

Creativity in a Changing World:
How Personality, Work Environment, and Flexibility Affect Employee Creativity

by

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ABSTRACT

The work environment can have a measurable impact on the extent to which a person generates new and potentially useful ideas. The present study tested a comprehensive model of personality and employee creativity, moderated by the work environment. I proposed moderation effects that physical and social-organizational elements in the work environment as well as workplace flexibility may have on employee creativity. Participants (N = 81) were invited to take an online survey examining personality traits, the work environment, and creativity. Results showed that openness to experience was a significant predictor of employee creativity. Findings also suggested that the relationship between personality and employee creativity is altered by social-organizational elements in the work environment. Specifically, employees with high levels of openness displayed more divergent thinking and creative behavior in the office work environment when levels of realized social-organizational elements were high. Additionally, employees with high levels of extraversion engaged in less creative behaviors in the home work environment when levels of realized social-organizational elements were very low. The relationship between personality and employee creativity is also altered by the perceived importance of social-organizational elements in the workplace in general. Findings revealed that employees with high levels of openness displayed more creative behavior and ideational behavior when the perceived importance of social-organizational elements in the workplace in general was high. Conversely, findings revealed that employees with high levels of extraversion displayed less creative behavior and ideational behavior when the perceived importance of social-organizational elements in the workplace in general was low. Given the lack of research exploring

moderating effects of the work environment on creativity, further research is recommended to investigate the impact of both physical and social-organizational elements and workplace flexibility on employee creativity, the ability to generate novel and potentially useful ideas.

Keywords: openness to experience, extraversion, personality, work environment, physical, social-organizational, workplace flexibility, creative behavior, divergent thinking, ideational behavior, employee creativity

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CHAPTER 1

INTRODUCTION

Creativity is regarded as a driving force behind organizational success (Zhou & Hoever, 2014) and ranks among the top qualities employers look for when hiring (Petrone, 2018). Research suggests that certain employee personality traits may indicate creative potential (Runco & Pagnani, 2011). For example, empirical evidence shows how openness to experience is a predictor of creativity (George & Zhou, 2001; McCrae & Costa, 1997) and has been correlated to divergent thinking (McCrae, 1987), ideational behavior (Batey et al., 2010), and idea generation (Costa & McCrae, 1985). Additionally, extraversion may also play a role in activating employee curiosity and desire to seek stimulation, thus enhancing creative thinking (Costa & McCrae, 1992; Sung & Choi, 2009). A work environment which supports an employee's openness and extraversion will most certainly encourage creative behaviors within the workplace (Runco & Pagnani, 2011). However, as employees find themselves working with increased levels of flexibility, questions arise about how the home and office environments are affecting employee creativity at work, specifically the generation of new and potentially useful ideas. What social-organizational and physical variables in the work environment impact employee creativity?

COVID-19 dramatically impacted organizations across the globe, affecting how and where we work. Moving beyond the pandemic, employees have expressed their desire for increased flexibility and numerous companies plan to adopt a remote or flexible work arrangement in the future (Forman, 2021; Gartner, 2020). As a result, many employees now find themselves balancing work between the home and office work

environments. The implications of these flexible work arrangements on employee creativity deserve considerable attention. Until now, researchers have primarily studied the impact of work from home on productivity, however, research on how remote work affects creativity has yet to be explored (Kniffin et al., 2020; Vedantam, 2020).

Social factors as well as physical elements in the work environment have a measurable impact on the extent to which a person generates new ideas (Woodman et al. 1993, Amabile et al. 1996). Research is required to further explore how these factors affect the creative process and employee ideational behavior. Unfortunately, research on how the work environment impacts creativity is lacking, and this approach accounts for the least researched area in creativity studies (Said-Metwaly, 2017). The purpose of this study is to test a comprehensive model of personality and employee creativity, moderated by the work environment. I propose a moderation model in which physical elements, social-organizational elements, and work flexibility in the work environment impact employee creativity.

The present study assumes an interactionist perspective (Woodman et al., 1993), examining the actor-context interactions taking place, and is among the few studies exploring moderating effects of both physical and social-organizational elements as well as workplace flexibility on employee creativity. This research is timely, especially in the context of Covid-19, and vital for informing ongoing conversations about the future of work. Fostering creativity requires leaders to radically change how they consider their organizational culture, spaces, and practices. Results will bear significant contributions for leaders and practitioners who engage in creative work.

This paper is structured as follows. First, I present the relevant literature and theory which serve as the foundation for my hypotheses. Next, I share my methods for data collection, measures, and analysis. Finally, I discuss the theoretical and practical implications, limitations, and recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

Defining Creativity

Due to its multidimensional nature, creativity has proven difficult to define and definitions can vary greatly (Runco, 2004, 2007). A compendium by Treffinger (1996) listed over 100 definitions pulled from classic and contemporary literature. Nonetheless, researchers generally agree on two necessary characteristics of creativity: novelty and appropriateness (Amabile, 1996, Flaherty 2005, Mumford 2003, Runco, 2014). In other words, ideas must be original and surprising. However, originality alone is not sufficient for something to be designated as creative (MacKinnon, 1962). Creative ideas must also have utility, solving a problem and fulfilling the purpose for which it was intended (Runco, 2014). For the purposes of this paper, creativity will be defined as the generation of novel and potentially useful ideas (Shalley et al., 2004).

Creative ideas ultimately lead to creative solutions. In fact, creativity is considered the foundation for innovation (Amabile, 1996; Dul & Ceylan, 2014) and viewed as a key strategic imperative for many organizations (Mumford et al., 2002). A study by LinkedIn (2018) found that creativity ranked as the number one soft skill desired by employers. This highly-desirable skill functions as part of the problem-solving process (Runco, 2004). Employee creativity, the ability to produce novel and potentially useful ideas, leads to successful development of new programs, product innovation, and services (Amabile, 1996). Organizations are seeking problem-solvers to develop creative solutions, ultimately giving organizations the ability to gain a competitive advantage (Amabile, 1988).

Not only is creativity beneficial to organizations, but it also provides physical and psychological benefits to individuals (Runco, 2004; Runco & Richards 1997), contributes to society and culture (Simonton 1991), is considered an engine of cultural evolution (Runco, 2004), and is seen as a major force behind economic growth (Florida, 2002, 2012). On a global scale, creativity is a crucial and necessary problem-solving skill to confront complex problems of the modern world (Azzam, 2009).

Images of creativity are often associated with the romanticized view of artists and scientists, however, creativity is not exclusive to a specific domain (Amabile, 1996; Azzam, 2009; Feist, 1998; Mumford, Whetzel, & Reiter-Palmon, 1997). Rather, creativity can be exercised by any domain or individual applying creative problem solving processes. Creativity, the generation of ideas, can be observed in a multitude of sectors such as engineering, finance, marketing, and management (Mumford et al, 2002).

Approach and Theory to Creativity Studies

Researchers agree that creativity is not the result of a single, individual phenomena. Rather, creativity results when multiple components converge (Amabile, 1983; Csikszentmihalyi, 1988; Sternberg, 2012). Csikszentmihalyi (1988) proposed a “systems approach” to studying creativity, modeling the complex interaction between a person, domain, and field. Amabile (2012) proposed the componential theory, presenting a comprehensive model of social and psychological components required for an individual to produce a creative outcome. The four components include domain relevant skills, creativity-relevant processes, intrinsic task motivation, and the social environment.

Taking a comprehensive view of creativity aids in better understanding the factors and relationships which enhance or hinder employee creativity within the work environment. Amabile (1996) proposed a conceptual model for the creative work environment including organizational encouragement, supervisory encouragement, work group support, freedom (autonomy), resources, challenging work, workload pressure, and organizational impediments. Further investigating factors such as these will aid in understanding the actor-context interactions taking place. Research from this perspective is lacking (Zhou & Hoever, 2014). Zhou and Hoever (2014) encourage taking this type of interactionist perspective, emphasizing these actor-context interactions, and believe it holds much promise (Zhou & Hoever, 2014).

Creativity is a multifaceted phenomenon. Rhodes (1961) is noted for identifying four perspectives by which to conceptualize creativity: person, process, press, and product (Runco, 2011). Rhodes described creativity as a phenomenon in which an individual ('person') utilizes mental mechanisms ('process'), while encountering pressures from the environment ('press'), to ultimately produce a final creative outcome ('product'). In general, researchers assume one or more of these approaches when studying and measuring creativity. This paper takes a person, press, and product perspective. Due to methodological issues and weaknesses of measurement approaches, I did not include a process perspective (Said-Metwaly et al., 2017a; 2017b).

A person-based perspective on creativity focuses on examining the personal characteristics and traits of the creative individual. Studies typically focus on the personality traits of eminent creators within certain domains or the general population of everyday creatives (Gruszka & Tang, 2017). Areas of research include the role of

intrinsic motivation (Amabile, 1983) as well as Big Five personality traits (Sung & Choi, 2009). Measurements typically rely on self-report questionnaires, assessing personality traits such as extraversion and openness (Said-Metwaly et al., 2017a). The importance of understanding the relationship between these personality traits and creativity may allow for prediction of potential creative action (Runco & Pagnani, 2011). Additionally, Runco and Pagnani (2011) suggest that an environment which supports these traits, and their creative potentiality, will almost certainly manifest itself into creative behaviors.

The concept of press (also referred to as ‘place’) describes the pressures of the environment on a creative individual or the creative process (Murray, 1938; Rhodes, 1961; Runco, 2011). Taking a press perspective on creativity analyzes the work environment where creativity occurs and examines the interactions taking place between the creative person and their outcomes. These factors typically do not have a direct impact, however, they usually mediate or moderate the relationship between the person and creative output (Gruszka & Tang, 2017). Instruments for assessing the work environment evaluate the degree to which the work environment supports or inhibits creative potential or performance. Social-organizational factors include a range of variables such as job challenge, supervisor support, teamwork, autonomy, task rotation, and recognition for creative ideas. Physical factors include variables such as window views to nature, inspiring colors, quantity of light, smell, furniture, and spatial arrangements. Vithayathawornwong et al. (2003) argue the importance of researching how both the social and physical elements in the work environment support employee creativity, asserting this understanding will benefit and contribute to the growing body of knowledge on organizational creativity. Unfortunately, research is lacking from this

perspective. Said-Metwaly et al. (2017a) conducted an analysis of 152 studies, examining the approaches used to measure creativity. Results revealed that a press (environment) approach was the least conducted, accounting for 4.12% of studies.

A product approach to creativity studies looks at the outcomes resulting from the creativity process. The assumption of this approach generally views creative products as a tangible outcome such as a painting, publication, or invention. However, the results of creative efforts can take on many forms (Runco & Pagnani, 2011). Runco, Plucker and Lim (2001) conclude that ideas can be treated as products of creative thinking, a notion first proposed by Guilford (1967). Assessment of creative products generally relies on evaluations by experts in the relevant domain (Amabile, 1983). Although the criteria can differ depending on the field and context, most researchers agree on at least two criteria: originality and effectiveness (Runco & Jaeger, 2012).

Conceptual Model

This study assesses creativity from a person, press, and product perspective. I will examine the personality traits of the creative individual to see how openness to experience and extraversion relate to employee creativity. Next, taking a press perspective, I will evaluate the impact of the physical and social-organizational elements in the work environment and degree of work flexibility on the creative individual. Lastly, I will assess the product, the ideas and behaviors resulting from creative thinking. In this case, the product will be measured by creative behavior, divergent thinking, and ideational behavior.

Figure 1 shows a proposed conceptual model for this study, depicting the relationship between personality and employee creativity. Furthermore, it is argued that

the relationship is moderated by the work environment, as will be explained in more detail below (see Figure 1).

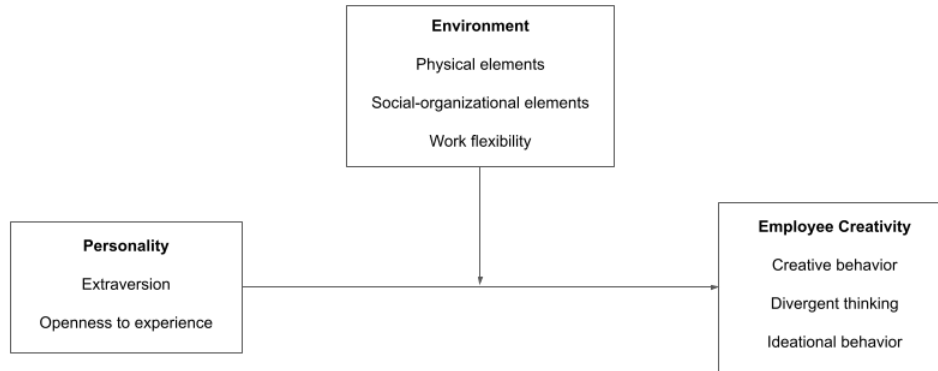


Figure 1. A model of employee creativity.

Employee Creativity as a Dependent Variable

Employee creativity is defined as an employee’s ability to create novel and potentially useful ideas for an employing organization (Shalley et al., 2004; Woodman et al., 1993). When employees act creatively, they produce original and effective ideas which potentially benefit their organization with opportunities to grow and compete (Oldham & Cummings, 1996) Researchers encourage using several measurement tools when assessing creativity (Silvia et al., 2012). Since creativity is a multidimensional construct, by using multiple variables we can gain a more comprehensive assessment of employee creativity. For this reason, I will use a mixture of measures to look at creative behaviors, ideational behavior, and divergent thinking.

Creative Behavior

Perceptions of creativity are often associated with “Big C” creativity, the transformative, breakthrough creations by well known, eminent persons. For example, we

tend to think of Thomas Edison for patenting over 1000 inventions or Vincent Van Gogh for his dramatic paintings and redefining the boundaries of art. However, of equal importance, is the common, everyday creative behaviors by ordinary people. This is known as “little c” creativity, the humble creativity used in daily life and problem solving. For example, this can be witnessed in a wide range of activities such as creating a new recipe, writing a poem or paper, organizing an event, mentoring a peer, or redecorating your personal space. It has been proposed that these everyday creative behaviors lead to employee happiness (Silvia et al., 2014), physical and psychological benefits (Runco, 2004; Runco & Richards 1997) as well as fosters personal growth (Richards 2007; Silvia et al., 2014).

Divergent Thinking

Divergent thinking is a mental process used to generate multiple original ideas or solutions to a given problem. This ability to think up many ideas plays an important role in the creative process and helps to ultimately arrive at high-quality solutions.

Researchers have found a positive correlation between the number of ideas generated and the ultimate arrival at ideas of quality (Diehl & Stroebe, 1987; Paulus et al., 2011).

Divergent thinking is usually followed by convergent thinking, the process of narrowing down the ideas to a viable solution.

Divergent thinking assessments evaluate an individuals' ability to generate original ideas. An example is an *alternative uses* test which invites participants to generate as many original ideas as possible for uncommon uses of common objects (Guilford, 1967). It should be advised that *alternative use* tests do not predict actual creative performance (Baer, 2011) and that divergent thinking tests alone do not fully

represent an individual's entire creative ability (Baer, 2011, 2016; Batey & Furnham, 2006; Runco, 2008). However, these assessments can be considered reliable indicators of creative potential and future predictors of creative performance and ideation (Runco, 1991, 2008, 2012).

Ideational Behavior

Ideational behavior reflects an "individual's use of, appreciation of, and skill with ideas" (Runco et al., 2001, p. 394). The ability to generate ideas is considered a universal part of the creative process and can be achieved by anyone. Since everyone has the ability to produce ideas to a certain extent, it is suggested that studying ideational behavior may be helpful in better understanding everyday creativity (Scratchley et al., 2001). Research also indicates that ideational behavior is significantly associated with openness to experience (Batey et al., 2010) whereby openness may influence the richness of ideas produced. Additionally, measuring ideational behavior may offer predictive validity support to divergent thinking tests (Runco et al., 2001) and be an indicator of creative potential (Rojas and Tyler, 2018).

Personality Traits as Independent Variables

Studies often use the Big Five factors as a measure to assess the personality traits or characteristics related to creativity (Feist, 1998; Oldham & Cummings, 1996). Sung and Choi (2009) found that extraversion and openness to experience have significant positive effects on creative performance, while other traits tend to be less consistent (Batey & Furnham, 2006). For this reason, I propose using extraversion and openness to experience as having significant bearings on employee creativity.

Extraversion

Extraversion is believed to be evaluated on a spectrum. In other words, everyone displays both extraverted and introverted characteristics, however, one is typically more dominant than the other. Extraverts are energized by other people, enjoy thinking out loud, and tend to be risk takers. Introverts, on the other hand, are more reserved, prefer quiet spaces, tend to avoid large groups, and are energized by taking time alone and away from excess stimulus.

Research can be conflicting on the relationship between creativity and extraversion. There is evidence that suggests introversion is a quality of the creative personality (Feist, 1998). This supports the common stereotype that creatives are solitary geniuses, spending lots of time alone to hone their craft. However, there is also evidence that extraversion correlates with creative performance (Sung & Choi, 2009). Research suggests that extraversion may play a role in activating employee curiosity and enthusiasm for seeking stimulation, which may enhance creative thinking and performance (Costa & McCrae, 1992; Sung & Choi, 2009). Additionally, extraversion may play a role in prompting the exchange of information between coworkers as a means for generating creativity (Chiang et al., 2017). Anecdotally, the importance of proximity to others and exchanging ideas is highly valued and stressed by creative practitioners. For these reasons, I arrive at the following hypotheses:

Hypothesis 1: Extraversion will positively relate to employee creativity.

Openness to Experience

Empirical support indicates openness to experience as a positive predictor of creativity (George & Zhou, 2001; McCrae & Costa, 1997). Individuals with high levels

of openness tend to be more open-minded, curious and imaginative. In contrast, individuals with low levels of openness tend to be more conservative and cautious. Sung & Choi (2009) suggested that employees with higher levels of openness tend to accomplish their tasks more creatively. Openness to experience has been shown to positively correlate with creative behaviors and spending time on creative pursuits (Silvia et al., 2014). Openness has also been correlated to divergent thinking (McCrae, 1987), ideational behavior (Batey et al., 2010), and idea generation (Costa & McCrae, 1985). For these reasons, I propose the following hypothesis:

Hypothesis 2: Openness to experience will positively relate to employee creativity.

Moderating Role of a Creativity-Supporting Work Environment

The work environment can impact the extent to which a person generates new and useful ideas (Woodman et al. 1993, Amabile et al. 1996). Evidence reveals how a creativity-supporting work environment fosters creativity and leads to increased innovation (Dul & Ceylan, 2014). Most research on work environments tends to primarily account for social-organizational aspects such as job complexity, rewards, and supervisor support (Shalley et al., 2004). However, evidence suggests that physical elements in the work environment also have an influence on creativity (Dul & Ceylan, 2011). Physical examples include the presence of plants (Shibata and Suzuki, 2002, 2004) or having a window view of nature (Stone and Irvine, 1994). Researchers encourage examining how both physical and social elements work together in supporting employee creativity as a critical step in understanding organizational creativity (Vithayathawornwong et al., 2003) To account for both of these dimensions, researchers

Dul and Ceylan (2014) developed a comprehensive framework for evaluating a creativity-supporting work environment, accounting for both the social-organizational and physical elements of the work environment.

Physical Characteristics

Researchers maintain that the physical elements in the work environment can be a source of creativity (Amabile, 2013; Chaubey et al., 2019; Dul & Ceylan, 2014; Woodman et al., 1993) Effects by physical elements in the work environment are often smaller than social-organizational elements, however, there is still a measurable effect (Amabile, 2013; Dul & Ceylan, 2014). Elements such as color, sound, odor, and a window view of nature can enhance creativity (Dul & Ceylan, 2011; McCoy & Evans, 2002). Additionally, perceptions of the physical elements in the immediate work environment, such as natural views and spatial complexity, promote creative potential (McCoy & Evans, 2002).

While the direct effects of the physical elements in the work environment on employee creativity have been studied (Ceylan et al., 2008; Dul and Ceylan, 2011), evidence for moderating effects is lacking. Of the few studies that exist, evidence suggests moderation effects of dim illumination in supporting the generation of new ideas (Steidle & Werth, 2013). It is also suggested that the physical elements may indirectly contribute to the social-psychological conditions which promote creativity (Vithayathawornwong et al., 2003).

Dul, Ceylan, and Jaspers (2011) were among the first researchers to explore the moderating effects of both physical and social-organizational elements on creative performance. In developing their comprehensive framework for assessing the creativity-

supporting work environment, Dul and Ceylan (2014) reviewed studies in ergonomics, environmental psychology, and indoor/outdoor design. The resulting framework consisted of 12 physical characteristics for a creativity-supporting work environment: furniture, indoor plants/flowers, calming colors, inspiring colors, privacy, window view to nature, any window view, quantity of light, daylight, indoor (physical) climate, sound (positive sound), smell (positive smell). These elements are reflected in the following hypotheses:

Hypothesis 3: The physical environment will moderate the relationship between extraversion and employee creativity such that the positive relationship is strengthened when the realized physical environment scores are high (vs. low).

Hypothesis 4: The physical environment will moderate the relationship between openness to experience and employee creativity such that the positive relationship is strengthened when the realized physical environment scores are high (vs. low).

Social-organizational Characteristics

The social environment can influence both the level and frequency of creative behaviors (Amabile et al., 1996). When assessing the work environment, Amabile identified certain factors that support employee creativity such as work challenge, freedom (autonomy), supervisory support, and job complexity (Amabile, 1996; 1998). Evidence suggests how social-organizational factors act as moderating variables in the relationship between employee personality and creativity. For example, job autonomy and a supportive supervisor strengthened the relationship between employee trait-based emotional intelligence and creativity (Jafri, 2018). Additionally, supervisor support and

certain job characteristics (autonomy) positively moderated the relationship between employee psychological capital and creativity (Cai et al., 2018). Even less research specifically investigates the interaction effects between personality and creativity. George and Zhou (2001) discovered supervisor feedback moderated the relationship between openness to experience and creative behavior.

Dul and Ceylan (2014) reviewed prominent literature on social-organizational characteristics most likely to enhance creativity (Hunter et al., 2007; Runco, 2004; Shalley et al., 2004). Adding to their comprehensive framework (Dul & Ceylan, 2014), they included nine social-organizational characteristics as likely factors to enhance employee creativity: challenging job (complexity and how demanding the job is), teamwork (working in a group towards a common goal), task rotation, autonomy in job (e.g. decision latitude), coaching supervisor (a supportive supervisor who builds trust, commitment, and provides positive feedback), time for thinking (the availability of time for idea generation), creative goals, recognition of creative ideas, and incentives for creative results. These elements are reflected in the following hypotheses:

Hypothesis 5: The social-organizational environment will moderate the relationship between extraversion and employee creativity such that the positive relationship is strengthened when the realized social-organizational environment scores are high (vs. low).

Hypothesis 6: The social-organizational environment will moderate the relationship between openness to experience and employee creativity such that the positive relationship is strengthened when the realized social-organizational environment scores are high (vs. low).

Moderating Role of Work Flexibility

The COVID-19 pandemic abruptly and drastically impacted organizations and their work practices around the globe. Many organizations responded by transitioning to a work from home (WFH) model. Emerging from the pandemic, 74% of companies plan to adopt a remote or flexible work arrangement (FWA) in the future (Gartner, 2020), due to its proven effectiveness and ability to increase productivity (Bloom, 2015; Hunter, 2019). Workplace flexibility has been studied in regard to employee productivity, however, research on its impact on employee creativity is scant and considered a necessary area for future research (Kniffin et al., 2020; Vedantam, 2020).

The Society for Human Resource Management (SHRM) defines workplace flexibility as “a mutually beneficial arrangement between employees and employers in which both parties agree on when, where and how work gets done” (Kossek et al., 2014). According to SHRM, flexible work arrangements (FWA) positively influence employee retention, engagement, and job satisfaction (SHRM, 2021). There are various forms of flexible work arrangements such as part-time work, teleworking, flexible work hours, flex-time, work from home (WFH), or a hybrid work model.

Workplace flexibility has been explored as a moderating variable in regard to psychological empowerment (Jena, et al., 2019), employee well-being (Ab Wahab & Tatoglu, 2020), and in the context of mitigating negative effects of burnout in high demand workplaces (Maglalang et al., 2021). However, little to no research exists specifically investigating the impact of workplace flexibility on employee creativity. One article provides anecdotal evidence on how remote work improves work-life balance, increasing employee happiness, thus by extension encouraging creativity (Hunter, 2019).

Flexible work arrangements have in fact been linked to improved work-life balance and organizational performance (Klindžić & Marić, 2019).

Nonetheless, workplace flexibility is becoming more commonplace and work from home is here to stay (Bloom, 2020). As managers and employees decide on the ideal level of flexibility for their team, a few common options have emerged. One of the options presented by SHRM (Miller, 2021) is to “return two or three days a week.” According to Bloom (2020), the recommendation for the ideal work flexibility is for 2 days at home and 3 days in the office. For these reasons, I propose the following hypothesis:

Hypothesis 7: Work flexibility will moderate the relationship between extraversion and employee creativity such that the positive relationship is strengthened when individuals work at least 2 days a week from home.

Hypothesis 8: Work flexibility will moderate the relationship between openness to experience and employee creativity such that the positive relationship is strengthened when individuals work at least 2 days a week from home.

Hypotheses Model

As shown in Figure 2, I propose extraversion and openness will have a direct effect on employee creativity. Meanwhile, the physical elements, social-organizational elements, and work flexibility will have a moderating effect on these relationships.

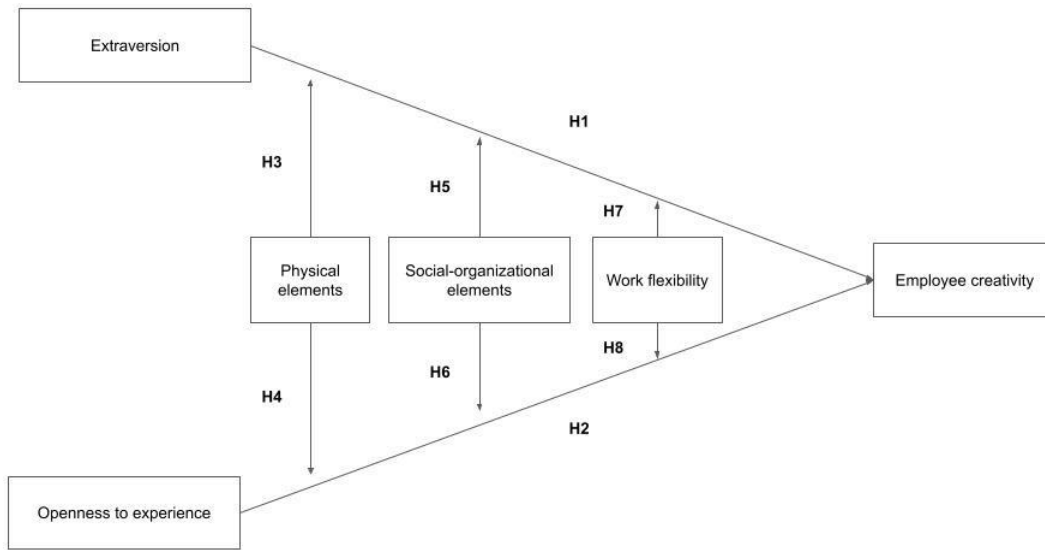


Figure 2. A hypotheses model for employee creativity.

CHAPTER 3

METHODS

Sample and Participants

This study included a sample of $N = 81$ participants. To test my hypotheses, I collected data from staff and faculty at a large North American design and arts institute. This sample of artists was an ideal sample to study since the organizational setting was one where creative ideation is strongly encouraged and considered a desirable work outcome. Participants came from a range of artistic domains: architecture, arts administration, dance, design, fine arts, film, theatre, and music.

For this sample group, information on age, gender, race, education, income, marital status, and number of children were also obtained. The mean age of the participants was 44.93 years old, with 32.1% males, 62.5% females, and 5.4% indicating 'other.' Of the sample, 10.7% identified as Hispanic or Latinx. The sample of participants was comprised of 83.6% White, 1.8% Black or African American, 3.6% Asian, and 10.9% indicating other. The highest level of education included 50% of participants with a master's degree, 33.9% with a bachelor's degree, 12.5% with a doctorate or equivalent degree, and 3.6% with some college. The average household income was 37.5% earning \$50,000 - \$100,000, 30.4% earning \$100,000 - \$200,000, 17.9% earning \$25,000 - \$50,000, 3.6% earning more than \$200,000, 1.8% earning less than \$25,000, and 8.9% preferred not to say. Regarding marital status, 62.5% were married, 32.1% were unmarried, 3.6% were divorced, and 1.8% preferred not to say. 62% of the participants had children under the age of 18 living with them during the past year, of whom the average age was 5.92 years old.

Procedure

Participants were invited to participate in an online survey concerning the relationship between creativity, work flexibility, and work environments. The online survey contained several instruments measuring their personality traits (extraversion and openness), the work environment (physical and social-organizational characteristics), workplace flexibility, and creativity (ideational behavior, creative behavior, and divergent thinking).

Measures

Personality

To assess personality traits, I used scale items from the International Personality Item Pool (IPIP), developed and validated by Goldberg (1992).

Extraversion. Using a 5-point scale (1 = *very inaccurate* to 5 = *very accurate*), participants were instructed to “describe yourself by indicating the accuracy of each statement below.” Extraversion (Factor I) was measured using a 10-item scale from the IPIP (Goldberg, 1992). Sample items included “I feel comfortable being around people,” “I start conversations,” and “I don’t mind being the center of attention.” The reliability score for the entire scale in this study was 0.89.

Openness to Experience. Using a 5-point scale (1 = *very inaccurate* to 5 = *very accurate*), participants were instructed to “describe yourself by indicating the accuracy of each statement below.” Openness (Factor V) was measured using a 10-item scale from the IPIP (Goldberg, 1992). Sample items included “I have a vivid imagination,” “I spend time reflecting on things,” and “I am full of ideas.” The reliability score for the entire scale in this study was 0.85.

Work Environment

Work Flexibility. To assess the level of work flexibility, I asked participants to use a slider to indicate the number of days worked from home. Participants respond to the following question: “In a typical 5-day work week, how many days do you work from home?” The resulting average of days worked from home among participants was 2.47.

Physical and Social-organizational Work Environment. To assess the creativity-supporting work environment, I used the Creativity Development Quick Scan (CDQS) developed by Dul & Ceylan (2014). This questionnaire assesses the physical and social-organizational elements within the work environment that are important in supporting an employee’s creativity as well as those that are present and realized in the employee’s work environment. Examples of the physical elements in the work environment include “inspiring colors,” “window view to nature,” and “quantity of light.” Examples of social-organization elements in the work environment include “autonomy in job,” “time for thinking,” and “incentives for creative results.” Using a 7-point scale (1 = *not important at all* to 7 = *very important*), participants were asked to consider their work environment in general and indicate how important various elements are in supporting their creativity. Next, using the same scale, participants were asked to reflect on the past year and indicate to what extent the various elements were present (realized) in their work environment. The survey provided two columns to evaluate the home and/or office environment, depending on their response to the previous work flexibility question. The reliability scores for the entire scale of realized elements in the home environment was 0.88, realized elements in the office environment was 0.93, and perceived importance of elements in the work environment in general was 0.88.

Employee Creativity

Ideational Behavior. To assess ideational behavior, I used the Runco Ideational Behavior Scale (RIBS; Runco, Plucker & Lim, 2001). This 23-item scale allows participants to self-report their use of and skill with ideas. Using a 5-point scale (1 = *never* to 5 = *very often*), participants describe their usual behaviors such as “I have many wild ideas” or “Sometimes I get so interested in a new idea that I forget about other things that I should be doing.” The reliability score for the entire scale in this study was 0.92.

Creative Behavior. The Biographical Inventory of Creative Behaviors (BICB; Batey, 2007) assesses an individual’s spontaneous everyday creativity and creative achievement. Participants reflect on the previous 12 months and respond to a list of 34 activities they have been actively involved in. Responses were on a 0/1 (*no/yes*) scale. The items are wide-ranging and include common activities related to visual and performing arts, creative writing, intellectual and scientific activities, and interpersonal activities such as coaching, mentoring, and leadership. Sample items included “produced your own food recipes,” “drawn a cartoon,” “published research,” “adapted an item and used it in a way that it was not designed to be, in what you consider to be an ingenious way,” “made up a joke,” “Mentored/Coached someone else to improve their performance,” and “composed a piece of music.”

Divergent Thinking. Divergent thinking tests (DT; Guilford, 1967) have long been used to evaluate idea-generating abilities and creative potential. To further assess individual ideation, participants were asked to come up with unusual uses for two common objects: a brick and a knife. Participants were specifically instructed to think

creatively and were given three minutes to come up with ideas. Studies have shown that a prompt to “be creative” increases validity in divergent thinking scores (Harrington, 1975). After three minutes, instructions were given to participants to evaluate their responses and select their top two most creative ideas. This part was untimed. The intent behind this step was to evaluate the creative quality of responses, not solely the quantity of responses.

To achieve maximum validity and dependable scores, I used a Top 2 scoring method with 3 raters. This was done in accordance with scoring and procedural recommendations by Silvia et al. (2008). After generating a number of responses to a given task, the Top 2 approach invites participants to indicate their top two most creative responses, allowing them a chance to evaluate their own work and assess the responses which best represent their abilities (Michael and Wright, 1989). The Top 2 scoring method with 3 raters is the optimal method with a G-coefficient of 0.81. Similar to Cronbach’s alpha coefficients, G-coefficients range from 0 to 1. The higher values indicated more reliable scores ($G > .80$). Each rater evaluated the top two most creative responses indicated by the participants. This evaluation was done using a 5-point scale (1 = *not very creative* to 5 = *very creative*). Instructions for judging creativity, which was provided to the raters, are listed in Appendix B.

Analysis

Data Screening and Cleaning

Data was initially compiled in Excel, then entered and screened in SPSS. While running missing data analysis, the Little’s MCAR test was not significant ($\chi^2 = 408.785$, $df = 374$, $p = .104$), suggesting that missing data was completely at random. Missing data

imputation was conducted to replace missing values in the data set (Tabachnick & Fidell, 2013)

Reverse scoring was required for Extraversion scale items 6-10 and Openness scale items 8-10. This was calculated by recoding the variables in SPSS. When looking at the data set for skewness and kurtosis, all variables were normally distributed.

In order to calculate a composite score for divergent thinking (DT), an interrater reliability analysis using Fleiss' Kappa was performed to determine consistency among raters (Landis & Koch, 1977). For unusual uses of the brick, the interrater reliability for raters on response 1 was found to be Kappa = 0.454 ($p < .000$), 95% CI (0.368, 0.540) and response 2 for was found to be Kappa = 0.309 ($p < .001$), 95% CI (0.225, 0.393). For unusual uses of the knife, the interrater reliability for response 1 was found to be Kappa = 0.361 ($p < .001$), 95% CI (0.265, 0.457) and response 2 was found to be Kappa = 0.378 ($p < .000$), 95% CI (0.293, 0.464). Overall, the raters agreed with one another from a fair to moderate degree when judging the participant's Top 2 creative responses. Finally, the average between the Top 2 Responses was calculated to arrive at a final composite score for DT.

Hypothesis Testing

Means, standard deviations, and correlations among the study variables are presented in Table 1. Results for multiple regression analyses predicting employee creativity are presented in Table 2.

To test for moderation effects, the PROCESS Macro (Hayes, 2013) was used in SPSS. I used Model 1 for simple moderation with 1,000 bootstrap samples and a confidence interval of 90. Conditional process analyses were performed according to

Hayes's (2018) guidelines. A total of 18 separate conditional process models were tested with two measures of personality (extraversion and openness) as the independent variable, three measures of employee creativity (creative behavior, divergent thinking, and ideational behavior) as the dependent variable, and three moderators (physical elements, social-organizational elements¹, and work flexibility). Regression results showing moderating effects of the work environment on employee creativity are presented in Table 3.

¹ Social-organizational and physical elements were measured by the perceived importance of the elements in the work environment in general and the realized (present) elements in the home and office work environment.

CHAPTER 4

RESULTS

Personality

Hypothesis 1 and 2 predict that extraversion and openness to experience will positively relate to employee creativity. Multiple regressions revealed a significant relationship between openness to experience and creative behavior, divergent thinking, and ideational behavior. The multiple regression models are presented in Table 2. Firstly, there was a significant relationship between openness and creative behavior ($\beta = .39, p = < .001$). This multiple regression model is a significant fit to the data ($F(2,78) = 7.16, p = .001$) with the two IVs explaining 15.5% of variance in creative behavior. We can conclude individual open to experiences participate in more creative behavior.

Additionally, there was a significant relationship between openness and divergent thinking ($\beta = .25, p = .026$). This multiple regression model is a significant fit to the data ($F(2,78) = 3.00, p = .056$) with the two IVs explaining 7.1% of variance in divergent thinking, suggesting that open people tend to think more divergently. Finally, there was also a significant relationship between openness and ideational behavior ($\beta = .71, p = < .001$). This multiple regression model is a significant fit to the data ($F(2,78) = 39.56, p = < .001$) with the two IVs explaining 50.4% of variance in ideational behavior. This means that open people display greater levels of ideational behavior. Hypothesis 2 was supported.

Ultimately, hypothesis 1 was not supported. Multiple regressions revealed no significant relationship between extraversion and creative behavior ($\beta = -.07, p = .520$), divergent thinking ($\beta = -.12, p = .297$), or ideational behavior ($\beta = -.05, p = .528$).

Moderating Effects of the Work Environment

Hypotheses 5 and 6 predict that social-organizational elements in the work environment moderate the relationship between personality and employee creativity. Moderation analysis results revealed significant direct effects, partially supporting hypothesis 5 and 6 that social-organizational elements of the office work environment moderate the relationship between extraversion and employee creativity as well as the relationship between openness and employee creativity. These results suggest that realized and perceived social-organizational elements in the work environment may encourage employees to engage in creative behaviors and promote idea generation.

Analysis #14 (Table 3 and Figure 3) revealed a significant interaction effect ($b = 2.17, p = .018$) with the moderation effect being statistically significant at medium and high levels of the moderator. Similarly, analysis #15 (Table 3 and Figure 4) revealed a significant interaction effect ($b = .64, p = .027$) with the moderation effect being statistically significant at medium and high levels of the moderator. These results suggest that the presence of social-organizational elements in the office work environment plays a role in promoting creativity by increasing divergent thinking and creative behavior. For both analyses, the levels of divergent thinking and creative behaviors are relatively the same at high levels of openness regardless of the moderator and dramatically different at low levels of openness across different levels of the moderator. Both analyses partially support H6 that social-organizational elements will moderate the relationship between openness to experience and employee creativity.

Analysis #29 (Table 3 and Figure 5) revealed a significant interaction effect ($b = 1.19, p = .071$), partially supporting H5 that social-organizational elements will moderate

the relationship between extraversion and employee creativity. The moderation effect was only significant at very low levels of the moderator. Results suggest that when realized social-organizational elements in the home work environment are very low, employees with higher levels of extraversion engage in less everyday creative activities. Conversely, introverted employees seem to be less impacted when realized social-organizational elements in the home work environment are very low.

Surprisingly, moderation effects of perceived importance of social-organizational elements in the general work environment had significant results as well. Analysis #40 (Table 3 and Figure 6) revealed a significant interaction effect ($b = .22, p = .009$) between extraversion and perceived importance of social-organizational elements on ideational behavior. Similarly, analysis #41 (Table 3 and Figure 7) revealed a significant interaction effect ($b = 2.14, p = .016$) between extraversion and perceived importance of social-organizational elements on creative behavior. For both analyses, the moderation effect was statistically significant at low levels of the moderator. Results suggest that people with higher levels of extraversion display less ideational behavior and creative behavior when perceived importance of social-organizational elements in the general work environment is low. For both analyses, the levels of ideational behavior and creative behavior are relatively the same at low levels of extraversion regardless of the moderator and dramatically different at high levels of extraversion across different levels of the moderator.

Analysis #19 (Table 3 and Figure 8) revealed an interaction effect ($b = .16, p = .096$) between openness and perceived importance of social-organizational elements in the general work environment on ideational behavior. The moderation effect was

statistically significant across all levels of the moderator. Similarly, analysis #20 (Table 3 and Figure 9) revealed a significant interaction effect ($b = 2.76, p = .027$) between openness and perceived importance of social-organizational elements in the general work environment on creative behavior. The moderation effect was statistically significant at medium and high levels of the moderator. For both analyses, results suggest that people with higher levels of openness to experience display more ideational behavior and creative behavior when perceived importance of social-organizational elements in the general work environment is high.

Hypotheses 3 and 4 were not supported. Moderation analysis results did not indicate a significant effect of the physical elements in the work environment on employee creativity. Additionally, hypotheses 7 and 8 were not supported. Moderation analysis results did not reveal a significant effect of work flexibility on employee creativity.

Table 1

Means, Standard Deviations, and Correlations among Study Variables

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
1. Extraversion	3.26	.78	(0.89)											
2. Openness to experience	4.07	.57	.07	(0.85)										
3. Days worked from home	2.47	1.48	.15	-.04	-									
4. Important physical elements in the work environment in general	5.28	.88	.20	.26*	.04	(0.87)								
5. Important social-organizational elements in the work environment in general	5.52	.79	.15	.31**	.12	.40**	(0.81)							
6. Realized physical elements in the home work environment	5.67	1.17	-.28*	.14	.09	.56**	.21	(0.93)						
7. Realized social-organizational elements in the home work environment	4.94	1.17	.15	.15	.23*	.22*	.21	.27*	(0.86)					
8. Realized physical elements in the office work environment	3.75	1.33	-.02	-.05	-.42**	.32**	.02	.11	.04	(0.92)				
9. Realized social-organizational elements in the office environment	4.85	1.12	.17	.06	.14	.17	.27*	-.04	.51**	.41**	(0.90)			
10. Ideational behavior	3.32	.56	-.00	.71**	-.03	.22*	.23*	.10	-.13	-.12	-.05	(0.92)		
11. Creative behavior	7.01	5.77	-.04	.39**	-.04	-.01	.10	-.11	-.26*	.07	-.13	.47**	-	
12. Divergent thinking	2.03	1.46	-.10	.24*	-.12	-.10	.01	-.09	-.27*	-.06	-.34**	.29**	.65**	-

Note: $N = 81$. Scale reliability α is presented in the diagonal of the matrix. * $p < 0.05$; $p < 0.01$ ** (two-tailed).

Table 2

Results of Multiple Regression Analyses Predicting Employee Creativity

Variable	Model 1		Model 2		Model 3	
	DV = Creative Behavior		DV = Divergent Thinking		DV = Ideational Behavior	
	β	S.E.	β	S.E.	β	S.E.
<i>Constant</i>		.124		.925		.115
Extraversion	-.067	.520	-.115	.297	-.051	.528
Openness to experience	.392***	<.001	.249***	.026	.711***	<.001
Adjusted R ²	.13		.05		.49	
F (df)	7.16*** (2,78)		3.00*** (2,78)		39.56*** (2,78)	

Note: $N = 81$. Beta is the standardized regression coefficient. Significance levels are based on directional, one-tailed t tests.

*** $p < .001$

Table 3

Regression Results Showing Moderating Effects of the Work Environment on Employee Creativity

#	IV	Moderator	DV	Moderation Effects		90% Bootstrap Confidence Intervals	
				b	S.E.	LLCI	ULCI
01	Openness to experience	Work flexibility	Ideational behavior	-.03	.607	-.12	.06
02	Openness to experience	Work flexibility	Creative behavior	-.20	.776	-1.40	.99
03	Openness to experience	Work flexibility	Divergent thinking	.16	.398	-.16	.48
04	Openness to experience	Realized physical elements in the home work environment	Ideational behavior	-.02	.626	-.10	.06
05	Openness to experience	Realized physical elements in the home work environment	Creative behavior	-.66	.293	-1.71	.38
06	Openness to experience	Realized physical elements in the home work environment	Divergent thinking	-.11	.529	-.39	.18
07	Openness to experience	Realized social-organizational elements in the home work environment	Ideational behavior	-.11	.115	-.23	.01
08	Openness to experience	Realized social-organizational elements in the home work environment	Creative behavior	.74	.430	-.81	2.30
09	Openness to experience	Realized social-organizational elements in the home work environment	Divergent thinking	.26	.299	-.16	.68
10	Openness to experience	Realized physical elements in the office work environment	Ideational behavior	.01	.843	-.09	.11
11	Openness to experience	Realized physical elements in the office work environment	Creative behavior	-.02	.983	-1.36	1.33
12	Openness to experience	Realized physical elements in the office work environment	Divergent thinking	-.11	.624	-.47	.25

33

13	Openness to experience	Realized social-organizational elements in the office work environment	Ideational behavior	.01	.943	-.14	.15
14	Openness to experience	Realized social-organizational elements in the office work environment	Creative behavior	2.71	.018	.85	4.58
15	Openness to experience	Realized social-organizational elements in the office work environment	Divergent thinking	.64	.027	.17	1.11
16	Openness to experience	Important physical elements in the work environment in general	Ideational behavior	.02	.823	-.15	.20
17	Openness to experience	Important physical elements in the work environment in general	Creative behavior	-.43	.760	-2.74	1.89
18	Openness to experience	Important physical elements in the work environment in general	Divergent thinking	-.41	.264	-1.02	.20
19	Openness to experience	Important social-organizational elements in the work environment in general	Ideational behavior	.16	.096	.00	.31
20	Openness to experience	Important social-organizational elements in the work environment in general	Creative behavior	2.76	.027	.72	4.79
21	Openness to experience	Important social-organizational elements in the work environment in general	Divergent thinking	-.17	.619	-.73	.39
22	Extraversion	Work flexibility	Ideational behavior	.02	.697	-.07	.12
23	Extraversion	Work flexibility	Creative behavior	.82	.158	-.14	1.77
24	Extraversion	Work flexibility	Divergent thinking	.11	.458	-.13	.35
25	Extraversion	Realized physical elements in the home work environment	Ideational behavior	.08	.216	-.03	.19
26	Extraversion	Realized physical elements in the home work environment	Creative behavior	-.02	.980	-1.13	1.10
27	Extraversion	Realized physical elements in the home work environment	Divergent thinking	.10	.557	-.18	.38
28	Extraversion	Realized social-organizational elements in the home work environment	Ideational behavior	-.01	.830	-.13	.10

29	Extraversion	Realized social-organizational elements in the home work environment	Creative behavior	1.19	.071	.11	2.28
30	Extraversion	Realized social-organizational elements in the home work environment	Divergent thinking	.09	.590	-.19	.37
31	Extraversion	Realized physical elements in the office work environment	Ideational behavior	.10	.121	-.01	.21
32	Extraversion	Realized physical elements in the office work environment	Creative behavior	-.65	.341	-1.79	.48
33	Extraversion	Realized physical elements in the office work environment	Divergent thinking	.10	.571	-.19	.39
34	Extraversion	Realized social-organizational elements in the office work environment	Ideational behavior	.08	.223	-.03	.19
35	Extraversion	Realized social-organizational elements in the office work environment	Creative behavior	.98	.154	-.15	2.12
36	Extraversion	Realized social-organizational elements in the office work environment	Divergent thinking	.07	.668	-.21	.35
37	Extraversion	Important physical elements in the work environment in general	Ideational behavior	.04	.681	-.11	.19
38	Extraversion	Important physical elements in the work environment in general	Creative behavior	-.31	.744	-1.91	1.28
39	Extraversion	Important physical elements in the work environment in general	Divergent thinking	.104	.668	-.30	.51
40	Extraversion	Important social-organizational elements in the work environment in general	Ideational behavior	.22	.009	.09	.36
41	Extraversion	Important social-organizational elements in the work environment in general	Creative behavior	2.14	.016	.70	3.58
42	Extraversion	Important social-organizational elements in the work environment in general	Divergent thinking	.32	.160	-.06	.70

Note: $N = 81$. B is the unstandardized regression coefficient.

Figure 3

Realized Social-organizational Elements in the Office Work Environment Moderated the Relationship Between Openness and Creative Behavior

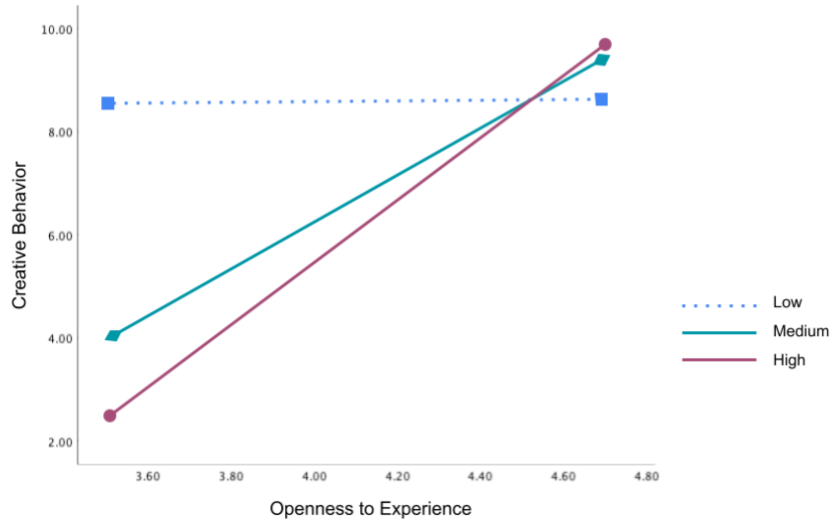


Figure 4

Realized Social-organizational Elements in the Office Work Environment Moderated the Relationship Between Openness and Divergent Thinking

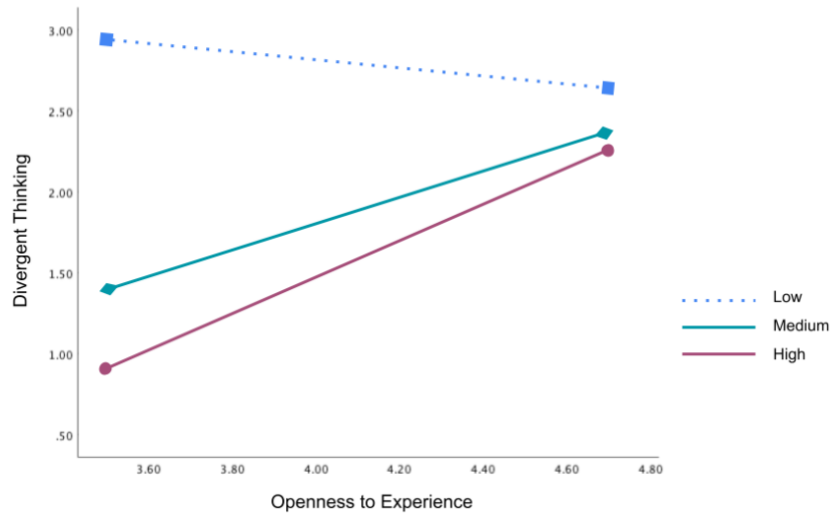


Figure 5

Realized Social-organizational Elements in the Home Work Environment Moderated the Relationship Between Extraversion and Creative Behavior²

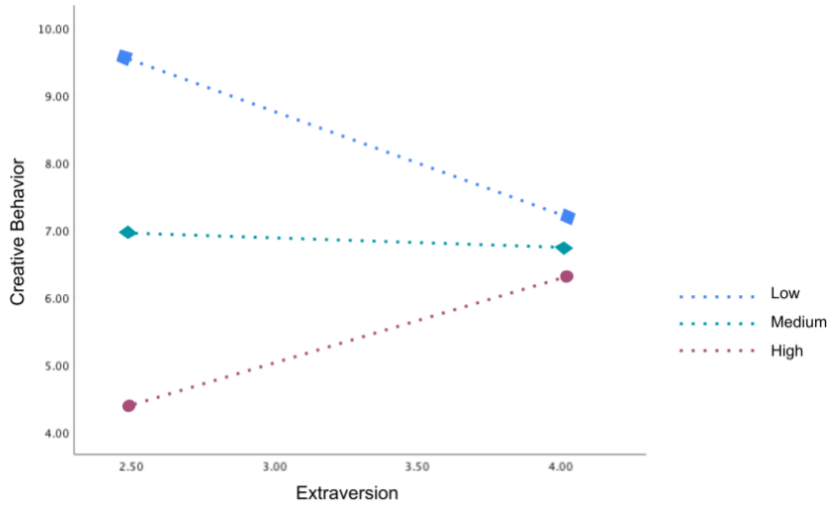
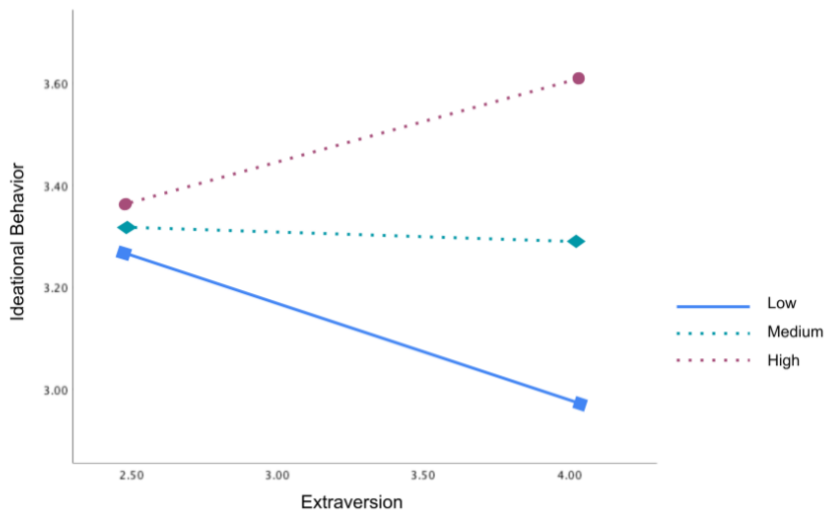


Figure 6

Perceived Importance of Social-organizational Elements in the General Work Environment Moderated the Relationship Between Extraversion and Ideational Behavior



² Moderation effect was only significant at very low levels of the moderator

Figure 7

Perceived Importance of Social-organizational Elements in the General Work

Environment Moderated the Relationship Between Extraversion and Creative Behavior

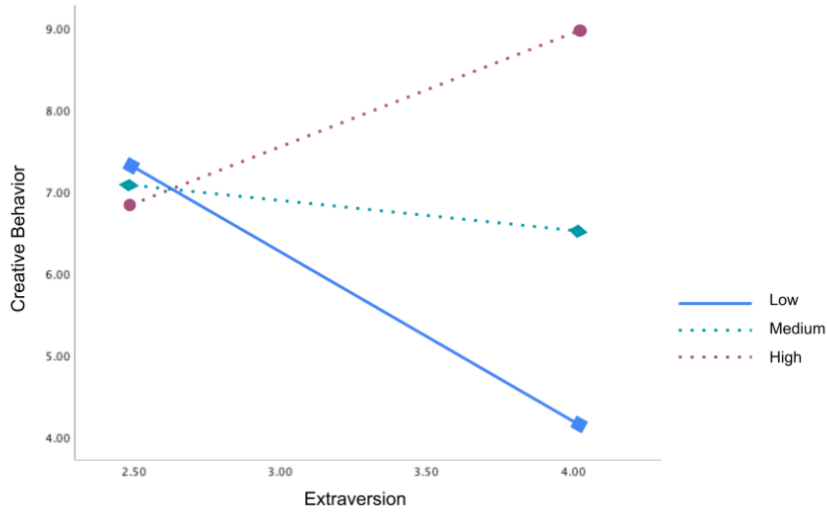


Figure 8

Perceived Importance of Social-organizational Elements in the General Work

Environment Moderated the Relationship Between Openness and Ideational Behavior

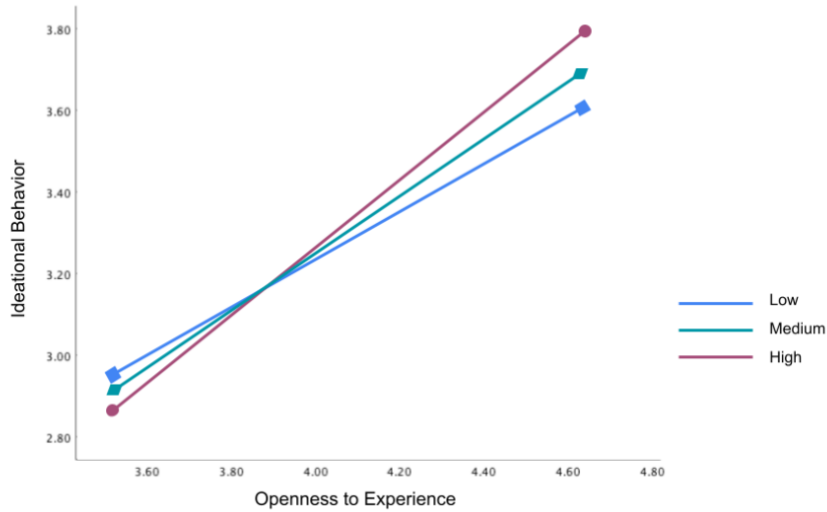
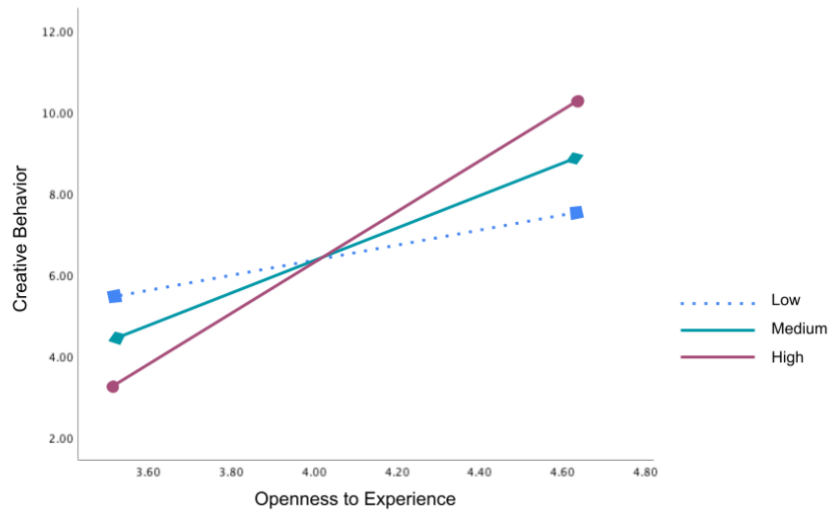


Figure 9

Perceived Importance of Social-organizational Elements in the General Work

Environment Moderated the Relationship Between Openness and Creative Behavior



CHAPTER 5

DISCUSSION

The purpose of this study was to understand the moderating role of the work environment. Results suggest that realized and perceived social-organizational elements have a moderating effect. These elements include job challenge, teamwork, task rotation, autonomy, coaching supervisor, time for thinking, creative goals, recognition of creative ideas, and incentives for creative results. This study also suggests that openness to experience is a main predictor of employee creativity.

Consistent with previous studies (Batey et al., 2010; Costa & McCrae, 1985, McCrae, 1987; Silvia et al., 2014), openness to experience exhibited a positive relationship with creativity. This may be due to the fact the employees with higher levels of openness tend to be more open-minded, curious, and willing to accept new perspectives. My findings offer additional support that openness to experience positively relates to employee creative behavior, divergent thinking, and ideational behavior.

Although H1 was not supported, that extraversion positively relates to employee creativity, the results suggest that creativity manifests among both extroverts and introverts. This would align with research by Csikszentmihalyi (1997), stating that creative individuals exhibit both traits of extraversion and introversion at the same time. Additionally, this finding may provide additional support for the creative personality depicted by Feist (1998), listing “introverted” as a consistent quality, and Susan Cain (2012) asserting introversion as a creative advantage.

Results indicated how the relationship between personality and employee creativity is affected by the work environment. In particular, when looking at levels of extraversion, results showed differing interaction effects on introverts and extroverts. When levels of social-organizational elements in the work environment were low, extraverts engaged in less creative behavior and ideational behavior (see Figure 5, Figure 6, and Figure 7). This could be due to the lack of richness and stimulation derived from supporting social-organizational elements. However, the interaction effect was not as dramatic for introverted employees. This suggests that extraverts may need to pay more attention to the social-organizational elements in their work environment to ensure these elements are not diminishing or lacking. Furthermore, it is also important to note that mid to high levels of social-organizational support did not have a significant interaction effect on employee extraversion, however, the effect was clear when these elements were lacking at low levels of the moderator.

The significant moderating effects in the office work environment were interesting to note (see Figure 3 and Figure 4). These results suggest that for employees with higher levels of openness, the office work environment could be stimulating their curiosity and imagination due to closer proximity to their colleagues and resources, and thus allowing them to perform their tasks more creatively. This would be in alignment with previous research (Batey et al., 2010; George & Zhou, 2001; Costa & McCrae, 1985; McCrae, 1987; McCrae & Costa, 1997; Sung & Choi, 2009).

Another significant finding was the significant effect of ‘perceived’ importance of social-organizational elements in the work environment. This aligns with research

indicating employee perception of the presence of these elements is also important for encouraging creativity, similar to the actual presence of the element (Amabile et al., 1996). Results revealed that high levels of perception of social-organizational elements in the work environment is associated with creative behaviors and ideational behavior among employees with high extraversion and openness.

Overall, the social-organizational influence on creativity was markedly stronger than physical elements in the work environment, which exhibited no significant interaction effect in this study. This is in alignment with conclusions made by other researchers asserting how effects of physical elements are often less than social-organizational elements, however, they still offer measurable effects (Amabile, 2013; Dul et al., 2011; Dul & Ceylan, 2014) Although hypotheses 3 and 4 were not supported, predicting a moderating effect of the physical elements in the work environment on employee creativity, these elements should not be ignored altogether. Research on the moderating role of physical elements in the workplace is severely lacking and requires further investigation.

To my knowledge, this study is one of the few which considers the social-organizational and physical elements of the work environment simultaneously when evaluating the work environment and its impact on the relationship between employee personality and creativity. Dul and Ceylan (2011) were one of the first pioneers to do so. This study offers additional findings from a press perspective on creativity, which is the least explored approach to creativity studies (Said-Metwaly et al., 2017a). Furthermore,

this study adds an additional modifier, workplace flexibility, which proved not to have a significant effect.

It is also important to reiterate and emphasize that these findings can be applied to any domain. The creative personality can vary from person to person and domain to domain (Runco, 2007). Results from the present study may reflect participants working within the creative arts, however, creativity is not exclusive to a specific domain (Amabile, 1996; Azzam, 2009; Feist, 1998; Mumford, Whetzel, & Reiter-Palmon, 1997). Creativity, the generation of novel and potentially useful ideas, can be observed in a multitude of sectors such as engineering, finance, marketing, and management (Mumford et al, 2002), and practiced by any individual utilizing a creative problem solving process.

CHAPTER 6

LIMITATIONS

There are four primary limitations in this study that could be addressed in future research. The first limitation was the sample size. Data collection and the survey release occurred during a challenging time in the academic calendar when participants were either on vacation or busy prepping for the fall semester. Nonetheless, power analysis revealed that this study had sufficient statistical power ($\beta > .80$). In the future, I would choose to release this survey during a different time of year.

Second, the Kappa results for divergent thinking rater scores could have been improved to represent a substantial to almost perfect agreement. Present results revealed a moderate agreement interpretation. For future studies, in order to increase Kappa results, I would suggest reducing the number of raters from three to two. Additionally, I would suggest altering the 1-5 scale to a 1-3 scale.

Third, there was a major limitation on referencing previous research discussing the relationship between workplace flexibility and employee creativity. One of the very few articles available discussed how flexible work arrangements may improve creativity, however, they only provided brief anecdotal evidence with no empirical support (Hunter, 2019). Regardless, this gap in the literature may serve as a potential opportunity for other researchers to investigate and contribute further findings on this topic.

Fourth, a more robust instrument could have been used to measure workplace flexibility. A more nuanced assessment could have identified and gathered more detailed information such as the participant's ability to take time off, when and where participants

work, the number of hours they work, and the opportunity to work remotely.

Alternatively, I could have assessed the specific types of flexible work arrangement being practiced by each participant. This could have provided a more comprehensive view of flexibility versus just relying on the days worked from home.

Despite these limitations, the present study contributes to a growing body of knowledge on moderating effects of the workplace environment, which is considered one of the least explored perspectives in creativity studies (Said-Metwaly et al., 2017a).

CHAPTER 7

IMPLICATIONS FOR FUTURE RESEARCH AND PRACTICE

Gaining further understanding about the elements that influence employee creativity provides practical and theoretical implications. The present study provides support for the importance of realized and perceived social-organizational factors in enhancing employee creativity. Additionally, it provides evidence of the effects on two personality traits, openness and extraversion.

To enrich employee ability to produce novel ideas, organizations can foster conditions that support social-organizational factors proven to influence employee creativity. Possible solutions include: granting appropriate levels of job autonomy and decision latitude, providing supervisor support and encouragement to employees, allowing time for thinking and idea generation, providing opportunities and space for meaningful team interactions, setting goals for creative outcomes, creating jobs with a healthy degree of complexity, providing opportunities for task rotation, recognizing new ideas, and providing incentives for creative results.

Theoretically, this study contributes to literature in several areas. To begin with, this is one of the first attempts at incorporating workplace flexibility as a moderating variable of the work environment assessing the effect on personality and employee creativity. In addition, this is one of the few studies that utilizes both physical and social-organizational elements as moderating variables in assessment of a creativity-supporting work environment, adding supportive evidence to a limited area of research from a press

(environment) perspective. Lastly, this study adds further support for the relationship between openness to experience as an indicator of employee creative potential.

The research presented provides several directions for future research. First, research on how workplace flexibility impacts employee creativity is practically non-existent. Future research could investigate the role of perceived workplace flexibility and its relationship to autonomy as a predictor of employee creativity. Another option would be to explore workplace flexibility (i.e. flexible work arrangements) as an independent variable instead of a moderator. Second, future studies could expand this comprehensive model and include a measurement for the creative process, fully assessing all perspectives within creativity research. Furthermore, researchers could assess how the creative process changes for employees working in the home environment compared to the office. Third, researchers could explore further refinements to the divergent thinking Top 2 rating and interrater scoring methodology. Fourth, future research could investigate how the work environment impacts introverts and extraverts differently. Fifth, future research could investigate each social-organizational element separately and measure the degree of effect on employee creativity within the home and work environments. Finally, future research could investigate a moderated moderation effects (see Model 3 of Hayes, 2013) of the physical elements on the social factors within the work environment.

CHAPTER 8

CONCLUSION

The present study tested a comprehensive model of personality and employee creativity, moderated by the work environment. I proposed a moderation effect that physical elements, social-organizational elements, and work flexibility in the work environment may have on employee creativity. Results suggested that the relationship between personality and employee creativity is altered when social-organizational elements are realized in the home and office work environments. Additionally, this relationship is altered by the perceived importance of social-organizational elements in the workplace in general. Lastly, findings supported openness to experience as a predictor of employee creativity.

Fostering creativity requires leaders to radically change how they consider their organizational culture, policies, and practices. As conversations on workplace flexibility and the changing work environment are becoming more commonplace, the implications on employee creativity deserves attention. Altering the social-organizational variables within a given environment offers perhaps the most promising avenue for influencing creative behavior and can have immediate, observable effects on performance (Amabile et al., 1996). This research is timely, especially in the context of Covid-19, and vital for informing ongoing conversations about the future of work and understanding creativity from an interactionist perspective.

The work environment has a measurable impact on the extent to which a person generates new ideas (Woodman et al. 1993, Amabile et al. 1996), and a work

environment that supports employee creativity leads to increased innovation (Dul & Ceylan, 2014), giving organizations a competitive edge (Amabile, 1988, 2016; Oldham & Cummings, 1996). This notion alone provides evidence for the strategic importance of creating workplace conditions that foster employee creativity, the ability to produce original and potentially useful ideas.

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APPENDIX A
MEASUREMENTS USED IN THE STUDY

Extraversion (Goldberg, 1992) ^R

Describe yourself by indicating the accuracy of each statement below.

5-point scale (1 = very inaccurate to 5 = very accurate)

1. I am the life of the party
2. I feel comfortable being around people
3. I start conversations
4. I talk to a lot of different people at parties
5. I don't mind being the center of attention
6. I don't talk a lot ^R
7. I keep in the background ^R
8. I have little to say ^R
9. I don't like to draw attention to myself ^R
10. I am quiet around strangers ^R

Openness (Goldberg, 1992)

Describe yourself by indicating the accuracy of each statement below.

5-point scale (1 = very inaccurate to 5 = very accurate)

1. I have a rich vocabulary
2. I have a vivid imagination
3. I have excellent ideas
4. I am quick to understand things
5. I use difficult words

^R Reverse coded items

6. I spend time reflecting on things
7. I am full of ideas
8. I have difficulty understanding abstract ideas [®]
9. I am not interested in abstract ideas [®]
10. I do not have a good imagination [®]

Creativity Development Quick Scan (CDQS; Dul & Ceylan (2014)

Indicate how important you consider each element in your work environment for supporting your creativity.³

Indicate to which extent the following elements are present (realized) in your work environment for supporting your creativity.⁴

7-point scale (1 = not important at all, 4 = moderately important, 7 = very important)

1. Challenging job
2. Teamwork
3. Task rotation
4. Autonomy in job
5. Coaching supervisor
6. Time for thinking
7. Creative goals
8. Recognition of creative ideas
9. Incentives for creative results

³ Question used to measure the perceived importance of elements in the work environment in general.

⁴ Question used to measure the realized (present) elements in the home and office work environments.

10. Furniture
11. Indoor plants/flowers
12. Calming colors
13. Inspiring colors
14. Privacy
15. Window view to nature
16. Any window view
17. Quantity of light
18. Daylight
19. Indoor (physical) climate
20. Sound (positive sound)
21. Smell (positive smell)

Runco Ideational Behavior Scale (RIBS; Runco, Plucker & Lim, 2001)

Describe the frequency of each statement using the scale below.

5-point scale (1 = never to 5 = very often)

1. I have many wild ideas
2. I think about ideas more often than most people
3. I often get excited by my own new ideas
4. I come up with a lot of ideas or solutions to problems
5. I come up with an idea or solution other people have never thought of
6. I like to play around with ideas for the fun of it
7. It is important to be able to think of bizarre and wild possibilities

8. I would rate myself highly in being able to come up with ideas
9. I have always been an active thinker—I have lots of ideas
10. I enjoy having leeway in the things I do and room to make up my own mind
11. My ideas are often considered “impractical” or even “wild”
12. I would take a college course which was based on original ideas
13. I am able to think about things intensely for many hours
14. Sometimes I get so interested in a new idea that I forget about other things that I should be doing
15. I often have trouble sleeping at night, because so many ideas keep popping into my head
16. When writing papers or talking to people, I often have trouble staying with one topic because I think of so many things to write or say
17. I often find that one of my ideas has led me to other ideas that have led me to other ideas, and I end up with an idea and do not know where it came from
18. Some people might think me scatterbrained or absentminded because I think about a variety of things at once
19. I try to exercise my mind by thinking things through
20. I am able to think up answers to problems that haven't already been figured out
21. I am good at combining ideas in ways that others have not tried
22. Friends ask me to help them think of ideas and solutions
23. I have ideas about new inventions or about how to improve things

Biographical Inventory of Creative Behaviors (BICB; Batey, 2007)

Check the box next to the activities you have been actively involved in. Please answer as truthfully as you can. In the past 12 months have you...

Responses on a 0/1 (no/yes) scale

1. Written a short story
2. Written a novel
3. Organized an event, show, performance or activity
4. Produced a TV/Play script
5. Designed and produced a textile product (e.g. made an item of clothing or household object)
6. Redesigned and redecorated a bedroom, kitchen, personal space, etc.
7. Invented and made a product that can be used
8. Drawn a cartoon
9. Started a club, association or group
10. Produced a picture, i.e. NOT a doodle (using paint, pencils, charcoal, acrylic, etc.)
11. Had an article published
12. Formed a sculpture using any suitable materials
13. Recognized where an accepted scientific theory/approach does not explain what it purports to
14. Produced your own food recipes
15. Produced a short film
16. Produced your own website
17. Produced a theory to explain a phenomenon

18. Invented a game or other form of entertainment
19. Selected to lead/manage others
20. Made someone a present
21. Composed a poem
22. Adapted an item and used it in a way that it was not designed to be, in what you consider to be an ingenious way
23. Published research
24. Choreographed a dance
25. Designed and planted a garden
26. Produced a portfolio of photographs (NOT photographs of a holiday, party, etc.,)
27. Acted in a dramatic production
28. Delivered a speech
29. Mentored/Coached someone else to improve their performance
30. Devised an experiment to help understand something
31. Made up a joke
32. Been made a leader/captain of a team/group (e.g. Debating society chairperson, Captain of the Hockey team, etc.)
33. Composed a piece of music
34. Made a collage

APPENDIX B
INSTRUCTIONS FOR JUDGING CREATIVITY

Creativity can be viewed as having three facets. Consider the following three dimensions when making your ratings. Creative responses will generally be high on all three, although being low on one of them does not necessarily disqualify a response from getting a high rating. You may also give lower scores to actual uses for a brick (e.g. making a wall or fireplace) or a knife (e.g. cutting a sandwich in half).

1. Uncommon

Creative ideas are uncommon: they will occur infrequently in our sample. Any response that is given by a lot of people is common, by definition. Unique responses will tend to be creative responses, although a response given only once need not be judged as creative. For example, a random or inappropriate response would be uncommon but not creative.

2. Remote

Creative ideas are remotely linked to everyday objects and ideas. For example, creative uses for a brick are “far from” common, everyday, normal uses for a brick, and creative instances of things that are round are “far from” common round objects. Responses that stray from obvious ideas will tend to be creative, whereas responses close to obvious ideas will tend to be uncreative.

3. Clever

Creative ideas are often clever: they strike people as insightful, ironic, humorous, fitting, or smart. Responses that are clever will tend to be creative responses. Keep in mind that cleverness can compensate for the other facets. For example, a common use cleverly expressed could receive a high score.

APPENDIX C

IRB APPROVAL/EXEMPTION FOR HUMAN SUBJECT TESTING



EXEMPTION GRANTED

[Mai Trinh](#)
[CISA: Leadership and Interdisciplinary Studies](#)
480/727-0416
Mai.Trinh@asu.edu

Dear [Mai Trinh](#):

On 6/30/2021 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	How Work Environments and Flexibility Impact Employee Creativity: A Model of Creative Work
Investigator:	Mai Trinh
IRB ID:	STUDY00014167
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • Consent Form_6-29-2021.pdf, Category: Consent Form; • IRB Social Behavioral_6-29-2021.pdf, Category: IRB Protocol; • Qualtrics_Survey_6-29-2021.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Recruitment_Methods_Email_29-6-2021.pdf, Category: Recruitment Materials; • Recruitment_Methods_Social Media Announcement Post_29-6-2021.pdf, Category: Recruitment Materials;

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 6/30/2021.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

If any changes are made to the study, the IRB must be notified at research.integrity@asu.edu to determine if additional reviews/approvals are required. Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

Sincerely,

IRB Administrator

cc: Christine Dongell
Christine Dongell