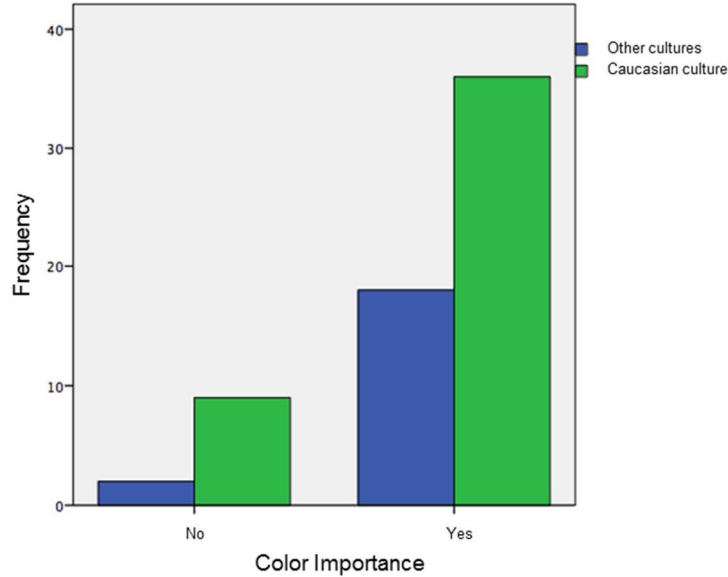


Figure 25. Response to color temperature importance by culture

### Qualitative Analysis

Qualitative analysis was conducted using Nvivo version 10 software for Windows to organize the data. Nodes (codes) were added to each concept creating categories and later themes. After themes were developed, a description capturing the essence of the participant's experiences concludes the qualitative analysis (Creswell, 2007).

In response to the question: With culture in mind, what visual characteristics would you like included in the design of your primary workplace environment? Findings revealed that nature, windows, color, space, and personalization were found to be most salient. Themes were ordered by the frequency in which they were mentioned from greatest to least.



## **Nature**

Nature was often commented on. Many individuals stated they would like more plants, the use of more natural materials such as wood and stone, and the ability to open windows for fresh air, natural views and access to natural light.

## **Windows**

Windows were often mentioned in relation to nature. However, it was used as a separate theme because it was referenced so often and in some cases it was only stated that a window was desired. One respondent stated, "I would love a window or at least some plants." Other comments referenced having the ability to access nature from their windows including views of nature, natural air, and natural lighting.

## **Color**

After nature, color was commented on most frequently. Many individuals referenced their dislike for the colors used on floors where their primary workspaces were located. One respondent stated, "I feel like I am in a grey box." Others desired warmer and more vibrant colors. In addition, some individuals want the choice to choose their own colors for their primary workstation.

## **Personalization**

Many respondents expressed the desire to personalize their primary workspaces, primarily with the ability to choose their own colors, or bring in artwork and posters to do so. It was also mentioned that space should be provided for personal items one participant stated: "Warmer colors, no carpet, wood furniture and bookcases, space for plants, space for images/pictures."

## **Space**

Space was a theme that emerged. Many individuals referenced space as it pertained to aesthetics, furniture, lighting, and types of spaces. However, aesthetics and types of spaces were more frequently commented on. An individual discussed the overall look of the building stating: “Less polyester carpeting. More art. Less corporate looking brown and purple interior in this academic setting. More use of wood and stone materials in keeping with [the] era of the building.” They also discussed the need for spaces that supported concentration or focused work as well as more informal common spaces as this respondent states: “There are no informal common spaces (such as an international café) in Folwell to meet with faculty from other departments.”

## **Discussion**

These comments support the theoretical framework used in this study. Hofstede’s (1984) cultural dimensions of space address communal and individual workspace as well as personalization in the individualism (INV) dimension. Nature and color are addressed in Travis’ (2010) principles of black cultural design referencing strong indoor/outdoor relationship, earth centeredness, and intense use of color. These qualitative findings support literature that makes the connection between culture, design, and well-being. In addition, other researchers (Kaplan, 1993; Park & Guerin, 2002; Wells, 2000) have shown the importance of these attributes relating to culture and well-being, thus supporting the qualitative responses in this study.

## **Chapter 5: Conclusion and Implications for Further Study**

### **Overview**

This chapter will summarize the research findings and discuss implications of the study. First, there is a brief review of the findings. Second, implications of social characteristics and workplace design are discussed along with a focus on the effects that design supporting culture and well-being has on organizations, and implications this study may have on SPOES instrument. Third, limitations are discussed in reference to sample size and diversity. Fourth, implications for future studies are examined, ending with the conclusion.

### **Review of Findings**

The purpose of this study was to investigate the relationship between employees' culture and well-being in their workplace environment. The secondary purpose was to test an instrument to measure impacts of culture on workplace well-being and test of a model.

None of the hypotheses in this model were found to be significant. The logistic regression model also revealed insignificant findings. As this was the case, an empirical model was not constructed. Because the individual questions were strongly correlated with the variables in the model and are supported by literature, it is suggested that continued testing be done. In addition qualitative results revealed that nature, color, space, windows, and personalization are important to the employees in this workplace environment.

There were some interesting findings that emerged in the data. Color was not correlated with the visual characteristics variable which was surprising as it has great significance in the built environment. In this study bivariate analysis revealed the opposite, showing individuals responded that color was important in the workplace environment. However, when asked about color preference, there seemed to be no preference across cultures contrary to the literature (Augustin, 2009; Guerin, Park & Yang, 1994; Park & Guerin, 2002). These results may have been due to sample size and lack of diversity in the population. There were however emerging preferences among nationalities. The addition of color was an important design characteristic in qualitative responses. This suggests that color perception may be important as long as it is perceived. Qualitative responses suggested hues such as grey and beige (those present in Folwell Hall) were perceived as being absent of color. Negative responses indicated the majority of participants who mentioned color were not satisfied. This may be an area that interior designers should pay attention to as many workplace environments use non-descript hues.

Personalization was a theme that emerged in the qualitative responses. Responses showed that many would like the choice or have input in designing their personal workspace. Comments included the desire to choose wall colors, space for images, bringing in their own plants, and being able to choose the type of space for different interactions. These findings were similar to those found in the literature (Miller, Erickson, & Yust, 2001; Wells, Thelen, & Ruark, 2007). Having personalization and flexibility to choose seemed to be an underlying connection with most of the themes. In previous versions of the SPOES survey questions about employees' design input and personal control were measured. It is recommended to conduct qualitative studies to

understand personalization and its relationship with culture and well-being. Themes that emerge can be used in the SPOES survey elaborating on its existing questions.

## **Implications**

### **Measuring Culture**

This investigation found that culture is a very complex, thus difficult concept to measure. Since culture is grounded in identity and values of individuals (Hofstede, 1981), it may be more appropriate and beneficial to understand culture in the workplace environment by asking about values. In doing so, participants may have a clearer understanding of the questions and not get caught up in the complexity of the word culture, which may be contextually different to individuals. In addition participants may be more apprehensive answering questions asked in the context of culture as it can be a personal subject to some.

### **Impact of Social Characteristics on Well-being in the Workplace Environment**

Social characteristics was the closest to being significant out of those fitted for the logistic model. Literature supports that social characteristics have an impact on workplace occupants (Burke, 2010; Heerwagen & Zagreus, 2005; Vischer, 2008). Qualitative responses stated that employees would like more informal gathering spaces to increase connectivity and also spaces where they can concentrate while doing focused work. There has been a recent shift to focusing on a diversity of spaces within the workplace (Herman Miller, 2010; Knoll, 2010b; Steelcase, 2012). Steelcase (2013) also has focused research on having a “palate of places” that give employees more flexibility and options to work how they want and best suited for the type of work they are doing.

Studies investigating culture and social characteristics in the workplace environment are important. An understanding of culture gives interior designers, architects, and planners important cues on cultural norms and traditions which can be translated into the hierarchical organization of the environment (Herman Miller, 2010; Hofstede, 1984, Steelcase, 2010). As literature shows, there is a connection between the hierarchical organization of a workplace and its effects on well-being (Burke, 2010; Hsiao, Hsiao, & Wang, 2013; Vischer, 2008). As seen from the results of the qualitative statements in this study and in the literature (Burke, 2010), qualitative research designs are important to develop valid conceptual constructs for culture and well-being investigations. Therefore, interior designers, facility planners, and other professionals who influence space planning might think of intentionally using social characteristics to impact culture and well-being when designing workplace environments.

### **Effects of Culture and Well-being Design on Organizations**

Incorporating spaces where impromptu meetings or conversations can occur can intentionally effect how employees relate to each other and provide places where familiarity with different individuals takes place. In these moments deeper relationships are formed where a better understanding of individuals occurs, breaking down misconceptions of one another based on cultural differences. When this happens diverse ideas and viewpoints are celebrated (Stevens, Plaut, & Sanchez-Burks, 2008). Companies who are successful in seamlessly incorporating diversity in all levels of their organizational culture are successfully using the all-inclusive multicultural (AIM) model and also begin to see increased profits (Hunt, Layton, & Prince, 2015; Stevens, Plaut, &

Sanchez-Burks, 2008). Utilizing space planning with cultural intention is a way to address diversity supported by the built and designed environments.

### **SPOES Instrument Revision**

The instrument for this study was a module of the SPOES survey using quantitative measures. Investigating culture and well-being for employees proved to be somewhat difficult as the concepts of culture and well-being are so nuanced and complex. It would be beneficial to use qualitative methods where the researcher can probe to find deeper meaning with many of the questions. It is recommended that SPOES conducts a pilot study with a mixed methods approach when using the culture module. Utilizing focus groups and/or face-to-face interviews will make the study richer and will offer more depth to the concepts of culture and well-being which are difficult to measure using solely quantitative tools.

### **Limitations**

#### **Sample Size and Statistical Significance**

The sample size in this study (n=65), may have contributed to the inability to evaluate the model and hypotheses having no significance even though data transformation was used to increase variability. Having a large sample size is important in conducting inferential statistics as it is related to power (Field, 2013). Field (2013) defines power as: the “probability that a given test will find an effect assuming that one exists in the population,” (p.69). He continues stating that: “Larger samples are better approximations of the population; therefore they have less sampling error,” (p. 70).

It is important to note that at the beginning of the second and final week of collecting data, the researcher was notified that a participant sent an office-wide email advising co-workers not to fill out the survey due to “personal questions asked” when they arrived at the cultural module section. After the email was sent an additional two participants completed the survey before it was closed. It is not known how many more responses would have been collected if this event did not occur. However, participant interference is important to consider as it may affect the sample size in a study. This reinforces the sensitive nature of culture and conversations around it, how we should talk about culture including what is acceptable and what is not. In addition, culture is very complex. Individuals may inherently identify with more than one culture or have lived in multiple geographic locations where they have taken on multiple cultural identities. Understanding this complexity and best ways to measure the construct of culture is very complicated and warrants further investigation beginning with qualitative methods.

### **Cultural Diversity**

In addition to sample size, this study lacked diversity in ethnicity and nationality. Culture was extremely salient as it drives this study and is a predictor variable for well-being. A key reason this setting was selected was due to the diversity in subject areas taught and the variety of faculty with various nationalities who office in the building. However, the sample of participants turned out to be demographically homogenous. The majority of participants who took the survey were Caucasian, and born in the United States. Consequently, these demographics reflect those of the individuals working at the University of Minnesota. When one looks at workplace diversity at this institution employees of color make up 14% (University of Minnesota, 2014), which include all



faculty, professional, administrative, civil service, labor, graduate assistants, and professionals in training. In addition the state of Minnesota has a less diverse workforce in comparison to the rest of the nation. Nationally, Whites make up the majority (79%) of the workforce in the U.S. (U.S. Bureau of Labor Statistics, 2014) while Minnesota percentages show higher disproportionate numbers as Whites make up 87% of the working population (Minnesota Department of Employment and Economic Development, n.d). Therefore, it would be beneficial to not only increase the sample size, but disproportionately sample from non-White individuals. Additionally, one could conduct research testing the model with companies and or departments that have greater diversity in their workforce.

## **Future Research**

### **Measurement of Culture in the Workplace Environment**

Preparing the variables used in this study was a thorough exercise of understanding and applying theoretical concepts to the framework and questions, and using statistical tests to ensure correlation and reliability. This iterative process was conducted until the researcher was confident with all the variables used for statistical analysis. Therefore further testing of the model is suggested, but first a better understanding of culture is needed.

Though there are studies that investigate culture and well-being in the workplace and environment independently, there are none with the goal of making the connection between culture and well-being in the interior environment and specifically workplace settings. Therefore, it is suggested that further research be conducted in this area. Until

more studies are conducted to understand what culture means to individuals and how the concept is defined for them in their workplace, it would be difficult to construct a culture and well-being scale. Backhouse and Drew (1992) stated “The relationship between partners of social interaction and spatial layout is more diverse and complex than previously understood, and that this complexity can only be fully accessed by a microanalytic qualitative methodology,” (p.573). It is then suggested that further qualitative methods be used to study concepts around culture and well-being. An example of a study would entail focus groups to understand what culture means to individuals in the workplace. It would also give insight into whether or not culture is a meaningful concept in achieving well-being. A purposive stratified sample of individuals from different organizations, ethnicities, and nationalities would be conducted. The researcher could ask a series of questions such as:

1. What does culture mean to you?
2. What does cultural diversity mean to you within your organization?
3. Does culture influence your sense of well-being?
4. From a cultural perspective, how does your physical work environment make you feel?
5. Does your physical work environment support cultural diversity?

The themes from the findings would be beneficial in measuring the concept of culture in survey instruments increasing validity in the concept of culture in workplace environments.

## **Mixed Methods Investigation of Culture and Well-being in the Workplace**

### **Environment**

It would also be beneficial to conduct a mixed methods investigation of culture and well-being in the workplace environment using findings from the previously proposed study to operationalize culture. In addition to a quantitative POE survey, qualitative responses would offer a richer and deeper understanding of responses that would not be possible to uncover otherwise (Creswell and Plano Clark, 2007). Face to face interviews would be conducted with employees asking 5-6 questions about culture, well-being, and the workplace environment. The researcher will be able to ask probing questions based on responses to build deeper meaning.

This study would maintain the existing theoretical frameworks, but would also include one on well-being. Incorporating a well-being framework may offer more clarity to the literature and questions as it is a major concept in the study. In addition all questions would include the same sentence structure adopted from an existing POE survey (Heerwagen & Zagreus, 2005). Questions might include:

1. I feel my culture is valued by the organization (agree/disagree)
2. There is a strong sense of community in this organization (agree/disagree)
3. I value my relationships at work (agree/disagree)
4. I enjoy being in my workspace (agree/disagree)

Similar to this study, descriptive statistics, correlation, regression, and developing themes would be used to analyze the data.

### **Social Characteristics**

As stated above social characteristics may be an area worth concentrating in future studies of culture and well-being. A suggestion for future study is to focus on Hofstede's (1984) individualism cultural dimension investigating how common spaces enhance employee well-being by supporting community and connectivity among employees. This direction can also be taken with spaces that support focused work. It is suggested that the initial investigations be qualitative face to face interviews or focus groups where themes that emerged can then be used in a survey instrument. In this investigation the research can ask questions about individualism and collectivism using a purposive sample of varied ethnicities, nationalities, and work locations. Questions would ask about preference in reference to their culture, and that of the organization. Questions may include:

1. Do you prefer to work alone or collaborate with others? Probe: Do you believe your preference is related to cultural norms?
2. Are there spaces that support informal interaction in the workplace environment?
3. Are there spaces that support concentration in the workplace environment?
4. How would you change the design of the office to best support how you socially interact with others at work?

Categories and themes would be used to analyze the responses. The resulting themes would serve as the variables tied to the social concept of individualism in a regression model similar to this study.

### **Visual Characteristics**

Further investigation of the visual characteristics nature and color are suggested. These variables were not found to be significant, but there is great value placed on these characteristics not only in the literature (Hsiao, Hsiao, and Wang, 2013; Travis, 2010; Ryan et al., 2014) but in this study. Strong correlations demonstrated that nature is of importance to occupants in this setting, qualitative statements supported this. A secondary purpose of further investigation would be to test the application of the principles across cultures.

A suggestion for future research is to use Travis' (2010) 10 principles of black cultural design as a framework for conducting focus groups to test these principles. Concentration would be given to visual characteristics of color, patten, texture, and nature. Focus groups would be used to develop exploratory concepts. Visual imagery would be an exercise used to help participants communicate complex topics such as culture and how it intersects with nature and color, texture, and pattern. Using disposable instant cameras, participants would be asked to take photos depicting the essence of culture to them with these elements in mind. They would be asked to talk about their perspectives and imagery. The researcher would use content analysis in developing themes using elements and principles of design to describe and explain them further. Findings would be used to advance the body of knowledge in the profession of interior

design and culture. Continued testing of the revealed concepts in qualitative and quantitative research designs would be suggested.

### **Conclusion**

Culture is not only a broad concept, but conversations around culture are difficult to have because it is greatly embedded in identity (Hofstede, 1981). Talking about culture may make individuals feel like their privacy is being violated (as one recipient did in this study) or it may seem that it reinforces or has the potential to create stereotypes. It was never the intention of this study to do either. Rather, the hope was that an acknowledgement of culture in the workplace environment can bring all people together. In this case the dataset turned out to be strongly skewed. As a result, nationality and ethnicity were largely homogeneous resulting in dichotomous variables that conceptualized culture. This circumstance rendered it difficult to avoid making inferences based on what essentially became one group vs. another.

As a country founded on equality for all people, we must continue candid dialogue and commit to actions that improve people's understanding of cultures different from one's own with the aim of decreasing cultural prejudice and increasing people's sense of belonging. Interior design can contribute to this sense of belonging, but an awareness of differing cultures and how to design for them is key.

As this area of study is in its infancy, more qualitative studies need to be conducted to better understand important concepts around culture and well-being in the workplace environment (Backhouse & Drew, 1992; Burke, 2010). Understanding these concepts operationalized by occupants in realistic settings will offer greater content

validity for the creation of measures and instruments as this study attempted. In addition using approaches such as Grant's (1991) inclusion approach in interior design research and education brings a heightened awareness of other cultural realities to not only practitioners, but also students. Cultural exposure for both populations is important as they will lead the way in designing future workspaces and other building types.

This study set out to understand the impact of culture on well-being in the workplace environment. Concepts of social characteristics and factors related to visual characteristics such as nature and color, were grounded in literature (Hofstede, 1984; Travis, 2010). Though the findings were not significant, this investigation adds to the body of literature as it attempts to better define theoretical concepts around culture and well-being. It is recommended that more studies be conducted, specifically qualitative investigations to further advance this area of research. With continued education, research, and tools developed in the field of culture, space can be designed to bring about awareness and connectivity among one another highlighting our similarities, celebrating our differences, and most of all as stated in the beginning of this investigation, our humanness.

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## **Appendix A**

# Folwell Hall SPOES Workplace Survey + Culture Module

SPOES Scan V.2 B3 MN Folwell Hall WPE R1 dgas

## Consent Form for Occupancy Evaluation of Workspace

You are invited to be in a research study because you have a workspace in a building designed and developed to meet the B3 Guidelines (formerly known as the Minnesota Sustainability Guidelines or MSBG). Please read this form and ask any questions you may have before agreeing to be in the study. This study is being conducted by researchers associated with the Center for Sustainable Building Research (CSBR), University of Minnesota.

## Background Information

The purpose of this study is to assess employees' perceptions of their facility and workspaces. The survey will take around 15 minutes to complete. The survey results can be used to inform the content and application of sustainable building guidelines in the future.

## Procedures

If you agree to be in this study, please complete the online questionnaire, which will be submitted to the CSBR at the University of Minnesota for analysis. Your employer will receive a report of the overall analysis, but no data on individual responses will be included.

## Risks and Benefits of Being in the Study

There are no risks and benefits of being in the study.

## Confidentiality

The records of this study will be kept private and stored securely; only researchers will have access to the records. We will not include any information in the reports that will make it possible to identify any individual respondent in the results. Your employer will not have access to these records.

## Voluntary Nature of the Study

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota. You are free to not answer any question or withdraw at any time without affecting those relationships.

## Contacts and Questions

The CSBR is conducting this study. You may ask any questions you have before you begin the survey or later. To do so, please contact Denise Guerin, PhD at [denise@mgdesignresearch.com](mailto:denise@mgdesignresearch.com) or Angie Scott at [brow0409@umn.edu](mailto:brow0409@umn.edu). If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650

All rights reserved.

\* 1. Answer YES to provide your consent and complete the questionnaire.

Yes

No

**Directions**

There are several pages in this questionnaire, and completion of the entire questionnaire is important to understand how **Folwell Hall** meets your needs.

**Section 1. Overall perception of the facility (site, building, and interior)**

First, please answer the following questions related to your perceptions of how you are affected by the **Folwell Hall** facility (site, building, and interior).

2. Overall, how **satisfied** are you with the physical environment of the **Folwell Hall** facility (site, building, and interior)?

Very Dissatisfied 1 2 3 4 5 6 Very Satisfied 7

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

3. Overall, how does the physical environment of the **Folwell Hall** facility (site, building, and interior) affect your **work performance**?

Hinders Work Performance 1 2 3 4 5 6 Enhances Work Performance 7

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

4. Overall, how does the physical environment of the **Folwell Hall** facility (site, building, and interior) affect your **health**?

Hinders Health 1 2 3 4 5 6 Enhances Health 7

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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5. Please let us know if you have any **additional comments** about the physical environment of the **Folwell Hall** facility (site, building, and interiors).

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**Section 2A. Primary workspace**

Please respond to questions about the physical environment of your **primary workspace** (e.g., private office, workstation, work area in a lab, or other primary workspace).

6. Which of the following best describes your **primary workspace**, i.e., the one where you spend the most time?

- Enclosed office, private
- Enclosed office, shared with other people
- Cubicle with low partitions (less than five feet high)
- Cubicle with high partitions (five or more feet high)
- Cubicle with both low and high partitions
- Desk in open office with no partitions
- Work area in a lab
- Other, please specify

7. Overall, how **satisfied** are you with the physical environment of your **primary workspace**?

Very Dissatisfied							Very Satisfied
1	2	3	4	5	6	7	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Overall, how does the physical environment of your **primary workspace** affect your **work performance**?

Hinders Work Performance							Enhances Work Performance
1	2	3	4	5	6	7	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Overall, how does the physical environment of your **primary workspace** affect your **health**?

Hinders Health							Enhances Health
1	2	3	4	5	6	7	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Section 2B. Primary workspace and Indoor Environment Quality (IEQ)**

Now, we have some specific questions about your satisfaction with the **IEQ conditions** associated with your **primary workspace** (e.g., private office, workstation, work area in a lab, or other primary workspace).

10. Please indicate how **satisfied** you are with each of the following aspects of your **primary workspace**.

	Very Dissatisfied	1	2	3	4	5	6	Very Satisfied	7
The overall thermal conditions [temperature (hot or cold), air velocity (drafty or stagnant), and humidity (dry or moist)]	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The temperature (hot or cold)	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The air velocity (drafty or stagnant)	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The humidity (dry or moist)	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The adjustability of the thermal conditions	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall indoor air quality (free of odors, staleness, chemicals or irritants)	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall acoustic quality (ability to hear desired sounds and limit undesired sounds)	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ability to hear desired sounds in your primary workspace	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ability to limit undesired sounds in your primary workspace	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall daylighting conditions	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The amount of daylighting	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The adjustability of the daylighting	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall electric lighting conditions	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The amount of electric light	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The adjustability of the electric lighting	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The adjustability of your task lighting	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall privacy (sound and visual privacy) conditions	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall view conditions (outdoor or distant interior views)	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall furnishings	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The adjustability of your furnishings	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The function of your furnishings	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall appearance (aesthetics)	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall technology (e.g., computer, telephone, etc.)	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall vibration and movement	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall cleaning and maintenance	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Section 3. Physical activity and commuting**

Just a few more questions about your **physical activities** and **commuting practices** associated with the **Folwell Hall** facility!

12. How does the **Folwell Hall** facility (site, building, and interior) affect your overall **physical activity** (walking, stair use, etc.).

Hinders Physical Activity 1	2	3	4	5	6	Enhances Physical Activity 7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Approximately how many miles is your typical daily home-to-work commute, one way?

- 0-5 miles
- 6-15 miles
- 16-30 miles
- 31-45 miles
- 46-60 miles
- 61-75 miles
- 76 or more miles

14. What is your primary mode of transportation used for your daily commute?

- Drive alone (or with children under 16)
- Carpool or vanpool
- Motorcycle/moped
- Public transit
- Bicycle
- Walk
- Telecommute (work from home)
- Other, please specify

15. How does the location of the **Folwell Hall** affect your ability to commute to work in an alternative way (e.g., walk, bicycle, public transit, van, or carpool, etc.)?

Hinders Alternative Commuting 1	2	3	4	5	6	Enhances Alternative Commuting 7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 4. Demographics

16. What is your age?

17. What is your gender?

- Male
- Female
- Other

18. How many years have you worked at **Folwell Hall**?

19. In a typical week, how many hours do you spend at **Folwell Hall**?

- Less than 20 hours
- 20-29 hours
- 30-40 hours
- More than 40 hours

20. What percentage of time per week do you spend in your primary workspace?

- Less than 25%
- 25-50%
- 51-75%
- More than 75%

21. Is your primary workspace located within 15 feet of an exterior window?

- Yes
- No
- I don't know

22. Please let us know if you have any additional comments about the physical environment of **Folwell Hall**.



Section 5. The following questions help us to understand your culture (i.e. nationality and ethnicity) and how it influences your perceptions of Folwell Hall(site, building, and interior) and your primary workspace. These questions are part of an extended study on culture and well-being. Thank you very much for continuing and giving your time to answer this last series of questions.

23. In which country were you born?

24. What is your ethnic background?

25. How long have you lived in the United States?

- 0-5 years
- 6-10 years
- Over 10 years

26. How important is cultural diversity to you? (cultural diversity is defined as a diversity of nationalities and ethnicities, including minorities and non-minorities)

Not at all important 1	2	3	4	5	6	Extremely Important 7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. Do you agree that your culture influences your well-being?

Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. Overall how satisfied are you with the visual appearance of Folwell Hall (site, building, and interior)?

Very Dissatisfied 1	2	3	4	5	6	Very Satisfied 7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. Overall how satisfied are you with the visual appearance in your primary workspace?

Very Dissatisfied 1	2	3	4	5	6	Very Satisfied 7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Section 5a. The next section helps us to understand the influence social concepts have in your physical workspace environment. Please indicate your level of agreement/disagreement with the following questions.**

30. Do you agree people should lead highly structured lives with few unexpected events?

Strongly Disagree      Strongly Agree 7

1                      2                      3                      4                      5                      6

31. Do you agree people should obey authority without question?

Strongly Disagree      Strongly Agree 7

1                      2                      3                      4                      5                      6

32. Do you agree in group loyalty even if individual goals suffer?

Strongly Disagree      Strongly Agree 7

1                      2                      3                      4                      5                      6

**5b. Please indicate your level of satisfaction with the following questions.**

33. How satisfied are you with informal gathering spaces in Folwell Hall (site, building, and interior)? (i.e., impromptu meeting spaces, lobbies, etc.)

Very Dissatisfied      Very Satisfied 7

1                      2                      3                      4                      5                      6

34. How satisfied are you with formal gathering spaces in Folwell Hall (site, building, and interior)? (i.e., conference rooms, auxiliary rooms)

Very Dissatisfied      Very Satisfied 7

1                      2                      3                      4                      5                      6

35. How satisfied are you with the hierarchy of workstations and offices in Folwell Hall? (i.e. division of management from non-management employees)

Very Dissatisfied      Very Satisfied 7

1                      2                      3                      4                      5                      6

36. How satisfied are you with the workstation types in Folwell Hall? (i.e. open office workstations, private offices)

Very Dissatisfied  
1                      2                      3                      4                      5                      6                      Very Satisfied 7



37. How satisfied are you with communal areas in Folwell Hall? (i.e. lunch room, break room, auxiliary rooms)

Very Dissatisfied  
1                      2                      3                      4                      5                      6                      Very Satisfied 7



38. How satisfied are you with the individual workspace in Folwell Hall? (i.e. spaces that support concentration or focused work)

Very Dissatisfied  
1                      2                      3                      4                      5                      6                      Very Satisfied 7



Section 5c. Finally, here are a few questions to help understand the influence your culture has on visual characteristics in Folwell Hall. Thank you very much for your time.

39. How important is color to you?

Not at all important 1      2      3      4      5      6      Extremely Important 7

40. How important is nature to you?

Not at all important 1      2      3      4      5      6      Extremely Important 7

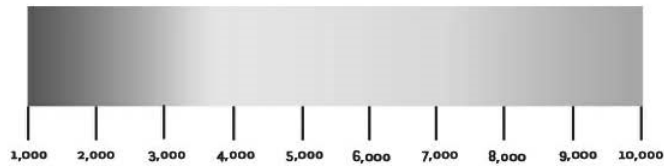
                                  

41. Do you prefer warm or cool colors?

- Warm
- Cool
- I don't have a preference

42. Using the image below, please indicate the color you are most drawn to by selecting the corresponding number.

- 1,000     2,000     3,000     4,000     5,000     6,000     7,000     8,000     9,000     10,000



43. What do you think is the relationship between humans and nature?

- Humans dominate nature
- Nature dominates humans
- Humans and nature live in harmony

5d. Please indicate your level of satisfaction with the following questions.

44. How satisfied are you with the use of color in Folwell Hall (site, building, and interior)?

Very Dissatisfied

1                      2                      3                      4                      5                      6                      Very Satisfied 7

45. How satisfied are you with the use of nature in Folwell Hall (site, building, and interior)? (i.e. plants, images, natural materials)

Very Dissatisfied

1                      2                      3                      4                      5                      6                      Very Satisfied 7

46. With your culture in mind, what visual characteristics would you like included in the design of your primary workplace environment?

Thank you for completing the survey. Your responses will help assess the outcomes of culture and sustainable and design efforts in this building and help identify issues and concerns in your facility.

Thank you for your time!

## Culture Module Code Book

Q2	Overall satisfaction with physical environment of the Folwell Hall facility?	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q6	Which of the following best describes your primary workspace?	1=Enclosed office, private 2=Enclosed office, shared with other people 3=Cubicle with low partitions (less than five feet high) 4=Cubicle with high partitions (five or more feet high) 5=Cubicle with both low and high partitions 6=Desk in open office with no partitions 7=Work area in a lab 8=Other, please specify
Q6a	Other, please specify	Qualitative
Q7	Overall satisfaction with the physical environment primary workspace	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q10i	Satisfaction with the overall daylighting conditions	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q10j	Satisfaction with the amount of daylighting in primary workspace	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q10r	Satisfaction with the overall view conditions (outdoor or distant interior views)	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q10v	Satisfaction with the overall appearance (aesthetics)	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q16	What is your age?	
Q17	What is your gender?	1=Male 2=Female 3=Other
Q18	How many years have you worked at Folwell Hall?	1=Less than 1 year 2=1-2 years 3=2-3 years 4=More than 3 years

Q20	Percentage of time per week in primary workspace?	1=Less than 25% 2=25-50% 3=51-75% 4=More than 75%
Q21	Is primary workspace located within 15 feet of an exterior window	1=Yes 2=No 3=I don't know
Q23	Country born in	1= Afghanistan 2= Albania 3= Algeria 4= Andorra 5= Angola 6= Antigua & Deps 7= Argentina 8= Armenia 9= Australia 10= Austria 11= Azerbaijan 12= Bahamas 13= Bahrain 14= Bangladesh 15= Barbados 16= Belarus 17= Belgium 18= Belize 19= Benin 20= Bhutan 21= Bolivia 22= Bosnia Herzegovina 23= Botswana 24= Brazil 25= Brunei 26= Bulgaria 27= Burkina 28= Burundi 29= Cambodia 30= Cameroon 31= Canada 32= Cape Verde 33= Central African Rep 34= Chad 35= Chile 36= China 37= Colombia 38= Comoros 39= Congo 40= Congo {Democratic Rep} 41= Costa Rica 42= Croatia 43= Cuba 44= Cyprus 45= Czech Republic 46= Denmark

47= Djibouti  
48= Dominica  
49= Dominican Republic  
50= East Timor  
51= Ecuador  
52= Egypt  
53= El Salvador  
54= Equatorial Guinea  
55= Eritrea  
56= Estonia  
57= Ethiopia  
58= Fiji  
59= Finland  
60= France  
61= Gabon  
62= Gambia  
63= Georgia  
64= Germany  
65= Ghana  
66= Greece  
67= Grenada  
68= Guatemala  
69= Guinea  
70= Guinea-Bissau  
71= Guyana  
72= Haiti  
73= Honduras  
74= Hungary  
75= Iceland  
76= India  
77= Indonesia  
78= Iran  
79= Iraq  
80= Ireland {Republic}  
81= Israel  
82= Italy  
83= Ivory Coast  
84= Jamaica  
85= Japan  
86= Jordan  
87= Kazakhstan  
88= Kenya  
89= Kiribati  
90= Korea North  
91= Korea South  
92= Kosovo  
93= Kuwait  
94= Kyrgyzstan  
95= Laos  
96= Latvia  
97= Lebanon  
98= Lesotho  
99= Liberia  
100= Libya  
101= Liechtenstein



102= Lithuania  
103= Luxembourg  
104= Macedonia  
105= Madagascar  
106= Malawi  
107= Malaysia  
108= Maldives  
109= Mali  
110= Malta  
111= Marshall Islands  
112= Mauritania  
113= Mauritius  
114= Mexico  
115= Micronesia  
116= Moldova  
117= Monaco  
118= Mongolia  
119= Montenegro  
120= Morocco  
121= Mozambique  
122= Myanmar, {Burma}  
123= Namibia  
124= Nauru  
125= Nepal  
126= Netherlands  
127= New Zealand  
128= Nicaragua  
129= Niger  
130= Nigeria  
131= Norway  
132= Oman  
133= Pakistan  
134= Palau  
135= Panama  
136= Papua New Guinea  
137= Paraguay  
138= Peru  
139= Philippines  
140= Poland  
141= Portugal  
142= Qatar  
143= Romania  
144= Russian Federation  
145= Rwanda  
146= St Kitts & Nevis  
147= St Lucia  
148= Saint Vincent & the Grenadines  
149= Samoa  
150= San Marino  
151= Sao Tome & Principe  
152= Saudi Arabia  
153= Senegal  
154= Serbia  
155= Seychelles  
156= Sierra Leone

		157= Singapore 158= Slovakia 159= Slovenia 160= Solomon Islands 161= Somalia 162= South Africa 163= South Sudan 164= Spain 165= Sri Lanka 166= Sudan 167= Suriname 168= Swaziland 169= Sweden 170= Switzerland 171= Syria 172= Taiwan 173= Tajikistan 174= Tanzania 175= Thailand 176= Togo 177= Tonga 178= Trinidad & Tobago 179= Tunisia 180= Turkey 181= Turkmenistan 182= Tuvalu 183= Uganda 184= Ukraine 185= United Arab Emirates 186= United Kingdom 187= United States 188= Uruguay 189= Uzbekistan 190= Vanuatu 191= Vatican City 192= Venezuela 193= Vietnam 194= Yemen 195= Zambia 196= Zimbabwe
		1=Caucasian 2=African American 3=African Immigrant 4=American Indian and Alaska Native 5=Asian American 6=Asian Immigrant 7= Native Hawaiian and Other Pacific Islander 8=Hispanic or Latino 9=Middle Eastern 10=Other, please specify
Q24	What is your ethnic background?	
Q24a	Other, please specify	Qualitative

Q25	How long have you lived in the United States?	1=0-5 years 2=6-10 years 3=Over 10 years
Q26	How important is cultural diversity to you?	7 point rating scale: 1-3.99=not at all important 4-4.49=neither unimportant nor important 4.5-7=extremely important
Q27	Do you agree that your culture influences your well-being?	7 point rating scale: 1-3.99=strongly disagree 4-4.49=neither disagree nor agree 4.5-7=strongly agree
Q28	Overall satisfaction with the visual appearance of Folwell Hall	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q29	Overall satisfaction with the visual appearance in your primary workspace?	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q30	Do you agree people should lead highly structured lives with few unexpected events? (UAI)	7 point rating scale: 1-3.99=strongly disagree 4-4.49=neither disagree nor agree 4.5-7=strongly agree
Q31	Do you agree people should obey authority without question?(PDI)	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q32	Do you agree in group loyalty even if individual goals suffer? (INV)	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q33	Satisfaction with informal gathering spaces in Folwell Hall? (i.e., impromptu meeting spaces, lobbies, etc.) (UAI)	7 point rating scale: 1-3.99=strongly disagree 4-4.49=neither disagree nor agree 4.5-7=strongly agree
Q34	Satisfaction with formal gathering spaces in Folwell Hall? (i.e., conference rooms, auxiliary rooms) (UAI)	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied

Q35	Satisfaction with the hierarchy of workstations and offices in Folwell Hall? (i.e. division of management from non-management employees) (PDI)	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q36	Satisfaction with the workstation types in Folwell Hall? (i.e. open office workstations, private offices) (PDI)	7 point rating scale: 1-3.99=strongly disagree 4-4.49=neither disagree nor agree 4.5-7=strongly agree
Q37	Satisfaction with communal areas in Folwell Hall? (i.e. lunch room, break room, auxiliary rooms) (INV)	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q38	Satisfaction with the individual workspace in Folwell Hall? (i.e. spaces that support concentration or focused work) (INV)	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q39	How important is color to you?	7 point rating scale: 1-3.99=not at all important 4-4.49=neither unimportant nor important 4.5-7=extremely important
Q40	How important is nature to you?	7 point rating scale: 1-3.99=not at all important 4-4.49=neither unimportant nor important 4.5-7=extremely important
Q41	Do you prefer warm or cool colors?	1=Warm 2=Cool 3=No preference
Q42	Indicate the color you are most drawn to	1=1,000 2=2,000 3=3,000 4=4,000 5=5,000 6=6,000 7=7,000 8=8,000 9=9,000 10=10,000

Q43	Relationship between humans and nature?	1=Humans dominate nature 2=Nature dominates humans 3=Humans and nature live in harmony
Q44	Satisfaction with the use of color in Folwell Hall?	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q45	Satisfaction with the use of nature in Folwell Hall? (i.e. plants, images, natural materials)	7 point rating scale: 1-3.99=very dissatisfied 4-4.49=neither dissatisfied nor satisfied 4.5-7=very satisfied
Q46	With your culture in mind, what visual characteristics would you like included in the design of your primary workplace environment?	Qualitative

## SPOES Project Initiation Form

### SPOES Project Initiation Form [EDIT: Title]

SPOES requires basic descriptive information on building type, location, function, space types, work modes, and application of sustainable guidelines.

- **B3-MSBG Client: Data from intake used here; if not complete, building or facility contact person must be contacted and complete the information.**
- **All other Clients: building or facility contact person must be contacted and complete the information.**

[EDIT FIELDS: For internal use only ... Use this area to identify

SPOES Research Team / Project Manager(s) \_\_\_\_\_

CSBR B3-MSBG Project Tracking Number \_\_\_\_\_ OR  
Non-B3 Buildings SPOES Tracking Number \_\_\_\_\_  
Initial Survey (9 months) \_\_\_\_\_ Follow up Survey (18 months) \_\_\_\_\_

Establish goal dates for survey process:

Date to initiate survey \_\_\_\_\_ (send information to building contact 15, 30, days prior to survey start?)

Start Date of Survey \_\_\_\_\_ (How many days is the survey open)

End Date of Survey \_\_\_\_\_

Date to complete survey analysis and report \_\_\_\_\_ (30, 60 days after survey closure)

*[Discuss - who does this and how long will the process take?]*

Date to send survey report to building contact \_\_\_\_\_

Date to upload information on CSBR knowledge website \_\_\_\_\_

*[Discuss - who does this and how long will the process take?]*

Date to close SPOES Project \_\_\_\_\_

To be filled out by building / project contact

Project / Facility / Building Name \_\_\_\_\_

Project / Facility Contact Name \_\_\_\_\_

Phone \_\_\_\_\_

Email \_\_\_\_\_

Address \_\_\_\_\_

Proposed Survey Date Start \_\_\_\_\_ Proposed Survey Date End \_\_\_\_\_

1. Overall building square footage
2. Number of floors, levels or story's (check floor plan to see how building is labeled)
3. Location (US Census definitions)
  - a. Urban
  - b. Suburban

- a. Rural
2. Location
- a. Country:
  - b. State/Province/region:
  - c. Other (to be defined as countries other than US and Canada are added)
3. Building type/function
- a. Office
    - i. Types of workspaces available
      - 1. Primary Workspace (private office, workstation, or assigned workspace)
      - 2. Alternative Workspaces (collaboration areas, concentration areas, seating areas, etc.)
      - 3. Reserved (workspaces for mobile workers, telecommuters and other visitors)
      - 4. Other - Open ended
    - ii. Work mode of employees (should this be primary work mode (select one option) or select all that apply, or select work mode based on percentage engaged or does this vary through-out facility)
      - 1. Concentration / Focused, (stay in primary workstation most of the time / identify percentage)
      - 2. Collaboration, move about the building most of the time (identify percentage)
      - 3. Mixed Other (to be defined as more information is available)
  - b. Educational
    - i. Types of classroom space available
      - 1. Traditional classroom,
      - 2. Active learning
      - 3. Lecture hall
      - 4. Laboratory
      - 5. Studio
      - 6. Other – open ended
    - c. Future / Other (to be defined as additional building types use B3)
4. Number of occupants (fill in a 1-5 digit number)
- a. Percentage of occupants that are full-time employed
  - b. Percentage of occupants that are part-time employed
5. Where any of the following sustainable design guidelines used in the design of this building? Check all that apply. (*More can be added*)
- a. LEED
  - b. B3- MSBG
  - c. Other \_\_\_\_\_
6. If you checked any of the above, did you achieve any level of certification?
- a. Yes
  - b. No

## **SPOES Building Coordinator Initial Contact Letter**

Message to SPOES coordinator for the building

Re: [Insert name of building]

Hello [ insert name],

I am directing the post-occupancy evaluation process for all B3 (sustainable) buildings. The B3 database shows you as the contact person for the above project. If you are not the current contact person, which may be likely as the building has been occupied for some time, please forward this message to that person and copy me. Thank you!

If you are the current contact person for the building, the SPOES team needs to conduct a post-occupancy evaluation of the occupants. We do all the data collection, analysis, and reporting--and it's free for B3 buildings! However, we need you to acquire the email addresses for all employees and send out the request to employees to complete the survey, which is in a link in the message.

Let's chat by phone or email and get this set up so we can proceed. Thank you so much.

If you have questions, please let me know; we're here to make this process very easy!

Sincerely,