

ENVIRONMENTAL PREFERENCES INDEX (EPI): IMPROVING THE PERSON -
ENVIRONMENT CONGRUENCE FOR AN OFFICE SETTING

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DEDICATION

I dedicate this work to my Lord, my husband, my family, and my friends that always were my first line of defense to propel me forward in excellence and for finishing strong.

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Abstract

Creating an effective workplace to fit each unique setting can be useful to change social cognitive behavior, increase employee retention, provide effective work environments, increase company profits and attract new employees. Corporate businesses are in a heightened pressure state to adapt to changing world economies. The margin for error of a faulty space plan is diminishing as the cost of doing business skyrockets. Businesses are being asked to adapt, realign and alter their practices in order to promote greater profits and maintain a stable workforce. Traditional planning methods are being found ineffective in today's changing environment. Most space planning practices use past ideas and intuitive guesses to create what is needed to for a satisfactory space plan. A level of internal understanding is needed to capitalize on management decisions and promote employee satisfaction. The level of understanding would benefit from a precise manner of determining workplace environmental preferences.

It is a common understanding within the architectural and business research fields that office employees are highly affected by the setting in which they conduct their work (Becker, 1995). Not only are workers users of spaces within the workplace, but also today's worker recognizes, responds to and is motivated by aesthetically pleasing places and useful spaces that are meaningful and congruent in supporting their work activities (Wicker, 1992). Past research has studied the person-environment relationship and studies have shown that the person-environment (P-E) congruence heavily influences the level of job satisfaction, employee retention and motivation (Caplan, 1987). The P-E congruence model seeks to understand the nature of how the environments that people use or experience have an effect upon their behaviors as well as the manner that people

will effect or modify the environment to create harmony for them. The creation of a precise measurement device to ascertain environmental preferences is an important area of study. As important as this study is to workplace planning success, little research has been conducted over the past 30 years and is long overdue to understand how corporations can position themselves to better optimize their practice in the 21st century. This index would be tested in a pilot study and be useful as a précis measurement device in the field of architecture as well as contributing to the academic body of knowledge. The Environment Preference Index (EPI) was structured by using the following measures: Employee's physical comfort, perception of control, flexible/adaptable furniture components, impact of noise, and levels of privacy. These factors, summed together with the factors of social interaction, degree of motivation and amount of time spent at work, will serve to create a precise measurement device that will be able to measure any type of work setting or organization. This research will focus on the idea of how the physical environmental setting can contribute to employee satisfaction and ultimately improve employee motivation and job retention.

Chapter 1. Introduction

If pressed, any person working within an office setting as an owner, manager, or worker will acknowledge that there are personally preferred office settings. While a person can make personal concessions in an incongruent office setting in order to be productive or remain employed, organizational profits, long term employee tenure and future employee attraction can increase when the person-environment congruency is closely aligned with an organization's declared culture. Preferred office settings are the sum total and interaction of elements commonly found in a constructed and inhabited work place. The setting elements for this study include freestanding furniture components, physically built spaces and rooms, arrangement and location of spaces, building-integrated electrical and mechanical systems, external window systems, and finish materials. Freestanding components include personal space components such as desks, chairs, storage components, and personal lighting. Furniture flexibility refers to the furniture's movement opportunity in any particular space by the office worker. Reception spaces, informal meeting rooms, formal conference rooms, private offices, break rooms, or copy rooms are examples of physically-built spaces for an office. Furniture groupings and room arrangements within an office provide the opportunity to generate a variety of environmental settings. For this study, environmental settings are considered to be physical components that are grouped together in a variety of patterns to support specific activities or illicit desired behaviors. While people have the ability to adapt to adverse setting configurations, this study will consider that there are varied preferences for some arrangement settings over others. Some people might prefer their personal office space to be close to common area activities such as break rooms or copy

rooms while others want to be able to work in more quiet and focused spaces. Other building component arrangements that have the opportunity to create congruent workspaces for people consider elements such as general overhead lighting, individual heating and cooling controls, along with window locations and window operability (Gifford, Hine, & Veitch, 1997). The final consideration of a preferred office setting is the finish material palette. The idea of a building's structure alone cannot adequately link an organization's culture to a person (Komberger & Clegg, 2004). Organizational culture is revealed to the observer through finish selection and designation to any particular part of the constructed building. Finish palettes can widely vary from the very inexpensive finishes to highly detailed and refined materials. Examples of finish level materials for walls and floors include simple wall paint to highly detailed wood paneling or vinyl tile flooring to plush carpeting. The interactive nature of these office components creates the total studied office environment and the perceived orchestration value is central to this index's creation for evaluating environmental preference.

When an office worker perceives that the office setting is congruent with his or her idealized version of the setting, then the office worker is positioned to operate with full effectiveness. Research studies suggest that while people have the ability to compensate in less than desirable circumstances and will develop personal alternative strategies, one can only speculate to what degree an ideal setting might have improved the end work product on a personal scale for a particular individual and/or to a larger degree for an entire organization. Failures to achieve environmental preferences within organizational settings have been found to affect overall office productivity and job performance outcomes, contribute to increased employee absenteeism, employee

retention, and even impact the capacity of an organization to attract future employees (247 Wall Street.com, 2012). In an attempt to measure, and thereby better understand, an individual's environmental preferences, a survey instrument, the Environmental Preferences Index (EPI) is the focus of this research. The newly created EPI provides a preference-prioritization tool for a particular organization's workplace and has the opportunity for yielding useful information toward future workplace setting preference research development.

Design project teams consisting of the organization's representatives and the design representatives including engineers, architects, and interior designers commonly collaborate to create a new office setting. In the case of completing an office or workplace design, the project team commonly will hold to a central goal of creating a new office that most accurately provides for all space requirements while representing the organization's true spirit or culture. Often in the process of collaboration, a proposed office design is a synthesis of an organization's requested spaces and visual concepts along with ideas brought by the design team. Ideas provided by the design team stem from the designer's past education, experience, or creative visions. Sometimes in this process, integrated ideas come from a generalized idea and not from a specific understanding of the unique organization and its workers. Office designs are easily completed without fully understanding the particular office worker's nature due in large part to a person's ability to adapt to less than optimal setting.

Sanoff and Cohn stated in the first Environmental Design Research Association conference preface that 'in the last decade, along with the growth of knowledge, there appeared an increasing specialization in the sciences where design disciplines were

breaking up into isolated sub-cultures with only tenuous lines of communication between them” (Sanoff & Cohn, 1970). The benefit of fully understanding the organization’s unique office environmental preference with an integrative approach can maximize work process congruency. The exploration of an individual’s preference for particular workplace environmental characteristics, the EPI, offers the opportunity to create harmonious and suitable office spaces congruent to offices workers’ perceptions. This index scale will obtain an office group’s environmental preferences and ranked relationships of the preferences will be reviewed. This research can also be used for future exploration linking physical environment workplace preferences congruency with employee productivity and satisfaction. Through an ecological understanding of an individual’s preferred workplace surroundings, architects and interior designers will be in a better position to create offices that have the opportunity to maximize the individual’s performance.

Fundamental to the EPI index development is the theoretical grounding created through four primary theories. These framework theories include systems theory, organizational theory, person-environment fit theory, and environment and human behavior theory. This theory integration strives for a multi-disciplinary approach and will contribute to further theoretical development and implementation within the environment and human behavior research. Many research architectural firms and commercial furniture manufacturers conducting workplace research have presented studies with central ideas about the way that people work. These studies focus upon individual and group workplace styles and have identified key work-focus typologies. Most commonly, these studies have been conducted through qualitative practices. These

conducted works contribute greatly as the fields of architecture and interior design seek to develop theory. One large obstacle in these practices is that few of these studies have presented empirically tested research integrating the importance of different objects within an office environment for the office worker. The development of the environmental preference index and the subsequent preference patterns provides further understanding regarding preference and will be useful for academics and practitioners alike.

Business model studies have long incorporated systems, organizational development, and behavior theories into processes through which organizations are studied and managed. The practices of architecture and interior design hold to creating an office setting based upon client's requests and work requirements with varying degrees of success. The contributions of Caplan (1979) and Barker's (1968) work regarding the person-environment fit, further refined Lewin's seminal form a substantial theoretical framework that the field of environment and human behavior can draw upon. Volkart (1951) stated:

The human situation often includes some factors common to both the observer and the actor...[but] also includes some factors that exist only for the actors, i.e., how they perceive the situation, what it means to them, what their definition of the situation is (p. 2).

Environment and human behavior theories consider different design interests that intersect upon a built structure and the people that use the structure. Stemming from psychology, sociology, and environment psychology studies, environment and behavior theory focus ranges from the macro level of community planning to an individual's

interaction with a given object. At all levels, the practitioner seeks to understand the benefits and diminishing effect that inanimate objects have upon the fullness of life for people (Duffy, 1993). This study will consider the following four primary constructs: privacy, territoriality, personal space, and crowding. While these constructs consider individual level interaction, these interpersonal environment and behavior constructs touch upon organization and design studies equally.

The benefit of physically built environments being created in such a way as to maximize the worker's opportunity for improved collateral output and experience has tremendous potential for organizational analysis processes. These environment and behavior constructs can also be considered with other theories. When viewed through related theories of systems and organizational research, the interacted nature of people and built spaces can be better understood. Many of the systems and organizational studies investigating workplace efficiency at the turn of the twentieth century helped create office management practice still found to be in use today (Lewin, Resolving social conflicts and field theory in social science, 2008). Lewin's Field Theory (2008) universally embraces systems theory, organizational development theory, as well as environment and human behavior theory. Field Theory describes the way in which people and groups interact, along with the processes being interchanged between the groups (Taborga, 2011).

Employing organization development and systems theory perspectives, the design professional can more effectively analyze the office worker's needs in an inclusive manner. Focusing upon the organizational and structural interrelationships affords the opportunity to refine the setting to maximize organizational goals. Understanding the

worker preferences through theoretical contributions from the person-environment fit recognizes the importance of tailoring the environment to enhance the individual experience. The integration of these related disciplines provides ground for environment and human behavior theories to flourish in the hands of academics and professionals.

While many singular studies focus on improving the efficiency model of any given environment, these studies have left the design professionals with their own past completed design projects and the best guess practice methods with little empirical result confirmation as the basis for design decisions. The EPI offers the opportunity to delve more deeply and quickly in assessing what an organization really wants in their office space. In order to identify the common environmental preferences held by today's office worker and simultaneously assist the design professional in refining work processes, the EPI tool was developed.

Research questions

In order to focus on the central concepts held within the environmental preference index development, the following research questions are considered:

Question one: What environmental preference relationships are most important for this group of office workers?

Question two: What contributions would the highest correlative relationships have toward future organizational and environmental preference construct development?

Literature review

The environmental preference index development background is dependent upon key theoretical research. The nature of the environmental preference index development

seeks to consider what people value and depend upon most within an office environment. The underlying framework provides structural understanding for the scale development and is based upon an interdisciplinary model that considers systems theory, person-environment congruent model, and environment and behavior theories. The nature of these transactional theories stresses the reciprocal opportunities for people and their surroundings (Stokols, 1995). The person-environment congruency model brings together the bidirectional contributions found among systems, organizational, and environment theories. Von Bertalanffy's (1940) primary objective for systems thinking considers an organization's relationship connections. Systems theory uniquely defines philosophy, methodology, and application subgroups as well significant contributions regarding person-environment fit theory and environment and human behavior understandings. Science field practitioners first regarded systems theory as linear and closed in nature. Closed systems theories consider entities as running parallel but never intersecting one another. Singular entities have their own unique internal effect, but as studies have noted also affect objects in their path. Physical and social sciences acknowledge open system theory's global effect upon multi-unit objects. This associative process found within macro-global ecosystems marks mankind for functional learning, growing, and changing opportunities. Systems perspective pervades diverse studies including medical practices, global warming considerations, and religious philosophies.

Organizations are understood as cooperative systems with system variations due to differing physical and social environment (Barnard, 1938). These systems have common characteristics of being social entities, goal-directed, deliberately structured

and coordinated activity systems and are linked to external environments (Daft, 1998, p.11). It is through these cooperative and connecting links that the fit or congruency is of central nature. Person-environment fit, environment, and behavior theories have also incorporated open systems deliberations. People are affected by their surroundings and, in turn, affect their environment. The interchange between people and their environment borrows heavily from organizational and systems theories. Lewin (1946) based much of the concept of the person-environment fit model upon systems theory. Behaviors stemming from personal contributions in a particular environment, along with the surrounding environment provision for harmony or discord, create the organization's mechanism for learning and growing. Environment and behavior theories provide guidance for architects and interior designers to shape the way environments better people lives. The environmental preference development index embraces general systems theory as well as Lewin's person-environment work and Barker's later refinements. Lewin provided the initial integrated framework still found in use within organizational and architecture practices, but Barker (1968) sought to further understand the full interactive nature between the environment and people. Barker's introduction of the person-environment interaction term allows for further clarity of this contributory system's nature and the contributing differences of each. Lewin holds fundamentally that behavior is a function of people and their environment. By adding the third interaction variable, person-environment interaction, Barker shows that behavior is a function of the person and the environment along with the effect or differences of the person and the environment. Introduction of the interactive term provides full comprehension of the effect between people and their environment to this study.

The theories of organizational culture and person-environment fit along with systems theory contribute heavily to environment and behavior research and associated constructs. As Rapoport (1990, p. 16) stated “humans live in systems of settings” and it is the effect of these complex systems upon people that is the central challenge. The scientific nature of environment and behavior ideas is complex and highly interdisciplinary. At a practice level, the design process used by architects and interior designers is accomplished through problem identification and solution application. The problem, as provided by the client to the designer, involves complete dissection through communication efforts from the client to the designer. Hopefully, arrival upon a final solution finds the project team with the best practical solution for all the project team’s stated goals. Throughout this process, new ideas have the opportunity to be introduced into the formal planning while on the other hand, ideas once regarded as highly important are sometimes discarded. The assimilation of client needs and designer experiences result in a created synergy among team members and often can be expressed, as ‘the sum of the parts is greater than the whole’. From a business model of considering the nature of how organizations operate, to understanding the practices of creating a best-fit environment, to planning an office space, these theories are connective and additive with their individual contributions. These contributions further clarify that organizational theory is not just the study of facts relating to people groups, but that this theory is also derived through the interaction of people based on patterns and regularities (Daft, 1998, p. 21).

Systems research and organizational theories are self-correcting and cumulative at their roots (Rapoport, 1994). Through sharing of information and the contributions of all

stakeholders, an organization has the opportunity to learn and grow. Environment and behavior studies contributions embrace the physiological perspective provided by a built space and share people's mental perception for the same space. Environment and behavior personal level constructs seek to understand the way a person experiences the built environment. The nature of the privacy constructs considers the studied spaces physical constraints. The physical attributes include the brick and mortar of a building along with any furniture components for an office worker's use. Interactions between the studied people and their physical space through the developed theoretical framework provide a coordinating mechanism for index development. This synergistic model considers the patterns that people rank constructed and applied physical provisions as well as the provided furniture and opportunities to control their personal spaces.

These previously described research fields along with design practitioner's experiences combine to form the basis for the environmental preference index. This index and research has the opportunity to improve on interior solutions congruency for office workers and to contribute back to the field of organization theory and analysis for further development and integration. In the truest spirit of systems methodology, the study of organizations affects the environment and behavior field and in turn, the environment and behavior contribution reciprocates in kind back to organizational work. The constructs of privacy, personal space, and territoriality, are inter-connective for studying office worker preferences and have defining mechanisms for people and the way they manage their personal space surroundings.

Personal space affordance allows the office worker in his or her immediate surroundings to better accommodate work tasks. Affordances are considered to be

environmental characteristics or perceptions relative to any of the occupants in the office (Gibson, 1977; Barker, 1978). When personal space needs cannot be met with a positive perceived individual experience, the effects of crowding can occur for the worker.

Crowding is commonly linked along with the concept of territoriality and considers how a person experiences personal space privacy deprivation. Office workers have individual and collaborative work task assignments, which forces the worker to adapt and choose their individual work methods. The opportunity for choice allows workers to modify their work environment to best fit their personal preferences (McCoy, 2002; McCoy, 2005). Similarly, people respond favorably to the opportunity in defining their personal space. The organization sets this practice or opportunity with policy to an individual and through the organization's culture. The heart and soul of any organization commonly is experienced through its culture, and culture is the delivery mechanism affording degrees of individual choice. Organizations create their culture through a framework of collective leadership values and behaviors. While seemingly inconsequential to some, the opportunity that an individual has to access the office supply cabinet is a result of the organization's cultural expression and policy. Culture can be expressed in very simple manners through office supply availability to furniture arrangements and finish quality assignments. For example, the opportunity for an office worker to seek out quiet spaces to accomplish individual work is an example of culture outcome. Often in office planning, the worker may or may not be considered in the decisions made by a design team. Organization cultural consideration when planning a space seeks to create spaces that are easily recognized by all employees. While these choices will always affect the individual at varying levels, the choices are not always beneficial. Unintended

detrimental consequences can occur within an office through a simple misjudgment of the organizational culture. The nature of this research is to improve the precision tools which form the basis for consideration and subsequent implementation of design decisions.

An organization that seeks to minimize individual choice will look very different from one that seeks to provide for individual choice. Different types of organizations exist in the marketplace ranging from isolated and highly structured to those that freely share information across all employee positions and accepting of new ideas coming from any levels. Organization research and analysis considers the environment and the effects of open systems theories upon the way that growth occurs. The environment also consists of the intangible element of stakeholder involvement. Often in organizational research, the “organizational environment is defined as all the elements existing outside the organization boundary” that have the opportunity to have an effect on different parts or the collective whole of the organization” (Daft, 1998, p. 82). Within the environments domain, there are sectors or subgroups that include industry, raw materials, human resources, financial resources, market, technology, economic conditions, government, sociocultural, and international considerations (Daft, 1998). These sectors can then be further subdivided into two specialized subgroups of “task and general environment” (Daft, 1998, p. 83). The nature of this preference study fits nicely within the task environment and then into the further detailed group held within of human resources. Borrowing from environmental psychology, DeYoung (2013) considered the environment to be “patterns of information” (p. 23). Throughout a typical workday, an employee will process untold bytes of nonverbal, verbal, and electronic data flow and successful understanding brings about feelings of fundamental well-being for the

individual. These messages are understood within the psychological domain for people as well as through surrounding physical components and materials. The nature of environment and behavior embrace both distinguishing aspects. Schoen (1995) describes the physical environment as a component for study when considering the manner that organizations learn. Organizations that learn and grow are known as “double loop learning,” and incorporate thoughtful consideration of every held belief, operational goals, employee interactions with each other, as well as the physical environment. In the same way that Barker (1968) elaborated upon Lewin’s theory (1946), Schoen’s research examines the effect of embracing organizational and systems theories. Organizational efficiency and value are empowered by consideration of all contributing stakeholders within the system (Watkins & Marsick, 1993). Studying the nature of the physical environment within the study of environment and behavior and organizational systems model has incredible contributory benefits. This blending of the intangible nature of a person’s experience with the physical components of the space is integrated by means of the systems framework.

The nature of a multi-discipline framework beckons for thoughtful consideration of each office element’s definition and the relationship between the connecting theories with each index item. The underlying focus for each index survey item is to measure the effect of importance for the individual. The research analysis units contained within the index considered the individual and the range of values for the individual within a particular group or organization. Central to the focus of this research was to considering an individuals’ opportunity for choice and self-selection or what is seen as item preference within an office space. Application of this information has the opportunity to

create setting congruence and contribute to understanding for greater clarity in any organization analysis effort.

History of the office

As the design profession enters into the twenty-first century, many benefits can result from the development of a measurement scale for environmental preferences. Through the discussion of the connecting theories, a background of the nature of the studied environment is a natural next step. The first consideration is to reflect upon the historical significance of the office, the reason the office came to be in existence and the subsequent effects that the office environment has upon the workers using the space. The modern office exists today as a result of centuries of development and change.

Sundstrom (1987) carries the definition of the office to be “settings where the primary activities comprise the handling of information for making plans and decisions”. Early offices were found in the sixteenth and seventeenth century buildings such as Palazzo Uffizi in Florence, Italy and the Bank of England building (Caruso St John Architects, 2012). As societies developed and fashioned ways to generate livelihood and promote business opportunities, an office naturally developed as a center to house the associated administration activities. Office work commonly centers upon the management of a particular business and its finances. Progressively through the twentieth century, inventions and technologies created the opportunity to office manage a business differently. As with the development of communication technologies such as the telegraph, telephone, and later the Internet, office functions could be remotely located from the business activity. The area for product production and the area where plans and decisions were reached no longer needed to be in close proximity. An example of this

relationship could be understood via the American farm. The farmer's home kitchen table may have served as the administrative center for a farm. As communication technology advancements were made, the farmer was able to move his office from the home to a space more closely located with other related ventures that may have been better suited to conduct business. New technologies allowed multiple businesses to come together in business centers such as town squares and later office buildings. As societies moved from an agrarian-based economy to that of an industrial state, the need for the office expanded. While these changes made a difference and allowed the farm more financial opportunity and gain, employment management and work practices also needed to be created. These changes in business practices affect the workers ultimately in the manner in which they work and the manner in which the office affects their work.

Commercial office spaces began appearing in North America during the late nineteenth century. As the capability to construct affordable steel structures developed, buildings expanded both in height and depth. The advent of fluorescent electrical lighting and office equipment technologies allowed businesses to stretch to new levels. With each change in the ability to produce supporting advancements, the office finds itself responding to the needs of the workers.

Systems and organizational theories

The twentieth century witnessed the emergence of the modern corporation as a primary manner in which business was globally conducted (Duffy F. , 2013). Corporations evolved from the industrial revolution to the present influencing the history of workers lives and times. Building on the work of Taylor (1911), Lewin (1946) focused upon the ideal of prioritizing workers' needs and encouraging the worker to

become a partner with management regarding the work process and overall organizational achievements and efficiency. Taylor believed that workers had no comprehension of how to complete work effectively and that only through effective management strategies would products be produced profitably (Rinehart, 1975). Lewin believed that while many workers were laboring in order to provide for their families, there were other contributing factors bringing meaning for the individual.

The importance of integrating systems theory into the environmental preferences index framework holds that operational systems can function at peak performance through a full understanding and involvement of all contributing forces. Systems theory considers that all organizational domains have the opportunity for direct and indirect effects upon the people working within the built environment. In return, the people working within the organization's physical environment have the opportunity to affect the external environment. Within the organization, the system's nature and components are considered as contributory to the atmosphere or setting that can elicit positive and negative worker environment congruence. This idea can apply to a range of settings that might include retail, hospitality, government, healthcare, institutional or corporate settings to name a few.

As organizational application and understanding moved from a closed system model to an open system framework, group dynamics evolved into complicated entities. Systems theory studies embrace the understanding and workings of separate organizational components and their unique attributes and contribute back to the complete frame whether through the study of medicine, groups, and families or within one individual. The manner in which systems theorists viewed an organization initially

viewed the system in a closed perspective. For a closed organizational system, it is assumed that there is no correlation between external or interdepartmental forces and that the organization is considered a sealed or closed entity (Sage Publications, 2012).

Simply, an analogy that could represent this type of idea is to consider the human system where no organ works in isolation and that the system is, in effect, put in operational effectiveness or situations of harm depending upon outside influences. If a person takes in healthy food, exercises, and tries to be in healthy climate conditions, the odds for improved personal, physical, and mental peak performances are improved for that individual. In the same way that an individual can maintain their prime functioning capacity with positive actions, so too can the large model of an organization be maintained through self-evaluation, reflection, and activities that promote worker congruency?

Open systems models take into account all stakeholders within and outside an organization, the internal workforce and its interrelationships, as well as outside influences such as clients and financial partners, at all management levels in the environment in which all work is conducted. In other words, open systems models take into account all entities that complete work or knowledge activities inside and outside a specific system's environment. By the nature of common goal pursuit with individuals contributing distinct and unique function, an organization is considered a collaborative orchestration of effort. Organizational synergy provides the opportunity to make use of individual strengths to achieve a greater possibility than if attempted by isolated individuals. If one element is affected within any given system, then it can be seen that all other elements will be holistically affected for that system. For example, when

treating the body for physical ailments, eastern medicine considers treating the mind and body simultaneously. The same concept can be linked with organizations comprised of people, groups of people, and the influencing elements of business. Many different methods of organizational analysis strategy exist in an effort to improve an organization's effectiveness.

Prior to the mid-1960s, most organizational theorists viewed organizations as being closed and isolated from the world. During the sixties, more humanistic approaches emerged. No longer could it be held that these systems were not affected by many different influences. The closed theory model influences organizational efficiencies. The open systems model contends that all organizations are unique and that their structure should accommodate these distinctive elements.

In order to analyze or diagnose an organization, different models can be utilized to study the system. This study is directly coordinated to assess the most appropriate of all change interventions. This idea of change interventions is very similar to patterns found in the medical field with a diagnosis model. Much in the same way that a physician gathers basic information, runs blood work, and performs various tests in order to get at the root cause for the patient's ailment; the organizational practitioner takes specific procedures to assess/evaluate/prescribe treatment for an organization. This method of looking at an organization holistically seeks to view the organization as a total system. This system view is known as the open system theory (Katz & Kahn, 1978). Framing the open system theory are the constraints of all internal and external inputs and outputs, technological components and operations, internal and external environmental attributes, organizational goals and strategies, desired behavioral characteristics, all work-

related processes, and culture issues for a particular environment. Each component is then connected by internal organization feedback loops. The feedback loops connect the idea that the systems are affected by the outputs (products and services) as well as the inputs. Because the theory involves all components of an organization, the members get the opportunity to learn and participate in the process and, later, the intervention.

Through the open systems theory, an organization can be viewed in many ways from studying the organization's espoused values and beliefs and the effect that can be held for the entity as well as its employees. Schein (1990) provides a way to conceive the open system's nature through integration and understanding of all organizational components.

Schein's (1990) organizational culture model provides the understanding that the culture is comprised of artifacts and behaviors, espoused values, and underlying assumptions. Through the open system's model, organizational culture integrates systems theory within these three levels. To more fully understand these levels, first organizational culture should be considered as the set of explicit and implicit values and norms that guide and shape behavior in an organization (Chatman & Barsade, 1995; Martin, 1992; Trice & Beyer, 1993). The environmental preferences index embraces the research model of culture. An organization has a unique culture that can be understood through tangible and observable objects. Schein holds that it is in the unobservable actions that bind a group of people in a culture. This intrinsically deep connection of shared experiences from leadership down to an organization's office workers is integrated within the creation of the index survey items.

Organizational leaders contribute to organization culture through primary and secondary attribute mechanisms or organizational espoused values (Schein, 1985).

Espoused values are those contributory ideals that an organization declares for itself. Seeking to find employee/organization congruency, workers seek symbols of corporate alignment. An example relative to this study is the espoused value that the employee is the organization's greatest asset. If an employee perceives that his/her surrounding work furniture is in poor repair and does not adequately address current work needs, the employee can develop a belief that the organization is not investing in the workplace at a competitive level. The declaration found in the human resource manual that the company is highly competitive in the marketplace is not found in evidence for the employee in his/her immediate surroundings. It is this connection between those things outwardly declared by an organization and the associated underlying assumptions made by the employee that are critical for this study. Schein's (1995) third level of artifacts is understood to encompass any tangible elements within the organizational environment. Organizational analysis often considers information from a wide perspective that might include reviewing an organization's human resources manual, casual observations in the working office, and informal employee interviews. Observations in the office can also involve noting office and furniture type availability as well as the manner that finishes are applied in the physical space. Integrating a visual inventory of the physical space with the organizational review allows for greater design congruency.

Person-environment (P-E) fit congruence model

Central to organizational behavior is the concept of person-environment fit (P-E). Many research models that regard an organization's capacity to attract and retain employees fully embrace this theory. The person-environment fit model assesses an employee's opportunity for maximum contribution while working in a maximized

environment (Edwards, 2008). The psychological constraint that this research suggests is that the person-environment fit can be described as the best-fit match between a person and his or her surrounding environment. Congruent environments have the ability to afford to its occupants a positive and growing experience by “addressing the person and his / her interaction and interdependencies with the environment, focusing on the fit between the two” (Lewin, 2008, p. 101). Lewin’s model of P-E fit explores that the ecological fit of interpersonal behaviors are the function of the person-environment fit $B=f(p, e)$ and competency models provided by Barker (1987) take further into account not only the person and environment as singular elements but also the interaction accounts between the two. Selecting the level of interactions and affording opportunities to provide more congruent settings for people in an office space to explore complex systems points toward the competency model. The involvement of Lewin and Barker’s models connects to the final theoretical input of environment and social behavior theories. Organizations and the operating members within an organization have a fundamental connection to the manner in which the person and environment work together and benefit from one another. This systematic approach forces a taxonomic approach. The environmental preference index is a collaboration to understand psychological and physical characteristics by beginning from a fundamental understanding the characteristics and objects that an office worker prefers. This preference is the beginning of the opportunity to create precise environment from a measured perspective.

Environment and social behavior theory

Research suggests that people are affected by room placement and environmental attributes provided by the organization (Altman, 1975). Organizational development and systems theory research are leading-edge contributors to workplace-environment intervention. Research focusing on the Person-Environment (P-E) relationship in the workplace demonstrates the office worker can be affected by their environment as well as returning their effect back to the environment. Reflection upon this relationship's nature as it is related to employee job satisfaction, employee retention and motivation is a critical link between organizational analysis and the profession of architecture (Ostroff, 1993). The nature of this relationship, its components, and how they interact systemically are important to understand when space is created or when an organization is studied in an attempt to improve an existing model. Defining a space as work-congruent simply means that the space supports, rather than hinders, any given work task. The nature of environment and social behavior embraces fully the theories of organizational studies and congruency with the person-environment fit as all are connected through a systems approach understanding.

Environment and social behavior constructs

Altman (1975) considered the nature of the constructs of privacy, territoriality, personal space, and crowding through the interconnections of people with their environment. The definition of micro-interpersonal orientation considers small groups through the perspective of a social psychological orientation and the manner that behaviors are shaped and modified by the environment (Altman). Altman's study found a great audience throughout the seventies as the generations began to explore this

importance. Many organizational and environmental psychology research theorists embraced this field of study, and, while it reached to the practice of design and architecture, recent trends seem to have left the study by the wayside. Rapoport (1989) provided a summary hypothesis for the theoretical advancement deficit nature for the field of environmental and behavior at EDRA 20. His philosophical analysis considered that the most critical need of the field of environment and behavior (E&B) was theory development. It is clear that the E&B theory is relevant and contributing body of knowledge for continued study that the conceptual terminology framework was lacking. Rapoport contended that through further framework attention, terminology would be further clarified and academic agreement could be achieved. Others have concluded that the field of architecture is only interested in the building or creating of new space and not in the evaluation of a completed project. Many components of these constructs are found within the white paper research of commercial architecture and in the commercial furniture industry, but the theoretical connection has not been made and the imperial testing has not been done. Prohasky (Altman, 1975) reflected upon the benefits of an integrated approach between the field systems theory, organizational studies, person-environment fit toward the development of an understood knowledge base. Through exploring the nature of these four constructs, this research seeks to add a missing key element to create connection within the field of environment and behavior. The missing element to be studied is the physically constructed environment in which individuals work on a daily basis. Privacy, personal space, and territoriality are concepts that originate within an individual's mind. Evaluating these past held considerations along with the measured intersect of the physical space has the potential to begin providing a

measured response between the intangible nature of the psychological experience held by an individual and the elements of physical components in any given office space.

Regardless of theory development origins, it is evident that practitioners struggle with understanding the true nature of preferred integrated interior components and the knowledge held by the academic community should be further vetted.

Privacy.

Altman (1975) defines the construct of privacy as the glue that binds the micro-interpersonal orientation and is the regulatory process by which a person grants and considers their personal space and the integration of territoriality. The individual sets the degree of provided information to others through the handling of privacy (Westin, 1967; Pastalan, 1970). Privacy is afforded at different states for a person. Solitude is the way a person will create a physical separation of themselves from others. In an office space, solitude is constructed through a system's furniture increased panel height or the actual constructed walls of a private office. Issues of intimacy can be viewed as the opportunity for seclusion and can be very useful when the discussion of human resource issues arise. The manner in which an office space is constructed can afford greater opportunities for sensitive information to be discussed. The third state of anonymity allows a person to blend into a crowd. While people want to be part of a group, their willingness to be separated out and to become an emphasis for discussion is very often undesirable. A final dimension of privacy might be understood through the current colloquial expression of too much information (TMI). We hold in reserve those things that we are unwilling to let out to the knowledge of the general population. In a business setting, often it is the case of crossing this boundary that is the subject of great liability. The nature of the

physical environment has a profound impact on the behavior of its workers and the degree of reserve afforded.

Territoriality.

As business entities began to consider that effects upon their business came from many forces within and outside their physical boundary, organizational models embracing the open systems stating the environment had profound influence on the system whole (Bastedo, 2006). The definition of territoriality most commonly is understood to encompass a designated area owned in a literal or philosophical sense by a person or group of people (Ashcroft & Scheflen, 1976). As territoriality is understood within the theoretical framework of environmental preferences, it is important to acknowledge and understand that within the declared space there are differences caused for and by the people using and interacting within the space.

Countries use borders to mark the controlled boundaries and enforcement areas to be controlled. While these borders are not visible, they are bound by latitude and longitudinal markings. Individual property areas can be established and enforced with survey and titles. At a more personal scale, rooms or furniture in offices and homes creates boundaries or territories for an individual.

The concept of territoriality is not absolutely defined by a visual periphery. The central understanding of territoriality is held within the idea of a defined space. The space can be held as a physical boundary, a symbolic gesture, or as an individual's personal perception. All three tell a story and are highly necessary for the design professional to understand when creating harmonic environments for office inhabitants (Lattimore, 1940). The outward boundaries of a space, in both personal and common use

space can be useful in establishing desired work practices and employee protocol. The assembly of these seen and unseen areas produces socially and behaviorally desired responses in the workplace. Specific room arrangements and space type offerings understood through the lens of unique user preference can dramatically increase an organization's performance.

Personal space.

Sommer's (1972) seminal work surrounding the nature of personal space broadly contributes to the theoretical underpinnings for environment and behavior and the person-environment fit considerations (Sommer, 1975). Personal space sets boundaries of distance for interaction with others. Much in the same way that there are distinct variances in acceptable distance between cultures such as Eastern and Western nationalities, the concept for an organization is set by the way that spaces are created and the furniture settings that are provided. Stemming through disciplines of sociology, communication, psychology, perception, and architecture, Sommer sought to understand more clearly the nature in which people interact with each other. Ranging from social to intimate zones, personal space sets about defining acceptable socio-spatial relationships for office workers. In this construct, the nature of "people as builders, creators, molders, and shapers of the environment" (Sommer) can be understood. People become their own shapers of the environment that they find themselves comprising.

Crowding.

Kaplan and Kaplan (1982) set about to understand the outcome that follows when privacy is not afforded. The previously discussed constructs of privacy, personal space, and territoriality are psychological aspects that people seek as regulatory mechanisms.

When the perceived person-environment fit is not in alignment for a particular individual, the resulting outcome is the construct of crowding. Previous environment and behavior research has integrated the considerations of privacy, territoriality, and personal space in a systematic manner. Through a system breakdown, crowding is the person's perception of misalignment within his or her environment. While it is important to understand the negative effects that can result from crowding in an organization, crowding, on some occasions, is desirable. If a person enjoys live music or sporting performances, it is highly likely he or she will be part of a crowd since crowds are evident at these types of events. It is highly probable that the person in this situation is not going to experience a breakdown in enjoyment due to high crowd numbers because a high crowd count is expected. This study is only considering the situation that an individual seeks the opportunity to maximize privacy and personal space constraints.

An office's culture can be outwardly defined to all experiencing the office's physical space with the provision of full height wall constructed office or systems furniture office spaces. Relational breakdowns among office workers have the opportunity to occur when office space assignment is incongruent with individual or organizational preferences. The EPI has integrated ideas that regard office provision and layout within the survey. Organizational settings will quite often provide different types of individual workspaces. Two workspaces settings that forms the spectrum for office types are full height constructed walls and workspaces known as systems furniture cubicles with moveable wall partitions. While there can be many aesthetical differences in these two types of workspaces, sound transmittance often perceives a primary difference between the two workspaces. The sound transmittance differences can result

in enhanced or diminished sense of privacy for the office worker. Offices or workspaces with full height constructed walls also carry with them a perception of elevated status within the organization. When planning a new or renovated office space for an organization, it is important for the organizational culture to be understood fully by the planning team. If the organizational culture is misunderstood, the resulting effects can be disastrous. The nature of the constructed elements of walls and furniture in an environment is a tangible product which all can see and touch. It is the impact that these components have upon the space's occupants that becomes environment and the central consideration of behavior studies. Literature detailing organizational stress suggests that job satisfaction in a work setting is highly linked to the worker's needs for autonomy and control (Caplan, 1983). The operational need to assess environmental characteristics along commensurate dimensions is an important beginning for the study of congruency or goodness of fit in an office. It is through the nature of crowding as constrained systematical approach in the person-environment fit that the resulting preferences can be understood with the manner that offices spaces are conceived and the furniture function can be fully understood.

Environmental preferences

Preferences, such as the employee's physical comfort, perception of control, flexible/adaptable furniture components, impact of noise, and levels of privacy, are useful to consider in the development of a precise measuring instrument. These constructs, when coupled with the factors of social interaction, degree of motivation, and amount of time spent at work are useful in assessing a multitude of work settings and or organizations. Developing the environmental preference index instrument is the next

logical step toward improving the person-environment fit congruence. This interconnection nature and resulting opportunities between considered theories are illustrated in Figure 1.

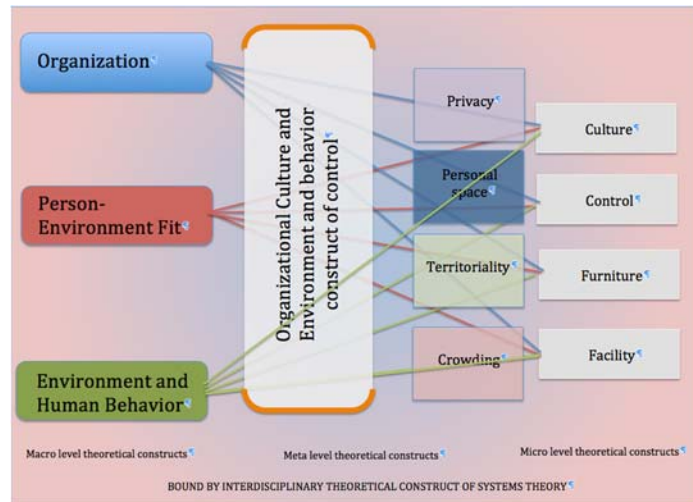


Figure 1. Environmental Preference Index Framework, Ellis, 2013.

While all make use of the systems theory of organizations, person-environment fit, and environment and human behavior theories (E&B), these theories are delivered to the micro-level survey index constructs of control, culture, facility, and furniture through the meta level values of organizational culture and the E&B construct of control. It is the meta-level constructs that serve as a regulating mechanism for the micro-level constructs.

Investigation relevance

Corporations are in a heightened pressure state to adapt to changing world economies. Businesses are asked to adapt, realign, and alter their practices in order to promote greater profits and maintain a stable workforce. In today's economy, the cost of creating or reorganizing existing office space requires increasing precision from the design professional with little room for error allowed. A level of internal understanding is needed to capitalize on management decisions, promote employee satisfaction, and

increase the bottom-line profit margin. The level of understanding will benefit from a precise manner of determining workplace environmental preferences. Extending past theoretical research with environmental preferences is long overdue and will be useful to help organizations better optimize their twenty-first century practice.

Commonly, design professionals have relied upon successful past project experiences and intuitive guesses to create a satisfactory space plan. In order to meet the demand for planning accuracy in today's office, it is important to consider the key elements of the person-environment (P-E) fit through the concepts and interrelations of privacy, crowding, territoriality and personal space (Altman, 1975). These concepts, when considered along with organizational change theories and practices, create a useful perspective in better understanding and evaluating an organization's preferences. The theoretical field of environment and behavior draws on the disciplines of sociology, psychology, and organization studies. Organizational behavior embodies a broad spectrum of disciplines including psychology, management, sociology, organization theory, social psychology, statistics, anthropology, general systems theory, economics, information technology, political science, vocational counseling, human stress management, psychometrics, ergonomics, decision theory, and ethics (Kreitner & Kinicki, 2010).

Organization theory draws upon many common theories when considering any organization's requirements. When an organization is considered through the lens of the open systems theory, the importance of considering all of the stakeholders involved with the system is paramount. Organizational stakeholders include all the people working within the company as well as those outside influences involved in daily operations and

their associated connections and the accompanying physical artifacts that are essential to the daily business practice. The built environment is considered in this study as a stakeholder as bound within the open systems theoretical model provisions. The built environment is considered in organizational culture models at the artifact level as previously discussed. Commonly, organizational research includes a brief consideration for the built environment component although with varying degrees of regard for the effect upon the individual worker. The definition of environment in organizational research is often limited regarding the climate created by inner and external business relationships. This model offers a distinct integration for academic and practitioner's exploration of a worker's environmental preference.

Barnard (1938) defines an organization as “a system of consciously coordinated activities or forces of two or more persons” (p. 73). The behavior of the organization embodies the manner in which people act and react to one another and to the organization. Organizations can be evaluated through the different perspectives including the individual, the group, and the global unit of the organization (Ashcroft & Scheflen, 1976).

Integrating the theoretical perspectives of environment behavior research and organizational studies is a natural evolution. While both fields recognize the other and the contributions that each has made, their relationship is somewhat underdeveloped. Because of the ever increasing complexity found in the workplace setting, many practitioners and clients are seeking practices that are more sophisticated, reliable and defensible, and better suited to meet the challenges such complexity brings. Today, relying on past project solutions or a keen sense of design alone is ineffective. The

creation of a precise measurement device to ascertain environmental preferences is an important area of study that can increase the workplace planning success.

Chapter 2. Method

The primary purpose of this quantitative study was to investigate the correlations among different environmental attribute preferences in a corporate office setting leading to the development of the environmental preference index. The nature of this correlation study creates the first step in determining construct categorization for future experimentation and determining relationships between a series of environmental attributes that prior studies and practice have hypothesized. Through a literature review of connective theories, past experience design projects, and commercial industry furniture research, a series of items was created for the environmental preference index. This index explores as many different considerations that an interior designer would want to investigate and incorporate into the analysis of a range of client wishes. Findings would then be incorporated into a final design solution for a commercial corporate office space.

Scale development

The constructed Likert scale test for environmental preference used a unique six-point categorical strategy, ranging from 1-very unimportant to 6-very important along with three demographic responses (gender, employment tenure, and age). The manner of a six-point scale represents a forced-choice method requiring the respondent to select a directional preference manner and not settle on a position of neutrality. A note of importance is inserted here since often a Likert scale index will have a center point of neutrality. One to three rankings indicate a measure of unimportance and rankings four through six provide varying degrees of importance. The instrument contained four

dimensions of environmental attributes in a total of 51 items that would be relevant to an office worker. The four conceived dimension items were culture, control, furniture and facility for reasons as previously discussed.

Culture issues were constructed to measure the degree of preference represented with issues of organizational culture and sought to understand the manner that interior office space reflects the organization's central identify belief. For example, if a company holds a deep belief that all workers, regardless of title, should have direct access to one another, one would not expect to find their offices very important or their appearance is set apart from those working in a systems furniture modular workstation. Control construct issues considered the manner in which an individual may make choices within his or her immediate work area, meaning that if a person wanted to control their immediate area personal task lighting, office lights would have switching available to workers rather than being powered from a central pre-programmed location. Likewise, instead of furniture being installed without casters, the furniture would be mobile and would provide personal freedom choice. Control dimensions would be inclusive for personal manipulation immediately found in the office worker's direct area with regard to furniture type and arrangement options and the display of personal effects in the work area. Issues centering upon the use and validity of an open office plan which uses systems furniture components along with the availability of private offices continue to drive discussions for the design profession and clients. Each office strategy has advantages as well as disadvantages. While connected to the furniture construct, issues explored in the control construct seek to determine the connections between facility arrangement and office type availability, the functionality of shared spaces such as

conference rooms, copy centers, and break rooms as well as limiting functions of controlled or available space to the office's overall population. The construct of control regards the manner under which people have the opportunity gain or share knowledge. Other understandings of control within the office setting is the opportunity that a worker can limit or embrace the noise that comes naturally out of many people working in an office. The control construct considers issues that the organizational management focuses upon daily as well of people that form the general office population. The opportunity for an individual to control their own space allows for increased autonomy and ultimately a heightened sense of organizational contribution. Consideration of autonomy include the opportunities that workers are provided to engage with each other collaboratively or to pull back and work alone, the means by which a workspace can be adapted to fit workspace location and work needs, opportunities to change lighting or air temperature for their personal needs, as well as the way people are encouraged to make alterations to their interactions with the office as a whole or within their personal workspace

The furniture construct seems as though it would be fairly apparent with its intent and for the most part is the nuts and bolts of what most people deal with daily. As people use their offices, most really do not stop to consider the effect that poorly conceived furniture design and placement has upon their quotidian productivity. This construct takes into consideration types of furniture that are available in common spaces and offices. These items include appropriate task supporting equipment resources, furniture that is mobile and flexible to provide for group and personal activities, and the availability of ergonomic furniture in task areas.

Facility issues affect building owners and tenants alike. While there are many things to which facility can refer, this research considers the building or office spaces that provide a secured office setting for an organization's employees. Frequently, buildings are built on speculation and leased out to organizations seeking office spaces and the building's size, materials, and rental rates can attract or deter desirability for future tenants. Whether a lessor or the organization itself owns the building, many important components can affect employee satisfaction, retention, and productivity. The manner in which a facility is well constructed and maintained, the availability of natural daylight and or ventilation, and mechanical systems that work well and support individual needs may seem like imperceptible issues, but this study seeks to determine if these ideas are valued by an office worker and, if so, to what degree. Interior plan issues such as lighting and acoustics along with the absence of physical barriers can heighten the degree of effectiveness for employees and are theorized to be valued. Other considerations worthy of study are the location of workstations and offices near common areas such kitchens or break areas, rest rooms, and vending spaces. Commonly, people want to be near these areas but not directly connected as the common areas can be a distraction. The survey index should be able to provide insight to this consideration. Other facility considerations include storage space availability outside the workspace, work area lighting control, wireless Internet availability and control, as well as the opportunity for adequate space for all occupants within the facility.

All index components took into account intrinsic theoretical work from environment and behavior, systems, and organizational studies along with actual application for construct considerations for culture, control, furniture, and facility

concerns. The three theories used in this study complete this study's framework along with the selected environment and behavior constructs of territoriality, privacy, personal space, and crowding which helped to create what is considered to be the most comprehensive range of environmental considerations. In addition to theoretical research inquiry, interior design and furniture industry along with academic preference research was reviewed and included in the index development.

Preference variables for testing

Linking organizational, person-environment fit, and systems theory with environment and behavior work is a natural direction for this research. The four theories provide a cross-discipline body of work as they weave between business and design research and professional work. At a macro level, this theoretical framework investigates the means by which an organizations operates systematically and transfers or controls information about itself to its employees and to outsiders. This information can be useful for interior designers and architects at a micro level as they seek to understand client operations in order to create the best possible client workspace. This systematic process understanding provides the opportunity for the researcher and practitioner to better understand their client. Successful design projects are highly dependent upon the strategic process of well-conceived selections and it is through client interview sessions and space use observations that a perceived preferred preferences level understanding occur. Watkins and Marsick (1993, 1996) express the idea that all companies have the capacity to learn and grow, but in order to successfully improve the organization's performance and value, the group must be willing to ask the right question and consider all factors. In this same manner, the design community has the opportunity to improve its discovery

processes. Combining past research work conducted by others along with professional design practice solutions serve to form the fundamental base that would assess an individual's office environment preferences.

Participants

Following an exemption application to the University of Missouri Institutional Review Board (eIRB), a letter requesting permission to conduct the environment preference study with the corporate office of a global greeting card organization was sent by electronic mail (Email) through the organization's point of contact. Once eIRB permission was granted, the survey index and instructions were internally hand delivered to the selected respondent group. Study participants included an art collaboration group of 123 people. The objectives of the study, the environmental preference index, timeline, and instructions for on-line survey completion were provided for departmental review.

Forty-one completed surveys determined the sample size. While relatively small, this sample size was useful to generalize outcomes for this particular corporate population group and for current and future instrument testing. The outcomes were useful to understand the variable relationships for an office worker's environmental preference as well as the creation of preference patterns. This sample size, along with an analysis for normal distribution of the resulting data, dictated the use of a non-parametric correlation analysis available through Spearman's Rank Order Correlation Coefficient.

Data descriptives summary

With the exception of three demographic requests, all survey items were structured as a continuous categorical item. The three demographic items represent gender (0=women and 1=men), age, and employment tenure. The age range values

varied from 24 to 55 years of age with the average respondent age of 42.2 years. Regarding gender 27 employees were women, 10 respondents were men, and four people did not provide a response. The median age of the low quartile range was 34.5 and the upper quartile range median age was 50.7. The average respondent's employment tenure was 16.9 years and ranged one year to 33 of service.

The appendix provides full descriptive statistics in Table 1. The resulting outcome analysis found 39 out of 41 respondents ranked minimum and maximum preferences scores from one to six indicating a full range of responses with 12 items. All other outcomes provided minimum and maximum values ranging from two to six, three to six, four to six, and two to five. The greatest mean score of 5.68 was associated with importance of appropriate supporting technology availability and ranged with minimum and maximum values of one to six. The highest mean scores of levels four through six included adequate storage, filing and shelves provided in the workspace (5.38) and if the facility had appropriate equipment and furnishings to support required work activities (5.10). The surveyed respondents provided the understanding that a response was important with mean values greater than five. Open office furniture availability was the lowest rank item having minimum and maximum values of one to five with a mean value rank of 2.43.

Chapter 3. Analysis

Correlation significance summary

The Spearman's r_s correlation test was run on all 51 environmental preference variables along with the three demographic dimensions. There were a total of 165 correlations equal to or greater than 0.400 tested at the alpha level of 0.01. Research

provides three values of relationships and r-values of .1 to .3 are weak relationships, r-values between .310 and 0.599 are moderate and those values above 0.600 are considered strong (Taylor, 1990). These levels serve the pattern evaluation and construction to follow later in this study. The moderate correlations range were from $r_s(36) = 0.409, p < 0.01$ to $r_s(37), p < 0.01$. Strong correlations range were $r_s(36) = 0.608, p < 0.0001$ to $r_s(37) = .695, p < 0.01$.

Group assignment levels provided relationship insights on strengths and common variable preference. Appendix Table 3 summarizes these overall relationships ranging from strong through moderate. Full findings analysis will discuss the lowest moderate level eight correlation to strong correlation range level one. Relationship levels were further detailed in quarter increments seeking greater clarity for each level providing unique correlation level insights.

Correlation clusters

The lowest level had eight correlations and ranged from 0.400 to 0.424. There were 14 items found to be in one relationship at the moderate level. Two facility construct items were found in two different correlations. Item 12 that regarded preference for the individual to have personal lighting control access and item 20 that considered an individual's access to office supply and equipment centers were used twice.

Level seven correlations represented 0.425 to 0.449 ranges and had the most correlative relationships with 46 group pairings. Seventeen items were in only one relationship at this level, and 26 other variables were used multiple times. Item 26 assessed an individual's importance ranking of workspace furniture being comfortable

and was found in four relationship pairings. Two other level seven items were used in five separate relationships. Item 13 regarded moveable conference room furniture that could be set up for different meeting requirements and item 25 sought to understand the importance that conference rooms (divider walls) could be rearranged to accommodate any particular meeting's requirements. Items 13 and 25 were found in five different correlations each.

Correlation level six represented values ranges from 0.450 to 0.474 and had 28 total relationships. Of these 28 relationships, there were 17 unique items used in one pairing each. There were ten additional items used in multiple pairings. Item 51 ranked the importance of a well-constructed facility and was used in five different correlations.

Correlation values ranging from 0.475 to 0.499 was associated with level five. There were 26 item variables used in 20 unique pairings for a total of 24 correlations within level five. The highest correlation within level five provided the insight that as the respondent's preference increased so did the preference increase regarding the individual's opportunity to control workspace task lighting $r_s(37) = 0.498, p < 0.02$. Item 20 was previously discussed at the level eight assessments and was also used three times at level five. Item 20 sought to assess the importance to the employee of having freely available office supplies and equipment.

Level four represented correlation relationships ranging from 0.500 to 0.549 and was the second most populous count of all the ranges with 39 total relationships. Level four had 24 correlative pairings used in one pairing each and three items used three times each. Item 35 sought to understand the importance for providing workspace furniture that would accommodate informal and instant meetings within the workspace and item 46 had

three different correlations at the level four. Item analysis for 35 and 46 provided the understanding that as the respondent's preference for flexible conference room arrangements increased, the preference for a group reception area would also increase $r_s(36) = 0.541, p < 0.01$.

Correlations that ranged from 0.550 to 0.599 formed level three. Item 13 were found within two of the eight correlation levels. Used with five pairings at level seven, item 13 was also found within the third level. This correlation level was the only level that found ten of the index items being used once resulting in five total correlation relationships. The highest correlation value at this level was 0.564, $p < .01$ with items six and 19. This relationship stated that as an individual's work patterns were increasingly supported effectively by the office layout, acoustical privacy for an individual's workspace preference increased.

Level two provided five total correlations with nine items being used once at this level and item 49 were used in two correlations. Provided ranges for level two were from 0.575 to 0.574, $p < 0.01$ and considered information found from all four of the micro-level construct areas of culture, control, furniture and facility.

As with levels two through eight, the correlation values at the first level allowed the null hypothesis to be rejected in favor of the alternative hypothesis that there were relationships, which were significant and were not equal to zero. There was a strong positive correlation relationships among 10 pairs with 18 unique variables, $r_s(41) = 0.608, p < .01$ to $r_s(37) = 0.695, p < .01$. The summary for this data information is found within Table 3.

Within the level one significance, the measure for lighting control within an individual's workstation was highly correlated with the importance of a well maintained facility, $r_s(41) = 0.605, p < .01$ and would be considered the lowest relationship of level one. This relationship was also found within the construct of facility. The second highest group was also found within the construct of facility and was the relationship of natural light being found within an individual's workspace with an actual window being located within a workspace, $r_s(36) = 0.608, p < .01$. The overall office layout that supported an individual's work preference style was related to the manner that the present technology supports the individual's work activities within their workspace, $r_s(41) = 0.614, p < .01$ and was found within the furniture construct. Another relationship within the furniture construct was the importance increases for furniture grouping areas that encourage socializing outside in common area office space; the importance level also increased for the workspace to provide for informal and instant meetings. This relationship was $r_s(37) = 0.619, p < .01$. The final strong correlation of this study within the furniture construct considered that as a respondent's preference increased to have a workspace equipped with ergonomic furniture so did the necessity of the comfort level of the workspace furniture. This relationship was $r_s(36) = 0.627, p < .01$.

Table 2*Correlation Significance Level: 0.600 - 0.699*

Variable One Description	Variable 2 Description	Coefficient	P> t	N
Culture				
Organization's culture is reflected in the physical environment's finish materials	Furniture reflects organization status	0.640	0.000***	37
Organization's culture is reflected in the physical environment's finish materials	Organizational culture is reflected in the facility's visual character	0.680	0.000***	36
Control				
Workspace provides identifiable visual boundary	Private offices are provided to support work activities	0.639	0.000***	36
Workspace provides visual privacy	Private offices are provided to support work activities	0.677	0.000***	37
Furniture				
Individual work requirements are supported by office layout	Present technology supports work activities	0.614	0.000***	41
Furniture areas outside workspace for socializing	Workspace provides for informal and instant meetings	0.619	0.000***	37
Workspace equipped with ergonomic furniture	Workspace has comfortable furniture	0.627	0.000***	36
Facility				
Lighting can be controlled within the individual workspace	Facility is well maintained	0.605	0.000***	41
Natural light in workspace	Window in workspace	0.608	0.000***	36
All occupants have adequate space to support work activities	Facility is well constructed	0.695	0.000***	37
Significance levels = * p < 0.10. ** p < 0.05. *** p < 0.01.				

The next two levels were very close in relationship importance but were found from two different constructs. The constructs of culture and control related closely to one another. Culture can be implied within an organization or can be explicitly experienced through tangible objects. Control is the regulatory condition that individuals experience corporate culture. Corporate culture is created by an organization's leadership and is enmeshed with the environment and behavior concept of control. If the nature of culture is understood as the construct that behaviors are understood, accepted, and displayed for a worker, the construct of control would be the organization's regulatory mechanism. The data analysis indicated that as an individual's preference increased toward a workspace be provided with an identifiable visual boundary so did the preference for the provision of private offices to support work activities for the control construct, $r_s(36) = 0.639, p < .01$. Also related to the manner that private offices were used in support of an individual's work activities was that a workspace should provide visual privacy. The nature of these two index items resulted in a relationship correlation of $r_s(37) = 0.677, p < .01$.

The second part of this relationship was found within the culture construct. As the individual's preference increased for the organization's culture to be reflected by the office's finish materials so did the need for the furniture used by the individual to reflect their personal status within the organization, $r_s(37) = 0.640, p < .01$. The two constructs of culture and control are used quite readily for organizational theory and environment and social behavior. The continued presence of these constructs further emphasize the necessity to consider the way that an organization assigns space to the individual, the approach spaces are represented to the worker and to outside observers interacting within

the space, and the nature that material and furniture selections are assigned as reflection of the organization nature.

The two highest correlated relationships found within this study were from the construct of culture and facility. Theoretically, the culture of any organization is supported by the facility in which the work takes place. In context with this study it was understood that as importance increased for the respondent view of the organization's culture should be reflected by the offices finish material so did the importance of the facility's visual character to reflect the tacit culture, $r_s(36) = 0.680, p < .01$. As important as it was for the organization's culture to be pervasively understood in the physical prominence of materials and furnishings, the most important and final relationship was found within the facility construct. As the importance of a well-constructed facility increased in importance to the respondent, so did the reality increase that all occupants should be provided with adequate work space and be supportive of the individual's work activities, $r_s(n=37) = 0.695, p < .01$.

This research's major constructs and their relationship to one another are represented in Figure 2. The solid line connects the index items resulting in strong correlative relationships. The broken line represents weaker relationships between the index items and demonstrates the nature of connection between constructs.

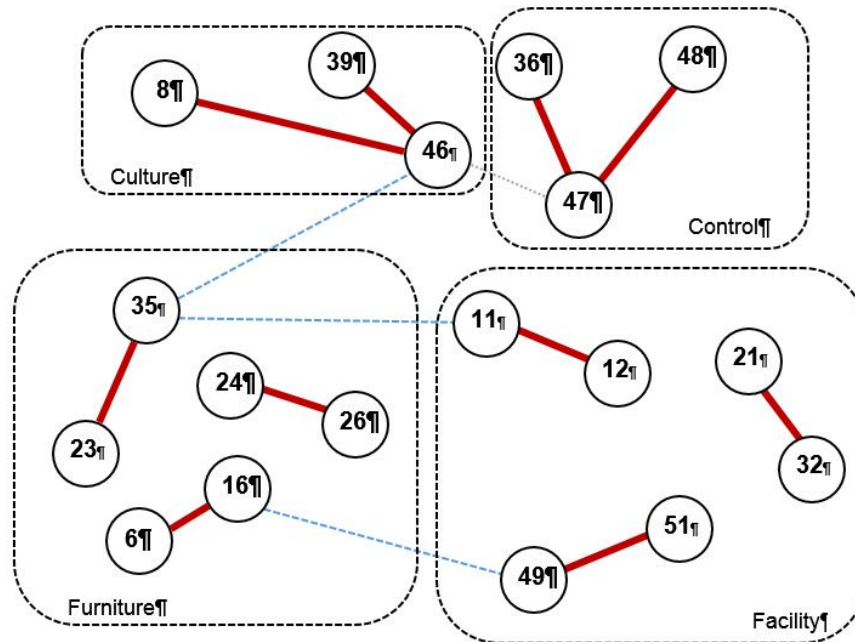


Figure 2. Construct Clustering upon High Correlation Relationship Variables, Ellis, 2013.

Multi-attribute utility theory (MAUT)

The interconnection of strong index correlations allowed the next step to be taken. Along with the environmental preference index data results, the variables were further manipulated through the use of the multi-attribute utility theory (MAUT). The MAUT was used as an aid in decision-making process as another related preference index (Collins, Rossetti, Nachtmann, & Oldham, 2006). The utility theory's nature was to create a means to rapidly interpret the true essence of the underlying user values for the design profession and for those completing organization analysis.

The strongest relationship correlations from the level one group served to form the base pattern preference measurement. The constructs of culture, control, furniture and facility represent unique parameters that organizational and design consultants frequently render when understanding the client desiring to change their surroundings. The new variable representing the measure for culture was created from two correlative

relationships. The first relationship is that an individual's assigned furniture reflecting their organizational status to others with the importance of the interior surroundings accurately reflected the stated organization's view of itself. The second relationship for culture includes the importance of the office's visual character being aligned with the facility's appearance being a direct reflection of the organization's stated identity.

Factors integrated into the control construct center upon two relationships. The correlation of visual privacy being available for the office work and an enclosed private office being the first pairing and the nature of clear demarcation of a personal work space for an individual and an enclosed private office.

Functional aspects of furniture type, what the furniture piece provides in terms of functionality, and facility equipment availability comprise the parameters for the initial index item inclusion. Respondents were also able to assign preference for furniture elements that considered ergonomic and comfort considerations. Ultimately, there were three relationships that populated the furniture construct. The first contributing pair provided that as importance that a person's workspace had furniture that signaled to others their status to others increased so did the importance of appropriate technology that would support the individual's work requirements. The second relationship contribution demonstrated an importance for common space furniture groupings that would support socializing opportunities along with personal workspace furniture supporting impromptu or instant meetings. The last correlation for the furniture construct was that as importance increased to the respondent for their workspace to be equipped with ergonomic furniture so did the importance increase for the furniture to be comfortable.

The final construct of facility includes elements of the office plan and the manner in which it is organized to better support the worker's tasks, the physical conditions, and functionality of the physical environment. Relationships that contributed to the contribution of the facility construct ultimately include three correlations in excess of 0.60. The first pair understands that as importance increased for the office facility to be well maintained so did the importance increase for individuals to be able to control their own work area lighting. Respondents also expressed the strong correlation between natural light being visible in their work area and exterior windows in the workspace. The final contributing relationship for the facility construct included that all workers being provided adequate space to complete their assigned work along with the importance of the work facility being well constructed.

Multi-attribute utility theory (MAUT) patterns

After these four variables were created, a descriptive statistics analysis was completed. The mean for culture was 4.18, control was 4.68, furniture was 4.93, and facility was a mean of 5.02. All construct variables had a minimum of one and a maximum of six. Binary construct variables were then constructed comparing the individual scores to the construct mean. If the value was equal to or greater than the mean, the value was assigned the binary code of one. If the value was less than the mean, the value was assigned a zero. The transformed variable resulted in a final pattern variable for this study. This pattern preference takes into account which of the four constructs reflects the entire respondent group's preference. Four variables contributing to the pattern variable resulted in 16 different unique pattern types ranging from patterns

zero to 15. The pattern construct legend provides the background for the user preference final outcome analysis and is represented in Table 4.

Pattern zero demonstrates that the respondent had no preference on any of the four constructs. This next review will go from those patterns that the respondents rated as high for only one construct working through to those patterns featuring multiple high preferences.

Table 4

Pattern Construct Legend

Pattern	Culture	Control	Furniture	Facility
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

Note: Under construct sub-categories, 0 = No user preference and 1 = user preference

Pattern construct frequencies

Pattern one indicated that the respondent was high only on the construct of facility but had no preference for any of the other constructs. Furniture was the only construct rated as high preference for pattern two. Pattern four carries with it the high rating

preference for the control construct and pattern eight states that only the construct of culture was highly preferred.

Those patterns featuring two highly preferred constructs were for patterns three, five, six, nine, ten and twelve. Pattern three represents high preference for furniture and facility and no preference for the constructs of culture or control. Control and facility were highly preferred for pattern five and control and furniture were highly preferred for pattern six. Three other patterns measured high preference for two of the four constructs. Pattern nine rated culture and facility highly and pattern ten provided high preference for the constructs of culture and furniture. The final pattern in this group was pattern twelve and preference was placed upon both culture and control.

Four patterns placed high preference upon three of the four constructs. Pattern seven provided high preference for the constructs of control, furniture and facility while no preference was assessed upon culture. Culture, furniture and facility form the high preference rating for pattern eleven and pattern thirteen placed high preference upon the constructs of culture, control and facility. Final pattern 14 in this group places high preference upon the constructs of culture, control and furniture. Pattern 15 places high importance on all four constructs.

Pattern construct frequency analysis

Evaluation of pattern frequencies is provided as summary in Table 5. Six people responded to pattern zero or no preference to any of the considered constructs.

Responding that there was no preference of any construct for an office worker forces the consideration of why this pattern occurs. Many possible explanations could be considered for this pattern occurrence ranging from a misunderstanding of many of the

index items, lack of time or interest at completing the survey, or possibly internal policies that cause an employee to not answer truthfully. Regardless of the reason and because this study wants to understand environmental preference and not lack of preference, for the time being, this group will not be studied further.

Table 5

Pattern Construct Frequencies

Pattern	Frequency	Percent	Valid Percent	Cumulative Percent
0	6	14.6	17.6	17.6
2	1	2.4	2.9	20.6
3	1	2.4	2.9	23.5
5	3	7.3	8.8	32.4
6	1	2.4	2.9	35.3
7	4	9.8	11.8	47.1
8	3	7.3	8.8	55.9
9	1	2.4	2.9	58.8
10	1	2.4	2.9	61.8
11	7	17.1	20.6	82.4
12	2	4.9	5.9	88.2
15	4	9.8	11.8	100.0
SubTotal	34	82.9	100.0	
Missing	7	17.1		
Total	41	100.0		

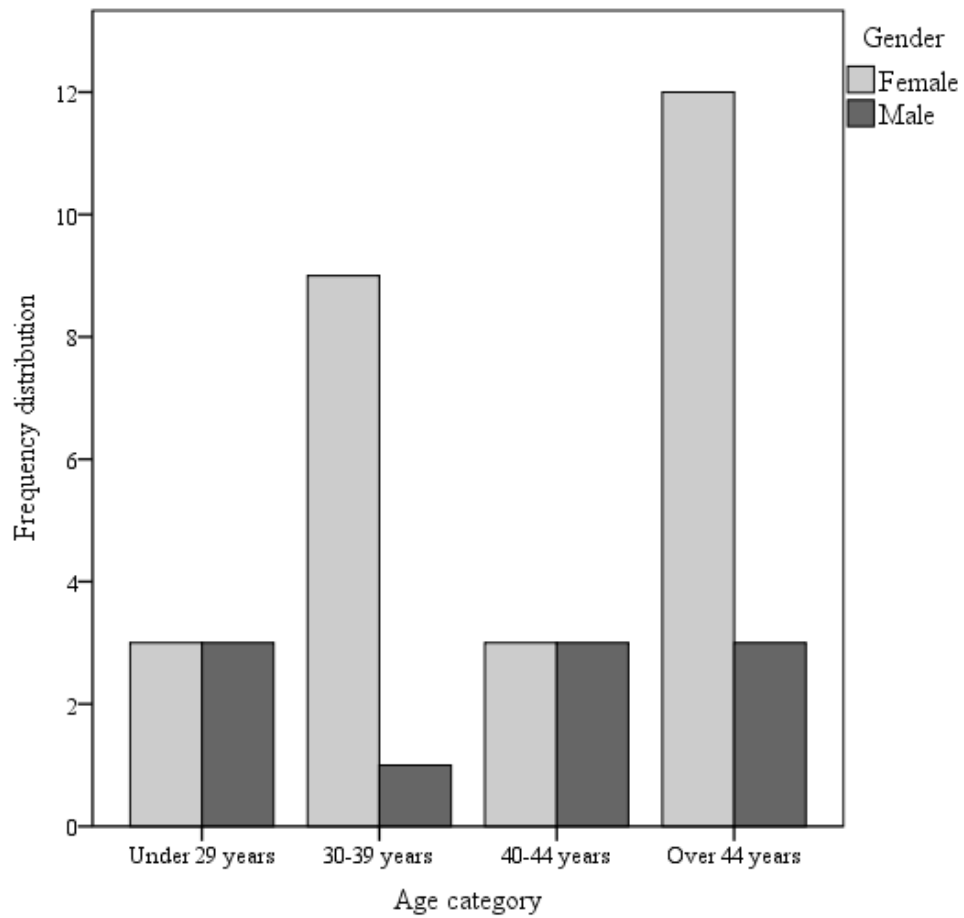
In summary, the frequencies demonstrate that the most preferred pattern was pattern 11 placing high preference upon the constructs of culture, furniture, and facility. These constructs are associated with furniture and finishes reflecting the individual's status within the company and the reflection of the organization culture to be evident in the facility, issues of visual privacy, identifiable work space boundaries and private offices, as well as the importance of a well-constructed and maintained facility. This

pattern frequency count included seven respondents and represents seventeen percent of the total.

Two pattern groups provide preferences by four people and these were patterns seven and fifteen. Pattern seven characterizes high preference for control, furniture, and facility and no preference regarding culture. This group represents 9.8 percent of the respondents. Pattern fifteen also represents 9.8 percent of those participating in the survey and all four constructs are represented in this construct. Pattern groups five and eight demonstrate that three people rated each pattern as highly preferred. Pattern group five places high preference upon control and facility and represents 7.3 percent of the respondents while pattern group eight places high preference only on the construct of culture. The significance of these five pattern groups will be discussed further as they relate to the demographic parameters and the constructs singularly.

Women over the age of 44 accounted for 12 of the 37 completed surveys with a sample group of 37. The second most frequently participating group came from the female workers between the ages of 30 and 39 with nine respondents. Male office workers were found to be in three of the four age categories. There were three men participants in the under 29 category as well as 40-44 and for those over the age of 44. The groups under 29 years of age and 40 to 44 years of age had equal gender representation with three women and three men each. The complete sample group in Figure 3 captures the complete survey population.

Figure 3. Quartile Age Distribution by Gender

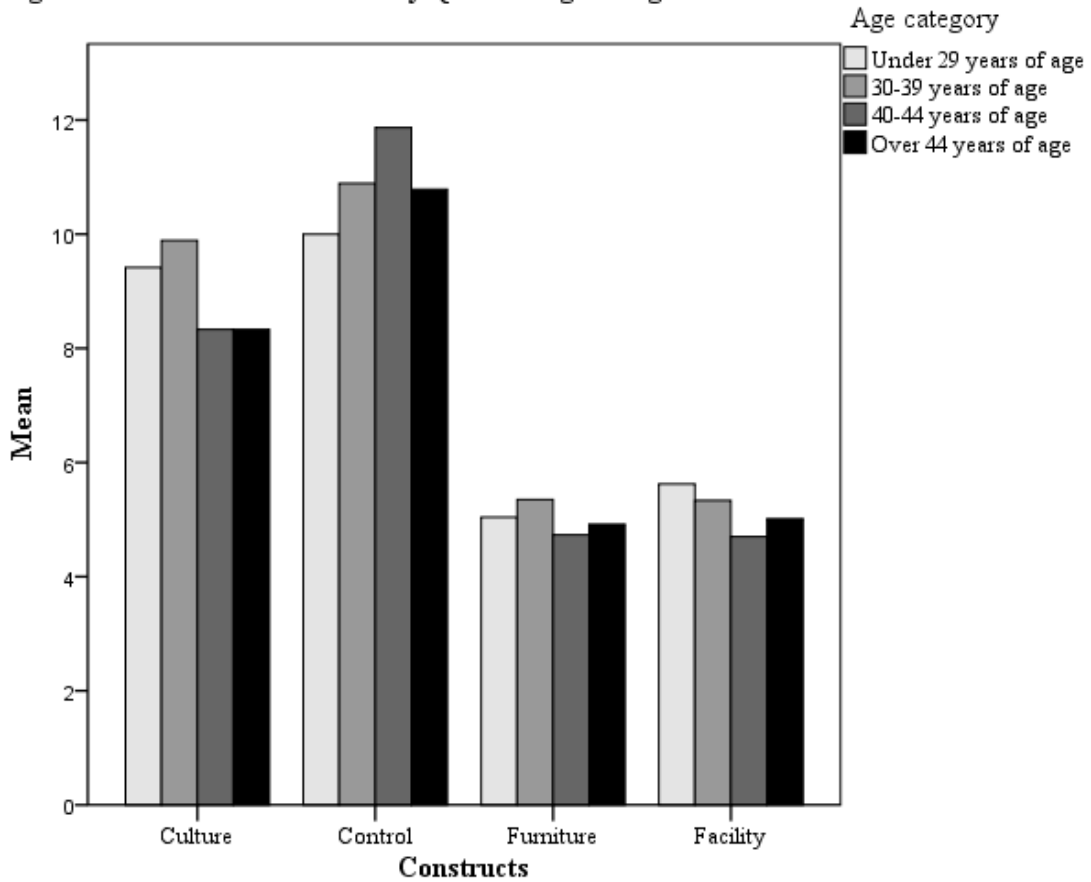


This research created four constructs regarding environmental preference and those constructs were culture, control, furniture, and facility. Two of the four constructs, culture and control were valued more highly than the remaining constructs of furniture and facility. There was a clear preference choice by the workers for the construct of control. Within the control construct group, there was a minimum respondent count of six people and a maximum of 12 for a group mean of 11.06. The lowest construct preference group was for the furniture construct and held a mean minimum value of two and a maximum of six. The mean value for the furniture construct group was 4.93 and

less than half of those found in the most preferred construct. Both of the lowest preferred construct groups found the respondent age groups of under 29 years of age and between 30 and 39.

Those employees between 40 and 44 years of age demonstrated highest preference for the construct of control with a mean of 12.11. The control construct regards the manner that personal information is shared with others. Age groups of 30 to 39 years of age and those over 44 were very close in preference with 4.73 and 4.64 mean respectively. While the lowest preference within the control construct was found in under 29 years age group with a mean of 8.5, this demographic group still provided a higher preference rank for control than those of the second most populous group of culture. The second highest construct group of culture presented the 30 to 39 year age category to be the most populous with nine people and a mean value of 9.89. There were 15 people expressing preference for the construct of culture over 44 years of age with a mean of 8.02. The full presentation for this data is found in Figure 4.

Figure 4. Construct Preference by Quartile Age Range.



The most frequently reported preference with the data considering construct preference by employment tenure found that 11 people between 15 and 25 years of employment preferred the construct of control with the second highest of 10 people in the tenure category of over 25 years.

These two tenure categories accounted for 51.2 percent of the respondents. Those of nine years or less employment tenure provided the lowest construct preference group toward the furniture construct with a mean value of 4.81. This information is provided in full within Figures 5 and 6.

Figure 5. Construct Preference by Employment Tenure.

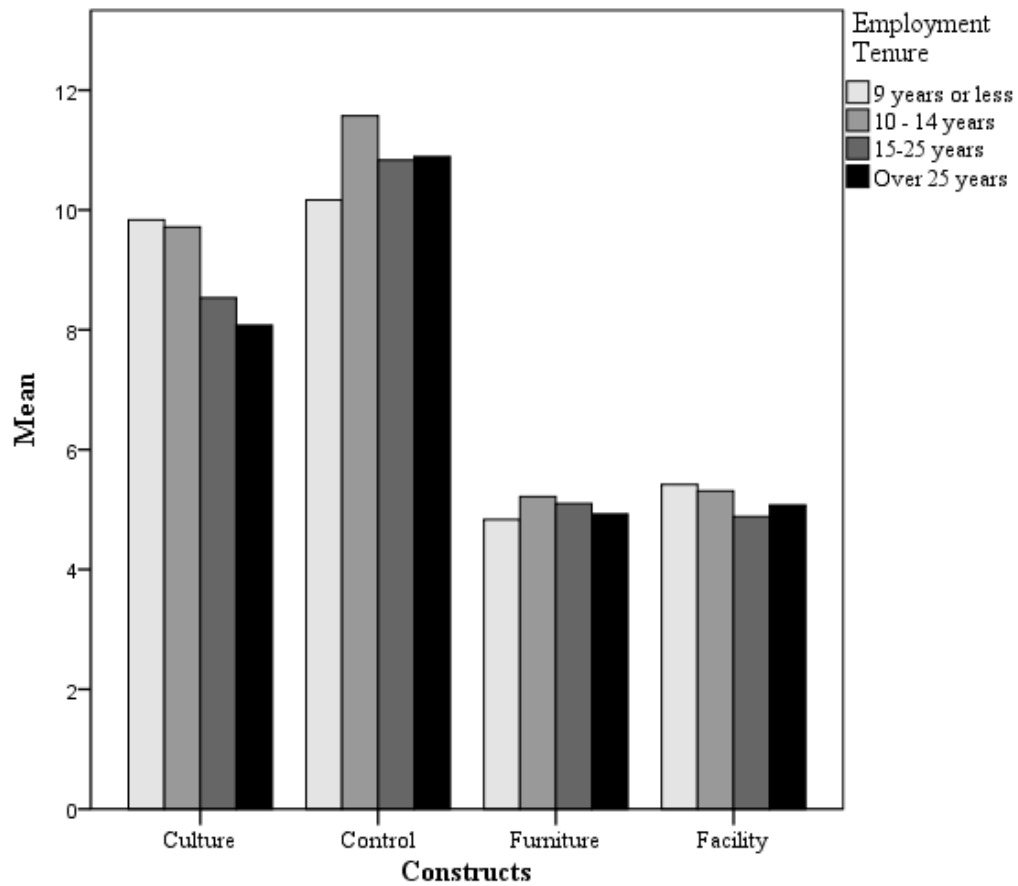
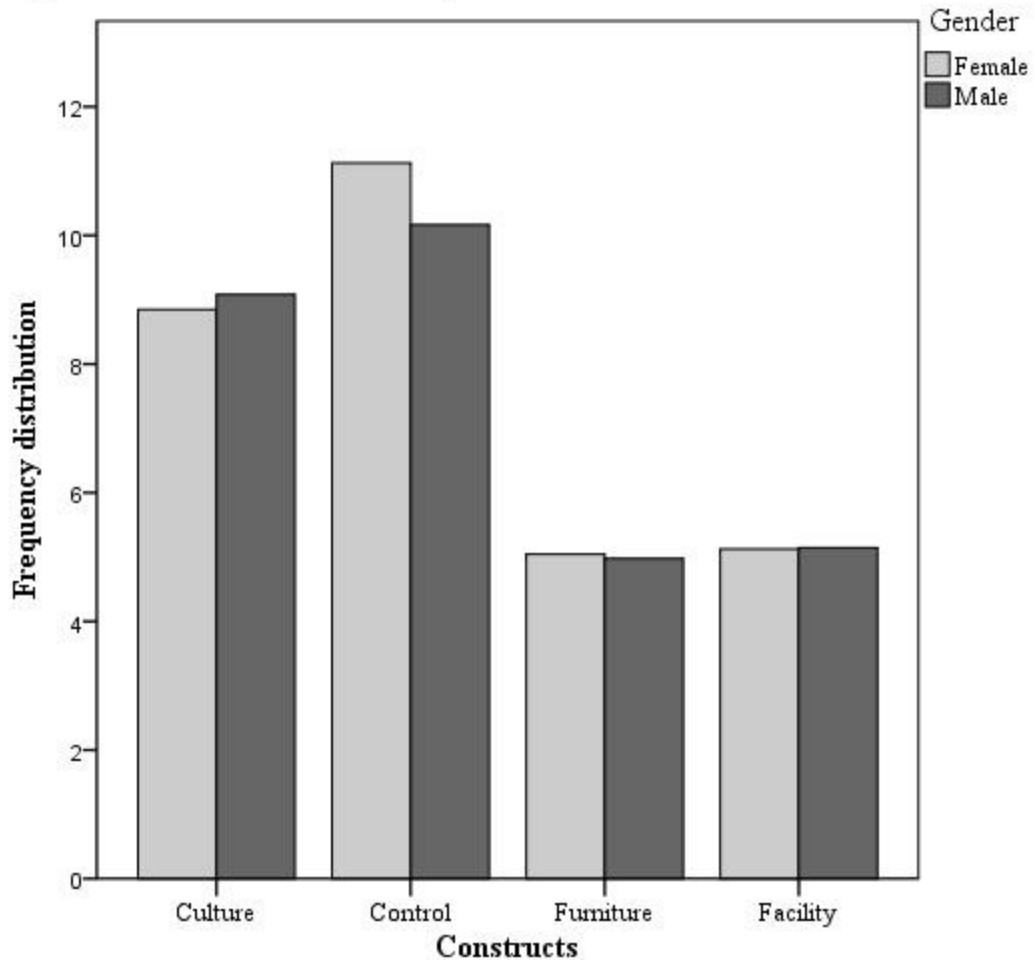


Figure 6. Construct Preference by Gender.

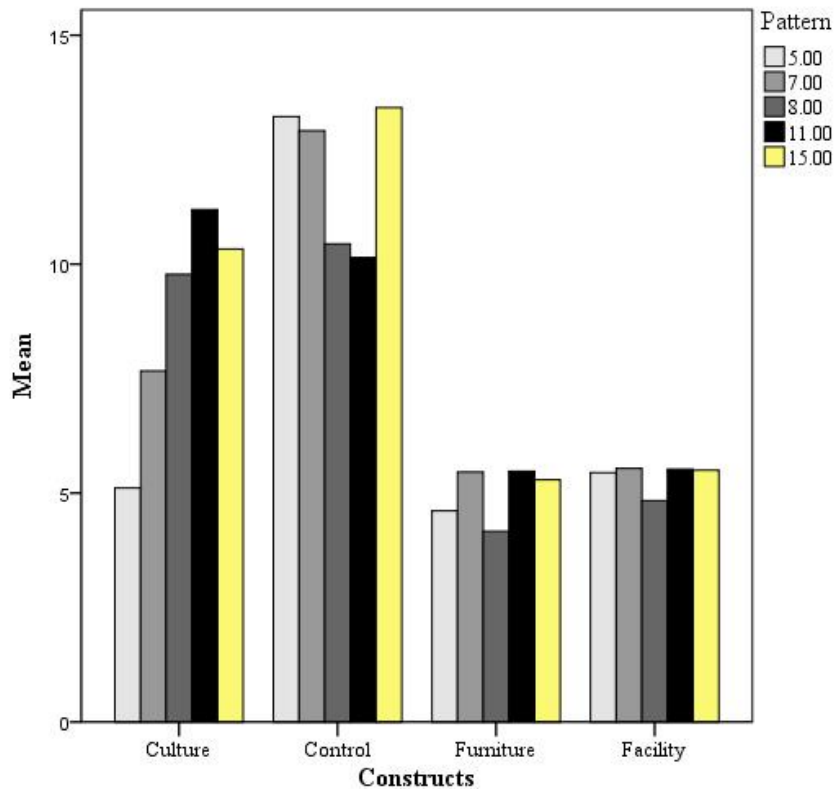


Whereas men that responded to the survey provided a mean value of 10.52 for the control construct, women slightly exceeded this value with a mean value of 11.14. There were 26 women that provided this outcome along with 9 men. The furniture construct held a preferred mean value of 4.9 for a sample of 35. The most common demographic group was female employees employed 10 to 14 employment years and held a preference for the construct of control.

The nature of the pattern preferences provides the capability of considering preference through a magnified lens. In a sense of weight or value, the studied construct

can be fully understood with an overall preferred weight value. This information as illustrated by figure seven demonstrates that the most highly considered construct of control held two primary patterns.

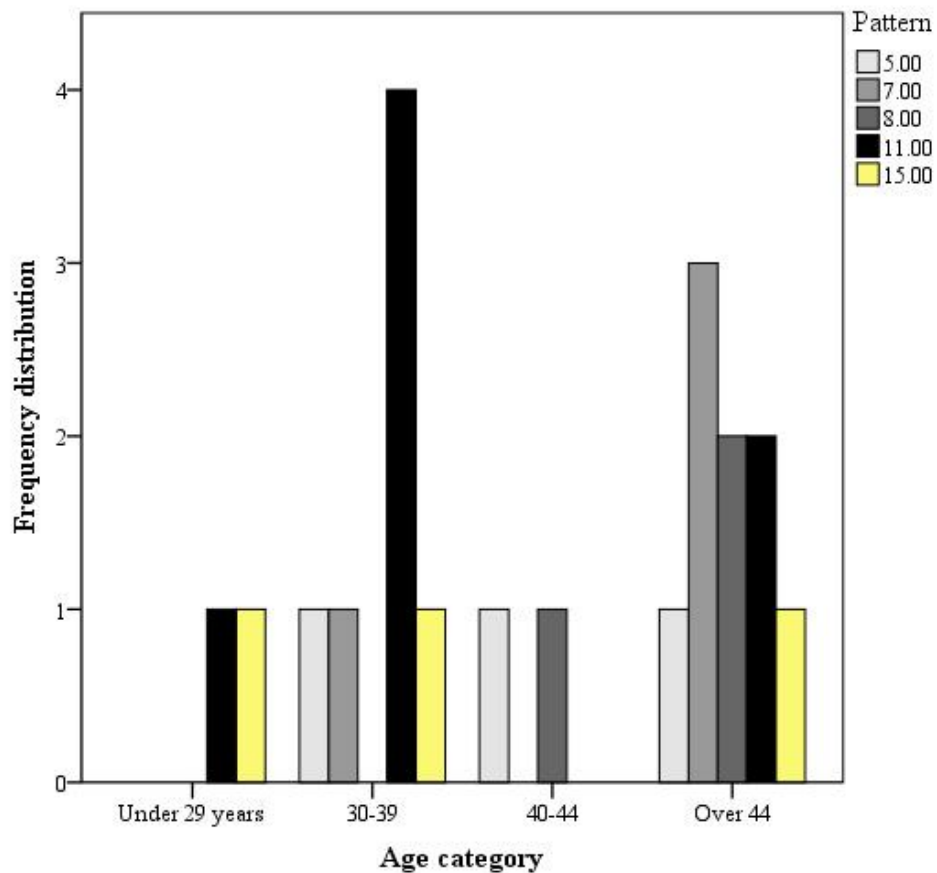
Figure 7. Pattern Preference by Construct Category.



Pattern 15 places high value upon all four constructs equally and was the number one pattern among the construct of control. The second highest pattern was that group expressing a high preference for the constructs of control and facility. Pattern 11 ranked among the third preferred pattern and also within the construct of control. This pattern considers that an individual would place high preference on all constructs with the exception of control. The lowest pattern preference of pattern eight was found within the furniture construct. Pattern eight conveys the information regarding preference being placed highly for only the construct of culture.

As detailed earlier in this review, the five highest pattern preference groups were the only patterns that were carried forward for further detailed analysis. Studying these top ranked patterns among the demographic information would be useful to gain greater insight for the constructed office environment. The 30 to 39 year categorical age group held the highest pattern preference in the study and is shown in figure eight. The most highly preferred pattern among the age group of 30 to 39 years was pattern 11 and provided the employee preference for all constructs with the exception of the control construct.

Figure 8. Age Category by Pattern Preference.

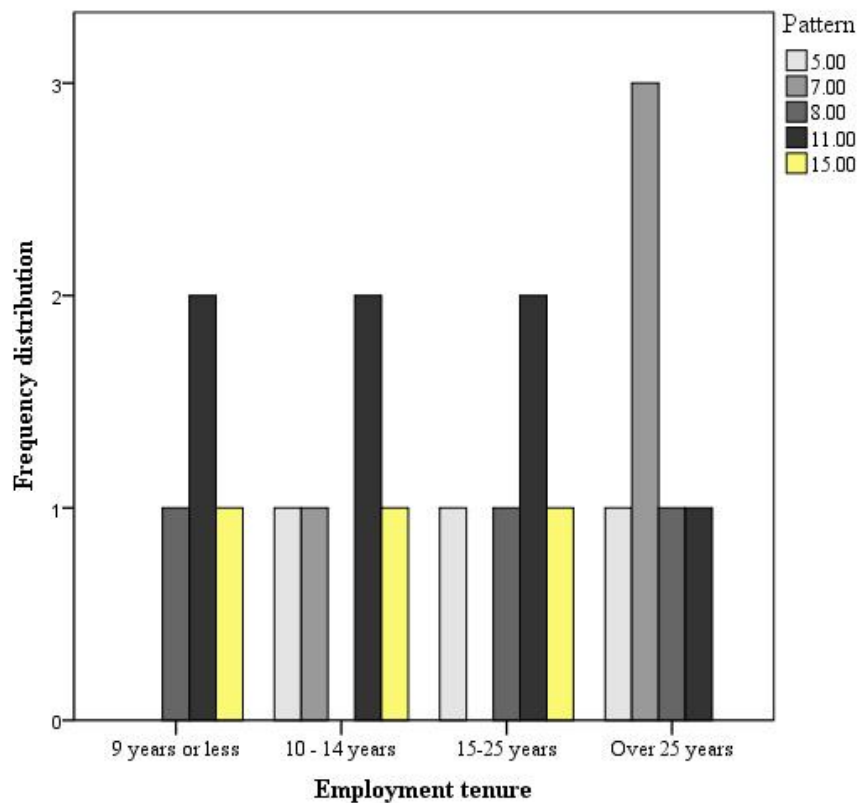


All five highly ranked pattern preferences were found within the age category of 44 years and older. The pattern that the 44 years and older most preferred was pattern

seven. Pattern seven placed high preference upon all constructs with the exception the culture construct. The lowest preferred pattern among this demographic group was shared between the patterns of five and 15. Pattern five placed high preference upon the constructs of control and facility.

The highest ranked pattern preference for respondents that had been employed for 25 years or more was pattern seven. Pattern seven regarded high value being placed along all constructs with the exception of culture. As Figure 9 indicates, not only was this the highest ranked pattern among all tenure categories, but it was also the highest ranked preference among all patterns.

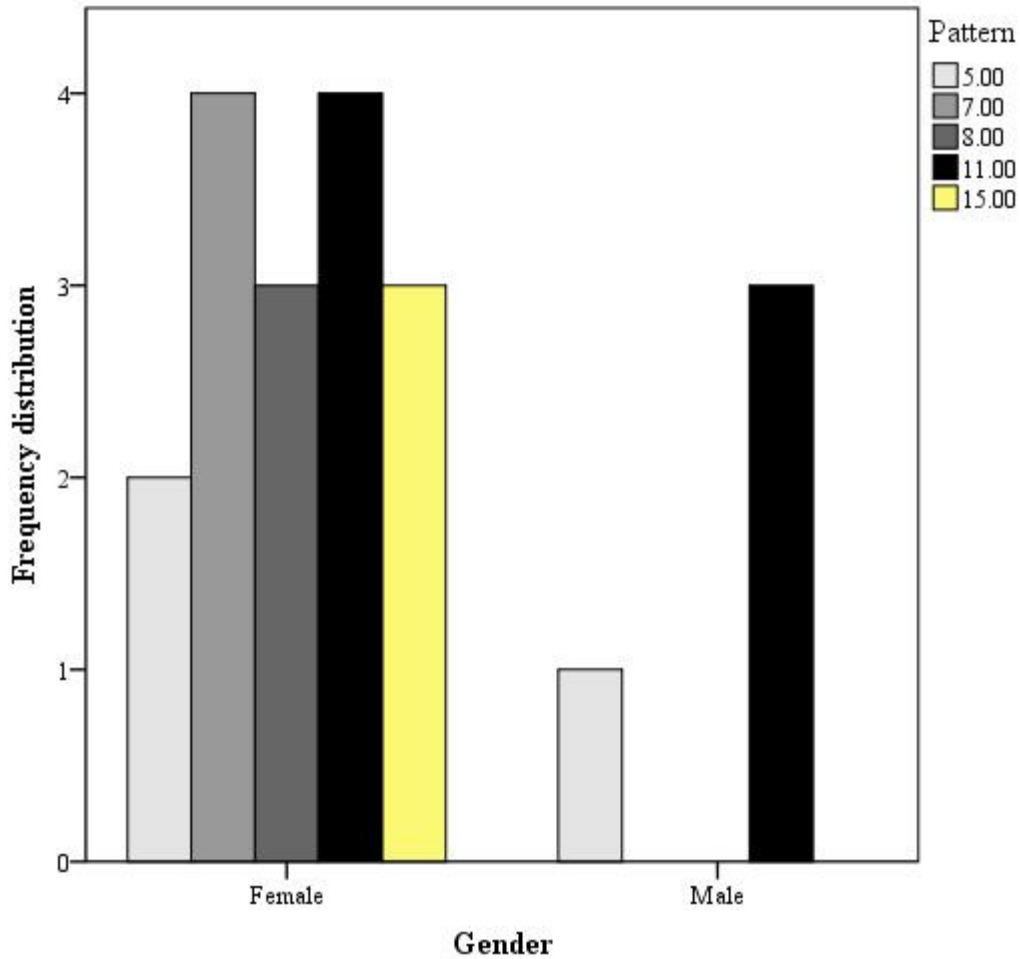
Figure 9. Employment Tenure by Pattern Preference.



The highest age and tenure demographic groups were held at the highest for those over 44 years of age and being employed 25 years or more. This is interesting to note in

that this figure also demonstrates a shifting trend with regard to pattern preference among the other three employment categories. Consistently pattern 11 was the second highest pattern among all employment tenure groups with the exception of those having continual tenure of over 25 years. This pattern preference change would suggest a shift from high preference for all constructs with the exception of culture to one that prefers all constructs except control. There was one missing pattern preference for each employment category with the exception of the category for those respondents with nine years or less tenure. The category of nine years and less found preferences for only patterns eight, 11, and 15. Of these patterns, only one of the patterns would be considered purely valuing only one construct. Pattern eight regards high preference only upon culture and patterns 11 and 15 regard preference to be placed upon more than one construct. The case of pattern 11 is of great interest in that control is the withheld construct for most employment tenure group. The demographic representation of gender is provided in figure 10. The female respondents provided the insight that they valued all five ranked pattern preferences. Patterns seven and 11 were the two highest ranked preferences with four respondents each. Among male respondents there were only two patterns present and those were patterns five and 11. Pattern 11 was the highest ranked pattern for three surveyed respondents.

Figure 10. Gender Category by Pattern Preference.



Chapter 4. Discussion

This study sought to answer two research questions. The first question was what environmental preference relationships are most important for this group of office workers and the second question was what contributions would the highest correlative relationships have toward future organizational and environmental preference construct development? The first question was answered the most important environmental preferences for this unique group of office workers through a correlation study using the Environmental Preference Index (EPI). The second question answered how the highest

correlative relationships could contribute toward future organizational and environmental preference construct development through use of the MAUT preference index. These highest-ranking preference pairings can contribute to those practicing in academic and professional practice to ascertain with a degree of precision the built environment for a particular office. Early documentation of organizational research and writings, along with the other connected theoretical framework components, forces a moment for pause. As long as humans have been involved working cooperatively within a designated space, research has sought better ways of organizing employee's workspace and opportunities. While there have been organizational management changes from the Taylor driven product over people considerations to Lewin's Field Theory, there continues to be a range of applied technique that varies and is often muddy. While technologies have advanced that provide different office strategies for the modern office worker, there remains a lack of precision when assessing the person-environment fit between the physical office environment and worker preference. While ecological and taxonomic frameworks for environment and behavior research continues to be generated, there remains a chasm between academics and practitioners as they each explore their own world of understanding without forming a bridge to share, define, and formulate cohesive terminology and greater yet a unified theory. People can be simply understood as information processing machines. Through processing of all available surrounding information, people seek meaning, connection, and value for themselves and those around them. Acknowledgement of the systematic process that these efforts are conducted is critical for further evaluation and study. A common term within organizational studies known as the silo effect considers the harboring of beneficial

information for others. Withheld or segregated information fosters stagnant theoretical development often ending up in chaos for all associated group members. The nature of a multidisciplinary approach can only be as strong as its contributing members. This study sought to develop an index that would be able to measure office worker preference for physical objects and perceived organizational culture practices. This index has the potential to influence the manner that the design practitioner assesses design decisions has the opportunity to contribute back to the development of environment and behavior constructs and theory.

Study strengths and weaknesses

Limitations of this study are directly related to the small sample size generated from the initial testing. My subsequent doctoral research should include an enlarged sample size that allows for testing to be conducted using parametric procedures. Parametric work, allows one to assume the assumptions surrounding normality of distribution and would result in a more robust quantitative evaluation.

When discussing the results of any statistical procedure, the contribution of respondent bias is important to review. Two types of bias can occur when either the respondent avoids selecting an extreme response or wants to present themselves or their group favorably. The index neutral response format seeks to mitigate the central tendency bias or the desire to present the respondent's most favorable presentation resulting in a social desirability bias. The use of a six-point Likert scale was a counter measure used in this research to minimize the effects of these biases. Without a neutral position, the respondent selection will provide information reflecting preference direction and lessen data skewing or biased results.

The primary group that this sample represented was female employees with an average age of 42.2 years and being employed for 16.9 years. The highest mean score for all surveyed items centered upon appropriate and available technology preference. Open office furniture choice was the lowest preference index item. With a 0.695 correlation relationship between the ideas of all occupants having adequate workspace to accomplish work assignments and the office facility being well constructed ranked highest.

Due to the small sample size, it is impossible to regard the generalizability of this study upon other offices of similar make-up, but it is possible to use for future worker preference evaluation.

Directions for future research

Consideration of the second research question that sought to determine the most important environmental preference relationships for a particular group of office works presents further future index development and testing. The highly correlated index items within this study contributed toward future study construct creation. The constructs of culture, control, furniture and facility can be used to assess actual and ideal organizational employee preferences along with another preference index known as the Organizational System Assessment Scale (OSAS) that measures work style preferences for employees along four dimension constraints. An integrated multiple scale instrument approach between the Environmental Preference Index (EPI) and OSAS would work toward assessing the relationship nature between the interior built environment and its occupants through actual and ideal work preferences. Architects and designers are currently facing greater challenges with less than optimally desired results. Systems research contributions along with organizational research form a taxonomic framework

that environment and behavior responds to naturally. Although it is now 40 years after the first EDRA conference, there is still a beckoning for future study. The mechanisms that link people and their environment are still not well known. The EPI is a tool that could provide insight into ideas of perception and cognition. Although change never seems to come easily for people, the necessity is obvious when faced with great client and market demands. In particular, the practitioner is forced to review common design practices and seek to rebrand the manner that design is accomplished. Cooperation and shared knowledge between academic and practitioner that seeks to go beyond what is known in the present moment and to also acknowledge that present training is insufficient at meeting an organization's interior environment needs is at a critical juncture. The expanded research will seek to understand the environmental preference index's relationship with the organizational regime characteristics through organizational testing. This study's theoretical framework provides the understanding and importance of creating congruently built environments for people. The literature supports moving toward clarified relationship development between people and their surrounding environment. Through the nature of construct conceptualization and testing, the EPI seeks to contribute toward further conceptual understanding.

Appendix A

Environmental Preference Index Questions by Construct (Survey questions below in

bold indicate high correlation relationship, 0.600 or greater)

CULTURE

1. Workspaces reflect organizational status

8. Furniture reflects organizational status

9. Workspace located near informal conference spaces.

25. Flexible conferencing room arrangements (furniture that can be re-arranged)

27. Dedicated team work environments (support team work and can remain in place for a reserved time period)

30. Unassigned work areas that have company network/phone and internet support / electrical service

39. Facility visual character reflects organization culture

40. Relaxation area(s)

42. Facility equipment reflects organization culture

44. Satellite reception space(s)

46. Finish materials reflect organization culture

CONTROL

4. Stimulating environment

10. Workspace located near formal conference spaces.

13. Flexible conferencing furniture

14. Mixture of private enclosed offices and open office systems.

15. Secure door(s) for workspace

18. Multi-purpose functions for informal and instant meetings outside of workspaces.

28. Display personal articles in workspace.

29. Workspace furniture arrangement flexibility

31. Open office systems

36. Visual privacy

37. Workspace natural ventilation

38. Soothing environment

47. Identifiable workspace visual boundary

48. Private enclosed office(s)

FURNITURE

6. Effective office layout that support individual work requirements

16. Appropriate technology to support work activities

23. Visiting and socializing furniture arrangements in common area

24. Ergonomic furniture in workspace

26. Comfortable furniture in workspace.

35. Workspace serves multi-purpose functions for informal and instant meetings.

43. Adequate workspace equipment (e.g., storage, shelves, files etc.)

50. Workspace task lighting

FACILITY

2. Workspace located near service core areas (e.g., kitchen/break, rest rooms, vending etc.).

3. Availability of food within facility

5. Facility equipment and furnishings

7. Storage space outside of workspaces.

11. Facility is well maintained

12. Workspace lighting control

17. Facility physical conditions support productivity.

19. Acoustical privacy (eg: talking on phone, office informal meetings, etc.)

20. Access to office supply and equipment centers

21. Workspace natural light

22. Facility mechanical systems function well (i.e. air conditioning, heating, ventilation, etc).

32. Secure window(s) for workspace

33. Facility is a beautiful place to work.

34. Individual workspace temperature control.

41. Absence of physical barriers.

45. Wireless Internet service

49. Adequate space for all occupants.

51. Facility is well constructed

52. Some other characteristic that we might have missed that is very important to you.

Appendix B

Table 1. *Descriptive Statistics*

	Mean	Std. Dev.	Minimum	Maximum	N
Organizational status reflected in workspace	3.80	1.249	1	6	41
Service core near workspace	4.34	1.132	1	6	41
Food facility near workspace	4.51	.952	2	6	41
Facility has a stimulating environment	4.76	1.200	1	6	41
Facility has appropriate equipment and furnishings	5.10	.664	4	6	41
Individual work requirements are supported by office layout	5.49	.870	1	6	41
Available storage space o/s workspace	4.20	1.418	1	6	41
Furniture reflects organization status	3.49	1.186	1	6	41
Workspace near informal conference spaces	3.76	1.319	1	6	41
Workspace located near formal conf. spaces	3.98	1.275	1	6	41
Facility is well-maintained	5.32	.934	1	6	41
Lighting can be controlled within the individual workspace	5.15	.963	1	6	41
Conference rooms has flexible arrangement furniture	4.05	1.244	1	6	41
Private office and systems furniture used	3.98	1.573	1	6	41
Workspace has a door that can be secured	4.07	1.349	1	6	41
Present technology supports work activities	5.68	.879	1	6	41
Facility's physical conditions supports work	5.20	.901	1	6	41
Facility provides opportunities for informal meetings outside workspace	4.10	1.200	1	6	41
Workspace provides acoustical privacy	5.37	.767	3	6	41
All people have access to equipment & supplies	4.59	1.095	1	6	41
Workspaces have natural daylight	4.88	1.229	1	6	41

Table 1. Descriptive Statistics, continued

	Mean	Std. Dev.	Minimum	Maximum	N
Facilities mechanical systems work well (heating and cooling temperatures)	5.50	.906	1	6	40
Furniture areas outside workspace for socializing	3.51	1.344	1	6	41
Workspace equipped with ergonomic furniture	5.35	.921	2	6	40
Multiple arrangement conference furniture	4.05	1.332	1	6	37
Workspace has comfortable furniture	5.38	1.010	1	6	37
Areas work groups to reserve for extended period	4.41	1.423	1	6	37
Display personal articles in workspace	4.84	1.118	1	6	37
Flexible workspace furniture for rearrangement	4.86	1.084	1	6	37
Unassigned workspaces available (hoteling)	4.00	1.247	1	6	37
Open office furniture used to maximize work activities	2.43	1.501	1	5	37
Window in workspace	3.97	1.404	1	6	36
Beautiful facility to work in	4.51	.870	3	6	37
Workspace climate temperature can be controlled by individual	4.51	1.170	1	6	37
Workspace provides for informal and instant meetings	3.73	1.407	1	6	37
Workspace provides visual privacy	5.00	.943	3	6	37
Workspace has natural ventilation (operable window)	4.27	.962	2	6	37
The facility environment is soothing	4.65	.824	3	6	37
Organizational culture is reflected in the facility's visual character	4.36	1.073	1	6	36
Facility provides relaxation areas	3.65	1.230	1	6	37
Facility is free of physical barriers	3.08	1.422	1	6	37

Table 1. Descriptive Statistics, continued

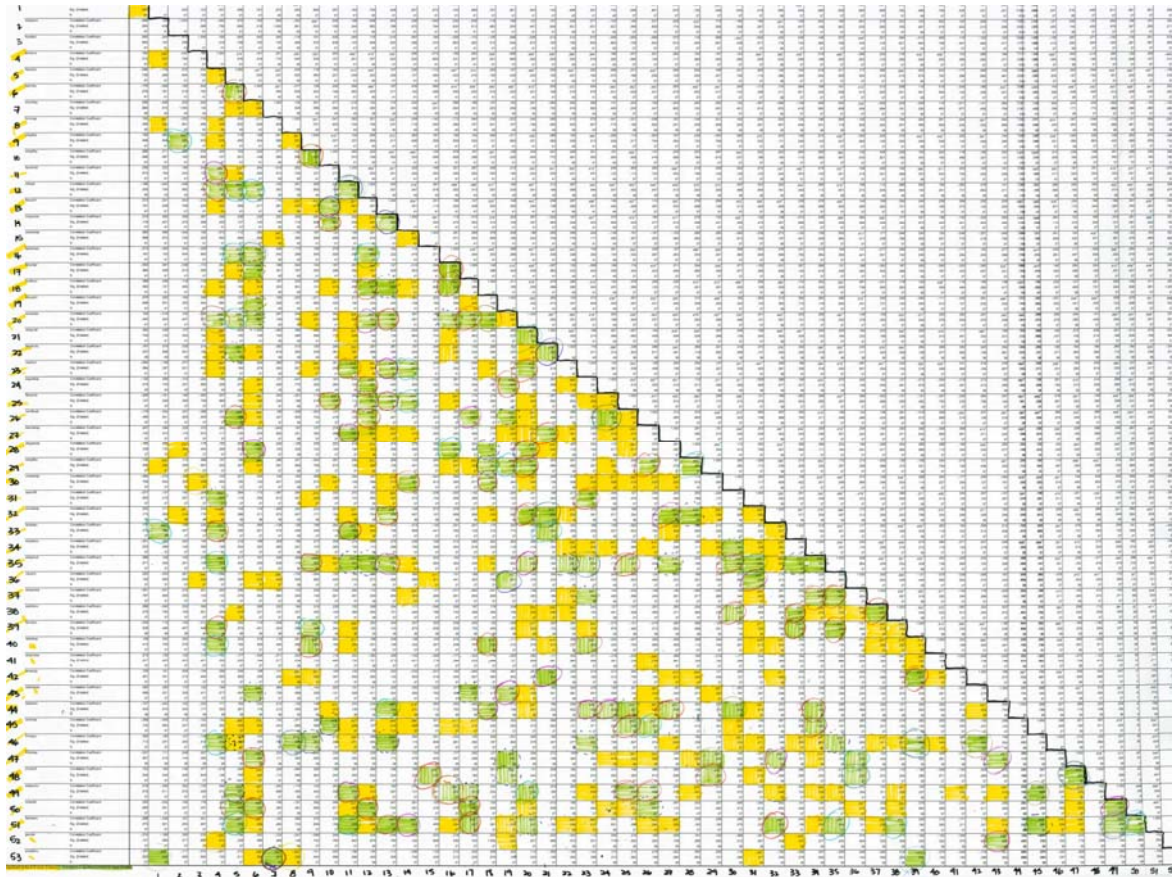
	Mean	Std. Dev.	Minimum	Maximum	N
Organizational culture is reflected with facility equipment	3.89	.994	2	5	37
Workspace provides adequate storage, filing, shelves	5.38	.681	4	6	37
There are multiple reception spaces for work groups	3.33	1.352	1	6	36
Facility has wireless internet available for everyone	5.27	1.262	1	6	37
Organization's culture is reflected in the physical environment's finish materials	3.92	1.090	1	6	37
Workspace provides identifiable visual boundary	4.92	.841	3	6	36
Private offices are provided to support work activities	4.35	1.317	1	6	37
All occupants have adequate space to support work activities	5.41	.927	1	6	37
Workspace has individual adjustable task lighting	5.22	.750	3	6	37
Facility is well constructed	5.16	.958	1	6	37
Age	42.22	10.103	24	55	36
Gender (1=male and 0=female)	0.24	.435	0	1	41
Tenure	33.00	16.892	1	33	37
n=					31

Table 3. Correlation Level Summary

	Correlation	Total Correlations	Unique Variables	Multiple Variables	Variables used most frequently
Level 1	.600 and above	10	18	2	Index items 46 and 48 used in two pairings
Level 2	.575 to .599	5	9	1	Index item 49 used two times
Level 3	.550 to .574	5	10	0	All index items used only once
Level 4	.500 to .549	39	24	19	Index items 13, 35, and 46 used three times
Level 5	.475 to .500	24	20	11	Index item 20 used in three pairings
Level 6	.450 to .474	28	26	10	Index item 51 used in five pairings
Level 7	.425 to .449	46	17	26	Variables index items 25 and 26 used in four pairings while 13 and 25 used in five
Level 8	.400 to .424	8	14	2	Index items 12 and 20 used two times respectively.

Appendix C

Illustration 1. *Environmental Preference Index Correlation Matrix*



Note. Original correlation table used to observe and note statistically significant index items.

Appendix D

Table 6. *Index Variable Correlation: 0.575 - 0.599*

Variable	Variable 1 Description	Variable. 2 Description	Variable	Coefficient	P> t
20	Access to office supply & equipment centers	Multi-purpose function spaces for informal/instant meetings outside workspace.	18	0.579	0.000***
30	Hoteling space	Satellite reception space	44	0.579	0.000***
47	Identifiable workspace visual boundary	Workspace furniture arrangement flexibility	29	0.586	0.000***
49	Adequate space for all occupants	Wireless internet service	45	0.566	0.000***
49	Adequate space for all occupants	Appropriate tech to support work activities	16	0.586	0.000***

Significance levels = * p< 0.10, ** p < 0.05, *** p <0.01

Appendix E

Table 7. *Index Variable Correlation: 0.550 - 0.574*

Variable 1	Variable 1 Description	Variable 2 Description	Variable 2	Coefficient	P> t
16	Effective office layout support individual requirement	Facility Physical condition supports productivity	17	0.558	0.000***
6	Effective office layout support individual requirement.	Acoustical privacy.	19	0.564	0.000***
20	Access to office supply/equipment centers	Stimulating environment.	4	0.558	0.000***
46	Finish materials reflect organizational culture	Facility equipment reflects organization culture	42	0.559	0.000***
50	Workspace task lighting	Facility equipment/furniture	5	0.55	0.000***

Significance levels = * p< 0.10, ** p < 0.05, *** p <0.01

Appendix F

Table 8. *Index Variable Correlation: 0.500 - 0.549*

Variable 1	Variable 1 Description	Variable 2 Description	Variable 2	Coefficient	P> t
4	Stimulating environment office environment	Open office systems	31	0.544	0.000***
5	Facility equipment / furnishings	Temperature/humidity controls function well	22	0.504	0.000***
5	Facility equipment / furnishings	Adequate space for all occupants	49	0.534	0.000***
6	Effective office layout support individual requirements.	Access to office supply/equipment centers	20	0.519	0.000***
6	Effective office layout support individual requirements.	Adequate workspace equipment ie: storage cabinets/filing cabinet/shelves)	43	0.530	0.000***
9	Workspace located near informal conference. space	Finish materials reflect organizational culture	46	0.508	0.000***
10	Workspace located near formal conferences spaces	Flexible conference. furniture	13	0.543	0.000***
10	Workspace located near formal conferences spaces	Wireless internet service	45	0.518	0.000***
12	Control of workspace lighting	Flexible conference room arrangements	25	0.503	0.000***
13	Flexible conference furniture	Multi-purpose functions with informal and instant meetings opportunities outside workspace	18	0.533	0.000***
14	Availability and correct mix of private & open office workspaces.	Flexible conference furniture	13	0.504	0.000***
16	Appropriate technology to support work activities.	Access to office supply and equipment center	20	0.507	0.000***

Table 8. Index Variable Correlation: 0.500 - 0.549, continued

Variable 1	Variable 1 Description	Variable 2 Description	Variable 2	Coefficient	P> t
17	Facility physical condition support productivity	Adequate workspace equipment ie: storage cabinets/filing cabinet/shelves)	43	0.525	0.000***
17	Facility physical conditions support productivity	Adequate space for all occupants	49	0.513	0.000***
18	Multi-purpose functions with informal and instant meetings opportunities outside workspace	Display personal articles in workspace	28	0.515	0.000***
18	Multi-purpose functions with informal and instant meetings opportunities outside workspace	Workspace furniture arrangement flexible	29	0.512	0.000***
19	Acoustical privacy	Identifiable workspace visual boundary	47	0.545	0.000***
19	Acoustical privacy	Private enclosed offices	48	0.545	0.000***
20	Access to office supply and equipment centers	Facility is well constructed	51	0.528	0.000***
22	Temperature/humidity controls function well	Workspace natural light	21	0.529	0.000***
22	Temperature/humidity controls function well	Workspace serves multi-purpose functions for informal and instant meetings	35	0.522	0.000***
23	Visiting/socializing furniture arrangements in common areas	Finish materials reflect organizational culture	46	0.536	0.000***
25	Flexible conference room arrangements	Satellite reception space	44	0.541	0.000***
26	Comfortable workspace furniture	Workspace task lighting	50	0.524	0.000***

Table 8. Index Variable Correlation: 0.500 - 0.549, continued

Variable 1	Variable 1 Description	Variable 2 Description	Variable 2	Coefficient	P> t
28	Display personal articles in workspace	Secure windows in workspace	32	0.533	0.000***
30	Unassigned workspaces have connectivity with voice/power/data services	Individual workspace temperature control	34	0.516	0.000***
35	Workspace serves multi-purpose functions for informal and instant meetings	Facility is well maintained	11	0.537	0.000***
35	Workspace serves multi-purpose functions for informal and instant meetings	Control of workspace lighting	12	0.519	0.000***
35	Workspace serves multi-purpose functions for informal and instant meetings	Dedicated team work environments (reserved time)	27	0.519	0.000***
35	Workspace serves multi-purpose functions for informal and instant meetings	Facility is a beautiful place to work	33	0.533	0.000***
35	Workspace serves multi-purpose functions for informal and instant meetings	Individual workspace temperature control	34	0.534	0.000***
35	Workspace serves multi-purpose functions for informal and instant meetings	Finish materials reflect organizational culture	46	0.533	0.000***
36	Visual privacy in the workspace	Acoustical privacy in the workspace	19	0.512	0.000***
45	Wireless internet service	Facility is well constructed	51	0.505	0.000***

Significance levels = * p< 0.10. ** p < 0.05. *** p <0.01.

Appendix G

Informed Consent Form for Social Science Research

Title of Project: Workplace environmental preferences.

Principal Investigator: Natalie Ellis, IIDA, LEED AP
Email: ndewf5@mail.missouri.edu
University of Missouri Extension
Housing and Environmental Sciences
University Place
1205 Matthews Street, Suite 400
573-882-6289

1. **Purpose of the Study:** To study place attachment in an office environment to identify possible linkages between personal workspace control and job satisfaction.
2. **Procedures to be followed:** Completion of a brief online questionnaire.
3. **Discomforts and Risks:** There are no risks in participating in this research beyond those experienced in everyday life.
4. **Duration/Time:** The survey will take approximately 7-10 minutes to complete.
5. **Statement of Confidentiality:** Your participation in this research is anonymous. The data will be stored and secured at the University in a locked file. The University of Missouri's Office of Research, the Institutional Review Board and the Office for Human Research Protections in the Department of Health and Human Services may review records related to this research study. In the event of a publication or presentation resulting from the research, no personally identifiable information will be shared.

No documents will be personally identifiable. Data containing personal information will only be accessed by the principal investigator.
6. **Right to Ask Questions:** Please contact the research investigator listed above with questions or concerns about this research. If you have any questions, concerns, problems about your rights as a research participant or would like to offer input, please contact the University of Missouri Institutional Review Board at 573-882-9585 or by mail at 483 McReynolds, University of Missouri, Columbia, MO 65211..
7. **Voluntary Participation:** Your decision to participate in this research is voluntary. You can stop at any time. You do not have to answer any questions you do not want to answer. Refusal to take part in or withdrawing from this study will involve no penalty or loss of benefits you would receive otherwise. You must be 18 years of age or older to consent to take part in this research study. **Your completion and submission of the survey will be deemed as your consent to participate in the study.**

Thank you for your participation.

Appendix H

INTRODUCTION LETTER TO HALLMARK

From: (Hallmark representing body of approval)
Sent: Date/Time
To: Hallmark Staff
Subject: Employee Environmental Preference Questionnaire

All:

Natalie Ellis, a University of Missouri graduate student in Architectural Studies is conducting a survey to determine environmental preferences in a corporate office setting. This study is strictly voluntary and is to be completed by those interested on their own personal time and not during normal working hours. Please see further explanation below from Natalie.

Please let me know if you have any questions.

(Hallmark representing body of approval)

REQUEST TO PARTICIPATE FROM STUDENT CONDUCTING GRADUATE WORK STUDIES

Greetings Hallmark staff!

As part of a research project that I am involved with along with my graduate studies work in Architectural Studies at the University of Missouri, you are being asked to be part of my pilot study. This study is to develop a survey instrument to determine environmental preferences. Your participation is invaluable as you will be helping to set design criteria for the design profession with both interior design and architecture.

This request is being provided to tell you everything you need to consider before you decide to consent (agree) and to be in the study or not to be in the study. It is entirely your choice. If you decide to take part, you can change your mind later on and withdraw from the research study

Purpose

The purpose of this study is to assess personal office environmental preferences.

Procedures

Participants will be sent an email with the survey link.

The study is to be completed by the volunteers on their own personal time and will not be conducted during working hours.

Duration of Study

The study will begin at noon on Monday, May 23, 2011 and conclude Sunday, May 29th at 11:59pm. **(If you would like a contact for questions, please insert here; otherwise, delete this information in red)**

Costs

There are no associated costs to this study.

Payment for participation

You will not be paid for being in this study.

Confidentiality

While all information from this study may be requested and given to the surveyed company, Hallmark, all obtained information will be made secure and anonymous. Identities of all respondents will not be part of study.

Appendix I

This survey focuses on environmental characteristics typically found in the workplace. You are asked to identify the importance to you of each of the items. There are no RIGHT or WRONG responses. Please indicate personal preference of each statement below. There can only be one selection per statement.

For each of the following items, select the single response that best describes your current workplace preference. How important/unimportant to you are the following environmental characteristics.

1. Workspaces reflect organizational status

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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2. Workspace located near service core areas (e.g., kitchen/break, rest rooms, vending etc.).

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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3. Availability of food within facility

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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4. Stimulating environment

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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5. Facility equipment and furnishings

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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6. Effective office layout that support individual work requirements

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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7. Storage space outside of workspaces.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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8. Furniture reflects organizational status

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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9. Workspace located near informal conference spaces.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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10. Workspace located near formal conference spaces.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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11. Facility is well-maintained

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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12. Workspace lighting control

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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13. Flexible conferencing furniture

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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14. Mixture of private enclosed offices and open office systems.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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15. Secure door(s) for workspace

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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16. Appropriate technology to support work activities

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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17. Facility physical conditions support productivity.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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18. Multi-purpose functions for informal and instant meetings outside of workspaces.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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19. Acoustical privacy (eg: talking on phone, office informal meetings, etc.)

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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20. Access to office supply and equipment centers

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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21. Workspace natural light

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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22. Facility mechanical systems function well (i.e. air conditioning, heating, ventilation, etc.)

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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23. Visiting and socializing furniture arrangements in common area

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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24. Ergonomic furniture in workspace

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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25. Flexible conferencing room arrangements (furniture that can be re-arranged)

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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26. Comfortable furniture in workspace.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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27. Dedicated team work environments (support team work and can remain in place for a reserved time period)

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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28. Display personal articles in workspace.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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29. Workspace furniture arrangement flexibility

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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30. Unassigned work areas that have company network/phone and internet support / electrical service

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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31. Open office systems

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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32. Secure window(s) for workspace

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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33. Facility is a beautiful place to work.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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34. Workspace temperature control.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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35. Workspace serves multi-purpose functions for informal and instant meetings.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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36. Visual privacy

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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37. Workspace natural ventilation

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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38. Soothing environment

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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39. Facility visual character reflects organization culture

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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40. Relaxation area(s)

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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41. Absence of physical barriers.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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42. Facility equipment reflects organization culture

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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43. Adequate workspace equipment (e.g., storage, shelves, files etc.)

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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44. Satellite reception space(s)

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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45. Wireless internet service

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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46. Finish materials reflect organization culture

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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47. Identifiable workspace visual boundary

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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48. Private enclosed office(s)

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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49. Adequate space for all occupants.

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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50. Workspace task lighting

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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51. Facility is well constructed

<input type="radio"/>	1-Very Unimportant	<input type="radio"/>	2- Unimportant	<input type="radio"/>	3-Somewhat Unimportant	<input type="radio"/>	4-Somewhat important	<input type="radio"/>	5-Important	<input type="radio"/>	Very Important
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52. Some other characteristic that we might have missed that is very important to you.

The following three survey items are intended to obtain general demographic information about you.

53. Please indicate gender: Female or Male

54. How long have you worked for this company?

Specify years: _____ years

55. Provide your age

Specify years: _____ years

References

- 247 Wall Street.com. (2012, August 10). *America's Worst Companies to Work For*. Retrieved September 8, 2012, from 247 Wallst:
<http://247wallst.com/2012/08/10/americas-worst-companies-to-work-for/>
- Altman, I. (1975). *The environment and social behavior*. Belmont, CA: Wadsworth Publishing Company, Inc.
- Ashcroft, N., & Scheflen, A. E. (1976). *People space: The making and breaking of human boundaries*. Garden City, NY: Anchor Books.
- Barker, R. G. (1968). *Ecological psychology: Concepts and methods for studying the environment of human behavior*. Stanford, CA: Stanford University Press.
- Barker, R. G. (1978). *Habitats, environments, and human behavior: Studies in ecological psychology and eco-behavioral science from the Mid-west Psychological Field Station*. San Francisco: Jossey-Bass.
- Barnard, C. I. (1938). *The functions of the executive*. Cambridge: Harvard University Press.
- Bastedo, M. N. (2006). Open systems theory. In F. W. English, *The SAGE encyclopedia of educational leadership and administration*. SAGE Publications, Inc.
- Becker, F. D. (1995). *Workplace by design: mapping the high-performance workscape* (Vol. 1st Edition). San Francisco: Jossey-Bass Publishers.
- Bertalanffy, L. (1969). *General system theory: Foundations, development, applications*. New York: George Braziller, Inc.

- Caplan, R. D. (1979). Patient, provider and organization: Hypothesized determinants. In S. J. Cohen (Ed.), *New directions in patient compliance* (pp. 75-110). Lexington, MA: Heath.
- Caplan, R. D. (1983). Person-environment fit: Past present and future. In C. L. Cooper, *Stress research: Issues for the eighties*. New York: Wiley.
- Caplan, R. D. (1987). Person-Environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanisms. *Journal of Vocational Behavior*, 248-267.
- Caruso St John Architects. (2012, September). *New National Office*. Retrieved from A Caruso St John site:
<http://www.carusostjohn.com/media/artscouncil/appendix/bibliography/index.html>
- Chatman, J. A., & Barsade, S. G. (1995). Personality, organizational culture, and cooperation: Evidence from a business simulation. *Administrative Science Quarterly*, 40, 423-443.
- Collins, T. R., Rossetti, M. D., Nachtman, H. L., & Oldham, J. R. (2006). The use of multi-attribute utility theory to determine the overall best in class performer in a benchmarking study. *Benchmarking: An International Journal*, 431-446.
- Daft, R. L. (2003). *Essentials of organizational theory and design*. Mason, OH: South-Western College Printing.
- De Young, R. (2013). Environmental psychology overview. In A. Huffman, & S. R. Klein (Eds.), *Green organizations: Driving change with I-O Psychology* (pp. 22-45). New York: Routledge Academic.

- Duffy, F. (1993). *The responsible workplace: The redesign of work and offices*. Oxford (England): Butterworth Architecture in association with Estates Gazette.
- Duffy, F. (2013). *Justifying place in a virtual world*. Retrieved from <http://www.aecom.com/News/Publications:>
http://www.aecom.com/deployedfiles/Internet/Capabilities/Design%20and%20Planning/Strategy%20Plus/FDuffy_Connected%20Real%20Estate.pdf
- Edwards, J. R. (2008). *Pages.Stern.NYU*. Retrieved from New York University: <http://pages.stern.nyu.edu/~eyoon/syllabi/Summer08/JEdwards%20Paper.pdf>
- Gibson, J. J. (1977). The theory of affordances. In R. Shaw, & J. Bransford (Eds.), *Perceiving, acting, and knowing: Toward an ecological psychology* (pp. 67-82). Hillsdale, NJ: Erlbaum.
- Gifford, R., Hine, D. W., & Veitch, J. A. (1997). Meta-analysis for environment-behavior and design research, illuminated with a study of lighting level effects on office task performance. In G. T. Moore, & R. W. Marans (Eds.), *Advances in environment, behavior, and design* (Vol. 4, pp. 223-253). New York: Plenum Press.
- Kantor, D., & Lehr, W. (1975). *Inside the family*. San Francisco: Jossey-Bass, Inc.
- Kaplan, S., & Kaplan, R. (1982). *Humanscape: Environments for people*. Ann Arbor: Ulrich's Books.
- Katz, D., & Kahn, R. (1978). *The Social psychology of organizations*. New York, NY: Wiley.

- Komberger, M., & Clegg, S. R. (2004). Bringing space back in: Organizing the generative building. *Organization Studies*.
- Kreitner, R., & Kinicki, A. (2010). *Organization behavior*. New York: McGraw-Hill.
- Lattimore, O. (1940). *Inner asian frontiers of China*. Boston: Beacon Press.
- Lewin, K. (1946). Action research and minority problems. *Journal of Social Issues*, 2, 34-46.
- Lewin, K. (2008). *Resolving social conflicts and field theory in social science*. Washington DC: American Psychological Association.
- Martin, J. (1992). *Cultures in organizations: Three perspectives*. New York: Oxford University Press.
- McCoy, J. M. (2002). Chapter 20: Work environments. In R. B. Bechtel, & A. Churchman (Eds.), *Handbook of environmental psychology*. Danvers, MA: John Wiley & Sons, Inc.
- McCoy, J. M. (2005). Linking the physical work environment to creative context. *Journal of creative behavior*, 39, 169-191.
- Ostroff, C. (1993, Marvh). Relationships between person-environment congruence and organizational effectiveness. *Group & Organizational Management*, 103-123.
- Pastalan, L. A. (1974). Privacy preferences among relocated institutionalized elderly. In D. H. Carson (Ed.), *The Environmental Design Research Association (EDRA)*. 6-8, pp. 73-82. Washington D.C.: EDRA.

- Rapoport, A. (1989). Changing paradigms: Individual vision statement. In G. Hardie, R. Moore, & H. Sanoff (Ed.), *Environmental Design Research Association (EDRA)* (p. 424). Oklahoma City: Omnipress.
- Rapoport, A. (1990). *Meaning of the built environment*. Tucson: University of Arizona Press.
- Rapoport, A. (1994). On 'The invisible in Architecture': an environment-behaviour studies perspective. In R. Van Toorn, & O. Bouman, *The invisible in architecture*. London: Academy Editions.
- Rinehart, J. W. (1975). *The tyranny of work (Canadian social problems series)*. Academic Press Canada.
- Sage Publications. (2012). *Open vs. closed systems*. Retrieved January 2013, from Sage Publications: http://www.sagepub.com/upm-data/33001_2.pdf
- Sanoff, H., & Cohn, S. (1970). Preface. *EDRA 1: Proceedings of the 1st annual Environmental Design Research Association Conference* (pp. v-vii). Stroudsburg, PA: Halsted Press.
- Schein, E. H. (1985). *Organizational culture and leadership*. San Francisco: Jossey-Bass.
- Schein, E. H. (1990). Organizational culture. *American Psychologist*, 109-119.
- Schon, D. (1995). *The reflective practitioner: How professionals think in action*. New York: Basic Books.
- Sommer, R. (1972). *Design awareness*. San Francisco: Rinehart.
- Stokols, D. (1995). The paradox of environmental psychology. *American Psychologist*, 50, 821-837.

- Sundstrom, E. (1987). *Work environments: Offices and factories* (Vol. 1). (D. Stokols, & I. Altman, Eds.) New York: John Wiley and Sons, Inc.
- Taborga, J. (2011, May 23). *Rethinking complexity: Studying systems for a humane and sustainable world*. Retrieved from The Saybrook Forum:
<http://saybrook.typepad.com/complexity/2011/05/kurt-lewin-lessons-from-the-od-master.html>
- Taylor, F. W. (1911). *Scientific management comprising shop management, the principles of scientific management (Testimony before the Special House Committee)*. New York: Harper & Row.
- Taylor, R. (1990). Interpretation of the correlation coefficient: A basic review. *Journal of Diagnostic Medical Sonography*, 35-39.
- Trice, H. M., & Beyer, J. M. (1993). *The cultures of work organizations*. Englewood Cliffs, NJ: Prentice Hall.
- Volkart, E. H. (1951). Introduction: Social behavior and the defined situation. In E. H. Volkart (Ed.), *Social behavior and personality: Contributions of W.I. Thomas to theory and social research* (pp. 1-32). New York: Social Science Research Council.
- Walsh, W. B. (2009). Person-Environment Fit. (S. W. Lopez, Ed.) *The encyclopedia of positive psychology*.
- Watkins, K., & Marsick, V. (1993). *Sculpting the learning organization: Lessons in the art and science of systematic change*. San Francisco: Jossey-Bass.
- Watkins, K., & Marsick, V. (1996). *In action: Creating the learning organization*. Alexandria: American Society for Training and Development.

- Wicker, A. W. (1992). Making sense of environments. In W. B. Walsh, K. H. Craik, & R. H. Price (Eds.), *Person-Environment Psychology: Models and perspectives* (pp. 157-192). Hillsdale, NY: Lawrence Erlbaum Associates.
- Zimring, C., & Peatross, D. (1997). Cultural aspects of workplace organization and space. In G. T. Moore, & R. W. Marans (Eds.), *Advances in environment, behavior, and design: Toward the integration of theory, methods, research, and utilization* (Vol. 4, pp. 195-221). New York: Plenum Press.