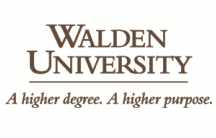

2016

The Effect of Workspace Layout on Individual Perceptions of Creativity Across Generational Cohorts

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This is to certify that the doctoral dissertation by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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Abstract

Organizations strategically design the physical work environment to enhance employees' creativity. Understanding the impact of workspace layout on individual perceptions of creativity across generational cohorts can be vital to sustaining organizational competitiveness. Researchers have theorized that workspace layout affects employees' perceptions of creativity; however, few studies have looked at the effect of generational cohort on this relationship. A quantitative study was conducted to examine the effect of workspace layout on individual perceptions of creativity across generational cohorts. A sample of 162 participants completed an online demographics questionnaire as well as aKEYS, a modified version of the KEYS to Creativity and Innovation instrument. An ANOVA was used to determine whether generational cohort and workspace layouts affected the participants' individual perceptions of creativity. Results did not support the theory that workspace layout and generational cohort affected individual perceptions of creativity. However, these nonsignificant results can be used strategically by organizations to design physical workspaces that foster individual perceptions of creativity in order to attract and retain a diverse workforce by accommodating employees equally rather than on generational cohort membership. Social change implications are that the results can provide organizations with an understanding of ways in which they can effectively treat and meet the needs of the workforce as a whole, rather than develop strategies based on generational cohort membership.

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Dedication

For Elaine and Leonidas Barrett.

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Chapter 1: Introduction to the Study

Introduction

Changing demographics, economic needs, cost, and flexibility influence the effectiveness and efficiency of workspaces, resulting in organizations examining the impact of defined, traditional versus open, nontraditional workspaces (McElroy & Morrow, 2010) on the individual perceptions of creativity of an age-diverse workforce (Oksanen & Ståhle, 2013). Defined, traditional workspaces refer to workspaces, offices, or cubicles with walls or partitions. Open, nontraditional workspaces refer to open, cubicle, and flexible workspaces that lack interior walls or partitions. Employees referenced in this study were managerial-level office workers whose job functions allowed for flexibility in the generation of new ideas, not adherence to strict guidelines (such as call center representatives). Employee creativity, a precursor of innovation and productivity and a known competitive advantage in the corporate world (Politis, 2005), has been and continues to be influenced by the work environment (Amabile, 2012; Woodman, Sawyer, & Griffin, 1993). Workspace layout can affect individual perceptions of creativity and the effect can vary depending on the generational composition of the workforce (Politis, 2005). The effect of workspace layout on individual perceptions of creativity is an issue that companies are facing as they adapt to the work patterns and preferences of a multigenerational workforce (O'Neill, 2010).

Workforce demographics are projected to shift significantly over the next decade, in response to which many organizations are adapting their workplace cultures and workspaces to meet the organizational objectives and expectations of new generations

(Bennett, Pitt, & Price, 2012; Finkelstein, Ryan, & King, 2013). Demographic workforce trends are being influenced by age diversity as younger generations enter the workforce and older generations postpone retirement (Hedge, Borman, & Lammlein, 2006). The U.S. Bureau of Labor Statistics (BLS, 2015) reported that the number of workers ages 55 to 64 years will increase by 36.5% and workers age 65+ years by 80%, significantly raising the average age of the workforce. U.S. workers 45 years and older increased from 34.9% in 2000 to 42.9% in 2010 (BLS, 2015). As this trend continues, organizations are developing strategies to accommodate an age-diverse workforce (Hedge et al., 2006) by creating physical work environments that align employee expectations with organizational goals (Hernaus & Pološki Vokic, 2014; Mencl & Lester, 2014).

The physical layout and use of the work environment can become an integral part of organizations' objectives to promote growth and strategies to attain and maintain a competitive advantage (McElroy & Morrow, 2010; Venezia & Allee, 2007). Understanding the different impacts of defined, traditional versus open, nontraditional workspaces on the individual perceptions of creativity of a multigenerational workforce can help organizations to assess the efficiency and effectiveness of the physical work environment as workforce demographics shift and the strategies to recruit and retain an age-diverse workforce evolve (Blok, Groenesteijn, Schelvis, & Vink, 2012). Customizing the physical work environment can be costly for organizations. Understanding how to accommodate the needs and expectations of a multigenerational workforce can mitigate expenses caused by ineffective workspace layouts (Vischer, 2008).

Encouraging individual perceptions of creativity can be a strategic asset in the production of new ideas that can lead to organizational growth and designing workspaces to foster individual perceptions of creativity can be a factor critical to organizational success (Amabile, 2012). However, understanding the various workforce demographic considerations can assist managers in designing workspace layouts that facilitate creativity (Joy & Haynes, 2011). Organizations need empirical evidence regarding workplace layouts and individual perceptions of creativity among an age-diverse workforce to assist with aligning the strategic objective of increasing growth while mitigating organizational expense (Venezia & Allee, 2007). Therefore, understanding how to maximize the effectiveness of physical workspaces to accommodate an age-diverse workforce can provide companies with insight into ways to increase organizational performance by strategically using the physical workspace to foster individual perceptions of creativity. To date, no researchers have examined the effect of organizational workspace layout type on older and younger generations of workers and individual perceptions of creativity.

Background

Some contemporary organizations have made creativity an important indicator of growth and productivity and they have sought ways to better stimulate individual perceptions of creativity by designing physical work environments conducive to idea generation (Joy & Haynes, 2011; Shalley & Gilson, 2004). As the competitive landscape of the business environment adapts to changing demographics as well as social and economic needs, organizations are using workspaces to foster individual perceptions of

creativity and innovative thinking among their age-diverse workforce (Shalley & Gilson, 2004). To accomplish this goal, organizations and their leadership need to know whether individuals are influenced by shared experiences or other factors across generations (Giancola, 2006). Because generational cohort members interact closely with each other, organizations are seeking to create physical work environments that attract and retain age-diverse workers (Hansen & Leuty, 2011).

Creativity

Creativity has been defined as individual perceptions of creativity that can result in the generation of novel or original ideas, products, and services (Amabile, Conti, Coon, Lazenby, & Herron, 1996); creativity can be a strategic and key driver of organizational growth and performance (Montag, Maertz, & Baer, 2012). Creativity is part of how individuals learn about and adapt to their environments (Maslow, 1968), and in organizations, the physical and social work environments can influence the creativity of employees either by fostering or inhibiting individual perceptions of creativity (Amagoh, 2008; Oksanen & Ståhle, 2013; Schneider & Somers, 2006).

The extent to which individuals generate new ideas is influenced and supported or hindered by the social context (e.g., resources, supervisory support, work culture, human resource [HR] management policies) within the work environment (Amabile et al., 1996; Woodman et al., 1993). Creative performance increases when workers feel that the work environment encourages and recognizes creative work (Amabile et al., 1996; Dul & Ceylan, 2011). Oksanen and Ståhle (2013) reported that the work environment increases creativity and innovation as employees' ability to collaborate and communicate within

close proximity of each other increases. Martens (2011), who found a positive relationship between the workplace environment and creativity, also reported that a stimulating physical work environment is linked to creativity based on employees' preferences (e.g., comfort, privacy, and workplace aesthetics). Martens suggested that individual perceptions of creativity are stimulated when employees can control such elements as noise, temperature, privacy preferences, and level of peer interaction within the work environment. Research on the social work environment and generational cohorts has been conducted, but research on the affect of individual perceptions of creativity based on physical workspace layouts has been scant (Kallio, Kallio, & Blomberg, 2015).

Age and Generational Cohorts

The origin of generational differences dates back to Mannheim's (1928/1972) problem of generations. Mannheim emphasized the importance of generations in a society and how its members are shaped by shared events and experiences based on a common point in historical time. A generational cohort has been defined as individuals who share birth years and similar environment and social experiences such as historical, political, and economic events and situations (Hannay & Fretwell, 2011; Kupperschmidt, 2000). The multigenerational workforce in the current study was categorized into three cohorts: Baby Boomers (1946-1964), Generation X (1965-1980), and Millennials (1981-1997) (Pew Research Center, 2015). Each cohort brings different values, attitudes, skills, and expectations to the workplace that are influenced by shared events and experiences (Lester, Standifer, Schultz, & Windsor, 2012; Parry & Urwin, 2011).

As the workforce becomes more age diverse, organizations are seeking to

leverage the talents of generational cohorts by understanding not only their formative experiences and general characteristics but also the affect of age and cognitive development on the capabilities of younger and older workers (Drabe, Hauff, & Richter, 2015). Individuals mature through major life events, and they develop values, attitudes, and traits that differentiate them from other generational cohorts (Macky, Gardner, & Forsyth, 2008). Younger employees bring with them new work patterns and ways of interacting within the work environment (Joy & Haynes, 2011; McElroy & Morrow, 2010), whereas older workers bring with them knowledge, skills, and experience that they can transfer to younger workers entering the workforce (Hedge et al., 2006). Leveraging the cognitive abilities of an older skilled workforce can help to recruit, retain, and motivate younger employees and enhance their performance (Drabe et al., 2015). Similarly, younger workers entering the workforce who have strong cognitive capabilities based on educational background can contribute to organizational growth by offering new information and skills (Hanushek & Woessmann, 2008).

Empirical evidence on generational differences in work values, attitudes, and perceptions has yielded mixed findings because individuals can have different characteristics and values within their own generational cohorts. These characteristics can be impacted more so by the maturation process, life stage, and socioeconomic status (SES) than by shifts in generational cohort membership attitudes and behavior (Hernaus & Pološki Vokic, 2014; McElroy & Morrow, 2010). Companies have diverse workforces, and because of the different backgrounds of these multicultural workforces, not all shared experiences of the individuals are similar (Costanza & Finkelstein, 2015). The different

backgrounds can produce diversity within a cohort range and can result in individuals interpreting experiences differently (Salthouse, 2013; Zemke, Raines, & Filipczak, 2000).

Workspace

Contemporary organizations that have transitioned from more defined, traditional workspaces to open, nontraditional workspace layouts have done so in an effort to improve the performance of an age-diverse workforce (Davis, Leach, & Clegg, 2011; Martens, 2011; Oksanen & Ståhle, 2013). The evolution of the workspace design has been driven by economic needs, changing demographics, cost, and flexibility, and this evolution has tried to accommodate the work interactions and patterns of an age-diverse workforce (Van der Voordt, 2004). The majority of empirical research on open, nontraditional workspace layouts has focused on the satisfaction of employees based on comfort factors such as privacy, lighting, furnishings, and distractions (Kim & de Dear, 2013).

McElroy and Morrow (2010) reported that generational cohorts have preferences regarding defined, traditional versus open, nontraditional workspaces. A commonality among all generational cohorts is that they value their privacy. However, older employees have reported being dissatisfied within open, nontraditional workspaces because of noise levels and other distractions (McElroy & Morrow, 2010). De Croon, Sluiter, Kuijer and Frings-Dresen (2005) determined that open workspace layouts produce employee dissatisfaction based on the lack of privacy and reduced workspace. Rothe, Lindholm, Hyvönen, and Nenonen (2012) reported that employee satisfaction with physical and social organizational work environments was linked to the complete work experience,

such as access to building services, ease of commuting, and work environment preferences. They also found that work environment preferences varied by age, meaning that older workers preferred control of room temperature and furniture placement. With that control, employee satisfaction with the work environment increased.

Kuratko, Hornsby, and Covin (2014) reported that the managers in their study influenced the internal work culture to be conducive to creative and innovative thinking by providing a supportive environment that fostered the growth of the diverse workforce. Proactively understanding the factors that can influence the behavior of generational workers can help managers to align the work culture to the functional needs of the organization and the workforce strategically (Mencl & Lester, 2014). Aligning the needs of the organization and the workforce with workspace layouts can potentially increase employee job satisfaction, creativity, and productivity (Lee & Brand, 2005; Rothe et al., 2012).

Anderson, Potocnik, and Zhou (2014) asserted that the workspace is an important determinant of organizational idea generation, performance, success, and long-term survival. More specifically, Vischer (2008) found that the workspace layout plays an important role in how employees' work patterns and expectations can lead to the generation of new ideas. Workspace has become a strategic factor in creating an environment to generate new ideas for success (Shalley & Gilson, 2004). Understanding the effect of type of workspace on individual perceptions of creativity gives organizations insight into ways of creating workspaces that support creativity (Dul & Ceylan, 2011).

Problem Statement

As the competitive landscape of business adapts to economic changes, organizations are leveraging workspace layouts to foster individual perceptions of creativity (Dul & Ceylan, 2011; Martens, 2011). Designing workspaces to foster individual perceptions of creativity is vital to generate new ideas, products, and services, and to attain and retain a diverse workforce (Anderson et al., 2014; Dul & Ceylan, 2011). Organizations are trying to understand which physical workspace layout, namely, defined, traditional workspaces or open, nontraditional workspaces, fosters individual perceptions of creativity more effectively (Oksanen & Ståhle, 2013; Martens, 2011). Oksanen and Ståhle (2013) reported that when employees can collaborate and communicate within close proximity, innovation and creativity increase. Martens (2011) reported a positive relationship between employees' perceptions and factors in the work environment (e.g. freedom to carry out new ideas, management's encouragement of new ideas, etc.) that can foster individual perceptions of creativity. Similarly, Dul and Ceylan (2011) reported that when employees perceive that elements in a social organizational and physical work environment support creativity, there is a significant increase in their creative performance.

Research has determined that productivity is linked to individual workspace preferences being met within the physical work environment (De Croon et al., 2005). Individuals from different generational cohorts prefer different types of work environments (McElroy & Morrow, 2010; Rothe et al., 2012). For example, McElroy and Morrow (2010) found that older employees reported being dissatisfied with open,

nontraditional workspaces because of the lack of privacy, high noise levels, and other distractions. Rothe et al. (2012) reported that Baby Boomer and Generation X workers preferred defined, traditional workspaces that gave them more control over climate and furniture placement, and that Millennials preferred open, nontraditional work areas and buildings that portrayed a contemporary company image.

Companies seek to maximize productivity, efficiency, and growth, so it was important to determine whether workspace layouts have differential effects on creativity depending on employees' ages to gain a better understanding of how to facilitate performance (Oksanen & Ståhle, 2013). Binnewies, Ohly, and Niessen (2008) reported that even though job control and support for creativity by coworkers and supervisors did not affect older workers' creativity, they did increase younger workers' creativity. Researchers have reported findings on generational cohorts and their preferences for social organizational elements in the work environment, but little empirical research has been reported on an age-diverse workforce and physical workspace layouts (Kim & de Dear, 2013; Rasila & Rothe, 2012). This study sought to bridge the gap in determining whether workspace layouts affect individual perceptions of creativity across generational cohorts.

Purpose of the Study

The purpose of this quasi-experimental study was to understand the effect of workspace layouts on individual perceptions of creativity across generational cohorts. As discussed, previous research has suggested that work environments can affect employees' creativity and that the impact can vary depending on generational cohort membership.

However, little empirical evidence exists on individual perceptions of creativity and the effects of defined, traditional layouts versus open, nontraditional workspace layouts. The purpose of the study from a social change perspective was to identify physical work environments that foster the individual perceptions of creativity across generational cohorts and attract, retain, and ensure the well-being of an age-diverse workforce.

Research Questions

This research sought to determine whether generational cohort and workspace layouts have an impact on individual perceptions of creativity. The research questions (RQs) and associated hypotheses were designed to address the gap identified in the literature:

RQ1: Does generational cohort affect individual perceptions of creativity?

H_{01}: Generational cohort (Millennials, Generation X, or Baby Boomers) does not affect individual perceptions of creativity, as measured by aKEYS.

H_{a1}: Generational cohort (Millennials, Generation X, or Baby Boomers) does affect individual perception of creativity, as measured by aKEYS.

RQ2: Does workspace layout affect individual perceptions of creativity?

H_{02}: Workspace layout (defined, traditional vs. open, nontraditional layout) does not affect individual perceptions of creativity, as measured by aKEYS.

H_{a2}: Workspace layout (defined, traditional vs. open, nontraditional layout) does affect individual perceptions of creativity, as measured by aKEYS.

RQ3: Do workspace layout and generational cohort affect individual perceptions of creativity?

H_{03}: Workspace layout (defined, traditional vs. open, nontraditional layout) and generational cohort (Millennials, Generation X, or Baby Boomers) do not affect individual perceptions of creativity, as measured by aKEYS.

H_{a3}: Workspace layout (defined, traditional vs. open, nontraditional layout) and generational cohort (Millennials, Generation X, or Baby Boomers) do affect individual perceptions of creativity, as measured by aKEYS.

Theoretical Framework

This study was influenced by Lewin's (1951) field theory, Mannheim's (1928/1972) theory of generations, and Woodman et al.'s (1993) theory of organizational creativity. Lewin's field theory focuses on the changing environment and the need to understand individuals through their relationship with it. According to Lewin, studying how individuals respond to the environment will provide an understanding of the ways in which surroundings influence their behavior. In contemporary organizations, the workplace environment influences creativity among employees by either fostering or inhibiting it (Amagoh, 2008; Schneider & Somers, 2006). The concept of generational cohorts dates back to Mannheim, who emphasized the importance of generations in a society and how its members are shaped by shared events and experiences. Mannheim proposed that individuals' formative experiences during their youth form social generational cohorts.

This study also was based on the individual level of the interactionist perspective of organizational creativity theory. This perspective posits that creativity is a complex interaction between individuals and their work situations based on situational and

behavioral factors at the individual, team, and organizational levels (Cokpekin & Knudsen, 2012; Woodman et al., 1993). Woodman et al. (1993) proposed that creativity on an individual level is enhanced or inhibited in the workplace by antecedent conditions (biographical variables), cognitive ability (divergent thinking), personality (self-esteem), social influences (rewards), and contextual influences (physical environment).

This study focused on the contextual influences of Woodman et al.'s interactionist creativity model, which helped in understanding creative situations and the relationship among workspace layout types, generational cohorts, and individual perceptions of creativity.

Nature of the Study

A quantitative study employing a quasi-experimental design was conducted to determine whether individual perceptions of creativity are affected by physical workspace layouts based on generational cohort membership. A nonprobability sampling method was used, and volunteers were solicited via electronic invitations. The participants were obtained from LinkedIn professional groups and Walden University's participant pool. The sample comprised employees who were working in either defined, traditional spaces with walls or open, nontraditional spaces without walls at the time of the study.

Participants completed a demographics questionnaire and provided information regarding age, gender, and current workspace layouts. Individual perceptions of creativity were determined using a modified version (aKEYS) of KEYS to Creativity and Innovation, also known as KEYS, instrument (Amabile, Burnside, & Gryskiewciz, 1999).

The demographics questionnaire and aKEYS were administered using SurveyMonkey, a web-based administration platform. The survey link was distributed via the LinkedIn invitation and the Walden participant pool invitation. An ANOVA, the appropriate post hoc tests were used to assess the relationship among the study variables and address the RQs by testing the associated hypotheses.

Definitions of Terms

For the purposes of this study, the following terms were defined operationally:

Baby Boomers: The segment of population defined as individuals born between 1946 and 1964, ages 52 to 70 years (Pew Research Center, 2015).

Creativity: Individual perceptions of creativity based on given situations that can result in the generation of ideas, products, and services that are novel or original (Amabile et al., 1996; Woodman et al., 1993).

Defined, traditional workspace: A workspace, an office, or a cubicle with walls or partitions (Davis et al., 2011).

Employees: Refers to managerial office workers, not occupational employees.

Generational age: Refers to the age range of individuals in specific generational cohorts: Baby Boomers (52-70 years) Generation X (36-51 years) and Millennials (19-35 years; Pew Research Center, 2015).

Generational cohort: Individuals belonging to one of the following categoric groups: Baby Boomers, born between 1946 and 1964; Generation X, born between 1965 and 1980; and Millennials, born between 1981 and 1997 (Pew Research Center, 2015).

Generational cohort membership: Members of an identifiable group who share a

specific span of time and have experienced similar environment and social experiences (i.e., historical, political, and economic events and situations; Hannay & Fretwell, 2011; Kupperschmidt, 2000).

Open, nontraditional workspace: Defined as an open and flexible workspace that lacks interior walls or partitions (Davis et al., 2011).

Physical work environment: Defined in the context of individuals' physical surroundings, such as the immediate workspace (Dul & Ceylan, 2011).

Social organizational work environment: Defined in the context of an organization's culture, supervisory support, and human resource management policies (Dul & Ceylan, 2011).

Assumptions

One assumption was that the participants would answer the survey questions truthfully and to the best of their ability. Another assumption was that participants who voluntarily agreed to be in the study worked in defined, traditional or open, nontraditional workspaces and did not work remotely. The assumption was made that the participants understood the meanings of workspace layout and individual perceptions of creativity. Yet another assumption was that the participants in the organization were office workers at a managerial level. The selected participants were assumed to be representative of the target population referenced in the study. There were assumptions that the participants' anonymity would be upheld, participation was understood to be voluntary, and participants could withdraw from the survey at any time without any negative consequences.

The researcher also assumed that aKEYS measurement had the appropriate content validity to measure individual perceptions of creativity. The hypotheses were relevant to understanding the variables in the study. The research methodology provided a reliable and valid explanation of the variables studied. The final assumptions were that the significance tests associated with model were met: (a) The variables were normally distributed, (b) there were an independence of observations, (c) the variables were measured without error (reliably), and (d) there was equal variance in the population (Field, 2013).

Scope and Delimitations

The future of organizations lies in their ability to align and adapt to the changing demographics and develop strategic objectives to grow and succeed. Understanding the effect of workspace layout on individual perceptions of creativity can give companies the tools necessary to design workspaces where individuals can generate new ideas. The participants were selected because at the time of the study, they were working for organizations that had either defined, traditional workspaces or open, nontraditional workspaces. The study was delimited to participants with different types of workspace layouts. Because participants younger than Millennials have had limited work experience and limited experience with different types of workspace layouts, they were excluded from the study.

Limitations

A limitation to the self-reported survey protocol used in this study was the social desirability bias response, which could have affected the validity of the questionnaire.

Even though the participants were assured of anonymity, research has shown that study participants seek to provide answers that reflect positively toward them (Frankfort-Nachmias & Nachmias, 2008). This is known as the Hawthorne effect.

Significance of the Study

Innovative and creative work environments are important to organizational success (Rothe et al., 2012). The strategic direction of contemporary companies is to provide efficient and effective workspaces that foster individual perceptions of creativity with the aim of attaining and retaining an age-diverse workforce that can contribute to the innovative success of the companies (Amabile, 2012; Dul & Ceylan, 2011; O'Neill, 2010). Creativity can be a strategic asset in generating new ideas that can lead to organizational growth, so designing workspaces to foster creativity can be a critical factor in long-term organizational success (Amabile, 2012). The practical and social change aspects of this study are for companies to accommodate and integrate multigenerational workforces by creating environments that attract and retain an age-diverse workforce (Dul & Ceylan, 2011; Hansen & Leuty, 2011). Therefore, understanding the effect of workspace layouts on individual perceptions of creativity based on generational cohort can give organizations insight into how their workspaces can best be orchestrated to meet the needs of employees and the strategic objectives of the organizations themselves.

Summary and Transition

Chapter 1 provided details about the background of the study; problem statement; purpose of the study; RQs and hypotheses; theoretical framework; nature of the study; definition of terms; assumptions, scope, delimitations, and limitations; and the

significance of the study. Also included was an introduction to creativity's importance to organizational growth and the need to understand how generational cohort membership is influenced by workspace layouts related to fostering individual perceptions of creativity. This quantitative study was an analysis of the effects of workspace layout designs on the individual perceptions of creativity among a multigenerational workforce.

As the competitive landscape of the business environment increases and the demographics shift to accommodate a new multigenerational workforce, organizations are looking for creative and innovative ways of staying relevant in the marketplace by meeting organizational objectives as well as employees' needs and expectations. Evidence has supported a connection between work environments and individuals' creativity (Woodman et al., 1993). This research sought to go beyond the social organizational work environment and creativity connection, and establish a connection between physical work environments and individual perceptions of creativity.

Chapter 2 contains empirical literature that adds relevance to the need for this study. The reviewed literature reflected different areas of study on workspace layout, creativity, age, and generational cohort membership. The literature highlighted the need to explore the specific variables selected in this study. Presented in Chapter 3 is information about the research design and methodology used to study the variables through the RQs. The chapter also contains sampling and recruitment procedures, and the instrument used to analyze individual perceptions of creativity. Chapter 4 contains a report of sample demographics, data collection and results of the data analysis, aligned with the RQs and their hypotheses, and supported by statistics, tables, and figures.

Chapter 5 contains an overview of the study, a discussion of the results, limitations of the study and recommendations for future research and implications for social change.

Chapter 2: Literature Review

Introduction

The intent of this study was to determine whether generational cohort and workspace layout designs affected the individual perceptions of creativity of the participants in this study. The workspace is an important determinant of organizational idea generation, performance, success, and long-term survival (Hirst, Knippenberg, & Zhou, 2009; Shalley & Gilson, 2004). As the competitive landscape of business adapts to accommodate shifting demographics, organizations are leveraging workspace layouts to foster individual perceptions of creativity among an age-diverse workforce (Dul & Ceylan, 2011; Martens, 2011). As this shift takes hold, contemporary organizations are using their physical work environments to attract and retain an age-diverse workforce by incorporating the trends, patterns, and interactions of a new generational workforce (Earle, 2003; Laing, 2006). It is strategically important for managers to understand whether generational cohort preferences do or do not exist, and to incorporate these preferences into the designs of physical workspaces in an effort to reduce miscommunications and to increase employees' creativity and innovation (Kupperschmidt, 2000).

Individuals' perceptions of creativity can be a core driver of productivity and growth (Montag et al., 2012), and companies are seeking to gain a competitive advantage in the corporate environment by fostering work environments where employees can create, share, and communicate information and ideas (Gensler, 2013; Politis, 2005). Gensler's 2013 Workplace Survey reported that the majority of physical workplace

environments that are not designed to meet employees' needs and expectations are ineffective, resulting in lost productivity, lost creativity, and lost innovation. Although a relationship between physical work environments and facilitation of the development of creative processes has long been suggested (Amabile, 1988), there has been little empirical evidence to support this relationship (Stokols, Clitheroe, & Zmuidzinas, 2002).

The physical work environments of organizations are a factor contributing to employees identifying with the organizations, and the physical spaces are objectively designed by architects and builders, and subjectively perceived by the employees (Kristensen, 2004). Employees' perceptions of their work environments influence the extent to which they generate new ideas (Foss, Woll, & Moilanen, 2013). Employees can interpret their physical spaces in the work environments based on how they perceive those spaces (Kristensen, 2004). Employees' perceptions influence their behavior based on their objective observations of their work environments, and these observations determine how employees interpret the influencers of creativity in such environments (Kristensen, 2004). This study sought to determine the impact of the physical work environments of organizations on individual perceptions of creativity across generational cohorts.

The researcher divided the review of the literature into four sections: defined, traditional and open, nontraditional workspaces; age-related changes; generational cohorts; and creativity. Each section references a theoretical foundation of the category, empirical research, and a summation of the findings. The literature review supported the need to build upon the existing research to bridge the gap in understanding the

relationship between individual perceptions of creativity and the physical work environments in organizations relevant to a multigenerational workforce.

Literature Search Strategy

The literature search included scholarly, peer-reviewed journals; articles; periodicals; publications; and dissertations. The information was obtained via electronic database searches. The psychology database search included PsycINFO, PsycARTICLES, and Psychology: A SAGE Full-Text Collection. The business and management database search included Business Source Complete, ABI/INFORM Complete, Emerald Management Journals, SAGE Premier, and journals by name. The following key search terms were used to search the electronic databases: *creativity*, *perception of creativity*, *workspace design*, *innovation*, *future workspace*, *work environment*, *multigenerational workforce*, *generational cohorts*, *age diversity in the workforce*, *workforce demographics*, *facilities*, *flexible work environments*, *closed workspace*, *traditional workspace*, open workspace, *unconventional workspace*, *psychology of work environment*, *postoccupancy evaluation*, *age*, *age and creativity*, *creativity and workspace*, *age diversity*, *aging*, cognitive development, and *fluid and crystallized intelligence*. Because the keyword search produced limited empirical results, the majority of studies that were referenced were obtained through references in research articles.

The database search for articles was generated by inputting a search range between the years 1904 through 2015, which provided access to early seminal theoretical works such as Lewin's (1951) field theory and Mannheim's (1928/1972) theories of

generations, and documentation such as Frank Lloyd Wright's' 1904 Larkin Building (as cited in Hills & Levy, 2014) open work environment concept. Areas where the search produced little current empirical evidence helped to establish the gap in the literature.

Defined, Traditional and Open, Nontraditional Workspaces

Lewin's Field Theory

The theoretical foundation for understanding the influences of individuals' behaviors in different work environments is Lewin's (1951) field theory, which took a psychological approach to explain how individuals are affected by the ways in which they respond to the field around them and the totality of the factors that encompass the field as they view it. Lewin proposed that the ways in which individuals interpret and behave in their spaces are the product of the individuals' histories, as well as their physical and social surroundings.

Research in social and environmental psychology has reported that individuals' behaviors and attitudes are influenced by elements in their physical environments (Lee & Brand, 2005). Lewin (1951) believed that individuals' behaviors are influenced by the life-spaces (i.e., physical and social environments) that they are part of. Life-spaces have been defined as individuals' subjective interpretations of the objective facts of situations in the environment (Kristensen, 2004; Lewin, 1951), and these objective facts within situations that individuals perceive and interpret within their environments are important based on the subjective meanings that individuals give the situations (Lewin, 1951). Individuals' life-spaces, connected with their social worlds, make up the social fields that determine how individuals behave in their particular environments (Lewin, 1951).

Environmental psychology has supported Lewin's (1951) theory that physical environments influence individuals' behaviors and has further expanded upon the theory by exploring the interrelationship between people and their physical settings (Oseland, 2009). Behaviors are a function of individuals and their environments, and behaviors are affected by how individuals interpret and interact within their environments (Oseland, 2009). Building upon the psychology of Lewin's life-space concept, Kristensen (2004) stated that physical spaces are foundational to individuals' perceived spaces that allow them to behave within environments based on the opportunities that the spaces allow. Vischer (2008) reported that physical workspaces, along with functional and psychological workspaces, could satisfy employees.

Workspaces within the contemporary business environment have become a strategic tool for aligning an age-diverse workforce to accommodate their needs, knowledge, and job functions (Narang & Dwivedi, 2010). Organizations are no longer designing their physical work environments to accommodate "one-size-fits-all" workspaces; rather, the spaces are being designed to be desirable to an age-diverse workforce (Meerwarth, Trotter, & Briody, 2008) and to promote progressive company images to attract and retain talented workers (Van der Voordt, Ikiz-Koppejan, & Gosselink, 2012).

Office Work Environment

The evolution of organizational workspaces has gone through many different configurations and concepts that date back to the open floor plan concept of Frank Lloyd Wright's Larkin Building in Buffalo, New York (Hills & Levy, 2014). The modern

architecture and open floor plans were intended to foster a collaborative office culture for employees to ensure high levels of productivity and collaboration (Hills & Levy, 2014). The most notable empirical research on psychosocial and physical work environments has been associated with the Hawthorne Studies on the effects of the working conditions based on lighting, temperature, and humidity within the work environment to identify any possible effect on worker productivity (Roethlisberger & Dickson, 1939).

Renewed interest in the work environment that reflected the ergonomic needs of employees occurred through the 1960s and 1970s; however, it was not until the 1990s that the new normal began, that is, the directive for companies to cut costs by reducing costs related to overhead, real estate, and square footage per employee (Vischer, 2008). As reductions in physical workspaces evolved, so, too, did the strategic directions of some companies to design their physical work environments to represent more contemporary corporate images and align the new work patterns and expectations of an age-diverse workforce (Hills & Levy, 2014).

Changes in innovation, globalization, technology, demographics, and economics have influenced the reconfiguring of workspaces by organizations (Van der Voordt, 2004). After human capital, real estate is the greatest financial expense for large corporations; therefore, companies have reduced their capital requirements by adapting their physical work environments to be more cost efficient and effective by designing open and flexible workspace layouts (Hills & Levy, 2014). As physical work environments evolve, it is critical that components in the design of work environments meet the business needs of organizations as well as the needs and expectations of the

workforce (Hills & Levy, 2014). Contemporary organizations have focused on key factors for space provisioning that can strategically add value to the organizations (Haynes, 2008). These factors include reductions in real estate overhead expenses; more comfort and security of employees; support of working styles and processes; maintenance of a corporate image that can attract and retain employees (Haynes, 2008); and willingness to adapt to employees' flexible working patterns (Singh, Bhandarker, Rai, & Jain, 2011).

Literature on the physical work environment in a business setting has described the workspaces as either defined, traditional or open, nontraditional layouts (Danielsson & Bodin, 2008). Empirical research on the work environment has produced extensive findings pertaining to the social organizational elements and individual comfort and aesthetic preferences that influence individuals' behaviors (Dul & Ceylan, 2011), but empirical research on the effect of the physical work environment on individuals' creativity has been limited.

A review of the literature has found mixed empirical findings on the influence of work environments on employees' individual perceptions of creativity. Davis et al. (2011) reported that open, nontraditional workspace layouts allow flexibility in reconfiguring physical workspaces based on the changing needs of organizations. Davis et al. also reported that open, nontraditional workspaces, more so than defined, traditional workspaces, provide employees with greater opportunity for communication and interaction. Conversely, Davis et al. also reported that flexible workspaces lead to distractions and the inability of employees to regulate peer interactions and noise levels.

Roper and Juneja (2008) reported that open, nontraditional workspace layouts increased employees' levels of physiological and psychological stress. Employees in their study reported being distracted by the surrounding conversations of coworkers that were personal and unrelated to work topics. These distractions were higher for employees involved in complex job tasks (Roper & Juneja, 2008). Rasila and Rothe (2012) reported that even though employees were not disturbed by continuous noise within their work environments, they were disturbed by sudden and unanticipated noises. McElroy and Morrow (2010) asserted that individuals were satisfied with elements within their work environments based on whether their expectations were being met and that some of the expectations were different because they were based on generational cohort membership. McElroy and Morrow also reported that individuals perceived open, nontraditional workspaces differently based on levels of distraction, department and meeting room space layouts, and sizes of the workspaces.

Kim and de Dear's (2013) research on open, nontraditional workspace layouts focused on the satisfaction of employees based on comfort factors such as privacy, lighting, furnishings, and distractions. They reported that open, nontraditional workspace layouts created higher levels of employees' dissatisfaction with their work environments than defined, traditional work environments did. Employees viewed visual privacy, sound privacy, amount of space, and noise levels as the greatest distractors in open, nontraditional work environments (Kim & de Dear, 2013). Employees who were able to control the elements within their work environments valued open, nontraditional workspace layouts; similarly, when the employees were not able to control elements

within their work environments, they responded negatively to open, nontraditional workspaces (Hill & Levy, 2014; Kim & de Dear, 2013).

Vischer (2008) determined that the relationship between employees and their workspaces influence their performance and organizational productivity. Task performance can be affected by environmental conditions such as lighting, temperature, and furniture ergonomics (Vischer, 2008). Employees' job performance, productivity, and satisfaction are common factors used to determine how work environments affect employees. Research on physical work environments from the perspectives of collaboration and privacy based on shared desks in open spaces and private individual spaces determined that concentration levels and creative work decreased in open, shared workspaces and that collaboration increased in the same spaces (Parkin, Austin, Pinder, Baguley, & Allenby, 2011). Employees felt that the open, nontraditional workspace was conducive to collaboration because of the close proximity of their coworkers; however, the close proximity also increased distraction levels (Hills & Levy, 2014).

The digital revolution of the 21st century has changed the landscape of the business work environment and has created a new work environment that never existed before (Davis et al., 2011). Comparing the open floor layouts of past decades to the current open layouts of today's design is not fair because companies are using advanced technology, social media tools for communications and collaboration, and mobile devices that have allowed employees to work in open spaces while maintaining private communications (Davis et al., 2011).

Work Environment and Creativity

The cultural context of the contemporary work environment is now strategically being used to attract and retain an age-diverse workforce by providing an environment that fosters creativity and productivity (Earle, 2003). Researchers have reported that the employees in their studies perceived their workspace layouts as playing an active role in supporting their work patterns and interactions, and they viewed their work culture as an environment that encourages creativity (Cokpekin & Knudsen, 2012; Vischer, 2008). The creative ability and creative thinking of employees was and still is an asset important to organizational growth (Dul & Ceylan, 2011). Companies continue to seek to encourage individual perceptions of creativity by designing physical work environments that are conducive to fostering the creative process (Dul & Ceylan, 2011).

Research on the effect of the work environment on individual perceptions of creativity has been reported through a variety of different elements, such as interior design elements (aesthetic objects); interior architectural surroundings (arrangement of workspace areas); and ambient conditions (light, sound, temperature). When combined, these elements influence how workers perceive their particular work environments (Hoff & Öberg, 2014). Mixed results on physical work environments have indicated that work environments affect employees' creative performance relates to the dependency of said performance on psychosocial elements within workplace environments (Vithayathawornwong, Danko, & Tolbert, 2003). Other research has reported that physical work environments are an independent source in influencing creativity when combined with individuals' personality traits and psychosocial work environments (Dul,

Ceylan, & Jaspers, 2011).

Elements that influence creativity in the work environment have been the focus of creativity studies, but little attention has focused on the characteristics of physical work environments that foster or hinder individual perceptions of creativity (Hoff & Öberg, 2014). Research on the impact of work environments on creativity has produced a wide range of results based on personality traits, job functions, and psychosocial perceptions of employees (Hoff & Öberg, 2014). Lee and Brand (2005) reported that employees who felt that they were not in control of the elements such as lighting, distractions, and noise levels within their work environments perceived their physical workspace layouts as not conducive to creative thinking. Toker and Gray (2008) reported that the proximity of employees in open workspaces can fosters collaboration among employees, which facilitates the creative process.

Research on the work environment has focused on employees' job performance, productivity, and job satisfaction (Haynes, 2011; Vischer, 2008). The most common elements that have been studied are the effects of ambient conditions, that is, noise levels and distractions, and the psychosocial factors that can have a positive or a negative impact on employees' behaviors (Vischer, 2008). Positive ambient conditions can create positive moods and positive perceptions of individuals' work environments (Dul et al., 2011; Forgas & George, 2001).

Research of workers in defined, traditional and open, nontraditional work environments has determined that differences and commonalities exist among workers based on psychosocial and physical elements within those work environments based on

job complexity (Roper & Juneja, 2008); control of elements within the work environments (Kim & de Dear, 2013); and privacy and distractions levels (Rasila & Rothe, 2012). Understanding how physical work environments can affect individual perceptions of creativity can help management to design and create workspace layouts that encourage the development and implementation of creative ideas among a diverse workforce (Dul & Ceylan, 2011). This knowledge can contribute to the success of organizations because workers feel creative and productive when they perceive that their physical work environments are enhancing their creativity (Joy & Haynes, 2011).

Although evidence has suggested that individual perceptions of creativity can be fostered or hindered by different workplace environments, factors other than generational cohort membership, such as age and gender, also can influence individual perceptions of creativity (Foss et al., 2013). Generational cohorts can be influenced differently in their physical work environments, not only because they share significant life experiences (Kupperschmidt, 2000) but also because needs and preferences of individuals vary (Rothe et al., 2012). Individuals might have been impacted by generational cohort membership during their formative years, but as they progress through life, it is the passage of time not generational cohort membership, that can be attributed to changes (Queiri, Wan Yusoff, & Dwaikat, 2014). As they progress through life, they continue to adapt to their surrounding circumstances and environments.

Age-Related Changes

Generational effects are inherently confounded with the effects of life cycle and historical period (Costanza & Finkelstein, 2015). Age is distinguished from the formative

years that define generational cohort membership because life cycles are dynamic as social and historical events evolve (Lyons, Urick, Kuron, & Schweitzer, 2015). The changing effects from various life cycle perspectives (i.e., childhood, adolescence, adulthood, and old age) can increase the ability of individuals to adapt to change (Cogin, 2012). Understanding age-related changes within a generational cohort range could determine how individuals perceive the changing work environments. Other factors, aside from generational cohort membership, such as age, can be attributed to individuals' differences and commonalities.

Organizations comprise complementarities between and among workers who create a workforce that is productive based on its strengths as a whole, not the sum of its parts (Ennen & Richter, 2009). An age-diverse workforce consists of employees with specific knowledge, values, and preferences that can increase creative thinking when they are combined (Backes-Gellner & Veen, 2012). A cohort range holds a great deal of diversity, which results in not all individuals in that cohort attributing the same meanings based on shared experiences (Zemke et al., 2000). Consequently, analyzing chronological age can be a better indicator to assess changing aspects of the physical and social environments that influence cognitive functioning (Salthouse, 2013). Separating the effects of generational cohort membership and development stage is difficult because their influences can intersect and produce similar behaviors from employees (Costanza & Finkelstein, 2015). Understanding whether an age-diverse workforce is influenced by the stage of age development or by generational cohort membership can provide insight into strategically leveraging the talents of employees (Backes-Gellner & Veen, 2012).

The literature pertaining to work environments and creativity has reflected individuals' perceptions of their situations (Kristensen, 2004). Cognition and emotion are influenced by the physical realities of individuals' situations, and the process of creativity allows individuals to adapt to the physical realities of the changing influences in environments and generate new ideas that bring new insight into how to respond to situations (Kristensen, 2004). Creativity involves a complex set of cognitive processes based on perceiving, planning, deciding, and appreciating that can change to adapt to creative processes at different age stages (Martens, 2011) based on cultural and physical surroundings (Kristensen, 2004).

Employees' creative outcomes are a function of multiple cognitive processes that are enhanced or hindered by individuals' positive and negative reactions (Baas, Nijstad, & De Dreu, 2015). Kanfer and Ackerman (2004) indicated that cognitive changes affect younger and older individuals differently based on level of fluid intelligence (i.e., abstract reasoning, ability to process new information, and working memory) versus crystallized intelligence (i.e., knowledge accumulated over a lifetime). An age-diverse workforce can contain a greater pool of problem-solving skills, an element of the creative process that can increase creative thinking (Backes-Gellner & Veen, 2012).

Ng and Feldman (2008) found that differences between younger and older workers were the result of needs and expectations based on career stage development, not generational cohort membership. Because of this, the researchers suggested that the abilities of employees performing job functions were not affected negatively by age development and cognitive stage. Similarly, Drabe et al. (2015) found that although

cognitive abilities of workers were different based on job satisfaction, younger and older workers were cognitively skilled for the jobs that they were performing. Backes-Gellner and Veen (2012) reported that age diversity had a positive impact on productivity based on the creativity of employees. Employees who engaged in more creative and challenging tasks rather than routine and predictable tasks were more productive because of their ability to pool their cognitive problem-solving skills to solve problems and generate new ideas creatively (Backes-Gellner & Veen, 2012).

Ng and Feldman's (2012) research on stereotypes of older workers determined that contrary to stereotypical beliefs, older workers are not resistant to change in the work environment and are adaptable and confident in their ability to disseminate and implement new ideas. Understanding the unique characteristics of employees and age development is important for managers to avoid bias in stereotyping their employees (Hedge et al., 2006). Separating reality from myth can help organizational leadership to design physical workspace layouts that are effective in melding the commonalities of age-diverse workers by providing flexible work environments that meet their needs and expectations (Deal, Altman, & Rogelberg, 2010).

Age and the influence of the surrounding workplace environment have an impact on different age groups because life experiences and life stages reflect different cognitive levels (Salthouse, 2010). Understanding employees' cognitive development stages can give managers insight into the job performance, skills, and abilities of workers (Kanfer & Ackerman, 2004). Leveraging the cognitive abilities of an older skilled workforce can help to recruit, retain, and motivate those employees, as well as enhance their

performance (Drabe et al., 2015). Similarly, younger workers entering the workforce who have strong cognitive capabilities based on educational background can contribute to organizational growth by contributing new information and skills (Hanushek & Woessmann, 2008).

Generational Theory

Rather than chronological age, membership in a specific generational cohort might be an important factor in workspace design and creativity (Haynes, 2011). Generational identity is most widely referenced in the seminal work of Mannheim (1928/1972). Mannheim's theory of generations emphasized the importance of generations in a society and how its members are shaped by shared events and experiences based on a common point in historical time. Mannheim defined generational members by the shared experiences, not shared birth years, that create a concrete bond between the members within a generation

Mannheim (1928/1972) proposed that the existence of generations has its genesis in individuals' formative years. As new participants in a generational cohort emerge, former participants continually disappear, and these generational cohort members participate only in a temporally limited section of the historical process. As the process evolves and continues, the need for constant transmission of knowledge from the disappearing generational cohort members to the emerging generational members keeps the inventory of experience shared with the current members (Mannheim, 1928/1972).

Supporters of the multigenerational theory have argued that individuals' beliefs, values, attitudes, and expectations in the workplace are influenced by their formative

years based on their experience of social and historical events (Glass, 2007; Mannheim, 1928/1972). To maintain productive and creative work environments and satisfaction among employees, organizations must maximize the talent of each generational cohort and create an organizational culture that optimizes generational diversity (Kupperschmidt, 2000; McGuire, By, & Hutchings, 2007).

Cohort Analysis Theory

The cohort analysis theory (Mason & Wolfinger, 2001) posited that individuals enter a system at the same time and have similarities that are the result of shared experiences based on cohort effects, age effects, and period effects Age effects represent individuals' views and attitudes. These views and attitudes influence individuals' behaviors as the individuals mature, and period effects refer to the impact of individuals' environments on their values, behaviors, and attitudes at particular points in time (Parry & Urwin, 2011).

Individuals of a specific generation do not necessarily interpret their shared societal experiences in the same ways, so chronological age often has been used by researchers to understand individuals' physical, social, emotional, and cognitive development (Pitt-Catsouphes, Matz-Costa, & Besen, 2009). Understanding how age development is related to outcomes such as creativity can provide insight into the contextual factors that influence workers' behaviors within their work environments (Hedge et al., 2006; Kanfer & Ackerman, 2004).

Generational Cohort Membership

Generational cohort membership has been defined as individuals who share a specific age range and who have experienced similar environmental and social experiences, for example, historical, political, and economic events and situations (Hannay & Fretwell, 2011; Kupperschmidt, 2000). Generation theorists have posited that the age ranges of generational cohorts are based on traumatic historical events and important social change (Mannheim, 1928/1972; Strauss & Howe, 1991). Generation theorists and developmental psychologists have argued that the generation cohort range is established during individuals' formative years because the formative years leave the greatest imprint on individuals (Mannheim, 1928/1972; Strauss & Howe, 1991). Generational cohorts bring different values, attitudes, skills, and expectations to the job (Lester et al., 2012), and as individuals mature through major life events, they develop values, attitudes, and traits that differentiate them from other generational cohorts (Macky et al., 2008).

Generational cohort membership is not based on age, but on the social, historical, and demographic events that define the period into which the individuals in that cohort were born (Johnson & Johnson, 2010). Generational cohorts comprise individuals who are part of a unique membership by the coincidence of birth years and shared defining experiences (Johnson & Johnson, 2010; Zemke et al., 2000). The researcher of the current study focused on the Millennial, Generation X, and Baby Boomer cohorts because they continue to represent the majority of the workforce.

Generational Cohort Characteristics

Research and the popular literature have attempted to find characteristics that are distinctive to each generational cohort (Giancola, 2006; Kupperschmidt, 2000). The characteristics associated with generational cohorts can provide management with insight into how the members of a multigenerational workforce interact with each other in different physical work environments (Finkelstein et al., 2013) based on the beliefs, preferences, and attitudes of each member (Arsenault, 2004). Key characteristics associated with the different generational cohorts are discussed next.

Baby Boomers. Baby Boomers are the segment of the population defined as individuals born between 1946 and 1964 (Pew Research Center, 2015). They represent the largest cohort based on the number of births (Crumpacker & Crumpacker, 2007). Baby Boomers are more than a product of the postwar era; they also are the product of the positive and optimistic times resulting from the economic expansion in the United States (Zemke et al., 2000). By 1964, more than 76 million Baby Boomers had been born into nuclear families (Zemke et al., 2000). The size of the Baby Boomer cohort instilled in its members the importance of teamwork and collaboration (Kupperschmidt, 2006; Zemke et al., 2000), and the preference to communicate with people face to face (Zemke et al., 2000).

Baby Boomers prefer work environments that can accommodate closed off areas for private meetings to uphold confidentiality (Joy & Haynes, 2011). They value the acoustic privacy and quality of meeting spaces (O'Neill, 2010). Baby Boomers are realistic and place their emphasis on earning a living (Chan, Hui, Cheng, & Ng, 2013),

and they seek to develop their expertise in the use of social media and newly developed technology (Gratton, 2011).

Generation X. Generation X are the segment of the population defined as individuals born between 1965 and 1980 (Pew Research Center, 2015). They are the smallest cohort in number of births, representing a population of 51 million (Crumpacker & Crumpacker, 2007; Kupperschmidt, 2000; Zemke et al., 2000). Generation X grew up with women's liberation protests, Watergate, and corporate downsizing, and they are characterized as having a "survivor's mentality" of self-reliance and independence. They also value diversity, are technologically savvy, and are unimpressed by authority (Kupperschmidt, 2006; Zemke et al., 2000).

Generation X workers are interested in staying current with their skills for personal gain (Lowe, Levitt, & Wilson, 2011). They are not willing to commit to their employers for their entire working lives (Eisner, 2005; Johnson & Johnson, 2010). Because of this lack of commitment, management seek to retain them by providing work environments that satisfy their preferences (Johnson & Johnson, 2010). Generation X, like Baby Boomers, prefer closed off areas to hold meetings in order to uphold confidentiality (Joy & Haynes, 2011). Generation X value engaging work environments and seek emotional security at work (O'Neill, 2010).

Millennials. Millennials are the segment of the population defined as individuals born between 1981 and 1997; they also are known as Generation Y (Pew Research Center, 2015) and are the largest generation to enter the workforce (Crumpacker & Crumpacker, 2007). The BLS (2015) reported that the Millennial population of 83.1

million members represent one quarter of the U.S. population. They are the largest cohort, even surpassing the Baby Boomers. Millennials have experienced 9/11, the Columbine massacre, globalization, and 24-hour news broadcasts, and they have been depicted as being confident, optimistic, achievement oriented, and technologically connected via social networks (Crumpacker & Crumpacker, 2007; Howe & Strauss, 2000; Zemke et al., 2000). Millennials are constantly connected through mobile devices that allow them to multitask and gather and share information quickly (Gorman, Nelson, & Glassman, 2004; Howe & Strauss, 2000; Joy & Haynes, 2011).

Millennials seek flexible and casual physical work environments that promote creativity and facilitate socializing and collaborating with colleagues (Lowe et al., 2011). Like Generation X, Millennials seek engaging work environments (O'Neill, 2010). They also seek meaningful jobs that value their creativity (Chan et al., 2013). Millennials want to work for companies whose progressive visions and brand identities are reflected in the physical work environments (Haynes, 2012).

Generational Cohort Preferences

The prevailing belief that there are different workplace preferences among generational cohorts has led some organizations to examine the various needs of generational cohort members in order that they have cohesive and productive workforces (Hillman, 2014). As organizational leaders reevaluate the utilization of physical work environments, one issue facing them is the effect of workspace layouts on individual perceptions of creativity based on generational cohort membership (Haynes, 2011; O'Neill, 2010; Meerwarth et al., 2008). Organizations that want a competitive advantage

rely on their ability to generate new ideas (Politis, 2005), so and designing physical work environments that foster creative thinking can lead to commercial success (Arsenault, 2004; O'Neill, 2010; Politis, 2005). However, understanding the needs and expectations of a multigenerational workforce is important to create workspaces that leverage the commonalities and strengths of each generational cohort and encourage creative thinking among employees (Foss et al., 2013).

Researchers have determined that the unique characteristics and preferences of cohort members can influence workers' behaviors based on the ways in which physical work environments are structured (Haynes, 2011; Joy & Haynes, 2011). Understanding these characteristics and preferences can provide insight into how to structure different physical work environments (Haynes, 2011). For example, Baby Boomers value formal meetings and teamwork; Generation X workers value collaborating with colleagues and working on their own; and Millennials value socializing, collaborating, and working with creative people (Joy & Haynes, 2011). With such knowledge of generational cohort preferences, workspace layouts can be designed to provide Baby Boomers with work areas for formal meetings, Generation X workers with private space, and Millennials with areas conducive to collaborative work (Joy & Haynes, 2011), thus accommodating each generational cohort.

Millennials are becoming the largest generational cohort in the workforce, and with this shift, human resource management are trying to understand the work patterns and expectations of this new generational workforce in order to attract and retain skilled individuals (Earle, 2003). Organizations that are financially able to transition from

defined, traditional workspace layouts to open, nontraditional workspace layouts can successfully engage the new generation of Millennials entering the workforce (Rikleen, 2014). Millennials do not want to inherit the defined, traditional workspace layouts of Baby Boomer and Generation X workers (Rikleen, 2014); instead, they want work environments that meet their needs and expectations (Earle, 2003; Lowe et al., 2011; Pfeffer, 2007). Knowing that generational cohorts have workplace preferences can help managers to design cohesive working environments amenable to all generational cohort members (Meerwarth et al., 2008) with the aim of minimizing potential conflict and miscommunication among workers (Hillman, 2014).

Generational Cohort Research

As contemporary organizations adapt to a demographic shift in the workforce, physical work environments are being designed to provide engaging work experiences that support the diverse needs of generational cohorts (O'Neill, 2010). Empirical evidence on generational cohorts and their workplace preferences has yielded mixed findings because individuals can be impacted more readily by the maturation process, life stage, and socioeconomic status than by the shared experiences that come with generational cohort membership (Hernaus & Pološki Vokic, 2014; McElroy & Morrow, 2010).

Most empirical research available on generational cohorts and physical work environments has reported on employees' perceptions of their workspaces based on job satisfaction, work conflict, personality traits, values, and attitudes (Crumpacker & Crumpacker, 2007; Earle, 2003; Smola & Sutton, 2002). Researchers have determined

that the behaviors manifested by generational cohort members are more the result of the values formed during their formative years than the progression of age and maturation (Crumpacker & Crumpacker, 2007; Earle, 2003; Smola & Sutton, 2002).

Crumpacker and Crumpacker (2007) reported that employees' behaviors in their particular work environments could be the result of the beliefs, values, and expectations of their generational cohort membership. In addition, personality traits, values, and attitudes can influence how employees perceive their work environments. These findings indicate that accommodating the workspace layout preferences of generational cohorts can influence their behaviors positively and enhance their creative thinking (Bell, 2008; Foss et al., 2013). Employees' perceptions of their work environments legitimize their realities and drive their behaviors that directly or indirectly influence creative thinking (Bell, 2008; Foss et al., 2013).

Research on physical workspace layouts has determined that preferences and commonalities exist among generational cohorts (Joy & Haynes, 2011; Pitt-Catsouphes & Matz-Costa, 2008). Joy and Haynes (2011) noted that Baby Boomer and Generation X workers value confidentiality and prefer physical workspace layouts that include closed spaces to accommodate meetings. McElroy and Morrow (2010) determined that employees in defined, traditional office layouts, versus employees reassigned to open, nontraditional office layouts, have generational commonalities. They asserted that Baby Boomer and Generation X workers perceive redesigned open, nontraditional workspaces as smaller and more distracting than defined, traditional workspaces. McElroy and Morrow determined that employees who perceive their workspaces to be adequate view

their organizations positively and negatively if the workspaces are not perceived as adequate. Millennials are not affected by changes in workspace layouts, perhaps because of their lack of experience in defined, traditional workspaces (McElroy & Morrow, 2010).

Pfeffer (2007) reported that Millennials expect physical work environments to be flexible and conducive to informal mingling with coworkers and sharing of information. Lowe et al. (2011) determined that the layouts of physical work environments are part of a Millennial worker's criteria for accepting job offers and for remaining with organizations. Rasila and Rothe (2012) reported that Millennials, although aware of distractions and noise levels, like open, nontraditional workspaces and do not view issues such as noise levels as negative. Millennials perceive contemporary open, nontraditional, and flexible work environments as normal components of progressive companies (Lowe et al., 2011).

The literature on generational cohorts has not produced empirical research specifically pertaining to whether workspace layouts impact individual perceptions of creativity across generational cohorts. This lack of research highlights the relevance of this study in helping to bridge existing gaps. The literature has, however, determined that commonalities exist among the three generational cohorts and that managers can leverage this knowledge to create cohesive workgroups by aligning their work environments to meet the needs and expectations of the members of each generational cohort.

Creativity

As companies grow globally, creativity and innovation have become critical to organizational success and long-term survival (Anderson et al., 2014; Shalley, Zhou, & Oldham, 2004). Innovation is the implementation of new ideas; without creativity, innovation cannot exist, and without creativity at an individual level ideas and products cannot be implemented at an organizational level (Coelho, Augusto, & Lages, 2011; Woodman et al., 1993). Companies aggressively seek to gain a competitive advantage in their industries by increasing and expanding creative and innovative products and services (Shalley et al., 2004).

Research over the past few decades on workplace creativity has focused on employees in job-specific functions that require creativity as a prerequisite (Foss et al., 2013). Previous researchers have conceptualized creativity as individuals' dispositions or traits (Barron & Harrington, 1981) or the output of employees in creative professions, such as architects, graphic design artists, or engineers (Ford, 1996; Hoff & Öberg, 2014; Stokols et al., 2002). However, in contemporary organizations, leaders view creativity as the responsibility of all employees, not just those employees assigned to creative job functions (Foss et al., 2013; Shalley & Gilson, 2004). Individual perceptions of creativity are the result of creative ability, which can be activated by supporting factors within the individuals' work environments (Amabile et al., 1996). As employees interact within their work environments, their perceptions of situations either inhibit or facilitate creative thinking (Hsu & Fan, 2010).

Individual perceptions of creativity can allow individuals to problem solve at a high level that generates new opportunities, ideas, processes, and products, and is critical to organizations' competitiveness (McWilliam & Haukka, 2008). Creativity is inherent in human nature, and because of this innate characteristic, individuals possess different levels of creativity (Maslow, 1968). These innate characteristics allow individuals to process and assimilate information to generate new ideas (Amabile, 1988; Shalley & Gilson, 2004). This study focused on individual perceptions of creativity that are affected by physical workspace layouts based on generational cohort membership.

Creativity Theory

The theoretical foundation for understanding individual perceptions of creativity is based on two models, namely, the componential model (Amabile, 2012) and the interactionist model (Woodman et al., 1993). The componential model proposes that elements in different work environments can foster individual perceptions of creativity through contextual influences such as organizational and management encouragement of creativity, job autonomy, and sufficiency of resources (Amabile, 2012). The interactionist model of organizational creativity proposes that creativity is a complex interaction between individuals and their work situations based on situational and behavioral factors at the individual, team, and organizational level (Cokpekin & Knudsen, 2012; Woodman et al., 1993). Woodman et al. (1993) proposed that individual creativity is enhanced or inhibited at work by antecedent conditions (biographical variables), cognitive ability (divergent thinking), personality (self-esteem), social influences (rewards), and contextual influences (physical environment). The physical work environments of

contemporary organizations can influence creativity among employees by fostering or inhibiting employee creativity (Amagoh, 2008; Schneider & Somers, 2006).

Creativity Research

Employees' creativity contributes to organizational productivity and can help organizations adapt to changing business environments (Anderson, De Dreu, & Nijstad, 2004). Researchers have reported that when environmental conditions are conducive to fostering the creative process, individuals are more likely to be creative (Amabile et al., 1996; Paulus & Nijstad, 2003). Literature pertaining to the relationship between the work environment and creativity has reflected individuals' perceptions of their situations (Kristensen, 2004). Cognition and emotion are influenced by the physical realities of situations, and the process of creativity allows individuals to adapt to the physical realities of changing influences and generate new ideas that bring new insight (Kristensen, 2004). Creativity involves cognitive processes based on perceiving, planning, and deciding that adapt and change based on individuals' age stages (Martens, 2011) and cultural and physical environmental influences (Kristensen, 2004).

Employees' creative outcomes are the function of multiple cognitive processes, and these processes are enhanced or hindered by individual perceptions of creativity towards positive and negative reactions (Baas et al., 2015). Ohly, Sonnentag, and Pluntke (2006) reported that fluid intelligence influences creativity, meaning that cognitive ability to problem solve and process new information contributes to the creative process. Similarly, crystallized intelligence influences creativity because the more experience and knowledge that individuals have in their job function, the more that individuals'

perceptions of creativity within their areas of expertise can increase (Ohly et al., 2006). A multigenerational workforce can contain a greater pool of problem-solving skills, an element of the creative process that can increase creative thinking (Backes-Gellner & Veen, 2012).

Stokols et al. (2002) reported that physical work environments, combined with psychosocial elements, can influence employees' creativity. They determined that employees' perceived support for creativity can be reduced by higher distractions such as noise levels, lack of privacy, and foot traffic. Backes-Gellner and Veen (2012) reported that employees who engage in more creative and challenging tasks rather than routine and predictable tasks are more productive because of their ability to pool their cognitive problem-solving skills to solve problems creatively and generate new ideas.

Individual perceptions of creativity are influenced by antecedent conditions, cognitive style and ability, personality factors, motivation, incentive, organization and job fit, and social and contextual influences (Woodman et al., 1993). Research has determined that elements in physical work environments can influence creativity based on employees' moods, which are influenced by psychosocial elements within workplace environments (Dul & Ceylan, 2011); however, research of how physical workspace layouts enhance employees' creativity has been limited (Kristensen, 2004). Hoff and Öberg (2014) reported that the individuals in their study viewed elements in their physical work environments as having a positive influence on creativity when combined with elements of psychosocial, functional, and inspirational support within the work environment as a whole. Workers preferred flexible physical workspaces to

accommodate different job tasks (Hoff & Öberg, 2014). The layout preferences of workers were positive when psychosocial and inspirational support from management fostered creative thinking and creative processes (Hoff & Öberg, 2014).

Kallio et al. (2015) reported that the employees who were relocated from a defined, traditional building to an open, nontraditional building increased their interactions and collaboration with coworkers. Kallio et al. determined that the physical space, from an organizational level, could support an organizational culture that is conducive to creativity. Researchers have determined that workers who view the aesthetics of their work environments as pleasing and stimulating also view them as enhancing their perceptions of creativity (Kallio et al., 2015; McCoy & Evans, 2002).

The fast-paced economy of the United States and increased globalization have made fostering individual perceptions of creativity a necessity in different work environments, resulting in organizations must take advantage of promoting work environments conducive to increasing individual perceptions of creativity (Rego, Machado, Leal, & Cunha, 2009). Creativity within the business environment is essential to organizational success (Kallio et al., 2015). However, literature on creativity has been limited because creativity is subjective and difficult to measure (Kallio et al., 2015). Creativity is encouraged through innovative and dynamic workplaces, and understanding commonalities in the workforce based on generational cohort membership can help managers to design physical workspace layouts that facilitate creative thinking (Deal et al., 2010).

Summary and Transition

The review of the literature found consistent themes among companies that include the need to adapt to flexible workspaces to accommodate economic needs, organizational needs, and the needs and expectations of a multigenerational workforce. Similarly, companies have strategically focused on designing work environments to foster individual perceptions of creativity in order to attain and retain a talented multigenerational workforce for company growth. Empirical research predominately has consisted of the effects of psychosocial elements associated with workplace environments rather than on the effects of physical work environment layouts on individual perceptions of creativity.

There has been a lack of empirical evidence on the individual perceptions of creativity of a multigenerational workforce based on the effects of physical work environments (Kallio et al., 2015; Martens, 2011). The lack of empirical evidence aligning physical work environments with individual perceptions of creativity was the impetus for this study and the need to bridge the gap in research. The literature has determined that psychosocial elements within work environments contribute to employees' perceptions that these work environments are creative, but the literature has not shown directly whether physical work environments influence individual perceptions of creativity (Kallio et al., 2015). Understanding the characteristics that influence the perceptions of generational cohort members can be advantageous to human resource managers in structuring physical work environments to align with organizational and employee needs (Joy & Haynes, 2011).

As physical workspace layouts continue to evolve, the professional and social needs of workers requires understanding the complex interactions of a multigenerational workforce and providing workers with physical work environments that meet their cohort-specific needs and expectations (Davis et al., 2011). Employers are creating physical work environments as part of their contemporary image and brand strategies to attract and retain individuals across all generations by leveraging the commonalities of the workforce based on generational cohort membership and career stage development. Management can best leverage the skills and talents of workers by combining the knowledge of life stages and generational cohort characteristics to better understand the influencers of employee behavior (Parry & Urwin, 2011). This study sought to contribute to research focusing on physical work environments by understanding the needs of a multigenerational workforce in order to create a cohesive workgroup that can increase creative thinking among employees in order to sustain a competitive advantage and recruit and retain a competitive workforce (Parry & Urwin, 2011).

Chapter 3 provides information on target population and sample size, data collection, instrument validity and reliability, and elements of the demographics questionnaire. Also provided in Chapter 3 is an explanation of the quantitative, quasi-experimental methodology that used data from the aKEYS instrument to report on the individual perceptions of creativity of a multigenerational workforce; an iteration of the RQs and hypotheses, and information about the research design, ethical considerations, and data dissemination. Chapter 4 contains a report of sample demographics; data collection; and results of the data analysis, aligned with the RQs and their hypotheses,

and supported by statistics, tables, and figures. Chapter 5 contains an overview of the study, a discussion of the results and the limitations of the study, recommendations for future research, and implications for social change.

Chapter 3: Research Method

Introduction

Included in Chapter 3 is information about the research design and an explanation of the rationale for the methodology. The chapter also covers the target population, sample and sampling procedures, data collection, and data analysis. Also described in the chapter are the psychometric properties of the measurement instrument. The chapter concludes with a summary.

Research Design and Rationale

The researcher used a quantitative, quasi-experimental research design to examine the relationship between the independent variables (IVs) of generational cohort and workspace layout design (i.e., defined, traditional vs. open, nontraditional workspace layouts) and the dependent variable (DV) of individual perceptions of creativity. An ANOVA was used to test the hypotheses, and an additional analysis included descriptive statistics and post hoc tests. There was no manipulation of the variables, nor was there random assignment or control, so the use of a nonexperimental design was appropriate because the RQs and associated hypotheses were created to examine differences or similarities between the variables.

Target Population and Sample

A nonprobability sampling method was used. The researcher solicited the volunteers via LinkedIn network groups and Walden University's participant pool. To attain the appropriate sample size, an invitation seeking survey participation was sent to groups in LinkedIn, with access to the survey URL, which contained the informed

consent letter inviting their voluntary participation, explaining the purpose of the study, and informing them of their rights and ensuring their anonymity.

The minimum number of participants based on a stratified sample of three generational cohorts and two workspace layout types was calculated by G*Power, which conducted a power analysis for the planned ANOVA. It determined that a minimum sample of 90 participants was necessary to ensure a statistical power of .80 (Faul, Erdfelder, Buchner, & Lang, 2009). The expected statistical power of this test required a larger sample size because the goal was to obtain enough participants from each generational cohort. Therefore, the aim for generalizability generated a sample size of at least 150 participants, approximately 25 per cell stratified by three generational cohorts and two workspace layout types (Research Advisors, 2006).

The sample was comprised of participants who were employed in either defined, traditional workspaces or open, nontraditional workspaces. The employee participants had the appropriate technological capabilities to receive and complete an online survey. Participants had 4 weeks to complete the survey. Age was used to establish each participant's generational cohort membership. Type of workspace was obtained from the demographics questionnaire item responses that categorized participants in defined, traditional workspaces versus open, nontraditional workspaces.

Survey Instruments

The two surveys administered in this study were combined. The first was the demographics questionnaire (see Appendix A), and the second was the aKEYS measurement. Participants answered four demographics questions and then answered the

aKEYS measurement.

Demographics Questionnaire

The demographics questionnaire asked the participants to provide information regarding age, gender, and present workspace layout type, and whether they resided in the United States or elsewhere. Self-reported age was used to define the generational cohort range for each participant: individuals born between 1981 and 1997 (Millennials), 1965 and 1980 (Generation X), and 1946 and 1964 (Baby Boomers). Type of workspace was obtained to categorize participants as working in defined, traditional workspaces or open, nontraditional workspaces.

KEYS to Creativity and Innovation

The instrument used to measure individual perceptions of creativity was KEYS, which was developed by Amabile et al. (1999). The researcher chose KEYS because it is an assessment used in the corporate environment to examine the climate of creativity. KEYS also provided the appropriate psychometric properties required for research. In order to obtain permission to use KEYS a research request form and proposal was submitted to the Center for Creative Leadership (CCL, n.d.). The cost to use for research purposes KEYS was $100 when used. Approval to use KEYS was obtained from CCL (n.d.; see Appendix B).

KEYS is a 78-item measure that was adjusted by removing a scale (28 questions), per approval from CCL (n.d.). The adjusted survey is represented in tables and figures in Chapter 4 as aKEYS. For the current study, it contained 50 items in the form of positive and negative statements. Each item uses a 5-point Likert-type scale of responses ranging

from 1 (*never*) to 5 (*not applicable*). Topics in the aKEYS survey questions range from the production of new ideas to the contribution of creativity to the organization. Example items include, "We are encouraged to develop new ideas" and "Creative work is valued and recognized."

Validity and Reliability

Research has indicated that the psychometric properties of KEYS have demonstrated acceptable reliability and validity (Mathisen & Einarsen, 2004). The Cronbach's alpha for KEYS varies from .66 to .91, with a median of .84 (Amabile et al., 1996), indicating that it is a reliable instrument. KEYS, which has been recognized as authoritative and efficient when used with corporate participants, also has demonstrated face validity (Callahan, 2001). Discriminant validity was established by comparing KEYS to the Kirton Adaptation-Innovation Inventory (Kirton, 1976) and the Work Performance Inventory (Amabile, Hill, Hennesey, & Tighe, 1994), and convergent validity established moderate correlations with data from the Work Environment Scale (Insel & Moos, 1974). The test-retest reliabilities range from .71 to .94, indicating that it is a reliable instrument (Amabile et al., 1996; Culpepper, 2010). As aKEYS was modified, it was necessary to establish reliability independently. Cronbach's alpha was computed for the modified valid cases that were included in the ANOVA analysis. An alpha of .92 was consistent with a high degree of internal reliability reported for KEYS.

Research Questions and Hypotheses

This study sought to determine whether individual perceptions of creativity were different based on generational cohort and workspace layouts. The following RQs and associated hypotheses were designed to address the gap identified in the literature:

RQ1: Does generational cohort affect individual perceptions of creativity?

H_{01}: Generational cohort (Millennials, Generation X, or Baby Boomers) does not affect individual perceptions of creativity, as measured by aKEYS.

H_{a1}: Generational cohort (Millennials, Generation X, or Baby Boomers) does affect individual perception of creativity, as measured by aKEYS.

RQ2: Does workspace layout affect individual perceptions of creativity?

H_{02}: Workspace layout (defined, traditional vs. open, nontraditional layout) does not affect individual perceptions of creativity, as measured by aKEYS.

H_{a2}: Workspace layout (defined, traditional vs. open, nontraditional layout) does affect individual perceptions of creativity, as measured by aKEYS.

RQ3: Do workspace layout and generational cohort affect individual perceptions of creativity?

H_{03}: Workspace layout (defined, traditional vs. open, nontraditional layout) and generational cohort (Millennials, Generation X, or Baby Boomers) do not affect individual perceptions of creativity, as measured by aKEYS.

H_{a3}: Workspace layout (defined, traditional vs. open, nontraditional layout) and generational cohort (Millennials, Generation X, or Baby Boomers) do affect individual perceptions of creativity, as measured by aKEYS.

Data Collection

Data collection was initiated by providing the participants with access to an online survey administered by SurveyMonkey, an online survey software company used to collect data securely. Participants were targeted via LinkedIn and Walden University's participant pool. Participants targeted on LinkedIn received an introductory invitation to complete the survey. The informed consent letter was part of the survey that the participants saw when they accessed the survey via SurveyMonkey. Once the participants agreed to consent to join the study, they were directed to the survey. Participants had 4 weeks to complete the survey, after which time the researcher securely transferred the data from SurveyMonkey into SPSS for analysis.

Data Preparation

Before analyzing the data, the researcher examined the raw data to find and eliminate any potential errors, such as missing data or data that did not met the exclusion criteria. Data preparation included the reverse coding of negatively worded survey items and the multiple imputation of missing data items. Data preparation is discussed in detail in Chapter 4.

Data Analysis

To estimate the effect of the IVs of generational cohort and workspace layout on the DV of individual perceptions of creativity, the researcher conducted an ANOVA and post hoc *t* tests to examine the main effects or interaction effects present in generational cohorts and workspace layout based on individual perceptions of creativity. An omnibus test was run to assess the main effects and interactions of generational cohorts and

workspace layout based on perceptions of creativity. The benefit of an ANOVA was that it helped the researcher to determine whether there were any significant differences between the means of the IVs in order to understand whether differences existed before examining the interaction of the IVs.

The ANOVA analysis determined whether there was a statistically significant difference in the main effect of individual perceptions of creativity total scores across generational cohort (Millennials, Generation X, or Baby Boomers) and for workspace layout (defined, traditional vs. open, nontraditional) on aKEYS total scores. Planned post hoc tests were conducted to examine pairwise comparisons among the variables. Additional analysis included separate one-way ANOVAs for generational cohort and workspace layout.

The researcher entered the raw data into SPSS. The data from aKEYS examined creativity scores based on the ANOVA results. Descriptive statistics were calculated via SPSS, and the data were analyzed to ensure that the assumptions of an ANOVA were passed, namely, that the DV was measured at a continuous level, the two IVs consisted of two or more categorical groups, there was independence of observations, there was homogeneity of variances for each combination of the groups, and they were normally distributed without being strongly affected by outliers (Field, 2013).

RQ1: Does generational cohort affect individual perceptions of creativity?

H_{01}: Generational cohort (Millennials, Generation X, or Baby Boomers) does not affect individual perceptions of creativity, as measured by aKEYS.

H_{a1}: Generational cohort (Millennials, Generation X, or Baby Boomers) does

affect individual perception of creativity, as measured by aKEYS.

Null Hypothesis 1 was tested by conducting an ANOVA to test for significance of generational cohort on its own.

RQ2: Does workspace layout affect individual perceptions of creativity?

H_{02}: Workspace layout (defined, traditional vs. open, nontraditional layout) does not affect individual perceptions of creativity, as measured by aKEYS.

H_{a2}: Workspace layout (defined, traditional vs. open, nontraditional layout) does affect individual perceptions of creativity, as measured by aKEYS.

Null Hypothesis 2 was tested by conducting an ANOVA to test for significance of workspace layout on its own.

RQ3: Do workspace layout and generational cohort affect individual perceptions of creativity?

H_{03}: Workspace layout (defined, traditional vs. open, nontraditional layout) and generational cohort (Millennials, Generation X, or Baby Boomers) do not affect individual perceptions of creativity, as measured by aKEYS.

H_{a3}: Workspace layout (defined, traditional vs. open, nontraditional layout) and generational cohort (Millennials, Generation X, or Baby Boomers) do affect individual perceptions of creativity, as measured by aKEYS.

Null Hypothesis 3 was tested by conducting an ANOVA to examine the main effects or interaction effects present in generational cohorts and workspace layout based on individual perceptions of creativity.

The assumptions included that there was independence of observations and equal variance in the population (Field, 2013). Post hoc tests were conducted to examine the pairwise comparisons of generational cohorts and workspace layout, and individual perceptions of creativity. The post hoc test selected to analyze the pairwise comparisons was Tukey, which controlled Type 1 error.

The aim of the study was to examine individual perceptions of creativity that are affected by the physical workspace layouts based on generational cohort membership. The overall interpretation of the results can provide stakeholders with a summary of the data by identifying similarities and differences in individual perceptions of creativity based on types of workspace layout and generational cohort. The findings can continue to build upon previous research as the composition of the workforce continues to change and adapt to the physical work environment based on changing organizational needs and a new multigenerational workforce.

Ethical Considerations

The study was conducted by following Walden University's Institutional Review Board's (IRB approval #05-13-16-0369901) research guidelines for ethical standards as well as the ethical standards of U.S. federal regulations. The welfare, rights, and privacy of the participants were safeguarded during the study. Participants were informed of their rights through an informed consent form that was accessible to them electronically with the online survey. The consent form contained the purpose, procedures, and time duration of the study. The consent form also informed the participants that their participation was voluntary, no harm would come to them by their being in the study, and they could

withdraw from the study at any point without repercussions. They were informed of their right to privacy and the researcher's assurances of maintaining their anonymity. The participants were informed that they would not receive any compensation for joining the study. Even though there was minimal risk to the participants of being in the study, the participants received the researcher's contact information and information about the procedure to withdraw voluntarily by exiting from SurveyMonkey by closing their browsers. The participants provided voluntary consent by clicking on a consent button prior to proceeding to the survey.

Data Dissemination

Aggregated data were compiled into a data set in which no personal identifiers of the participants existed. The data were then formatted and cleaned in SPSS. Providing the data to CCL (n.d.) is a requisite for use of KEYS. CCL provided a letter ensuring that the data were being stored internally and that the organization was abiding by the same ethical guidelines as Walden University's IRB for research best practices. Walden University's IRB approved the request to provide CCL with the research data, provided that the request was documented in the IRB application.

Summary and Transition

Chapter 3 provided the rationale for the research design and the methodology for the selection of the nonexperimental design used to examine RQs and hypotheses. Also described were the methods and procedures that the researcher used to obtain the target population and sample, along with the survey instruments (demographics questionnaire and aKEYS). The researcher explained the data collection and data analysis procedures,

as well as the ethical standards and guidelines required when using human participants. The study is expected to contribute to the literature by determining whether individual perceptions of creativity are affected by generational cohort membership and workspace layout design.

Chapter 4 reports sample demographics, data collection, descriptive statistics, and results of the data analysis. The results of the data analysis are aligned with the RQs and their hypotheses, and they are supported by statistics, tables, and figures. Chapter 5 provides an overview of the study and a discussion of the results and limitations of the study. It expounds on the meaning of the findings, the importance of the findings, and the implications for social change. Also provided in Chapter 5 are recommendations for future research.

Chapter 4: Results

Introduction

The purpose of this study was to understand the affect of workspace layouts on individual perceptions of creativity across generational cohorts. Looking for likely relationships between individual perceptions of creativity based on workspace layout (i.e., defined, traditional workspace; open, nontraditional workspace; or some combination of both) as a function of generational cohort defined by three groupings: Millennials (19-35 years), Generation X (36-51 years), and Baby Boomers (52-70 years) was examined secondary purpose of the study. The study was designed to follow a two-way factorial model (i.e., three levels of cohort x two levels of workspace) to facilitate a direct statistical evaluation of the RQs with a standard 3 x 2, between-cases ANOVA. In this design, aKEYS served as a measure of the DV, individual perceptions of creativity. The design, characterized by the interaction of the two IVs, generational cohort and workspace layout, is reported through the statistical outcomes presented in order of the three RQs.

The first research question examined the possible existence of an independent relationship between generational cohort and individual perceptions of creativity. Alternative Hypothesis 1 stated that a true relationship of the main effect of cohorts was statistically evaluated against Null Hypothesis 1 of no significant relationship of the main effect of cohorts. RQ1 examined differences across Millennials, Generation X, and Baby Boomers based on individual perceptions of creativity. If differences existed among generational cohorts based on individual perceptions of creativity, the alternative

hypothesis would suggest that there was a relationship of generational cohort membership and individual perceptions of creativity, thus suggesting a statistically significant main effect for the cohort factor. If there were no differences in individual perceptions of creativity based on generational cohort membership, there would be no significant effect consistent with the null hypothesis, suggesting no relationship for the cohort factor.

The second research question examined whether a true independent relationship existed between workspace layout and individual perceptions of creativity. RQ2 was statistically evaluated by the main effect of workspace layout. The alternative hypothesis examined whether there was a true relationship in individual perceptions of creativity based on whether employees worked in defined, traditional workspaces versus open, nontraditional layouts. If there were no differences in individual perceptions of creativity based on workspace layout, there would be no significant effect consistent with the null hypothesis, suggesting no relationship for the workspace layout factor.

Finally, the third research question examined whether a true dependent relationship existed between generational cohort and workspace layout, and addressed the interaction of generational cohort by workspace layout used to assess individual perceptions of creativity for the six categories formed by pairing each of the three levels of generational cohort with the two levels of workspace layout. The alternative hypothesis suggested that there was a significant interaction between generational cohort and workspace layout, suggesting that generational cohort membership by workspace layout type had an effect on individual perceptions of creativity. The null hypothesis

suggested that there was no significant interaction between generational cohort by workspace layout, suggesting that generational cohort membership by workspace layout did not have an effect on individual perceptions of creativity.

The analysis in Chapter 4 begins with a brief description of the demographics of the initial sample of cases provided by SurveyMonkey. Next is a test of whether the selection process might have introduced a systematic bias beyond any that might have already been present in the uncontrolled convenience sample. The next section provides general demographics of the retained cases and then the presentation and analysis of the tabled cell frequencies for each of the six groups. Descriptive statistics are presented, followed by assumptions, including a discussion of the construction of aKEYS as an effective measure, the results of a statistical evaluation of its internal reliability, and a test of its effect as a DV on the selection of cases that were omitted prior to the planned analyses. Next is a presentation of the ANOVA table and planned and unplanned post hoc tests.

Sample and Participants

The data were collected within a 1-month period from two sources, LinkedIn and Walden University's participant pool. There were no discrepancies in data collection from the planned method of collection described in Chapter 3 and from the approved IRB application. SurveyMonkey delivered the survey response data in an SPSS data set compatible with all of the planned analyses. Of the original 183 participants, the researcher obtained 158 via LinkedIn and 25 from the university's participant pool. This

dataset did not include a means of distinguishing from which of these two populations individual cases were drawn.

Of the 183 participants in the original sample, 21 cases (12%) were omitted from the analyses either because it was impossible to categorize them (i.e., One participant did not provide an age, and another, age 75 years, fell outside the cohort ranges), or as a set basis for inclusion, a participant failed to respond to at least 95% of the questions. A total of 162 retained responses were subsequently considered as valid cases to be analyzed.

Before proceeding, there was a question of whether or not these deletions were systematically related to a participant's membership in one of the six categorically defined cells. As a hypothetical example, Baby Boomers working in closed workspaces might have feared that the results would not be not anonymous and might have decided not to complete the survey. This could have led to additional uncontrolled sampling bias in the convenience sample, inconsistent with the basic assumption of independence of observations across groups. The issue was addressed by examining the frequencies of retained and omitted cases. In order to rule out sampling bias within the omitted cases, the researcher used a Fischer's exact test to establish significant differences in the omitted cases because the frequencies were less than five. Based on the result of the exact test, $p = .19$, there was no support for systematic selection bias.

Participant Demographics

Of the 162 participants retained for in the study for subsequent analysis, 77 (47%) were male, and 85 (53%) were female participants. A total of 156 (96%) participants resided in the United States at the time of the study. Participants ranged in age from 19 to

70 years, with a mean age of 43 (*SD* = 12.45). Seventy-eight (48%) participants reported working in defined, traditional workspaces, and 84 (52%) indicated that they worked in open, nontraditional workspaces. Age was used to assign cohort membership: Millennials (19-35 years), Generation X (36-51 years), and Baby Boomers (52-70 years). The 162 participants were categorized as follows: 53 (33%) Millennials, 54 (33%) Generation X, and 55 (34%) Baby Boomers. Of the 78 participants who self-identified as working in defined, traditional workspaces, 22 (14%) were Millennials, 24 (15%) were Generation X, and 32 (20%) were Baby Boomers. Of the 84 participants who self-identified as working in open, nontraditional workspaces, 31(19%) were Millennials, 30 (18%) were Generation X, and 23(14%) were Baby Boomers.

Descriptive Statistics

The descriptive statistics presented in Table 1 include the mean, standard deviation, skewness, and kurtosis. There appeared to be very little difference among the means for the six groups, and the standard deviations were large, relative to the observed differences. In addition to the lack of observed differences across conditions, there appeared to be little difference between the means within each condition.

Table 1

aKEYS Score Descriptive Statistics by Generational Cohort by Workspace Layout

Cohort	Layout	*n*	*M*	*SD*	Skewness	*SE*	Kurtosis	*SE*
Millennials	Closed	22	2.81	.37	-.11	.49	-1.4	.95
	Open	31	2.77	.35	-.34	.42	-.77	.82
Generation X	Closed	24	2.74	.40	-.40	.47	-.52	.91
	Open	30	2.73	.36	-.54	.43	-.66	.83
Baby Boomers	Closed	32	2.54	.33	-.16	.41	-1.12	.81
	Open	23	2.79	.31	-.23	.48	.22	.94
Combined	Closed	78	2.68	.38	-.10	.27	-.86	.54
	Open	84	2.76	.33	-.41	.26	-.01	.52

The tabled measures of skewness and kurtosis suggested that the distributions might have been slightly more peaked than what might have been expected for a normal curve with a mild leftward skew. Left skew was further supported by the observation that mean aKEYs were slightly lower than median aKEYs. This descriptive summary is supported by the individual distributions presentation in Figure 1.

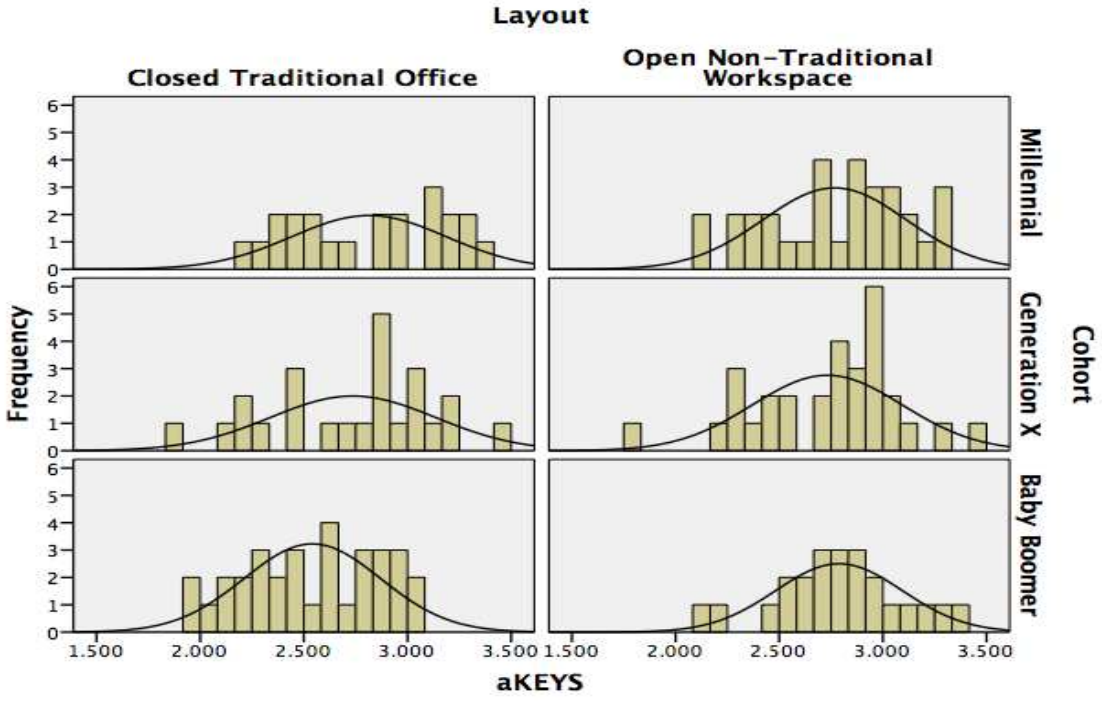

Figure 1. Distributions of aKEYS scores by generational cohort and workspace layout.

Pearson correlation coefficients were computed to assess the relationship between the variables used in the current study (see Table 2). No significant correlations existed between the given variables analyzed.

Table 2

Pearson Correlational Matrix of Cohort and Layout Variables

	N = 162	Cohort	Layout	aKEYS
Cohort	Pearson correlation	1	-.137	-.162*
	Sig. (2-tailed)		.083	.039
Layout	Pearson correlation	-.137	1	.114
	Sig. (2-tailed)	.083		.147
aKEYS	Pearson correlation	-.162*	.114	1
	Sig. (2-tailed)	.039	.147	

Note. *Correlation is significant at the .05 level (2-tailed).

Test of Assumptions

The issue of unequal cell sizes has been considered a potential problem for a two-way ANOVA (Parra-Frutos, 2012), as was the case with the present 3 x 2 ANOVA planned to explore the three RQs. Unbalanced designs generally have less power when the sample is equally distributed, and in extreme cases, they might mask the interactive component of the ANOVA. The statistical significance of the observed differences in cell sizes, which could have affected the ANOVA, was evaluated by a contingency test. Fisher's exact test was used to determine whether there was any significant difference within the six groups collectively, $p = .19$. Overall, there was no statistical evidence for the significance of the observed differences in cell size.

The primary assumptions for an ANOVA used in this study concerned the distributions of the aKEYS scores within and between groups. To determine the aKEYS scores, 16 of the negatively worded items were reverse coded. Because aKEYS was a

modification of KEYS, it was necessary to establish its reliability independently. Cronbach's alpha was computed using the SPSS option to input means for missing items on the aKEYS for all of the valid cases included in the ANOVA. These means were then used to replace (imputed) the responses to any missing items (Allison, 2000). The alpha of .92 was consistent with a high degree of internal reliability reported for aKEYS, comparable to the high end (alpha = .91) of the range of values found in different studies that were reported by Amabile et al. (1996).

The observed distributions of the aKEYS scores within each of the six study groups are depicted in Figure 2. Although ANOVA is considered very robust, the most critical assumption for a two-way analysis is homogeneity of variance. There was no significant difference among the variances for these six groups (Levene's test, $F[5, 156] = .74$, $p = .60$), consistent with the assumption of homogeneity. The assumption of normality was visually assessed using the superimposed distributions in Figure 1. The extent to which these distributions skewed slightly to the left and tended to be more highly peaked than true normal curves was noted in the discussion of the descriptive statistics. However, the Shapiro-Wilk's test, which is generally more sensitive than what is required for an ANOVA, found no significant deviation for any of the six cells: W = .93, $p = .14$ Millennials; W = .97, $p = .61$ Generation X; W = .96, $p = .22$ Baby Boomer Closed; W = .96, $p = .33$ Millennials; W = .96, $p = .36$ Generation X; and W = .98, $p = .81$ Baby Boomer Open.

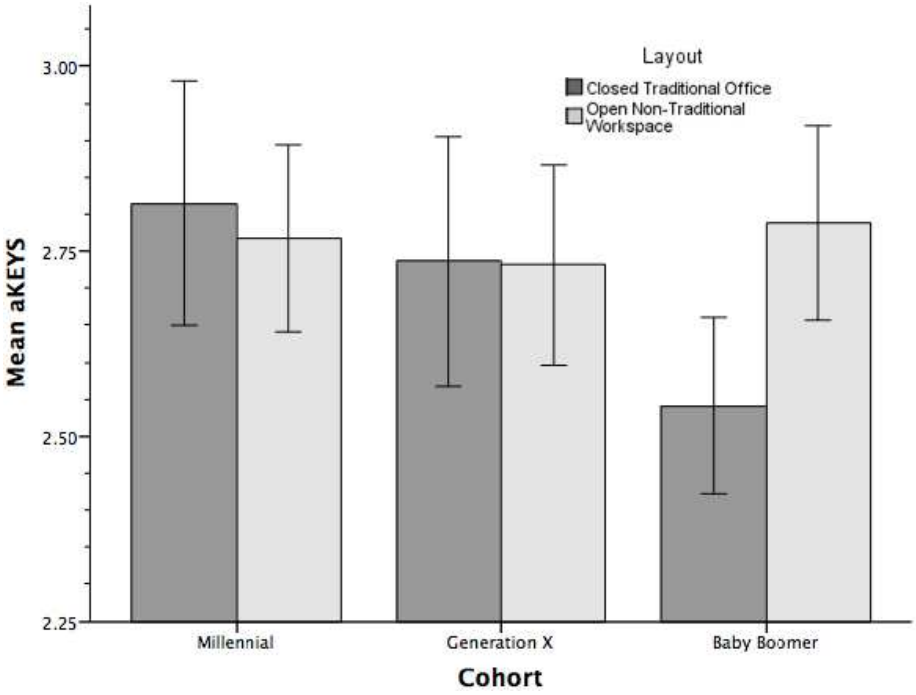

Figure 2. Cohort by workspace comparison based on aKEYS (95% CIs).

Statistical Analysis

Prior to any formal analyses, the outcome of the study is the most easily understood and summarized by inspection of the clustered bar chart depicted in Figure 2, which includes the six critical mean aKEYS with 95% CIs. The degree to which these intervals overlapped and the lack of any a priori hypotheses predicting specific differences that might have justified one-tailed tests suggested little likelihood of a significant difference between even the most highly separated means. Similarly, it also was unlikely that either of the main effects or the interaction evaluated in the planned ANOVA was significant.

On an observational basis, it appears that the plot might have been approximately summarized as indicating that there was little suggestion of any differences in individual

perceptions of creativity across generational cohorts in an open, layout workspace, whereas Millennials appeared to have approximately equal individual perceptions of creativity for either layout, but this perception weakens over successive generations. Neither this nor any other explicit outcome was predicted a priori, and any analysis would have required unplanned post hoc testing.

ANOVA Results for Mean aKEYS

The outcome of the two-way ANOVA was an omnibus test of the effects of generational cohort, workspace layout, and generational cohort by workspace layout on individual perceptions of creativity (see Table 3). Neither the interaction nor main effects were significant. However, the interaction and main effects results were examined in the specific context of the three RQs and further examined in a planned post hoc test.

Table 3

Two-Way ANOVA Cohort and Layout Main Effect and Interaction

Source	Type III *SS*	*df*	*MS*	*F*	*p*	Partial η^2
Cohort	.42	2	.21	1.69	.19	.02
Layout	.17	1	.17	1.35	.25	.01
Cohort * layout	.67	2	.34	2.70	.07	.03
Error	19.41	156	.12			

Note. DV: aKEYS

Research Question 1

RQ1 concerned the possible relationship between generational cohort and individual perceptions of creativity. This question was directly addressed by the main effect of cohort in the ANOVA. The observed mean aKEYS across levels of generational cohort were as follows: Millennials [$M = 2.79$, $SD = .36$, 95% CI (2.69, 2.89)];

Generation X [$M = 2.73$, $SD = .375$, 95% CI (2.64, 2.83)]; and Baby Boomers [$M = 2.64$, $SD = .340$, 95% CI (2.57, 2.76)].

There was no statistically significant difference among these means (see Table 3), suggesting that there was no effect of generational cohort on individual perceptions of creativity as addressed by RQ1. There was some justification for exploring the effect of generational cohort in a separate one-way ANOVA because there were unequal cell sizes (significant or not), and given that Figure 2 suggested an interaction that might have been too weak and too specific for the omnibus ANOVA to capture. However, the results of the separate one-way ANOVA were not statistically significant, $F(2, 159) = 2.20$, $p = .11$, partial $\eta^2 = .03$.

Research Question 2

RQ2 concerned the possible relationship between workspace layout and individual perceptions of creativity. This question directly addressed whether or not there was a true independent relationship between workspace layout and individual perceptions of creativity. This question was evaluated statistically by the main effect of office layout in the ANOVA (see Table 3). The observed mean aKEYS across workspace layout as a category was as follows: ($M = 1.52$, $SD = .50$). The observed mean aKEYS across the two categories within workspace layout were defined, traditional workspace [$M = 2.68$, $SD = .378$, 95% CI (2.62, 2.78)]; and open, nontraditional workspace [$M = 2.76$, $SD = .34$, 95% CI (2.69, 2.84)]. There was no statistically significant difference among these means, suggesting that there was no effect of workspace layout on individual perceptions of creativity as addressed by RQ2.

Research Question 3

RQ3 concerned the possible relationship between workspace layout and creativity and whether or not there was a true nonindependent relationship between generational cohort based on differences in individual perceptions of creativity between participants employed in defined, traditional workspaces versus open, nontraditional workspaces. This question corresponded directly to the test of the interaction of generational cohort by workspace layout factors in the ANOVA used to assess the mean aKEYS for the six categories formed by pairing each of the three levels of the generational cohort factor with the two levels of the workspace layout factor (see Table 3).

The observed mean aKEYS across levels of generational cohort by workspace layout were as follows: Millennials Closed ($M = 2.81$); Millennials Open ($M = 2.77$); Generation X Closed ($M = 2.74$; Generation X Open ($M = 2.73$); Baby Boomers Closed ($M = 2.54$); and Baby Boomers Open ($M = 2.579$). There was no statistically significant difference among these means (see Table 3), suggesting that there was no effect of generational cohort by workspace layout on individual perceptions of creativity as addressed by RQ3.

Planned Post Hoc Testing

As planned, 15 pairwise comparisons were performed using Tukey's test. As had been expected following the consistently overlapping CIs apparent in Figure 1, none of the results presented in Table 3 was significant. Despite the lack of overall significance between generational cohorts and individual perceptions of creativity, a planned post hoc pairwise comparison was conducted to determine whether significant differences not

reflected in an overall trend existed. The planned Tukey HSD post hoc was conducted on the three possible pairings of generational cohorts and individual perceptions of creativity (see Table 4). The Tukey test confirmed the results of the ANOVA that there was no significant difference between generational cohort pairings in terms of individual perceptions of creativity.

Table 4

Tukey HSD Post Hoc Tests for Cohort x Layout

Cohort x layout	Cohort x layout	*M Diff*	*SE*	Sig.	95% CI lower	95% CI upper
Millennial closed	Millennial open	.05	.10	1.00	-.24	.33
	Gen X closed	.08	.10	1.00	-.22	.38
	Gen X open	.08	.10	1.00	-.20	.37
	Baby Boomer closed	.27	.10	.06	-.01	.56
	Baby Boomer open	.03	.11	1.00	-.28	.33
Millennial open	Gen X closed	.03	.10	1.00	-.25	.31
	Gen X open	.04	.10	1.00	-.23	.30
	Baby Boomer closed	.23	.09	.12	-.03	.48
	Baby Boomer open	-.02	.10	1.00	-.30	.26
Gen X closed	Gen X open	.01	.10	1.00	-.27	28
	Baby Boomer closed	.20	.10	.32	-.08	.47
	Baby Boomer open	-.05	.10	1.00	-.35	.25
Gen X open	Baby Boomer closed	.19	.09	.28	-.07	.45
	Baby Boomer open	-.06	.10	1.00	-.34	.23
Baby Boomer closed	Baby Boomer open	-.25	.10	.11	-.53	.03

Unplanned Post Hoc Testing

It was previously observed that there appeared to be a downward trend in perceived creativity across successive generational cohorts in a defined, traditional workspace that was not apparent in an in open, nontraditional workspace layout. Even though the discrepancy in cell sizes was not statistically significant per se, Parra-Frutos (2012) argued that any difference has the potential to distort the interpretation of an interaction in a two-way ANOVA. Parra-Frutos suggested that separate analyses of one

factor for each level of the other be performed routinely, regardless of the statistical significance, or lack thereof, of the interaction effect.

Consequently, unplanned, separate one-way ANOVAs were run for the effects of generational cohort for both defined, traditional workspaces and open, nontraditional workspaces. There was no significant cohort effect for participants working in open, nontraditional workspaces, $F(2, 83) = .187$, $p = .83$ (see Table 5). However, there was a significant cohort effect for participants working in defined, traditional workspaces, $F(2, 77) = 4.11$, $p = .02$ (see Table 6). Had this been planned a priori, or if the interaction had been significant, this outcome would have been important. As an unplanned post hoc test that was not evaluated with some conservative adjustment the significance of the overall description initially provided in the presentation of Figure 1 was difficult to assess (Field, 2013).

Table 5

One-Way ANOVA for Open Layout

	SS	*df*	*MS*	*F*	*p*
Between groups	.04	2	.02	.187	.83
Within groups	9.46	81	.12		
Total	9.51	83			

Table 6

One-Way ANOVA for Closed Layout

	SS	*df*	*MS*	*F*	*p*
Between groups	1.09	2	.55	4.11	.02
Within groups	9.95	75	.13		
Total	11.04	77			

Summary and Transition

The results and analyses were based on data collected in a survey meant to examine the relationship between individual perceptions of creativity as a DV measured by aKEYS, a modification of KEYS, and the two IVs of generational cohort and workspace layout. The internal validity of aKEYS was acceptably high, and it was found to be a continuous measure providing an acceptable level of normality and equal variance across the demographically defined groups, thus meeting the requirements for the planned ANOVA.

The ANOVA results failed to provide any statistical support for the significance of either generational cohort (a main effect of addressing RQ1) or workspace layout (a main effect addressing RQ2) separately or in combination (interaction addressing RQ3). This result had been anticipated based on a simple plot of the fixed aKEYS means with the associated CIs.

None of the alternative hypotheses related to the three RQs was definitively supported by statistically significant outcomes. There was an interesting hint that layout might have affected the generational cohorts differentially, but there was no supportive interaction in the planned ANOVA, so the true statistical value of the unplanned analyses was difficult to determine.

Chapter 5 provides an overview of the study, along with a discussion of the results and limitations of the study. It expounds on the meaning of the research findings, explains the importance of the findings, and discusses the implications for social change. Also offered in Chapter 5 are recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Changing demographics and economic needs have contributed to some organizations examining their physical workspace layouts in order to increase efficiency and effectiveness, with the hope of gaining a competitive advantage in the workspace (McElroy & Morrow, 2010; Venezia & Alee, 2007). Employee creativity, which is critical to the success of an organization, is known to contribute to an organization's productivity (Anderson et al., 2004). Because employee creativity is critical to organizations, the researcher identified and examined the need to understand the affect of workspace layout on individual perceptions of creativity across generational cohorts.

The researcher conducted the study using a quantitative approach to look for likely relationships between individual perceptions of creativity based either on workspace layout as a function of generational cohort or some combination of both. After completing an extensive literature review, the researcher determined that empirical research did not exist on individual perceptions of creativity based on workspace layout across generational cohorts. This study was conducted to bridge the gap in the empirical research. A factorial model was used, and the participants were recruited from LinkedIn and Walden University's participant pool. The raw survey data were collected via SurveyMonkey and exported to SPSS for analysis. After data preparation, the valid sample size comprised 162 cases.

The purpose of the study from a social change perspective was to determine whether the design of the physical work environment influences individual perceptions of creativity across generational cohorts and fosters the ability of organizations to attract, retain, and accommodate the needs and work patterns of an age-diverse workforce. The study's intent was to understand whether individual perceptions of creativity based on workspace layout across generational cohorts was different. The results should help leadership teams understand whether employees' perceptions of creativity are influenced differently based on workspace layout type. This knowledge can be used as a strategic tool by organizations to provide employees with physical workspaces that are conducive to the generation of new opportunities, ideas, processes, and products that can be critical to organizational growth. This information could provide organizations with insight into deciding whether workspace layout types should be designed differently based on generational cohort membership and provide leadership teams with the ability to develop strategies that are targeted to all employees.

The current study followed a two-way factorial model that examined three levels of cohort (i.e., Millennials, Generation X, and Baby Boomers) and two levels of workspace layout (i.e., defined, traditional vs. open, nontraditional). A modification of KEYS (Amabile et al., 1999) was used as the measure of individual perceptions of creativity. The researcher used the analyses of the three RQs to report the statistical outcomes of the individual perceptions of creativity based on generational cohort and workspace layout. RQ1 examined the possible existence of an independent relationship between generational cohort and individual perceptions of creativity. RQ2 examined

whether a true independent relationship existed between workplace layout and individual perceptions of creativity. RQ3 examined whether a true nonindependent relationship existed between generational cohort by workspace layout type for the six categories formed by pairing the three levels of generational cohort with the two levels of workspace layout.

The ANOVA failed to provide any statistical support for the significance of generational cohort (RQ1), $F(2, 156) = 1.69$, $p = .19$, partial $\eta^2 = .02$; workspace layout (RQ2), $F(1, 156) = 1.35$, $p = .25$, partial $\eta^2 = .01$; and generational cohort by workspace layout (RQ3), $F(2, 156) = 2.70$, $p = .07$, partial $\eta^2 = .03$. There appeared to be justification for planned *t* tests based on a potential weak interaction representation of generational cohort by workspace layout, as plotted in Figure 3. Planned post hoc Tukey tests, however, indicated no significance in pairwise comparisons. One issue that could be of importance for future research is the question of gender. The gender of the participants was obtained in order to assess its potential inclusion as a variable for future studies. The results, with gender added to the ANOVA, indicated significance of cohort x gender, $F(2, 150) = 3.94$, $p = .02$, partial $\eta^2 = .05$.

Interpretation of Findings

The literature review, as addressed in Chapter 2, revealed consistent themes that included the need for organizations to adopt flexible workspaces to accommodate economic needs, organizational needs, and the needs of an age-diverse workforce as the result of shifting demographics. Empirical research predominately has reported the effects of psychosocial elements associated with the work environment that can foster or

hinder creativity based on individuals' personality traits, work preferences (Dul et al., 2011; Vithayathawornwong et al., 2003); work culture (Cokepkin & Knudsen, 2012); and supervisory support (Amabile et al., 1996; Kallio et al., 2015; Woodman et al., 1993). The review however did not find empirical evidence on individual perceptions of creativity based on generational cohort and workspace layout design. Because of the lack of empirical evidence, research was conducted into this area. Results determined that the analysis of individual perceptions of creativity based on generational cohort and workspace layout type failed to find any significant relationship among the variables.

Zemke et al. (2000) suggested that employees are motivated differently based on generational cohort membership. However, little empirical evidence has been able to substantiate this popular notion. The diversity within a cohort range means that not all individuals attribute the same meanings to their shared experiences of their formative years (Zemke et al., 2000). Individual commonalities and differences might be the result of career stage and cognitive development, not generational cohort membership. The literature review showed that employees have differences in preferences regarding elements such as aesthetic objects, interior architectural surroundings, and ambient conditions. However, the employees surveyed in the current study to determine their individual perceptions of creativity, as determined by the aKEYS measurement, suggested that differences in generational cohort based on workspace layout type did not exist.

Theoretical Framework Context

The findings were analyzed and interpreted based in the context of the theoretical framework of Lewin's (1951) field theory; generational cohort theories (Mannheim, 1928/1972; Mason & Wolfinger, 2001); and creativity theories (Amabile, 2012; Woodman et al., 1993). These theories have helped researchers to understand the influences of individuals' behaviors on the work environment. Lewin's field theory suggests that from a psychological approach, individuals are affected by the fields around them and that these fields influence their behaviors. Mannheim's (1928/1972) generational theory proposes that members in a society are shaped by shared events and experiences based on a common point in time. In addition to shared experiences, the cohort analysis theory posits that the combination of cohort effects, age effects, and period effects influence individuals' behaviors as they mature (Parry & Urwin, 2011). The creativity componential model proposes that psychosocial elements in the work environment can foster creativity through contextual influences, and the interactionist model proposes that creativity comprises the interactions between individuals and their work situations based on situational and behavioral factors at the individual, team, and organizational levels (Cokpekin & Knudsen, 2012; Woodman et al., 1993).

Commonalities among the theories reinforce the notion that individuals' behaviors in the work environment are based on their interpretations of psychosocial elements in that environment. Based on the results compiled from aKEYS, the current study suggests that there were no differences in individual perceptions of creativity based on workspace layout type or generational cohort.

Limitations of the Study

A limitation of the study was that the researcher was not able to conduct the study in a corporate environment with defined, traditional and open, nontraditional workspace layouts. This lack of access to a large target population of employees might have had an impact on the cell sizes of each categorical group.

Recommendations

There are several recommendations for future research into the individual perceptions of creativity. The first recommendation is to include age rather than cohort range to assess individual perceptions of creativity by workspace layout. Chronological age might be a better indicator to assess individual commonalities and differences. Creativity involves complex cognitive processes that individuals use differently based on age (Martens, 2011). Therefore, future researchers might want to consider using age to examine physical workspaces and individual perceptions of creativity. The influence of the surrounding environment can have an impact on individuals of different ages because life experiences and life stage reflect different cognitive levels (Salthouse, 2010). The next recommendation is that the survey be distributed in a corporate work environment that has defined, traditional and open, nontraditional workspace layouts in an effort to increase the sample size. The last recommendation is to use a multiple regression analysis to facilitate the addition of variables such as gender.

Implications for Positive Social Change

Workforce demographics are projected to shift significantly over the next decade; consequently, organizations are trying to understand how to maximize the effectiveness

of the physical work environment to meet the needs and work patterns of an age-diverse workforce. Knowledge gleaned from the results will allow leadership teams to focus on accommodating the entire workforce rather than customize workspace layout types based on generational cohort membership. Aligning the needs of the organization and workforce with the most appropriate physical work environment has the potential to increase individual perceptions of creativity as well as employees' job satisfaction and productivity (Rothe et al., 2012; Lee & Brand, 2005).

Workspace configurations continue to evolve to meet organizational objectives that encompass the need for greater efficiency, effectiveness, and productivity (Hills & Levy, 2014). As the competitive landscape of the business environment changes, so, too, do organizations' marketing strategies to attract and retain a multigenerational workforce (Earle, 2003). The findings, although not statistically significant, are important for leadership teams to use the physical workspace strategically to increase individual perceptions of creativity. A contemporary work environment that is reflective of a company's brand image and encourages the generation of new ideas, processes, and products can attract and retain an age-diverse workforce.

Conclusion

Analyses of the data collected from the aKEYS survey responses failed to provide any statistically significant results based on the relationship between individual perceptions of creativity and workspace layout across generational cohort. Insight gained from this study can be beneficial to leadership teams when designing physical work environments that seek to foster and support the individual perceptions of creativity of an

age-diverse workforce. Knowing that individual perceptions of creativity are not different based on generational cohort or workspace layout type can help leadership teams to foster individual perceptions of creativity for all employees equally rather than accommodate employees differently based on generational cohort.

A company's competitive advantage relies on its ability to generate new ideas (Politis, 2005) and designing the physical work environment to foster creative thinking and accommodate a workforce can enhance that advantage (O'Neill, 2010; Politis, 2005; Arsenault, 2004). This study contributed to the understanding of individual perceptions of creativity based on generational cohorts and workspace layout, by providing insight for leadership teams when designing the physical work environment to accommodate their workforce.

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Appendix A: Demographics Questionnaire and aKEYS Survey

Directions. Please complete the following demographic questions as they related to you.

Per the informed consent agreement your responses will be kept strictly confidential.

1. What is your age? _____

2. What is your gender? Female: _____ Male: _____

3. Do you work in a defined closed traditional workspace or an open, nontraditional workspace? Defined closed traditional_____Open, nontraditional_____

4. Do you live in the United States? Yes:_____No:_____

The survey questions were answered with the following 5-point answering options:

5. I have too much work to do in too little time.

6. This organization is strictly controlled by upper management.

7. My area of this organization is innovative.

8. In this organization, there is a lively and active flow of ideas.

9. There is much emphasis in this organization on doing things the way we have always done them.

10. I have insufficient time to do my project(s).

11. Overall, this organization is effective.

12. Overall, the people in this organization have a shared vision of where we are going and what we are trying to do.

13. People in this organization are very concerned about protecting their territory.

14. There are too many distractions from project work in this organization.

15. New ideas are encouraged in this organization.

16. There is destructive competition within this organization.

17. Performance evaluation in this organization is fair.

18. There are many political problems in this organization.

19. The facilities I need for my work are readily available to me.

20. In this organization, top management expects that people will do creative work.

21. Procedures and structures are not too formal in this organization.

22. There are realistic expectations for what people can achieve in this organization.

23. Generally, I can get the resources I need for my work.

24. People are quite concerned about negative criticism of their work in this organization.

25. People are recognized for creative work in this organization.

26. People in this organization feel pressure to produce anything acceptable, even if quality is lacking.

27. There is an open atmosphere in this organization.

28. Ideas are judged fairly in this organization.

29. Top management does not want to take risks in this organization.

30. Failure is acceptable in this organization, if the effort on the project was good.

31. The budget for my project(s) is generally adequate.

32. My area of the organization is creative.

33. My area of this organization is productive.

34. People are encouraged to solve problems creatively in this organization.

35. People are rewarded for creative work in this organization.

36. Overall, my current work environment is conducive to my own creativity.

37. My area of this organization is effective.

38. A great deal of creativity is called for in my daily work.

39. People in this organization can express unusual ideas without the fear of being called stupid.

40. I can get all the data I need to carry out my projects successfully.

41. This organization has a good mechanism for encouraging and developing creative ideas.

42. I am able to easily get the materials I need to do my work.

43. I feel that top management is enthusiastic about my project(s).

44. Overall, this organization is productive.

45. People are not critical of new ideas in this organization.

46. Overall, my current work environment is conducive to the creativity of my work group.

47. I feel a sense of time pressure in my work.

48. Overall, this organization is efficient.

49. My area of this organization is efficient.

50. The information I need for my work is easily obtainable.

51. I believe that I am currently very creative in my work.

52. Other areas of the organization do not hinder my project(s).

53. Destructive criticism is a problem in this organization.

54. New ideas are encouraged in this organization.

Appendix B: Instrument Permission Letter

Letter of Approval for Using KEYS

Dear Leslie,

I am writing to inform you that Teresa Amabile, Ph.D., and the Center for Creative Leadership (CCL) have approved your proposal to use KEYS in your research. Specifically, we are granting you permission to use the item content from KEYS in your own survey to collect data for your study. The item content for KEYS can be found in the attached sample report. Please note that there are several requirements for using KEYS in your research.

- You should have procedures in place to protect the content of KEYS from use by others, as well as the confidentiality of any data collected.

- Unless you receive permission from Teresa M. Amabile, Ph.D., and the Center for Creative Leadership, you may not alter KEYS items in any way. You may, however, use only one or more scales rather than all KEYS scales.

- On all printed and electronic surveys using KEYS item content, you must include the following copyright information for those items: "©1987, 2009 Teresa M. Amabile, Ph.D. and Center for Creative Leadership. All Rights Reserved." You must also indicate that this item content is reprinted in the survey with our permission. Please use this wording: "Items from KEYS are reprinted, for research purposes only, with the permission of Teresa M. Amabile, Ph.D., and the Center for Creative Leadership."

- Once you have collected data, we ask that you share your data with CCL. These data will be stored internally and will potentially be aggregated with CCL data for the purpose of conducting additional, psychometric evaluations of KEYS assessment. Please send your data in SPSS format to Dr. Phillip Braddy at xx@xx

- If you use data collected on items from KEYS in your thesis, dissertation, or any other manuscript, you must (a) include a line or footnote saying that KEYS items were used with the permission of Teresa M. Amabile, Ph.D., and the Center for Creative Leadership; and (b) provide the appropriate citation for KEYS in your "measures" section. Please use the following two citations: (1) Amabile, T. M. (1995). *KEYS: Assessing the climate for creativity*. Greensboro, NC: Center for Creative Leadership; and (2) Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal, 39,* 1154-1184.

- Finally, please note that you should share any papers (theses, dissertations, conference papers, or publications) using KEYS data with CCL and with Dr.

Teresa Amabile. Please send copies of papers for CCL to Dr. Phillip Braddy (xx@xx). Dr. Amabile's email address is: xx@xx

In closing, I would like to congratulate you for obtaining approval to use KEYS in your study. Good luck with your research!

Sincerely,

Phillip W. Braddy, Ph.D.
Psychometrician
Center for Creative Leadership
xxx.xxx.xxxx (office)
xxx.xxx.xxxx (fax)