Spring 2019

Knowledge Sharing and Creative Confidence in Promoting Employees' Creative Behavior

Elnaz Dario
Old Dominion University, edari001@odu.edu

KNOWLEDGE SHARING AND CREATIVE CONFIDENCE IN PROMOTING EMPLOYEES' CREATIVE BEHAVIOR

by

Elnaz Dario
B.A. May 2008, Marmara University School of Law, Turkey
M.E.M. December 2013, Old Dominion University
M.B.A. August 2014, Marmara University, Turkey

A Dissertation Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the Degree of

DOCTOR OF PHILOSOPHY

ENGINEERING MANAGEMENT AND SYSTEMS ENGINEERING

OLD DOMINION UNIVERSITY
May 2019

Approved by:

Resit Unal (Director)

Kaitlynn M. Castelle (Member)

Charles B. Daniels (Member)

Rafael E. Landaeta (Member)

ABSTRACT

KNOWLEDGE SHARING AND CREATIVE CONFIDENCE IN PROMOTING EMPLOYEES' CREATIVE BEHAVIOR

Elnaz Dario
Old Dominion University, 2019
Director: Dr. Resit Unal

The purpose of this research is to investigate the influence of knowledge sharing and creative confidence on the relationship between organization creative environment and employee creative behavior. This study individually assesses the relationship between factors from heterogeneous survey participant data and compares the result for two groups; engineers and non-engineers. A theoretical framework is adopted to explain how a creative climate stimulates an individual's creative behavior and how this relationship is moderated and mediated by knowledge sharing and creative confidence. This is a relatively unexplored concept in the current literature. The results demonstrated that knowledge sharing and creative confidence significantly jointly mediate the relationship between creative climate (the independent variable) and creative behavior (the dependent variable), furthermore moderation analysis results indicate that knowledge sharing and creative confidence do not significantly and jointly moderate the relationship between creative climate and creative behavior. This research supports the existing body of literature relating to organizational behavior in technical environments.

This dissertation is dedicated to my family, Behrooz Dario, Susan Ramezani and Aidin Dario, who always believed in me.

ACKNOWLEDGEMENTS

I acknowledge the following individuals for their contribution to my efforts in completing my dissertation:

My sincere appreciation for Dr. Resit Unal, my advisor, who guided me through this process from the first day in graduate school, and saved me from giving up. It all started in 2012 when he offered me such a great opportunity to join the Engineering Management and Systems Engineering department. Additional thanks to his wife Dr. Mujde Unal, I have received a great deal of support from her.

For Dr. Charlie Daniels, for always being available for questions and to alleviate fears and frustrations. For Dr. Kaitlynn Castelle, who guided my dissertation, she inspired me by her hardworking and passionate attitude. For Dr. Rafael Landaeta, for his continued support throughout my journey. For Dr. Andres Souse-Poza, who has shown me, by his example, what a good leader should be. For Ms. Kim Miller, who has been supportive of all the graduate assistants in the Engineering Management and Systems Engineering Department, she has a beautiful heart.

For my friends: Cansu, Gulsah, Farinaz, and my extended family, whom I had the pleasure to work with, in the Engineering Management and Systems Engineering Department at Old Dominion University.

For my lovely family: who supported me in all steps of my life, my father Behrooz, my mother Susan, and my brother Aidin, you are always there for me. This work would not have been possible without your emotional and financial support.

NOMENCLATURE

ANOVA	Analysis of Variance
CFA	Common Factor Analysis
EFA	Exploratory Factor Analysis
MMR	Moderated Multiple Regression
PCA	Principal Component Analysis
SD	Standard Deviation
VIF	Variance Inflation Factor

TABLE OF CONTENTS

Page

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

Chapter

I. INTRODUCTION

Today's business environment requires creativity and innovation to meet rapidly changing customer demand. Employee creativity, a forerunner of innovation and productivity and a recognized competitive advantage in the corporate world (Politis, 2005), has shown to be influenced by the work environment (T. Amabile, 2012a; Barrett, 2016; Woodman, Sawyer, & Griffin, 1993). Since the employee's creative idea is advantageous for work outcomes, it is important to devote attention to identify the antecedents of employee creativity (Gong, Huang, & Farh, 2009; J. Zhou & Shalley, 2008). According to the investment theory, creativity requires a union of six different, but interrelated, resources: knowledge, motivation, environment, intellectual abilities, styles of thinking, and personality. While levels of these resources are bases of individual differences, often the choice to use the resources is the more significant source of individual differences (Csikszentmihalyi, 1999; Sternberg, 2012). Encouraging individual perceptions of creativity can be a strategic benefit in the creation of new ideas that can lead to organizational growth and an organizational environment that fosters individual perceptions of creativity and can be an element critical to organizational success (T. Amabile, 2012a; Barrett, 2016).

This study focuses on knowledge and environment resources to explore the link between the environment in which employees work and their level of creativity. The research investigates knowledge sharing and creative confidence as moderating and mediating effect on employee creativity. A theoretical framework is adopted to explain the factors that shape creative climate

and enhance creativity in an organization. To date, there is a lack of empirical investigations that have examined the moderating effect of knowledge sharing and creative confidence on the relationship between creative climate and employee creativity.

REASEARCH OVERVIEW

This study intends to investigate the relationship between creative climate; an environment that promotes creativity for developing new ideas, and employee creativity. The research objective is to extend the literature on the impact of knowledge sharing and creative confidence in strengthening the effect of organizational climate on creativity. The findings of this research promote an understanding of employee creativity as a result of the creative climate of the environment and the effect of knowledge sharing behavior among employees.

This study applies validated instruments to test the relationship between creative climate and employee creativity that is hypothetically moderated by creative confidence and knowledge sharing, developed as a new construct. After thoroughly reviewing the literature, the quantitative research method was chosen to measure the relationship between variables. The results of this investigation may be used strategically by organizations to change work environments in a way that foster individual creativity in order to increase organization creative outcome. Furthermore, the results can provide organizations with ways in which they can successfully meet the needs of the employees, rather than develop innovative strategies only based on time and money investments to achieve competitive goals. Additionally, the effect of two moderators and mediators is examined to assess the strength of the relationship between creative climate and employee creativity.

PROBLEM DEFINITION

The concept that a creative climate facilitates an individual's creativity has been studied in the literature and previous research has addressed different aspects of social context; however, the role of wider institutional context in knowledge sharing and adaption of knowledge to create still remains unclear. Besides, most of the previous studies examined creative performance, for example (Jaiswal & Dhar, 2015; Ma, Cheng, Ribbens, & Zhou, 2013; Q. Zhou, Hirst, & Shipton, 2012), but not employee's perception of their creative behavior. One way to increase the potential for organizational competitive benefit is to generate a climate that promotes creativity (Axelsson & Sardari, 2012).

Creative climate is the support of positive relationships among employees. The current and future demand for creativity and innovation are high. The need for understanding what motivates people or stops them from pursuing their ideas recently has increased (Černe, Nerstad, Dysvik, & Škerlavaj, 2014; Dweck, 2013). The rising importance of creativity makes scholars look deeper into the problem. There are several factors that impact employee creativity. One of the most significant factors on creativity is sharing knowledge (Ma et al., 2013). Examining the relations of knowledge sharing and employee creativity has become a huge interest to researchers both in industry and education for example, (Gilson, Lim, Luciano, & Choi, 2013; Kim & Park, 2015; T.-C. Lin & Huang, 2010).

The core of creative confidence is the theory of self-efficacy (Phelan & Young, 2003). Bandura (1997) stated that strong self-efficacy is a necessity for a creative outcome and the discovery of "new knowledge." Despite the importance of creative confidence in creating new ideas within an organization, it has received little attention in the creativity literature. Therefore, it is important to investigate more on the relationship between organization creative climate,

knowledge sharing, and employees' creativity. This research draws upon models developed within knowledge sharing and creativity research in an attempt to predict the effect and the relationship between these factors.

Predictor variables are drawn from the Jaiswal and Dhar (2015) model and the model of Kucharska and Kowalczyk (2016) and are adapted to refer to the knowledge sharing effect on the variables in their models. However, it is not clear from their studies how the two variables, knowledge sharing, and creative confidence, together or individually influence the effect of the organizational climate on creative behavior through moderation or mediation. It is hypothesized that knowledge sharing and creative confidence can be measured and shown to have mediation and/or moderation effects on the way organizational creative climates affects an individual's creativity. The main purpose of this study explores these proposed models.

OPERATIONAL DEFINITIONS

To have a meaningful explanation about terms we use here, it is essential to carefully define them. French Jr and Kahn (1962), think "Every concept must have an operational definition which has validity in the sense that it measures those properties and only those properties specified in the conceptual definition...[they] are essential for empirical testing of a hypothesis" (p. 5). The conceptual definitions in this section help to specify the aspect of the study, they also assist a conceptual framework in which the topic can better be discussed and different definitions of the concepts can be illustrated (Castelle, 2017). Building on previous research, this study defines:

- *Climate* as a collective perceptual concept that reflects a lower level of abstraction based on observation and experience on behavior and interaction (Schein, 2004);
- *Creative climate* as the perception of the organizational environment or work climate that

enables or inhibits the generation of creative ideas and encourages risk-taking behavior (Schumpeter, 1934);

- *Knowledge sharing* as a process occurring and measured at the individual or organizational level, where individuals mutually exchange their knowledge and create a new knowledge (Van den Hooff & De Ridder, 2004);
- *Knowledge sharing behavior* as a set of individual behaviors relating sharing one's work-related knowledge and expertise with other individuals within one's organization, which are useful or beneficial to the organization (Yi, 2009);
- *Creative self-efficacy* as a belief an individual has regarding their ability to produce a creative outcome, which plays a motivational role in the process of creativity and innovation (Bandura, 1997; Tierney & Farmer, 2002);
- *Creative confidence* as a person's belief in their own ability to come up with creative ideas and courage to try them out (D. Kelley & Kelley, 2013);
- *Employee creativity* as a mental process of developing new ideas and the raw ingredient of innovation (Teresa M. Amabile, Conti, Coon, Lazenby, & Herron, 1996); and
- *Creative behavior* as a complex interaction between personal and situational factors (Teresa M Amabile, 1996; Scott & Bruce, 1994) that generates useful and novel ideas, and can result in innovation (George & Zhou, 2001).

RESEARCH PURPOSE AND OBJECTIVES

The purpose of this study is to understand the effect of two variables as moderators and mediators on the relationship between creative climate and employee creative behavior.

Creativity is one of the essential skills in the organizations all around the world. It is critical

to understand how climate, the psychological atmosphere that employees work, influences the creative outcomes. It is also important to understand the nature of that theoretical relationship. This research helps to answer the following questions:

1) How does the organization's creative climate impact employee creative behavior?
2) How does knowledge sharing strengthen/influence the effect of the organization's creative climate on employees' creative behavior?
3) How does creative confidence strengthen/influence the effect of the organization's creative climate on employee's creative behavior?

The remainder of this dissertation is structured as follows: First, review previous literature on individual creativity and creative climate and the two moderators, and set out the objectives of the study. Next, report the results from a cross-sectional study designed to test mediation and moderation models for the variables of interest.

RESEARCH HYPOTHESES

Given the effects of organizational creative climate on employees' creativity, employees working in such a work environment are likely to have a higher creative performance (Jaiswal & Dhar, 2015). Therefore, this study proposes to reject null hypotheses in favor of accepting the alternative hypotheses through tests of mediation and moderation models.

H1: Creative climate has a positive relationship with employee creative behavior.

H2: The direct relationship between organization creative climate and employee creative behavior is moderated by knowledge sharing. In a way that the relationship is strengthened when knowledge sharing is higher rather than lower.

H3: The direct relationship between organization creative climate and employee creative behavior

is moderated by creative confidence. In a way that the relationship is strengthened when creative confidence is higher rather than lower.

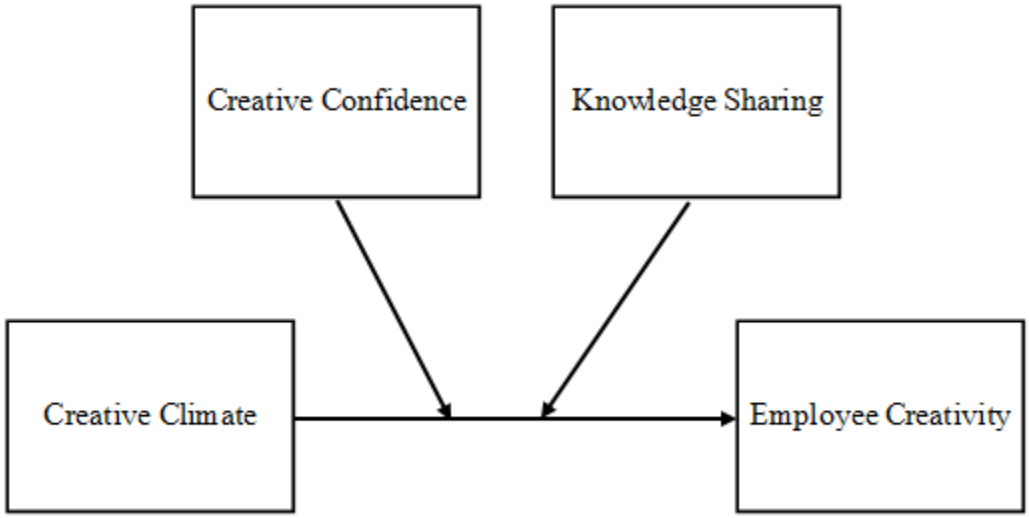
H4: The direct relationship between organization creative climate and employee creative behavior is mediated by knowledge sharing.

H5: The direct relationship between organization creative climate and employee creative behavior is mediated by creative confidence.

THEORETICAL FRAMEWORK FOR MODERATION

This study explores the previously demonstrated theoretical relationship between organization creative climate, the independent variable, and employee creative behavior, the dependent variable, and the moderating effects of knowledge sharing and creative confidence that may impact the magnitude and direction of the relationship. Figure 1 shows a general overview of the theoretical framework guiding the research:

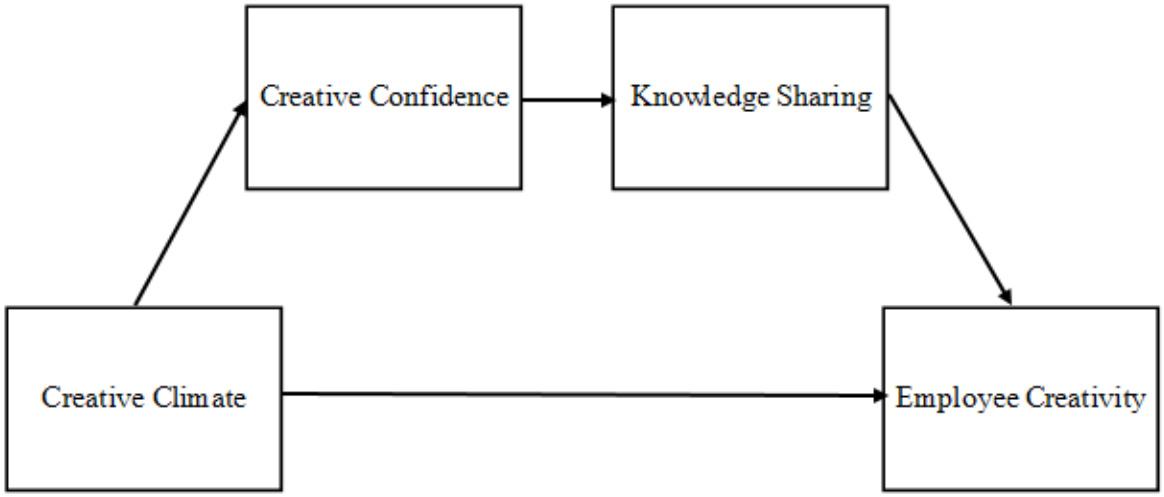
Figure 1: Researchers' Theoretical Framework for Moderation



THEORETICAL FRAMEWORK FOR MEDIATION

Cognitive psychology perspective believes that an individual's cognitive process plays an important role in influencing individual behavior (Bandura, 1997). Previous research has shown that creative self-efficacy has a mediation role, indirectly influencing individual innovation (Hu & Zhao, 2016). Therefore, a mediation analysis is a proper analytical strategy (Andrew F. Hayes, 2013). In this study, certain variables were hypothesized to intervene the theorized relationship between the organization's creative climates on employee creative behavior. The mediators tested in this model are knowledge sharing and creative confidence. Figure 2 shows a general overview of the theoretical framework guiding the research:

Figure 2: Researchers' Theoretical Framework for Mediation



II. LITERATURE REVIEW

This chapter provides an overview of the state of research in this area. The literature review addresses theories regarding organizational climate, knowledge, and confidence. While existing literature is limited in the context of creative confidence, a search for available research as well as some background into the broad subject of creative confidence was researched. Also, the research models, methodologies and instruments regarding this study that have been used and exist in the literature is investigated.

In the previous chapter, the terms organizational culture and organizational climate are distinguished, in terms of operational definitions. Throughout this chapter, the history, context, and nature of creative confidence research, the assumed theoretical basis of confidence, means of measurement are covered.

CREATIVITY

Eysenck (1995), stated that creativity is considered as a latent characteristic underlying creative behavior. Researchers also describe creativity as the production of unpredictable novelty and useful ideas (Teresa M. Amabile et al., 1996; Kaufman & Sternberg, 2010; Sternberg & Lubart, 1999); in science, creativity focus is on the originality and usefulness of knowledge (Hollingsworth & Gear, 2012; Simonton, 2004; Ulibarri, Cravens, Royalty, Cornelius, & Nabergoj, 2014). An individual possibly has higher creative achievement if she has the

characteristics of a creative person (Oldham & Cummings, 1996; Zampetakis, Bouranta, & Moustakis, 2010).

Some people believe being creative is a talent, and some think it is a controlled process and link it to the ability of conscious analogical reasoning on creativity and knowledge. One of the most well-known studies on creativity was made by Rhodes (1961), which described creativity in four dimensions process (i.e., cognitive process), person (i.e., personality, or behavior), product (i.e., innovation), and place (i.e., press, or environment). Creativity is also considered as a habit and all innovations start with creativity, accordingly innovations result from a habit. That is when creativity becomes a behavior of everyday life not as something one can accomplish at unusual times (Sternberg, 2012).

From the cognitive aspect, Koestler (1989) described creativity as 'the ability to make connections between previously unconnected ideas' (p.95). Creativity is also described by the National Advisory Committee on Creative and Cultural Education; Creative and Education (1999), as 'imaginative activity fashioned so as to produce outcomes that are both original and of value' (p.30) which is acknowledging the social dimension and stress on the relationship between thought and action (Davies et al., 2014; Robinson, Minkin, & Bolton, 1999).

Nevertheless, more recently, researchers have studied creativity using an interactive approach, which suggests that creative behavior is a product of a rather complex interaction between individual and environmental factors (T. T. Luu, 2017; Oldham & Cummings, 1996).

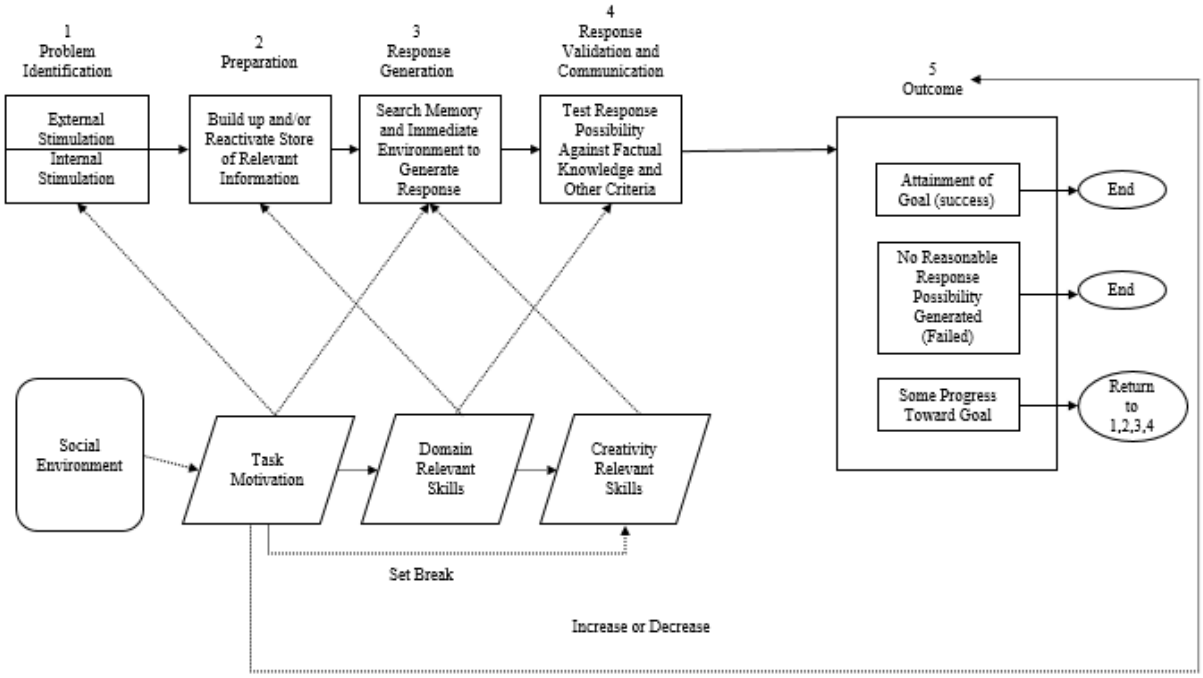
CREATIVE PERSON AND CREATIVE PROCESS

There is a creative process in every creative production that involves personality, cognitive,

and affective processes. Innovation theorists define the innovation process as a two-phase progression, the first initiation stage idea is being generated, and the second stage is when an idea is implemented or applied (Axtell et al., 2000; Janssen, 2000; King & Anderson, 2002; Martins & Terblanche, 2003; Scott & Bruce, 1994).

Teresa M. Amabile (1996) presented the simplified depiction of the componential theory, which states that the influences on creativity include three within-individual components; skills that are domain-relevant (expertise in the relevant domain or domains), creativity-relevant processes (cognitive and personality processes helpful to novel thinking), and task motivation (explicitly, the intrinsic motivation in doing activities out of interest, enjoyment, or a personal sense of challenge). Also, there are several sub-processes involved in the creative process: a problem identification step that consists of analyzing and articulating the exact nature of the problem to be solved; preparation step that helps to solve the problem by gathering information and improving any required skills; idea generation that produces ideas for solving the problem; a validation step that tests the chosen solution, and an idea sharing step that communicates that solution to others. These steps are not rigid; the sub-processes can occur in any sequence and will often recur iteratively until a creative outcome has been achieved (T. Amabile, 2012b). Figure 1 demonstrates all four of the creativity components that influence the creative process.

Figure 3. Amabile's (1983; 1996) Componential Model



Contrary to the common belief that just some people are creative, most individuals are born capable of being creative, this is observable in children's imaginary plays and questions. Yet, as individuals grow up and start to get a formal education they become more social so, they start to be more cautious, analytical, and consider other peoples (T. Kelley & Kelley, 2012). Almost all people have some level of belief about their creative ability. This type of thinking about one's own creative ability either helps them to move forward and achieve a breakthrough innovation or holds them back from finding their creative solution.

In today's market, organizations need their employees to generate new ideas and find creative solutions to compete on innovation. Employee creativity is a fundamental resource for a company's innovation and employees must contribute to developing new ideas (Dul & Ceylan,

2011; Madjar, Oldham, & Pratt, 2002; Shalley & Gilson, 2004). As employees come to understand the degrees of their jobs, they probably become more confident and feel that they can be creative in their work roles (Tierney & Farmer, 2002). However, firms cannot get to their goals without implementing creative ideas and turning them into tangible products or services. For instance, Kodak invented a prototype of the digital camera back in 1975, but never capitalized on it. The company struggled with bankruptcy protection in 2012 after it had failed to compete with digital technologies while its competitors did. Therefore, unimplemented creative ideas, when pursued and applied by competitors, can even lead to a competitive disadvantage for the focal firm (Gong, Zhou, & Chang, 2013).

Employee's creativity is regarding the generation, advancement, and implementation of novel and useful ideas about practices, products, services, or procedures (Ma et al., 2013; Q. Zhou et al., 2012). This definition is approaching creativity as a product-oriented process and focuses on the degree to which outcomes are creative. Several studies have suggested that self-rated creativity provides a valid approximation of individual creativity (Furnham, Batey, Anand, & Manfield, 2008; Zampetakis et al., 2010).

Previous research on creativity focused greatly on the individual characteristics of a person rather than the characteristics of the environment as precursors of creativity (Barron & Harrington, 1981). Nevertheless, one limitation with the examination of personality and creativity is that it is not domain specific but rather general across domains; beyond a domain set of characteristics, skills, tendency, and motivation can be effectively positioned in any domain (Kaufman & Sternberg, 2010; Plucker, 2004). Recent studies, however, propose that creativity's personal variables are domain specific (Baer, 1998; Zampetakis et al., 2010). Feist (1998), Han (2003), and Runco (1989) for instance, have found similar results regarding creative personal variables. They

argued that while personality characters do commonly and predictably relate to creative success in art and science, there seems to be temporal constancy of these distinguishing personality dimensions of creative people. In other words, creative artists who write a creative poem are not more likely or do not completely share the same unique personality profiles with creative scientists (Reiter-Palmon, Robinson-Morral, Kaufman, & Santo, 2012).

Many have studied the characteristics of the creative person. Torrance (1962), Barron (1963), Taylor (1964), D. W. MacKinnon (1962), and Dehlavi (1980), have found that a creative person is someone who is acting more independently than others, more self-sufficient, not dependent on others judgment, more self-accepting and open to the irrational in themselves, more imaginative and adventurous, more stable, more radical, more self-controlled, and more introverted but courageous. Their studies also showed that creative persons are more feminine in interests and personalities, maybe more emotionally sensitive, more self-assertive and dominant, and more complicated (Richardson, 1985). In addition to previous findings, recent studies demonstrate that the most important personality traits of a creative person are the willingness to deal with difficulties, enable to balance risks and benefits, tolerate uncertainty, and self-efficacy (Sternberg, 2012). Beside this assessment on creativity, rather than exploring purely individual factors, researchers have begun examining the impact of environmental factors, mainly those within a business organization on creativity within a person (Teresa M. Amabile et al., 1996; T. T. Luu, 2017).

CREATIVE BEHAVIOR AS MEASURE OF CREATIVITY

Innovation has no limits. From the creation of the wheel to the invention of the internet, a human has been trying to find a solution for problems. The innovative outcome is a result of

creative ideas, and in a knowledge-based economy, creativity is one of the essential and the most important indicator of the competitiveness of organizations in the world (Chiu, 2015). Companies who have greater knowledge can also use their innovation capabilities and creative potential to gain success and change the marketplace.

The theory of interactionism (Mead & Mind, 1934) explains why individual's behavior varies across situations. According to interactionism, behavior is directed by a combination of internal and external factors and that there is a mutual influence between individuals and the situations they encounter (T. T. Luu, 2017). Based on this theory, we assume an individual's personality and the environment they work in effect their behavior.

Tierney, Farmer, and Graen (1999) described creativity as the unique and valuable solutions of employees to answer work-related problems based on the organization's goals and visions. With reference to employees' creativity, George and Zhou (2001) stated that "Creative behavior is the production of novel and useful ideas by employees which can be the starting points of innovation" (p. 513).

Creativity and innovation are relevant to the progress of creating and applying new knowledge. It has been indicated that employees in many organizations do not have the ability to act on the knowledge they have. To bring innovation that is needed to the world people must use the existing knowledge and develop applicable new knowledge (Gurteen, 1998). In order to gain an advantage in the competitiveness, organizations need to grow the creative potential of their employees (Axelsson & Sardari, 2012). For organizations that want to improve their employees' creative behavior, they can assess the present climate of the organization and determine how it ideally should be. In this study, to measure creative climate, we use the questionnaire designed and used by Mayfield and Mayfield (2010), Yeh-Yun Lin and Liu (2012), which has three

dimensions; creativity support, work characteristics, and creativity blocks. This instrument is similar to the Teresa M. Amabile et al. (1996), model.

CREATIVE CLIMATE

In the literature, the organizational climate is defined as "the observed and recurring patterns of behavior, attitudes, and feelings that characterize life in an organization" (p. 57), (Göran Ekvall, 1991; Yeh-Yun Lin & Liu, 2012). Organizational climate refers to a psychological condition such as feelings, behaviors, and attitudes dominant in the organization. It influences organizational processes, for instance, problem-solving and communication, as well as psychological processes like learning and motivation (Goran Ekvall & Ryhammar, 1999).

Creative climate often referred to as the *climate for innovation,* has been a growing topic of interest in the past two decades. A current study involving 1,541 CEOs, senior public sector leaders, and general managers, were interviewed with senior leaders drawn from 60 countries and 33 industries, conducted by IBM revealed that senior leaders recognize that complexity is the biggest challenge they confront (Berman, 2010). Even though there is an assumption that most organizations are not currently prepared to manage and handle complexity; senior leaders perceive creativity as the single most important leadership skill for seeking a path through this complexity (Berman, 2010).

When creative ideas are generated in an organizational environment and they are praised by the organization or leaders, it encourages employees to develop more ideas through positive reinforcement. Likewise, greater team support in an organization will create an environment that encourages creative behavior and innovation (Yu, Yu, & Yu, 2013). Also, the other way organizations can become successful is that they have the ability to provide bonding between

creativity and innovation with their climate and management processes (Ismail, 2005; Moghimi & Subramaniam, 2013; Tushman, 1997). More specifically, the literature indicates that the outcomes of creativity and the general propensity of individuals and organizations to innovate is depends on an excessive level of a creative entrepreneurial climate (Goran Ekvall & Ryhammar, 1999; Scott G Isaksen & Isaksen, 2010; Scott G. Isaksen & Lauer, 2002; Paolillo & Brown, 1978; Suliman, 2001). Yet, the impact of the organizational climate can be both positive and negative, based on this, some researchers agreed that the major obstacles to innovation mostly come from the organizational climate (Gisbert-López, Verdú-Jover, & Gómez-Gras, 2014; Suliman, 2001).

Theories concerning creativity climate have tried to identify characteristics of work environments that facilitate creativity, mainly from the organizational perspective (Teresa M. Amabile et al., 1996; Yeh-Yun Lin & Liu, 2012). One of the significant steps that leaders can take to solve this issue is creating a work environment for stimulating and sustaining creativity (Scott G Isaksen & Isaksen, 2010). The confrontation between situational factors such as organizational structures, resources, goals, technology, and staff characteristics develops and determines the climate in an organization. The people in the organization are situational determinants of the climate, and they are both wearers and exponents of the climate. Therefore, climate influences organizational outcomes (Goran Ekvall & Ryhammar, 1999).

Various authors (Teresa M Amabile, 1996; Ford & Gioia, 2000; Gisbert-López et al., 2014; King & Anderson, 1995; Woodman et al., 1993) in literature base have argued that the context in which individuals work on their task and activities establishes a key source for the generation of ideas. For instance, Goran Ekvall and Ryhammar (1999) developed a model based on a theory of underlying psychological processes (Hunter, Bedell, & Mumford, 2007; Scott G. Isaksen & Lauer, 2002; Scott G Isaksen, Lauer, Ekvall, & Britz, 2001). Researchers suggest that

the combination of a challenging and supportive atmosphere sustains high creativity in organizations and employees (Yeh-Yun Lin & Liu, 2012). Employees need an environment that is supportive and rewarding of creative ideas (Sternberg, 2012; Sternberg & Lubart, 1995; Sternberg & Williams, 1996).

There are different theoretical frameworks have been used to show that creative performance can be influenced by the different type of climate variables such as a theory of intrinsic motivation for example, (Teresa M Amabile & Conti, 1999; Teresa M. Amabile et al., 1996; Teresa M Amabile & Gryskiewicz, 1989). Teresa M. Amabile (1996) proposed the eight dimension model (1) workgroup support, (2) challenging work, (3) organizational encouragement, (4) supervisory encouragement, (5) organizational impediments, (6) freedom, (7) workload pressure, and (8) sufficient resources. Moreover, the theory of team interactions used by West and His colleagues suggested the four-dimensional model: (1) participative safety, (2) support for innovation, (3) challenging objectives, and (4) task orientation (Anderson & West, 1998; Bain, Mann, & Pirola-Merlo, 2001; Burningham & West, 1995). Göran Ekvall (1991) and Goran Ekvall and Ryhammar (1999), model is based on a theory of underlying psychological processes helped to develop a nine dimension model also suggested the following dimensions of creative climate: challenge, freedom, idea support, trust/openness, dynamism/liveliness, playfulness/humor, debates, conflicts (impediment), risk-taking, and idea time (Göran Ekvall, 1996; Goran Ekvall & Ryhammar, 1999; Scott G. Isaksen & Lauer, 2002; Scott G Isaksen et al., 2001).

CREATIVE SELF-EFFICACY

Creativity involves openness, the courage to follow ideas, self-confidence to act on ideas that one considers valuable, and an internal effort of evaluation, regardless of external difficulties

or discouragements. While creativity is a valuable skill for organizations and productive, innovative researchers, learning how to become an innovative person is challenging (Ulibarri et al., 2014).

Bandura (1994) defined perceived self-efficacy or self-belief as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (p.71). This type of belief affects how individuals think, behave, feel, and how they motivate themselves.

The social cognitive theory explains that individuals are motivated by their judgments of individual's capabilities of performing a specific task and by beliefs of the results of their actions (Bandura, 1986, 1997; Michael, Hou, & Fan, 2011). So, it can be perceived that individuals listen to their "inner voices" when they want to show any creative action (Selby, Shaw, & Houtz, 2005; Treffinger, Young, Selby, & Shepardson, 2002).

(Bandura & Walters, 1977) also emphasized the importance of efficacy in the innovation process, as "Creativity constitutes one of the highest forms of human expression Innovativeness largely involves restructuring and synthesizing knowledge into new ways of thinking and of doing things. It requires a good deal of cognitive facility to override established ways of thinking that impede exploration of novel ideas and search for new knowledge. But above all, innovativeness requires an unshakeable sense of efficacy to persist in creative endeavor". (p. 239).

In regard to creativity, self-efficacy is the moderator between accomplishments and creative potential. Creative potential refers to individuals' psychological and environmental characteristics, also mental operation during the creative process of a product (Tavani, Caroff, Storme, & Collange, 2016). People with creative potential have the fundamental source of qualities that outline the limits of one's capabilities (Berikkhanova, Zhussupova, & Berikkhanova, 2015).

Tierney and Farmer (2002), described creativity as the creation of the novel and the useful idea in a domain and suggested that creativity in a domain should be predicted both by confidence for that domain and confidence for creativity. They examined hypothesis in a study of 585 employees, and proposed that job self-efficacy positively predict creative self-efficacy. Further, Choi (2004) studied creative self-efficacy as the mediator of creativity and to test this with 430 surveys that collected from students at a business school. Choi's confirmatory analysis showed that creative self-efficacy has a significant mediator impact on creative performance. Beghetto (2006) defined creative self-efficacy as "self-judgments of creative ability" (p.447) and examined the correlation of creative self-efficacy in middle and secondary students. The study's results showed that students' mastery and performance-approach beliefs about their creative ability affect their creative efficacy. The study was further described by Mathisen and Bronnick (2009), they examined the effects of creativity training on creative self-efficacy. For their study, they developed a creativity course based on social cognitive theory. Creative self-efficacy was measured before and after the course, and test results showed that self-efficacy improved significantly for both students and municipality employees of the course.

Different from previous studies, Spardello (2012) focused on creativity beliefs of elementary students. The study examined students in the visual art class and it suggested that nurturing and improving creativity in students can lead to career interests, and the rationale behind the inclusion of creativity in the curriculum is for the promotion of creative careers. Survey and interview methodology used to collect data concluded that factors of racial group, gender, and age reveal differences in the beliefs of the students, however, the study did not analyze specifically how those factors might influence the beliefs. The result also showed that most students included in the research study hold positive creative self-efficacy.

CREATIVE CONFIDENCE

Creative confidence was first explained by Bandura and Walters (1977), self-efficacy can be defined as "Perceived self-efficacy is concerned with people's beliefs in their capabilities to produce given attainments" (p. 307). In 1977, with the publication of "Self-efficacy: Toward a Unifying Theory of Behavioral Change," he recognized the importance of self-beliefs that was missing from social learning theory (Pajares, 2002). Other researchers described self-efficacy as the belief that individuals create and develop themselves regarding their ability to do or accomplish something (Bembenutty, 2007). In another study, Bandura (1994) defined perceived self-efficacy or self-belief as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (p.71).

Creative confidence formed on the base of creative self-efficacy suggests that creative confidence is a form of self-evaluation. Thus, creative confidence can be positively associated with achievement, and be related to the positive or negative belief one has about his or her ability to create something (Kadijevic, 2015). This definition assumes an element of purpose in that the intended outcomes are to some degree pre-conceived and pre-selected. It also subsumes a definition of creativity by Teresa M Amabile (1988). This type of belief affects how individuals think, behave, feel, and how they motivate themselves. Further, people with greater confidence in their capabilities take a different approach to challenges to overcome them rather than avoid them. They commit to their goals and are not afraid of facing challenges and they don't give up and lose their enthusiasm in the face of failure (Bandura, 1994).

Creative confidence is a core belief that people must have to go through steps of creativity and the innovation process. If people believe that they have the tools and skills to creatively solve

problems and view failure as an experience and a source of new skills while sustaining their efficacious attitude, they are eventually more likely to both succeed in solving problems and in creating more innovative ideas. Therefore, if we could instill creative confidence in individuals, they would be more likely to succeed as employees throughout their career (Ulibarri et al., 2014).

Self-efficacy is described as beliefs that individuals create and develop themselves regarding their ability to do or accomplish something (Bembenutty, 2007). On the other hand, creative confidence states an individual's belief in their ability or personal control to successfully create wanted change and envisioned outcomes (Phelan & Young, 2003). Hence, the difference between the two statements is the ability to act on the new idea and make the change.

Individuals evaluate their abilities in different situations in their daily life. They assess their skill and capability such as physical, cognitive, or social abilities of everyday work. However, this type of self-assessment may not always be correct. In the case of having overconfidence or low confidence, misjudgment, overestimation, or underestimation about one's own abilities, a person may face unseen results, positive or negative. While people may not be aware of it, they may consider their own mental and physical foundation when they face challenges or everyday tasks (Freund & Kasten, 2012).

(Phelan & Young, 2003) examined creative self-leadership and creative confidence in relation to creative style, preference, and training. They also used survey methodology to collect data and results showed that a creative style preference tending toward innovator was positively related to creative confidence, but at a low level and only in the condition prior to training.

Recent publications about creative confidence were done by D. Kelley and Kelley (2013). The study mostly defined creative confidence and provided suggestions that help individuals express their creativity with confidence. Previous researchers such as D. Kelley and Kelley (2013)

and Sweet, Blythe, and Carpenter (2015), suggested that creative confidence can be built with choosing to be creative, seeking inspiration in unfamiliar environment, being empathic to people, setting a creative goal, breaking tasks into small steps, developing a new image of own self and working with a positive mindset.

Besides having creative potential, to achieve creative outcome individuals are required to express a new thought, product, or direction (Keller-Mathers, 2004). Therefore, people need to have creative confidence to manifest their creative potential. Also, it is important to understand the role of belief in abilities playing a great role in people's success. Likewise, creative confidence is described as a person's confidence in overcoming problems that need creative thinking and creative functioning (Karwowski, Lebuda, Wisniewska, & Gralewski, 2013). Thus, creative confidence is a combination of thoughts and action (T. Kelley & Kelley, 2012). Accordingly, a confident person is generally described as a person being certain about their ability to do things they try to accomplish (Horne, Lincoln, Preston, & Logan, 2014). So, without confidence, it can't be expected for individuals to take a risk because they already think they can't accomplish something good.

Creative confidence was defined by Rauth, Köppen, Jobst, and Meinel (2010) as, “a development of trust in one's own creative skills" (P.6). Scholars suggest that creative confidence can be increased with selecting to be creative, searching inspiration in an unfamiliar environment, being curious and empathic to others, setting a creative goal, breaking down tasks into small sizes, changing image of own self, and working with a positive mindset (D. Kelley & Kelley, 2013; Sweet et al., 2015).

Furthermore, Creative Confidence is about believing in yourself and your capability of making a change in things around you, the ability to finish what you started. In other words,

creative confidence is a combination of thoughts and actions (T. Kelley & Kelley, 2012). It is commonly believed that creative confidence is the confidence individuals have about their creative ability, which determines whether they are willing to express their creativity when given the opportunity (Bandura, 1997; Beghetto & Kaufman, 2010; Sweet et al., 2015). For instance, supporting friendship and communication between individuals inside and outside of an organization may help to share knowledge. D. Kelley and Kelley (2013), also suggested, " that combination of thought and action defines creative confidence: the ability to come up with new ideas and the courage to try them out"(P.18).

The reason confidence is related to and significant in creativity is that people who lack confidence are not able to act on their ideas and take further steps. People need to have creative confidence to walk through the phases of the creative process. Believing that everyone has creative potential is crucial to notice and work on individuals to encourage them to solve problems that they may face in their everyday life. Having knowledge and experience cannot make a difference in the world by itself, but it is confidence that takes an individual's idea and imagination to the next level, encouraging them to take action and create knowledge.

IMPORTANCE OF KNOWLEDGE MANAGEMENT

Knowledge is considered as one of the most important organization's strategic resource for the competitive advantage (Ipe, 2003). Nowadays, people with knowledge have incredible value and employees are not just mechanisms that work in the industry so they are not just expecting to be assigned to a task, they are seeking knowledge to improve themselves. Organizations that are aware of their knowledge sources can make full use of this collective expertise and it will assist them to be more innovative and advantageous in the marketplace in a

more efficient and effective way (Levin & Cross, 2004).

Knowledge sharing has been explained as activities meant to transfer or spread knowledge between different people (Lee, 2001), and it is essential because it allows people to think of and invent new solutions for existing problems by getting the advantage on current knowledge sourced within and outside the organization. Consequently, with innovation, they support the organization with new development and a new product for the market (Nonaka & Takeuchi, 1995; S. Wang & Noe, 2010).

TYPES OF KNOWLEDGE

Researchers categorized knowledge in two types tacit, which is a type of personal knowledge that people gain by experience, and explicit knowledge that can be learned from books or other written sources and it can be codified and transferable (Nonaka & Von Krogh, 2009). Polanyi proposed the knowledge separation of explicit and tacit dimension in the 1950s. Brown and Duguid (1998) defined explicit knowledge as a type of knowledge that can be formalized and codified. The tacit knowledge refers to the personal and based on experience knowledge (Frost, 2014). Polanyi (1966) first defined tacit knowledge as that it is hard to define and mostly instinctual. Tacit knowledge is that which is personal in nature and hard to communicate, as well as acutely rooted in action, dedication, and involvement (Nonaka, 1994).

The distinction between explicit and tacit knowledge represents a dimension of knowledge creation that is called epistemological dimension. Another dimension is the ontological dimension of knowledge creation, related to the social interaction between individuals that share and develop new knowledge. This dimension is regarding the method individuals use to create new ideas, such

as reading, observing and exploring; also engaging in an interaction with each other plays a critical role in the creation of new ideas (Nonaka, 1994). In the knowledge creation practice when dealing with tacit knowledge, it is essential to have an environment where sharing experience can be made (Basher et al., 2008).

ACQUIRING KNOWLEDGE

Today, employees work in a complex and diverse environment that requires interaction with humans and various artifacts (Latour, 1999). To support individual interaction, cognitive artifacts that are more knowledge-laden, intelligent, and autonomous has been produced and used in both industry and academia. Knowledge and its associated concepts, such as motivation, capability, and intellectual intelligence, increasingly explain our work and activity in the knowledge-based society (Dario, 2017; Paavola & Hakkarainen, 2005). Importance of generating new knowledge is recognized in various sectors for its impact on the foundation of sustainable and competitive advantage (Kang, Kim, & Chang, 2008; Manaf & Marzuki, 2013). Also, different characteristics such as openness has its respective effects on personal interaction, therefore, on how individuals perform tasks at work (Judge, Bono, & Locke, 2000) and this includes people's readiness in the aspect of knowledge-sharing. With the intention of competing more effectively and efficiently in a market with rapidly changing demands, expectations, and following the surge of globalization, it is necessary for organizations in any sector to select individuals with the appropriate personality for the creation of new knowledge.

Cabrera, Collins, and Salgado (2006), stated that personality traits explain why some individuals have the enthusiasm to pursue knowledge-sharing more than others. One of the most important personality traits that help individuals to go for their ideas and through a process of

learning is confidence. It is also known that a considerable deal of tacit knowledge is weaved into social interactions via processes of communication and knowledge-sharing, so individuals need to be confident in their social interaction abilities (Manaf & Marzuki, 2013; Rahimi, Seyyedi, & Damirchi, 2012). One can use other people's tacit knowledge by communicating with them. They also need to be confident and believe in themselves to share the knowledge.

One of the main barriers in this fast-changing knowledge-based society is that individuals must learn different types of knowledge and adopt to the ways are applied, besides most employees must use this knowledge to develop and progress in work (Manaf & Marzuki, 2013). This process is only possible by understanding the essence of the activities and experiencing the work that eventually can lead to understanding and creating new knowledge (Nonaka & Takeuchi, 1995). And for this, besides learning capability, individuals need to have characteristics of a person that has the courage to take action, interact, and make ties with others (Dario, 2017).

The concept of knowledge management has been adopted in discipline and business for a long time. The term management indicates control of processes that may be uncontrollable in its nature. In knowledge creation, however, organizations should support the process instead of controlling process (Von Krogh, Ichijo, & Nonaka, 2000). According to the 1992 American Heritage Dictionary, knowledge is what an individual learns from education or experience (Schulz, 2001). It is a process and result of integrating new experiences and information (Tsoukas & Vladimirou, 2001).

KNOWLEDGE SHARING

The concept of Knowledge management arose around two decades ago. (Davenport, 1994), defined Knowledge management as the process of capturing, distributing, and successfully using

knowledge. Based on KM discipline, organizations identify and evaluate databases, documents, and procedures and capture employees' expertise and experience to develop their skills to create and sustain competitive advantage in their market (Koenig, 2012).

Additionally, KM is the creative and innovative capacity of human beings, and the combination of data and information processing capacity of information technologies (Peyman, Mohamad, Jalal, & Hamed, 2014). Organizations that aim to create and be innovative, need to explore new knowledge as well as using existing knowledge (Benner & Tushman, 2003).

Knowledge sharing is one of the most important aspects of employees' creativity. However, knowledge can't transfer without the giver and recipient's desire. Knowledge sharing depends on an individual's habit; co-operation and willingness of giving or receiving it otherwise knowledge transfer wouldn't be effective. Thomas H. Davenport (1998) divided knowledge transfer into two actions that are transmission and absorption. Based on their description these two actions together have no value if they don't influence behavior or grow some ideas that lead to new behavior.

Sometimes, besides employee's training and education, the sharing of experience, information and mentoring from others can have a big influence on employee's work speed and creativity, and consequently satisfaction of both parties. On the other hand, an unsatisfied employee can end up leaving the company or be fired which means loss of time and money that the company had spent on the employee's training during his employment. However, there are difficulties for organizations regarding sharing personal knowledge.

Van Nguyen (2002), points out the organization's traditional knowledge transfer problems that business organizations have to overcome. First, employees are the ones that have most of the organization's knowledge and this information is in their head and when they leave they take it

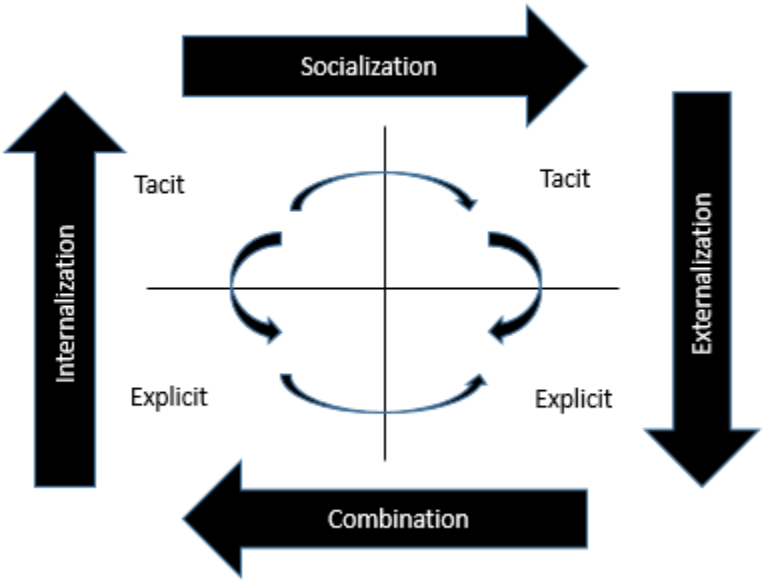
with them as experience. Therefore, the company suffers the loss of knowledge of great experiences, loss of client and bond with the supplier, and eventually loss of profit. Secondly, organizations that have a problem with effective knowledge transfer may suffer from wasting time and resources to solve problems that already have been solved or could be solved by using other individuals' knowledge.

In today's highly competitive business environment, the economy has evolved to become knowledge based, relying on collaboration and feedback, and supported by a culture of exchanging and sharing knowledge. Some studies describe the knowledge exchange to competitive power based on the resource based view (Hamel, 1991; W.-B. Lin, 2008; Prahalad & Hamel, 1990). To survive and compete, a company must have the ability to create an advantage over its competitors. This competitive strength is integrated into a company's ability to use the different resources, have strategies, skills, knowledge, and capabilities that are unique to the organization and unique from its competitors(Connell & Travaglione, 2004; Decker, Landaeta, & Kotnour, 2009).

Although organizations can specify where knowledge exists, it's hard to ensure that knowledge is transferred especially in the case of tacit knowledge transfer. The reason for the difficulty to transfer tacit knowledge is that this type of knowledge gained by doing is personal to an individual, technology, and environmental conditions (Argote, 1993).

According to knowledge spiral theory, there are four skills of personal knowledge transformation that helps knowledge creation and exchange. These are externalization, socialization, combination, and internalization (Yu et al., 2013). Figure 3 demonstrates four models of knowledge conversion.

Figure 4. Knowledge Creation Process (adapted from Nonaka et al., 2000).



Fang, Wade, Delios, and Beamish (2007) argued that knowledge is one of the most important resources for organizations to create and compete in the market. Existing research literature on knowledge sharing suggests that to increase opportunities for employees to propose new ideas, leaders need to support knowledge sharing within the organizations (R. S.-J. Lin & Hsiao, 2014).

Additionally, it is argued that with sharing existing knowledge, new knowledge can be developed and applied and knowledge sharing can help people to be more creative and think more critically. This type of new knowledge can assist organizations in advancing their product and services (Aulawi, Sudirman, Suryadi, & Govindaraju, 2009). Jantunen (2005) claimed that knowledge exchange in organizations may lead to higher firm innovation capability. Urbancova (2013) applied quantitative research through 109 organizations to examine innovation culture and

knowledge.

Knowledge sharing can be studied in different contexts such as: interpersonal and team characteristics, organizational, individual characteristics, motivational factors, and cultural characteristics. These areas consist of interrelated subjects. For instance, the organizational context includes organizational culture, climate, and management support (S. Wang & Noe, 2010).

When studying knowledge sharing, individual factors must not be overlooked. Factors such as motivation, perceived usefulness or cost, benefit of sharing knowledge, trust, fear, and technical skills or the ability of sharing, and personal innovativeness all influence knowledge sharing (Al-Busaidi, 2013). The individual level studies of knowledge sharing indicate employee's knowledge sharing occurs when colleagues interact to assist each other get something done better or more efficiently, and the organizations level is about capturing, reusing, and transferring the experienced-based knowledge and making it available to others (H.-F. Lin, 2007). Hence, an organization can benefit from knowledge resource when individuals translate their knowledge into organizational knowledge (Van den Hooff & De Ridder, 2004). Knowledge sharing may also be viewed from organization factors such as Management support, knowledge sharing culture, recognition or rewards, knowledge sharing resources, communication, and an incentives policy. Likewise, there are technological factors such as usability or functionality, ease of use, training, and the presence and use of communication channels (Al-Busaidi, 2013). For this research a measure of knowledge sharing behavior in an organization was used that was developed and used by Yi (2009); Bartol and Srivastava (2002); Fong and Wu (2007); Huang and Tsai (2003) and by Yu et al. (2013).

RESEARCH CONTRIBUTION

The present study adds to the existing literature and managerial practices in several ways. First, this study is unique in that previous studies on creativity did not examine knowledge sharing and creative confidence as moderators and mediators. Therefore, this study is filling a gap within the creativity literature. This study expects to examine individual's perception of the creative climate of the organization and how it fosters a positive effect on employees' creative behavior. The findings of the study guides the managers and organizations who were constantly devoting their managerial and financial resources in promoting creativity among their employees. The previous sections presented theoretical support to build up the hypotheses followed by a research method. Data analysis and results are added following the data collection. Finally, we discuss, implications, conclusions, and limitations of the study. The table below demonstrates the gap in the literature.

Table 1: Current Literature on Creative Confidence and Employee's Creativity

Paper	Title	Data collection Method	Methodology	Knowledge sharing	Creative confidence	Creative Climate	Creativity
Deborah S. Esslinger, (2011)	Encouraging Women's Creative Confidence: A Case Study Of Women's Insights Into Their Own Creativity	Interviews - Focus group	Qualitative analysis		✓		✓
Sherry Phelan & Angela Yound, (2003)	Understanding Creativity in the Workplace: An Examination of Individual Styles and Training in Relation to Creative Confidence and Creative Self-Leadership	Survey	ANOVA		✓		✓
Baer, Oldham, Jacobsohn, Hollingshead, (2008)	The Personality Composition of Teams and Creativity: The Moderating Role of Team Creative Confidence	Survey	Regression		✓		✓
Smith, Hannah Strong, (2018)	Exploring Students' Internal Motivation for Engineering Creativity: Creative Confidence and the Arts	Interviews and Survey	T-test, ANOVA		✓		✓
Chao-Sen Wu Cheng-Jong Lee Li-Fen Tsai, (2012)	Influence Of Creativity And Knowledge Sharing On Performance	Survey	Regression	✓			✓
Swati Mittal Rajib Lochan Dhar , (2015)	Transformational leadership and employee creativity Mediating role of creative self-efficacy and moderating role of knowledge sharing	Survey	Regression	✓			✓
Bhu and Yidan Zhao (2016)	Creative Self–Efficacy Mediates The Relationship Between Knowledge Sharing And Employee Innovation	Survey	Regression	✓			
Ma, Y. ; Cheng, W. ; Ribbens, B.A. ; Zhou, J., (2013)	Linking Ethical Leadership To Employee Creativity: Knowledge Sharing And Self-efficacy As Mediators	Survey	Regression	✓			✓
Chien yu, Tsai-Fang yu, Chin-Cheh yu, (2013)	Knowledge Sharing, Organizational Climate, And Innovative Behavior: A Cross-level Analysis Of Effects	Survey	Hierarchical Linear Modeling	✓		✓	
Neeraj Kumar Jaiswal, Rajib Lochan Dhar, (2015)	Transformational Leadership, Innovation Climate, Creative Self-efficacy And Employee Creativity: A Multilevel Study	Survey	Hierarchical Linear Modeling			✓	✓
Elnaz Dario	KNOWELDGE SHARING AND CREATIVE CONFIDENCE IN PROMOTING EMPLOYEES' CREATIVE BEHAVIOR	Survey	Regression	✓	✓	✓	✓

SUMMARY OF LITERATURE REVIEW

The literature has analyzed various factors that effects creativity, for example, (Hu & Zhao, 2016; Khalili, 2016; Maley & Bolitho, 2015; Wu, Lee, & Tsai, 2012). Also, the impact of knowledge sharing on employees' creative behavior is an argued topic in creativity research (Perry-Smith, 2006; Perry-Smith & Shalley, 2003). But the majority of researchers discussed and

focused on the factors that effects employee's knowledge sharing in terms of creativity (Hu & Zhao, 2016; Radaelli, Lettieri, Mura, & Spiller, 2014). To date, however, the effect of knowledge sharing and creative confidence on the relationship between organizational climate and employees' creativity remain relatively unexplored. Furthermore, creativity is sensitive to environmental variables (Hennessey & Amabile, 1998; Y. Wang & Wang, 2016). Researchers such as Yeh-Yun Lin and Liu (2012) and Mafabi, Munene, and Ahiauzu (2015) study organizational creative climate with adopting the model by Teresa M Amabile (1997) to explore the associate of creative climate and innovation. The majority of studies have used quantitative, survey method to collect data, and hierarchical regression to analyze and measure the data (Hu & Zhao, 2016; Y. Wang & Wang, 2016). This literature review shows that creative confidence is an important part of the creative process which involves people. These studies all support that to create a new idea individuals need to have both the right environment, motivation and also training to strengthen their creative confidence. Since tacit knowledge is the major part of an individual's asset, organizations should motivate their employees to freely share this knowledge and believe in their ability to produce useful ideas.

III. RESEARCH METHODOLOGY

Quantitative methodologies are accepted usually as dominant within the social sciences (Burrell & Morgan, 1979; Crotty, 1998; Saunders & Bezzina, 2015). Quantitative research is used for testing objective theories by exploring the relationship between variables (Creswell & Creswell, 2017). This chapter covers the focus of the study, including the selection of a survey methodology and quantitative analysis, the surveys chosen to operationalize the variables, the deployment of the survey to the population of interest, and the samples collected. The methods used for performing the quantitative analysis of the hypotheses are also explained.

SURVEY METHOD AND SELECTED INSTRUMENTS

Neuman (2013) claimed that "Survey is the most widely used social science data-gathering technique" (pp.308). This is a quantitative study and uses the survey method to collect data. All scales use a 5-point Likert format (1=*Strongly Disagree*, 5=*Strongly Agree*). For each of the four variables of interest, the following questionnaires were selected based on their reliability, validity, and researcher accessibility:

- *Creative Behavior*, the dependent variable, was measured using a 13-item scale developed by George and Zhou (2001) and Scott and Bruce (1994), used by M. Luu (2017) and Moghimi and Subramaniam (2013). The items measured the degree to which individuals displayed creative behavior on the job.
- *Creative Environment*, the independent variable, was measured using an 8-item scale

developed by Mayfield and Mayfield (2010).

- *Knowledge Sharing*, studied for its moderating and mediating effects, was measured using a 6- item scale developed and used by Yu et al. (2013); Bartol and Srivastava (2002); Fong and Wu (2007); Huang and Tsai (2003).
- *Creative Confidence*, also studied for its moderating and mediating effects, was measured using a 12-item scale developed, validated, and deployed in a number of studies, including Phelan and Young (2003), Harrison, Rainer Jr, Hochwarter, and Thompson (1997) and Stevens and Gist (1997).

Descriptive statistics and tests for normality were performed on the sample to guide, the appropriate approach for the regression analyses. Before performing moderation and mediation analyses, the Pearson correlation coefficients test were calculated in order to examine the relationships among the measured variables.

HYPOTHESES AND APPROACH

Hypothesis testing involves seeking to reject a null hypothesis in favor of the alternate hypothesis; otherwise, the only conclusion that can be made is that the researcher has failed to reject the null hypothesis, and may need to collect more data, reframe the research questions, or reconfigure their methodology. Rejection of a null hypothesis allows a researcher to conclude with a degree of confidence that a statistical relationship does not occur by chance. After conducting descriptive statistics and correlations analysis, hypotheses are tested using hierarchical multiple regression (MRC) analyses to study mediation and moderation effects, using SPSS.

The first relationship explored was between the independent and dependent variables.

Null Hypothesis 1: There is no significant relationship between creative behavior and creative confidence.

To check the relationship between creative climate and employees' creative behavior a linear regression is performed to determine which components of organizational climate are the best predictors of employees' creative behavior, and to determine which among the components of organizational climate correlated significantly with creative behavior, stepwise multiple regression analysis is performed.

The relationship may change with the introduction of mediating and moderating variables. First, mediation were tested for both intermediate variables:

Hypothesis 2: Knowledge sharing does not mediate the relationship between creative behavior and creative confidence.

Hypothesis 3: Creative confidence does not mediate the relationship between creative behavior and creative confidence.

To check the mediating effect, first the direct effect of the independent variable on the outcome variable is analyzed. Then, hierarchical regression analysis were done to test the effect of the independent variable on the mediating variable, and the effect of the mediating variable on the outcome variable. Furthermore, we were bringing the mediating variable into the model to test whether creative confidence is a partial or full mediator.

Both of the mediation variables from (2) and (3) were tested in the following double mediation model:

Hypothesis 4: The relationship between creative behavior and creative confidence will not change in the presence of mediators; creative confidence and knowledge sharing.

Moderation effects of the two variables separately and together were also explored, with the following hypotheses:

Hypothesis 5: Knowledge sharing does not moderate the relationship between creative behavior and creative confidence.

Hypothesis 6: Creative confidence does not moderate the relationship between creative behavior and creative confidence.

Hypothesis 4: The relationship between creative behavior and creative confidence will not change in the presence of moderators; creative confidence and knowledge sharing.

To check the moderating effect, we first analyzed the direct effect of the independent variable on the outcome variable. Then, moderated hierarchical regression analysis were used to test the effect of the moderating variable on the outcome variable.

POPULATION AND SURVEY SAMPLE SIZE

Survey is among the most common and used method to collect data in quantitative research. Survey sampling methods are classified as either probability or nonprobability. Random sampling is a method of probability sampling. Probability sampling (simple random) used to have a representative sample (Bernard & Bernard, 2012; Moghimi & Subramaniam, 2013). In this method, each member of the population has a known non-zero and equal probability of being selected. The main question to answer at this stage is: How large of a population sample size is needed?

In order to establish reliable factors for Confirmatory Factor Analysis (CFA), the sample size needs to be proportionate to the amount of questions asked (Costello & Osborne, 2005; Field, 2009; Hof, 2012b; Tabachnick & Fidell, 2001). The reason for having a requisite sample size is that the smaller the number, the greater the chance that the correlation coefficients between items differ from the correlation coefficients between items in other samples (Field, 2009; Hof, 2012a).

However, determining the sample size also largely depends on the percentage of variance in a dataset a factor explains. For example, variables correlate greatly with a factor when that factor explains lots of variance in a dataset that is loaded highly on that factor (Hof, 2012a). A factor with four or more loadings greater than 0.6 "is reliable regardless of sample size." (Field, 2009), (p. 647). Moreover, to determine the adequate sample size similarly to factor analysis, Kaiser-Meyer-Okin (KMO) can be used that "represents the ratio of the squared correlation between variables to the squared partial correlation between variables." (Field, 2009), (p. 647).

In order to consider sample size, researchers generally prioritize reaching acceptable statistical power to observe accurate relationships in the data (Wolf, Harrington, Clark, & Miller, 2013). Statistical power is described as the probability of rejection of the null hypothesis when it is false. In the other words, it has the likelihood of not making a Type II error (i.e., 1 – beta) (Cohen, 1988).

The variables represented in each factor and the alpha value are analyzed to determine power. Power is dependent on different factors such as (a) the desired level of alpha which is typically $\alpha = .05$, (b) the extent of the effect of interest, and (c) the sample size. In the case when the alpha is too restrictive, the power is reduced because it makes it difficult to find a major difference. Cohen (1988), stated that studies should be considered in such an approach that they have an 80% probability of detecting an effect when there is an effect there to be detected.

Nevertheless, power is not the only factor in defining sample size as parameter estimate bias, and standard errors also have a role in it (Wolf et al., 2013).

Sample size also can be calculated based on the margin of error and the confidence level. With a population size larger than 100,000 and 95% confidence level and 5% of margin of error, the sample size can be determined as 400. Also, 20% response rate is considered good. Response rate is important because of the potential impact on the validity and reliability of survey results. Getting high response rates is critical in obtaining high-quality survey data and can strengthen statistical power, reduce sampling error, and enhance universality of results (Castelle, 2017). Table 2 exhibits required sample size for different population size.

Table 2: Sample Size per Margin of Error

Population Size	Sample Size per Margin of Error (%95 confidence level)		
	±3%	±5%	±10%
500	345	220	80
1,000	525	285	90
3,000	810	350	100
5,000	910	370	100
10,000	1,000	385	100
100,000+	1,100	400	100

DEMOGRAPHICS

Participants were asked to answer six demographic questions regarding their age, gender, level of education, and tenure at the current organization. A key demographic that was centralized

in the study are engineers and non-engineers.

MEDIATION VERSUS MODERATION

Mediation and moderation are distinctly different concepts to describe variables in the model, and as a contribution to methodological practice, both were explored to demonstrate different regression relationships among the variables. The main difference between two is that moderator variable directly influenced the relationship between two variables. On the other hand, a mediator forms a separate indirect relationship (Williams & MacKinnon, 2008). The following table provides an overview of the two concepts:

Table 3: Mediation versus Moderation

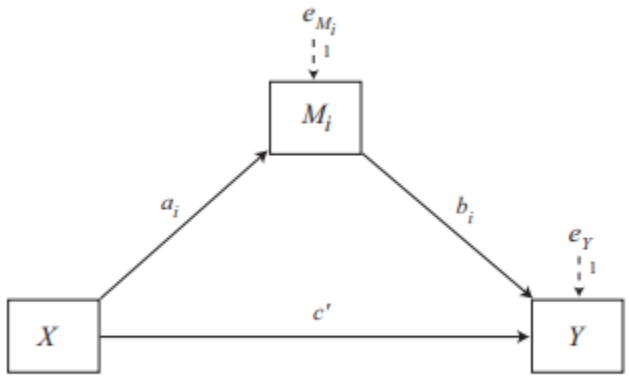
Mediation	Moderation
Intervening variable	Interaction variable
Variable does not influence an existing relationship; rather, it forms a separate indirect relationship (MacKinnon, 2008)	Has a direct influence on the relationship between two other variables
Independent variable X influences a mediator variable M, which in turn influences Y	The strength of the relationship between an independent variable X and a dependent variable Y is affected by a moderator M
Helps explain how or why an effect occurs (Baron & Kenny, 1986) (e.g. effect occurs because of the presence of the mediation variable)	Helps explain when or under what conditions the effect occurs (Baron & Kenny, 1986) (e.g. effect is stronger in presence of the moderating variable)

The choice of moderation versus mediation largely depends on the research strategy and the knowledge that is desired, although it is not uncommon for a researcher to begin with one approach and then decide to pursue the other. The study analyzed the relationship between creative climate and creative behavior, and how this relationship changed in the presence of knowledge sharing and creative confidence, which were both assessed for their mediating and moderating effects.

The mediation effect explains the relationship between creative climate and creative behavior; it explains why the relationship exists. In mediation analysis, creative climate leads to a change in knowledge sharing and creative confidence, which then leads to a change in creative behavior.

The moderation effect influences the strength of the relationship between creative climate and creative behavior, the moderation effect might change the strength of the relationship between two variables from strong to nothing. The purpose of the investigation is to discover how an intervening variable explains part of the relationship between an independent and dependent variable, as shown in Figure 5:

Figure 5: Mediation Model (adapted from Hayes, 2013)



The following three regression equations can be used to test for multiple mediation (Baron & Kenny, 1986), where X represents the independent variable (creative climate), Y represents the dependent variable (creative behavior), and M_1 represents the mediating variable (knowledge sharing), and M_2 represents the mediating variable (creative confidence). Equations are:

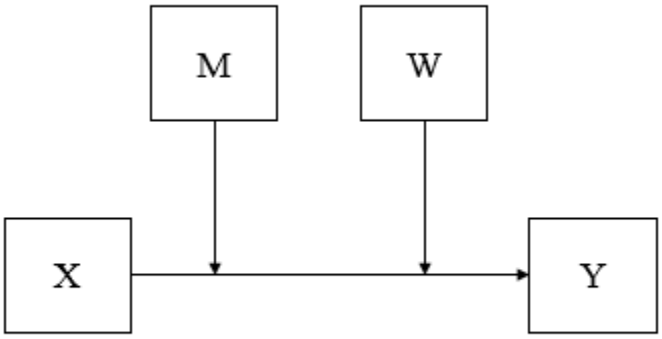
$$M1 = i\ M_1 + a_1X + eM_1 \qquad (1)$$

$$M2 = iM_2 + a_2X + d_{21}M_1 + e\ M_2 \qquad (2)$$

$$Y = iY + c'\ X + b_1M_1 + b_2M_2 + e_Y \qquad (3)$$

In multiple moderation analysis, the equation for multiple linear regression model with three predictor variables, X (Creative climate), and M variable (knowledge sharing), and W variable (creative confidence) is:

Figure 6: Moderation Model (adapted from Hayes, 2013)



This model (figure 6) also is represented in the form of a statistical diagram in Figure 19. Equation can be written in this form:

$$Y = i_1 + b_1X + b_2M + b_3W + b_4XM + b_5XW + e_Y$$

DOUBLE MODERATION AND DOUBLE MEDIATION

The multiple-mediation model used for the study of the creative climate and creative behavior is illustrated as a path diagram in figure 12 and 13. The multiple-mediation model includes a three-path mediating effect through both knowledge sharing and creative confidence, which allows one mediator (i.e., KS) to causally affect the other mediator (i.e., C. confidence) (J. Wang et al., 2012). The two variables selected for the moderation and mediation hypotheses were also collectively analyzed in a double moderation model (Hypothesis 4), and a double mediation model (Hypothesis 7).

There are two types of mediation; parallel mediation and serial mediation. For parallel

mediation, the causal relationship between both mediators should be limited or zero and high coordination is not desirable (Hansen, 2012). On the other hand, for serial mediation, the causal relationship between both mediators should be extensive.

The original assumption of this three-path mediating effect is that the individuals who work in a creative environment are willing to share their knowledge and are more likely to be confident about their creative ability, which in turn leads to a higher creative behavior. In double mediation, in addition to the indirect effects that links each of the mediators alone, we explore the indirect effect passing through both mediators.

There are several popular ways to analyze mediation effect such as casual steps approach, Sobel test, Monte Carlo simulations, and Bootstrapping approach. Given the availability of easy-to-use SPSS software, and robust assessment of indirect intervention effects that bootstrapping approach provides it was decided to apply the Bootstrap method in this study.

The bootstrap method is a non-parametric resampling test developed by (Kristopher J. Preacher & Hayes, 2004; Kristopher J Preacher & Hayes, 2008). This method does not rely on the assumption of normality, therefore, it fits for smaller sample sizes (Hair et al., 2014; Pardo & Roman, 2013). As a result of bootstrapping, if zero is not between the lower and upper bound of a CI% confidence interval, it can be concluded that the indirect effect is not zero with ci% confidence. Theoretically this is the same as rejecting the null hypothesis that the true indirect effect is zero at the 100 – ci% level of significance (Andrew F Hayes, 2009).

Sobel test is an inferential method that is the product of coefficients approach (Sobel, 1982, 1986). For this test, standard error of *ab* should be estimated. The ratio of *ab* to its standard error should be used as a test statistic for testing the null hypothesis that the "true" indirect effect is zero, with the *p*-value resulting from the standard normal distribution (Andrew F Hayes, 2009).

Another way to interpret the result of the mediation analysis is based on the strength of the indirect and the direct effects (D. P. MacKinnon, Fairchild, & Fritz, 2007). To determine if the mediation is successful, the result must be significant for the indirect effect (D. P. MacKinnon et al., 2007). As a result of this, the direct effect may remain significant or may disappear. In the case of the complete mediation, the significance must disappear (i.e., the effect of *X* on *Y* is entirely due to *M*), while if it remains, then there is partial mediation (i.e., M does account for part of the relationship between *X* and *Y*, but, *X* still predicts *Y* even when taking into account *M* (Kane & Ashbaugh, 2017; D. P. MacKinnon et al., 2007). However, results of simulation study show that bootstrapping is more powerful than the Sobel test and the causal steps method to testing intervening variable effects (Andrew F Hayes, 2009; D. P. Mackinnon, C. M. Lockwood, & J. Williams, 2004; Williams & MacKinnon, 2008).

With regard to possible moderating effect, multiple moderation model should be conducted for the partial association between independent and dependent variable control for both moderators, the limitation that the effect of independent variable is controlled to be unconditional on both moderators should be allowed (Andrew F. Hayes, 2013). In the model (see figure 5), the independent variable, creative climate, is related to creative behavior, which has also been demonstrated in previous research (Moghimi & Subramaniam, 2013). Knowledge sharing and creative confidence were introduced as a hypothesized moderator variable, suggesting that the relationship between the independent variable and dependent variable is strengthened with the presence of two moderations. The research employs statistical techniques on the dataset to test the hypothesis that knowledge sharing and creative confidence are moderator variable.

SUMMARY OF METHODOLOGY

All the study variables were measured on the scales that have been developed and used in previous research. Primarily one common methodology for researching and measuring creative climate, is one of the two questionnaires designed by Göran Ekvall (1996), and Goran Ekvall and Ryhammar (1999), and Teresa M. Amabile et al. (1996), which suggested the following dimensions: challenge, freedom, idea support, trust/openness, dynamism/liveliness, playfulness/humor, debates, conflicts (impediment), risk-taking, and idea time. For this study, Creative Environment scale that included creativity support, work characteristics and creativity dimensions developed by Mayfield and Mayfield (2010) was used. Knowledge sharing was measured using the scale developed by Yi (2009). A sample question is" When I am preparing a document, I am willing to write down what I know for my colleagues to refer to". It was used to assess the extent to which employees exchange knowledge with colleagues inside and outside their organization. A 12-item scale, developed by Phelan and Young (2004), Harrison et al. (1997); Stevens and Gist (1997), was used to measure creative confidence. A sample question is, "I feel that I am good at generating novel ideas". Employee creative behavior (self-rating) was measured using the scale developed by Gong et al. (2013) and Scott and Bruce (1994), a sample question is "I suggest new ways to achieve goals or objectives". The next section explains the outcomes of the tested hypotheses.

IV. RESULTS

This chapter shows the main outcomes rising from the deployment of the instrument that involves moderated and mediated multiple regression analysis. The chapter includes the detailed results of the analysis of the data collection in the main survey collected online, using SurveyMonkey.com. The survey contained four research instruments: Creative Environment Scale (CEP), Knowledge Sharing Scale (KSB), Creative Confidence Scale (CC), and Creative Behavior Scale (CB).

Data Analysis

The resulting measurement scales were subjected to a commonly used validation process to assess their reliability and validity. First, the reliability of the constructs was calculated using Cronbach's [alpha] coefficient (see Table 4). The reliability coefficients for the variables ranged from 0.757 to 0.929. Values higher than 0.7 are acceptable (Kline, 2013).

Table 4: Reliability Statistics of Scale.

Variable	Cronbach's Alpha	N of Items
Creative climate	.757	9
Knowledge Sharing	.827	6
Creative Confidence	.872	12
Creative Behavior	.929	13

Factor analysis was used to verify the convergent and discriminant validity of the measures, using SPSS software. Creative climate/environment instrument's KMO and Bartlett's test result = 0.753, and it was statistically significant p=.000. SPSS extracted one factor with no absolute value below 0.3. This one factor explains the 34% of the variance. The instrument scored highly in reliability and validity in the original development with the goodness of fit index test above 0.94, and significant chi-square test (Mayfield & Mayfield, 2010).

Table 5: Component Matrix for Creative Climate Scale

Component Matrix[a]	
	Component
	1
CC3	.735
CC1	.718
CC2	.697
CC7	.683
CC4	.539
CC8	.525
CC9	.492
CC6	.433
CC5	.378
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Knowledge sharing KMO and Bartlett's test result =0.815, p=.000. SPSS extracted one factor with no absolute value below 0.3. This one factor explains the 55% of the variance.

Table 6: Component Matrix for Knowledge Sharing Scale

Component Matrix[a]	
	Component
	1
KS3	.821
KS4	.821
KS2	.751
KS5	.734
KS6	.702
KS1	.603
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Creative confidence KMO and Bartlett's test result =0.892, p=.000. SPSS extracted one factor with no absolute value below 0.3. This one factor explains the 44% of the variance.

Table 7: Component Matrix for Creative Confidence Scale

Component Matrix[a]	
	Component
	1
CO12	.787
CO6	.778
CO7	.727
CO8	.726
CO5	.722
CO10	.718
CO9	.716
CO11	.703
CO2	.604
CO1	.588
CO3	.392
CO4	.365
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Creative confidence scale's reliability was 0.90 and factor analysis results were higher than 0.50 in the Phelan & Young (2003) study.

Table 8: Component Matrix for Creative Behavior Scale

Component Matrix[a]	
	Component
	1
CB9	.840
CB12	.834
CB7	.802
CB8	.782
CB11	.770
CB1	.754
CB13	.747
CB6	.739
CB5	.724
CB10	.699
CB4	.683
CB3	.629
CB2	.591
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Creative Behavior KMO and Bartlett's test result =0.915, p=.000. SPSS extracted one factor with no absolute value below 0.3. This one factor explains the 54% of the variance.

RESEARCH POPULATION AND SAMPLE

A survey link was created on SurveyMonkey.com and 158 participant took the survey. The demographics represent distribution among females and males (figure 6), age ranges (figure 7),

and sector that each participant employed in (figure 8). 57% of the participant in the study were male. 41% of the population were in the age range of 25-34. The majority of the population were working in science and engineering jobs (figure 9). The length of job experience of 35% of the population in between 1-5 years (figure 10).

Figure 7: Distribution of Males and Females in Survey Population

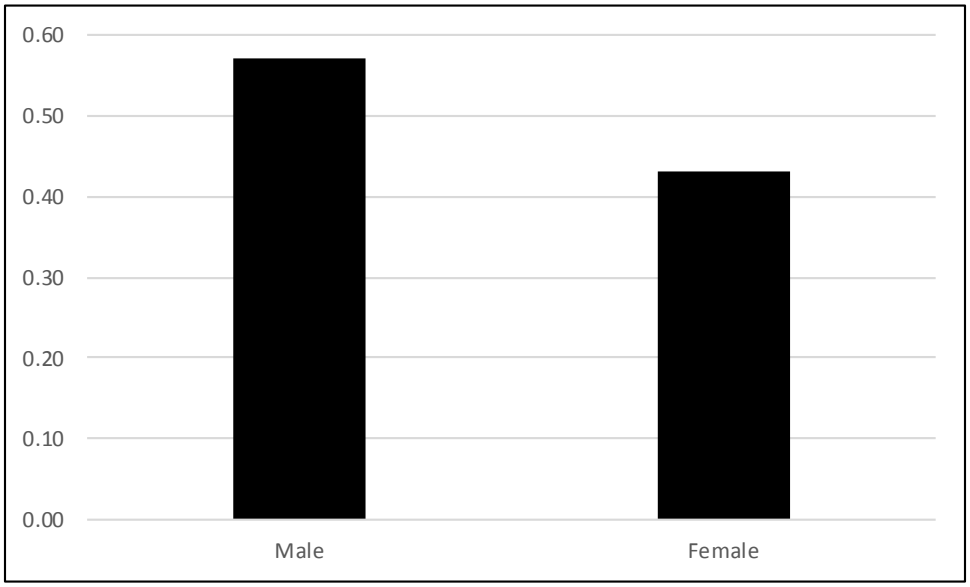


Figure 8: Distribution of Age Range in survey Population

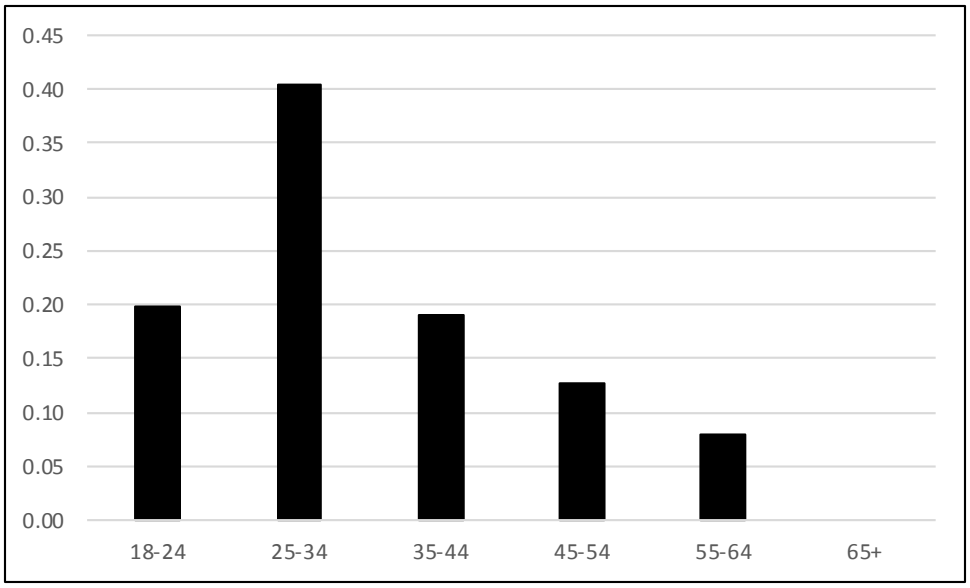


Figure 9: Distribution of Different Sector Employees in survey Population

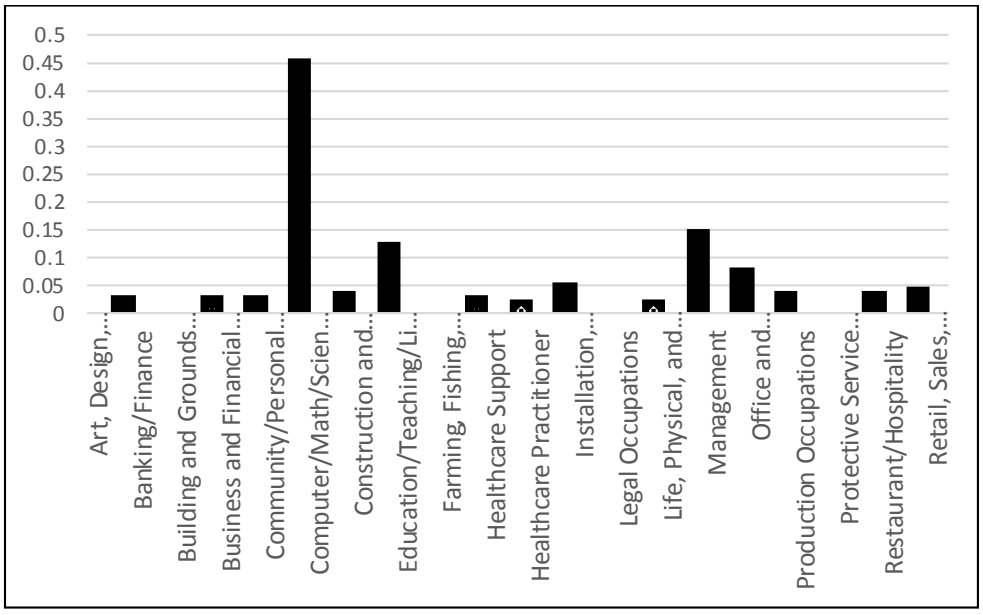
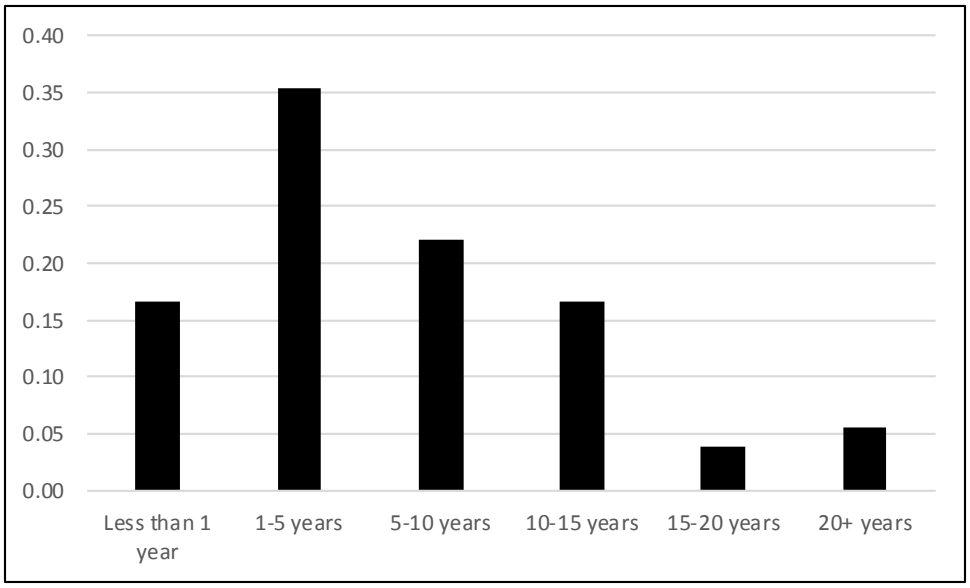


Figure 10: Distribution of Years of Experience Employees in Survey Population



In the next several sections, hypotheses from Chapter 1 were tested. For each hypothesis, the results from the total sample are provided. Any significant difference found in the engineer sample versus the non-engineer sample were included in the results. The supporting data is in Appendix Q and Appendix R.

HYPOTHESIS 1: RELATIONSHIP BETWEEN CREATIVE CLIMATE AND CREATIVE BEHAVIOR

The first relationship explored was between Creative Climate (the independent variable) and Creative Behavior (the dependent variable). In this analysis, if there is a significant

relationship between the independent variable *X* and the dependent variable *Y*, the slope will *not* equal zero.

H_0: $B_1 = 0$ (There is no relationship between creative climate and creative behavior)

H_a: $B_1 \neq 0$ (A nonzero relationship between creative climate and creative behavior could exist)

The results showed value of r = 0.148, R-sqr= 0.022 and p = 0.063 (p > .05). If we consider value of r=1 is high then, we conclude that there is not a strong relationship between independent and dependent variable. Y intercept or constant value for this relationship is – 8.88 and the slope for the regression line is 0.148.

We next analyzed data for two different groups; engineers and non-engineers to answer the question: Does the same linear regression test result hold true for engineers vs. non-engineers?

Table 9: Engineers and Non-Engineers Groups Comparison

Engineers	Non-Engineers
R-sq=.032, adj R^2=.020, ΔR2 =.032, p=.101 Durbin-Watson=1.798	R-sq=.017, adj R^2= -.002, ΔR2 =.017, p=.350 Durbin-Watson= 2.291

For engineers (see table 10), the results showed a correlation coefficient of r = 0.179, p = .101 (p > .05), constant value of 4.47 and slope for the regression 0.179. In this regression test there is failure to reject null hypothesis, so there is no relationship between creative climate and creative behavior.

For non-engineers, the results showed a correlation coefficient of r = .130 and p = .350 (p > .05), constant value 3.45 and slope of the regression line 0.145. In this regression test there is failure to reject null hypothesis, so there is no relationship between creative climate and creative behavior.

HYPOTHESIS 2: MEDIATION OF KNOWLEDGE SHARING

For this analysis, 5000 bootstrap samples and 95% confidence level was used. Also, all coefficients in this output are standardized ones. To obtain standardized coefficients, we transformed the variables into Z scores before entering them in the mediation and moderation. The step by step result of a hypothesis test are reported as follows:

H_{20} = Knowledge sharing does not significantly mediate the relationship between creative climate (independent) and creative behavior (dependent variable)

H_{2a}= Knowledge sharing significantly mediates the relationship between creative climate (independent) and creative behavior (dependent variable)

Step 1: Path c or indirect effect: b=.1483, t (156) =1.8732, p=.063 >.05 regression indirect effect between X and Y shows that creative climate is a positive but not statistically significant predictor of creative behavior.

Step 2: X effects M. Path a, b=.1978, t (156) = 2.52, p=.0127 <.05 shows that creative climate is a positive and statistically significant predictor of knowledge sharing.

Step 3: Y effects M. Path b: b=.6184, t (155) = 9.6591, p=.000 <.001 shows that knowledge sharing is a positive and a significant predictor of creative behavior

Step 4: The effect (coefficient) of path c' is not zero. Path c' or direct effect: b=.0260, t (155) = .4062, p=.685 >.001 shows that creative climate is positive but a non-significant predictor of creative behavior. Path c' is less significant than C path, which simply indicates that climate is indirectly related to creative behavior through its relationship with knowledge sharing. Hence, mediator is a good mediator.

Also, Bootstrapped Confidence Interval method was used to test the significance of a*b. The sampling distribution of a*b is non-normal. Bootstrapping is a computer intensive, used for no robust analysis technique and to generate confidence intervals that can be applied to non-normal data (Erceg-Hurn & Mirosevich, 2008). Interaction of a*b (.1978*.6184=1223) or indirect effect report the 95% confidence interval for this if the CI for a*b does not include zero, then mediation has occurred. BCa CI= [.0324, .2145]. The results showed that knowledge sharing is mediating the relationship between creative climate and creative behavior.

HYPOTHESIS 3: MEDIATION OF CREATIVE CONFIDENCE

Next, the mediation effect of creative confidence was explored.

H_{30} = Creative confidence does not significantly mediate the relationship between creative climate (independent) and creative (dependent variable)

H_{3a}= Creative confidence significantly mediates the relationship between creative climate (independent) and creative behavior (dependent variable)

The result of mediation analysis shows that creative confidence is mediating the relationship between creative climate and creative behavior. Therefore, we reject H_{30} and accept H_{3a}.

The process for mediation and output of the analysis are as follows:

Step 1: Path c or indirect effect: b=.1483, t (155) = 1.87, p=.0629 >.05 regression indirect effect

between X and Y shows that creative climate is a positive but not a statistically significant predictor of creative behavior.

Step 2: X effects M. Path a, b=.1933, t (156) = 2.46, p=.015 <.05 shows that creative climate is a positive, and a statistically significant predictor of creative confidence.

Step 3: Y effects M. Path b: b=.7587, t (155) = 14.23, p=.000 <.001 shows that creative confidence is a positive and a significant predictor of creative behavior

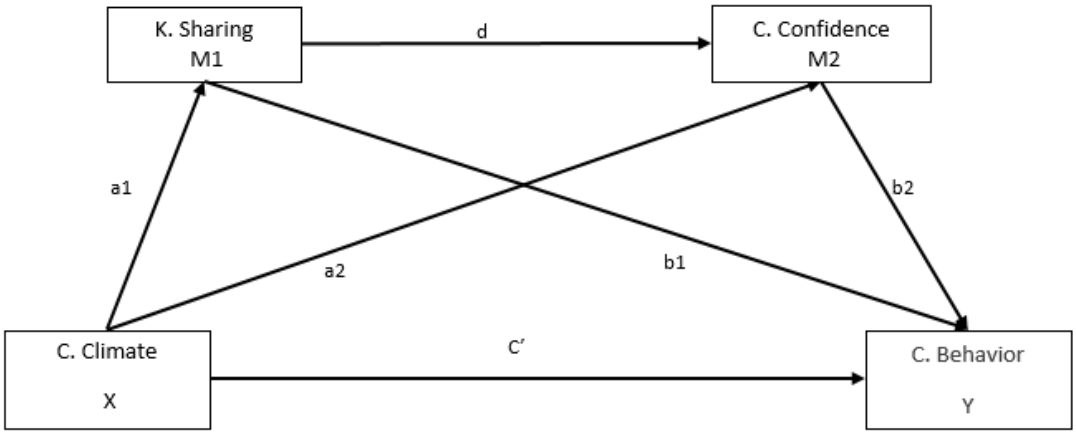
Step 4: The effect (coefficient) of path c' is not zero. Path c' or direct effect: b=.0017, t (155) = .0313, p=.975 >.05 shows that creative climate is positive but non-significant predictor of creative behavior. Path c' is less significant than C path, so mediator is a good mediator

a*b = .1466 is equal to indirect effect and indirect effect-report the %95 confidence interval for this if the CI for a* does not include zero b BCa CI= [.0265, .2760], then mediation has occurred.

HYPOTHESIS 4: SERIAL DOUBLE MEDIATION

As it is demonstrated in the figure, there are multiple indirect effects in this model (i) the indirect effect that goes to the mediator M_1 *(KS)*, bypassing M_2 *(CC)*, that can be considered as a_1b_1; (ii) the indirect effect goes to the mediator M_2, bypassing M_1, that can be considered as a_2b_2; and (iii) the three-path indirect effect passing through both mediators, which can be represented as a_1db_2. Furthermore, summation of all a_1b_1, a_2b_2, a_1db_2 paths makes indirect effect. The direct effect which is indicated as c', however, is the effect between creative climate and creative behavior not mediated by either mediator. Figure 11 demonstrates the conceptual diagram of a double mediation model.

Figure 11: Conceptual diagram of a double mediation model



The step by step result of a hypothesis test are reported as follows:

H_{40} = Knowledge sharing and creative confidence do not significantly jointly mediate (influence) the relationship between creative climate (independent) and creative behavior (dependent variable)

H_{4a}= Knowledge sharing and creative confidence significantly jointly mediate the relationship between creative climate (independent) and creative behavior (dependent variable)

Step 1: Path c or indirect effect: b=.1483, t (156) =1.8732, p= .0629 >.05 regression indirect effect between X and Y shows that creative climate is a positive but not statistically significant predictor of creative behavior.

Step 2: X effects M_1. Path a_1, b= .1978, t (156) =2.52, p=.0127<.05 shows that creative climate is a positive predictor, and a significant predictor of knowledge sharing.

Step 3: X does not effect M_2. Path a_2: b=.0751, t (155) =1.1644, p=.2461 shows that creative climate is not a statistically significant predictor of creative confidence

Step 4: Y effects M_1. Path b_1: b=.2564, t (154) =4.0426, p=.0001<.001 shows that knowledge sharing is a positive and a significant predictor of creative behavior.

Step 5: Y effects M_2. Path b_2: b=.6058, t (154) =9.5585, p=.0000<.001 shows that creative confidence is a positive and significant predictor of creative behavior.

Step 6: M_1 effects M_2. Path d: b=.5976 positive predictor, t (155) =9.2653, p=*.0000*<.001 shows that knowledge sharing is a positive and statistically significant predictor of creative confidence.

Step 7: The effect (coefficient) of path c' is not zero. Path c' or direct effect: b=-.0195, t (154) =-.3813, p=.7035.

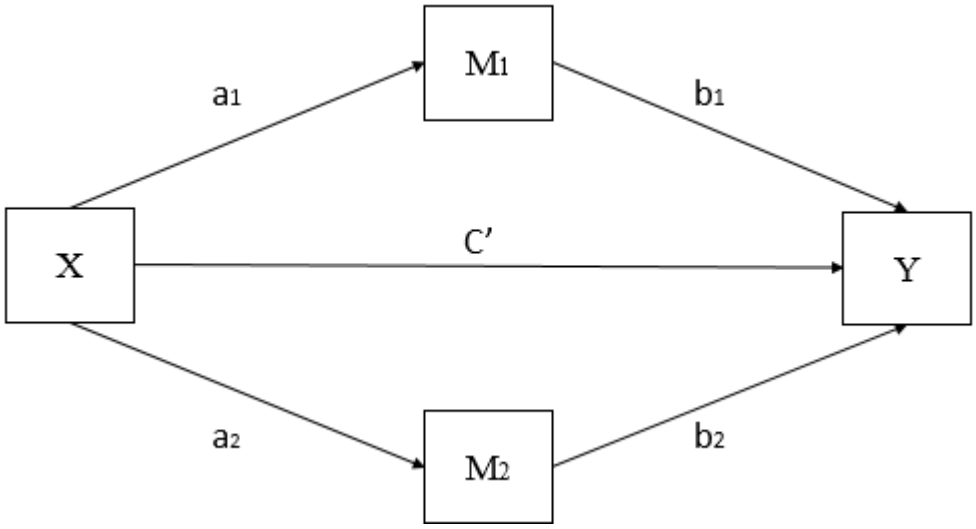
Results indicated that the direct effect of creative climate on creative behavior became non-significant when controlling for mediators, thus suggesting full mediation. The opposite signs, however, is a result of inconsistent mediation (mediators act like a suppressor variable). A 95% confidence interval based on 5000 bootstrap samples indicated that the indirect effect through knowledge sharing (a_1b_1 =.0507), holding creative confidence (M2) constant, was entirely above zero (.0090 to .1007). Also, creative confidence effect (a_2b_2 = .0455) is less than knowledge sharing effect when holding knowledge sharing (M1) constant. It was not entirely above zero (-.0318 to .1350).

The path with both mediators *CI* [.0156, .1453] does not include zero, which would indicate that the indirect effect is significant because zero is not in the realm of possible values for the effect. Therefore, we can conclude with 95% confidence that the indirect effect is positive for indirect path 1 and 3 and negative for indirect path 2. Based on the result we conclude that mediation has occurred.

HYPOTHESIS 5: PARALLEL DOUBLE MEDIATION

Simple mediation includes one mediator and is the simplest of mediation models. More complex models, such as parallel or serial mediation, have more than one mediator (Andrew F. Hayes, 2013). In parallel mediation, two or more variables (M1, M2, etc.) are included to mediate the relationship between X and Y (see Figure 12). The correlation between these variables is possible, but not to influence each other in causality (Andrew F. Hayes, 2013). This model is useful from the time when more complex assessment of the processes through which X affects Y is needed (Kane & Ashbaugh, 2017). With parallel mediation, we can test each proposed mediator while accounting for the shared variance between them (Andrew F. Hayes, 2013).

Figure 12: Parallel Mediation Using the Mediating Effect of Two Mediators



The step by step result of a hypothesis test are reported as follows:

Step 1: Path c or indirect effect: b=.1483, t (156) =1.8732, p=.0629 >.05 regression indirect effect

between X and Y shows that creative climate is a positive but not statistically significant predictor of creative behavior.

Step 2: X effects M_1. Path a_1, b= .1978, t (156) =2.52, p=*.0127*<.05 shows that creative climate is a positive predictor and is a significant predictor of knowledge sharing.

Step 3: X effects M_2. Path a_2: b=.1933, t (156) =2.46, p=.0150 <.05 shows that creative climate is a statistically significant predictor of creative confidence

Step 4: Y effects M_1. Path b_1: b=.2564, t (154) =4.0426, p=*.0001<.001* shows that knowledge sharing is a positive and a significant predictor of creative behavior.

Step 5: Y effects M_2. Path b_2: b=.6058, t (154) =9.5585, p=.0000<.001 shows that creative confidence is a positive and significant predictor of creative behavior.

Step 6: The effect (coefficient) of path c' is not zero. Path c' or direct effect: b= -.0195, t (154) = -.3813, p=.7035. Results indicated that the direct effect of creative climate on creative behavior became non-significant when controlling for mediators, thus suggesting full mediation.

A 95% confidence interval based on 5000 bootstrap samples indicated that the indirect effect through knowledge sharing (a_1b_1 =.0507), holding creative confidence (M_2) constant, was entirely above zero (.0091 to .1015). Also, creative confidence effect (a_2b_2 = .1171) is higher than knowledge sharing effect when holding knowledge sharing (M_1) constant. It was entirely above zero (.0191 to .2317).

Results of the mediation analysis confirmed the mediating role of knowledge sharing and creative confidence in the relation between creative climate and creative behavior b = .1678; *CI* = .0433 to .2943. Therefore, it can be concluded that individual's scored .1678 points higher in creative behavior as a result of the indirect effect through the mediators.

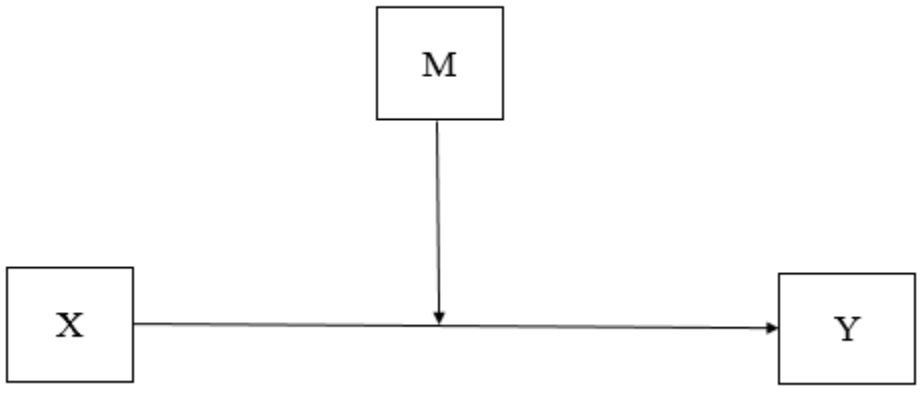
In both serial and parallel mediation the path with both mediators does not include zero, which would indicate that the indirect effect is significant because zero is not in the realm of possible values for the effect. Results from the parallel mediation analysis indicated that creative climate is indirectly related to creative behavior through its relationship with the knowledge sharing which expresses how individuals work in organizations with higher communication, personal interaction, contribution in problem solving, and creative confidence can show higher creative behavior.

HYPOTHESIS 6: MODERATION OF KNOWLEDGE SHARING

The effect of knowledge sharing was characterized statistically as an interaction, to show its effect on the relationship between dependent and independent variables. Figure 13 shows multiple moderation model. The statistical equation with X, M, and XM as predictors of Y is:

$$Y = b_0 + b_1 X + b_2 M + b_3 XM + e$$

Figure 13: Simple Moderation Model



The step by step result of a hypothesis test are reported as follows:

H_{50} = Knowledge sharing does not significantly moderate the relationship between creative climate (independent) and creative behavior (dependent variable)

H_{5a}= Knowledge sharing significantly moderates the relationship between creative climate (independent) and creative behavior (dependent variable)

For moderation test we first tried to answer these two questions:

Is model 1 (without the interaction term) significant? Yes, F (2,155) = 49.44, p< .001

Is model 2 (without the interaction term) significant? Yes, F (3,154) = 32.74, p< .001

Table 10: Moderated Regression Model Summary.

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.624[a]	0.389	0.382	0.7863812	0.389	49.441	2	155	0
2	.624[b]	0.389	0.378	0.7889281	0	0.001	1	154	0.977
a. Predictors: (Constant), Knowledge Sharing, Creative Climate									
b. Predictors: (Constant), K.Sharing, C.Climate, Creative Climate x Knowledge Sharing									

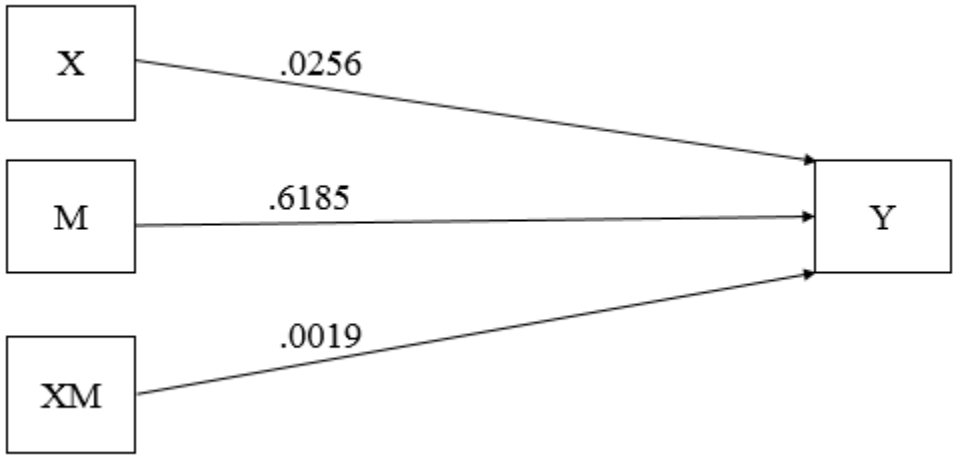
To test the hypothesis that whether knowledge sharing moderates the relationship between creative climate and creative behavior, a hierarchical multiple regression analysis was conducted. In the first step, two variables were included: creative climate and creative behavior. These variables accounted for a not significant amount of variance in creative behavior, R^2 = .389, F (2,155) = 49.44, p< .001. To make sure there is no problem of high multicollinearity with the

interaction term, the variables were centered and an interaction term between creative climate and knowledge sharing was created (Aiken & West, 1991).

Does model 2 account for significantly more variance than model 1?

In this example, Model 2 with the interaction between creative climate and knowledge sharing does not show more significant variance than just creative climate and knowledge sharing by themselves, R^2 change = .000, p = .977, indicating that there is not potentially significant moderation between creative climate and knowledge sharing on creative behavior. Figure 14 shows the statistical value of regression analysis.

Figure 14: Single Moderation model depicted as a statistical diagram



The confidence interval for the coefficient *b* values in Model is shown in Table 11.

Table 11: Confidence Intervals for Moderation Model Coefficient Values

Variable	95% Confidence Interval
Creative Climate	-.1039 < X < .1552
Knowledge Sharing	.4915 < M < .7455
Interaction (X × M)	-.1271 < X × M < .1309

The step by step result of a hypothesis test (SPSS Process Macro analysis) are reported as follows:

H_0 = the difference between conditional effect of X is equal to zero;

H_a = the difference between conditional effect of X is different from zero.

We cannot reject the null hypothesis, the R sq-change is equal to zero. The only significant predictor of creative behavior is knowledge sharing with p< .001. We also have a parallelism that shows that interaction is not significant p > .001. Next, the interaction term between creative climate and knowledge sharing was added to the regression model, which accounted for a not significant proportion of the variance in creative behavior, $\Delta R^2 = .000$, ΔF (1, 154) = .0008, $p = .976 > .05$, interaction: $b = .0019$, t (154) = .0290, $p > .001$.

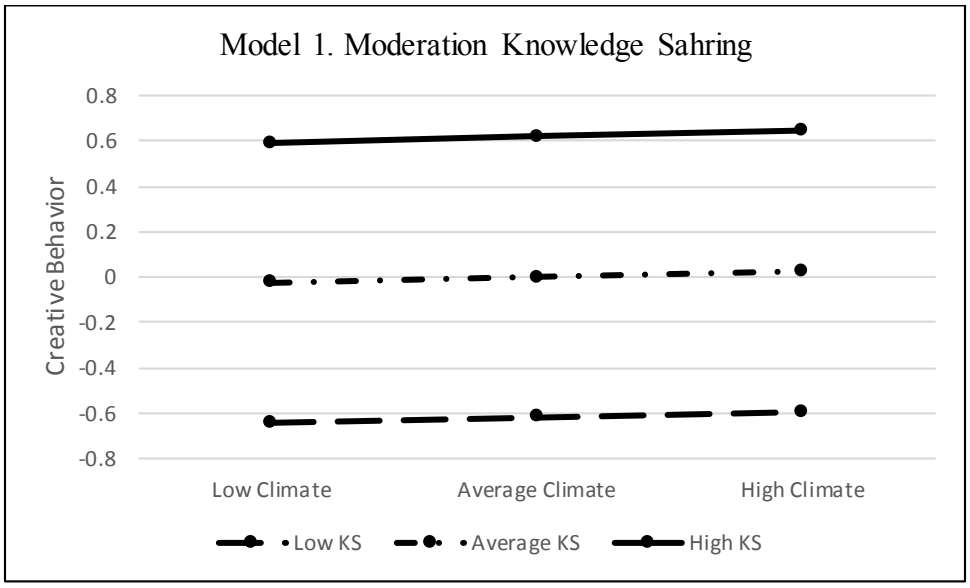
Table 12 shows the output from Andrew F. Hayes' PROCESS add-on that is used to visualize the conditional effect of X on Y set different levels of the moderator variable M, at the mean, in addition to at one standard deviation above and below.

Table 12: Conditional Effect of Creative Climate on Creative Behavior.

Creative Climate (CC)			
Knowledge Sharing (KS)	1 SD Below	Average	1 SD Above
1 SD Below	-0.6426	-0.026	0.5906
Average	-0.6189	-0.0004	0.6181
1 SD Above	-0.5951	0.0252	0.6456
	Negative CC	Neutral CC	Positive CC
Low KS	-0.6426	-0.026	0.5906
Average KS	-0.6189	-0.004	0.6181
High KS	-0.5951	0.0252	0.6456

Analysis of the interaction plot in figure 15 showed there is no effect that as climate increase creative behavior and Knowledge sharing increased, creative behavior increased.

Figure 15: Interaction Plot.



When knowledge sharing is high creative behavior is higher and it increase slightly when the climate is good for creativity. Individuals show average creative behavior with average knowledge sharing and with low level of knowledge sharing they show less creative behavior. In all three level of knowledge sharing, individuals' behavior changed slightly when creative climate is higher but not significantly.

HYPOTHESIS 7: MODERATION OF CREATIVE CONFIDENCE

For moderation model of creative confidence we hypothesized that:

H_{60} = Creative confidence does not significantly moderates the relationship between creative climate (independent) and creative behavior (dependent variable)

H_{6a}= Creative confidence significantly moderates the relationship between creative climate (independent) and creative behavior (dependent variable)

For moderation test we first tried to answer these two questions:

Is model 1 (without the interaction term) significant? Yes, $F(2,155) = 105.34$, $p < .001$

Is model 2 (without the interaction term) significant? Yes, $F(3,154) = 69.80$, $p < .001$

In table 13, the changes in r-square (R2) values from model 1 and model 2, which represent the amount of variance of a dependent variable in the multiple regression model.

Table 13: Moderated Regression Model Summary.

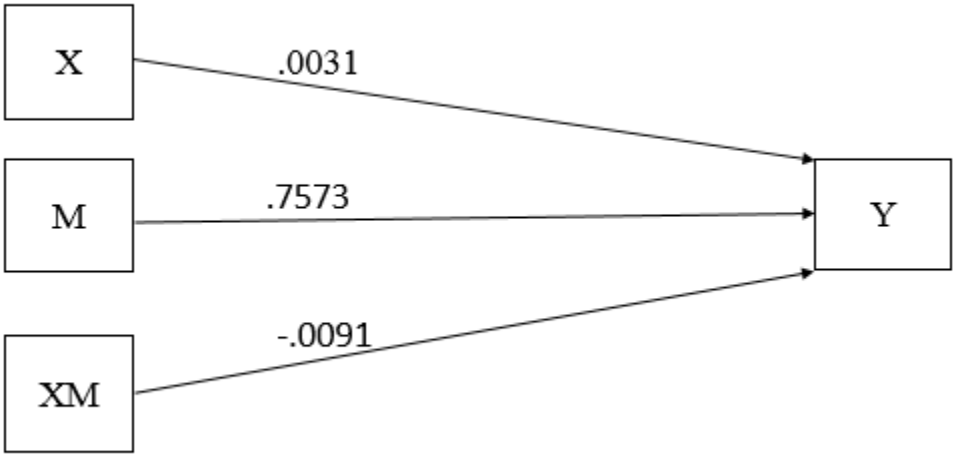
Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.759[a]	0.576	0.571	0.6552228	0.576	105.349	2	155	0
2	.759[b]	0.576	0.568	0.6572801	0	0.031	1	154	0.86
a. Predictors: (Constant), Creative Confidence, Creative Climate									
b. Predictors: (Constant), Creative Confidence, Creative Climate, ClimateXCreative Confidence									

To test the hypothesis that whether knowledge sharing moderates the relationship between creative climate and creative behavior, a hierarchical multiple regression analysis was conducted. In the first step, two variables were included: creative climate and creative behavior. These variables accounted for a not significant amount of variance in creative behavior, $R^2 = .576$, $F(2,155) = 105.349$, $p < .001$. To make sure there is no problem of high multicollinearity with the interaction term, the variables were centered and an interaction term between creative climate and knowledge sharing was created (Aiken & West, 1991).

Does model 2 account for significantly more variance than model 1?

In this case, Model 2 with the interaction between creative climate and creative confidence does not show more significant variance than just creative climate and creative confidence by themselves, R^2 change = .000, p = .860, indicating that there is not potentially significant moderation between creative climate and creative confidence on creative behavior.

Figure 16: Single Moderation model depicted as a statistical diagram.



.

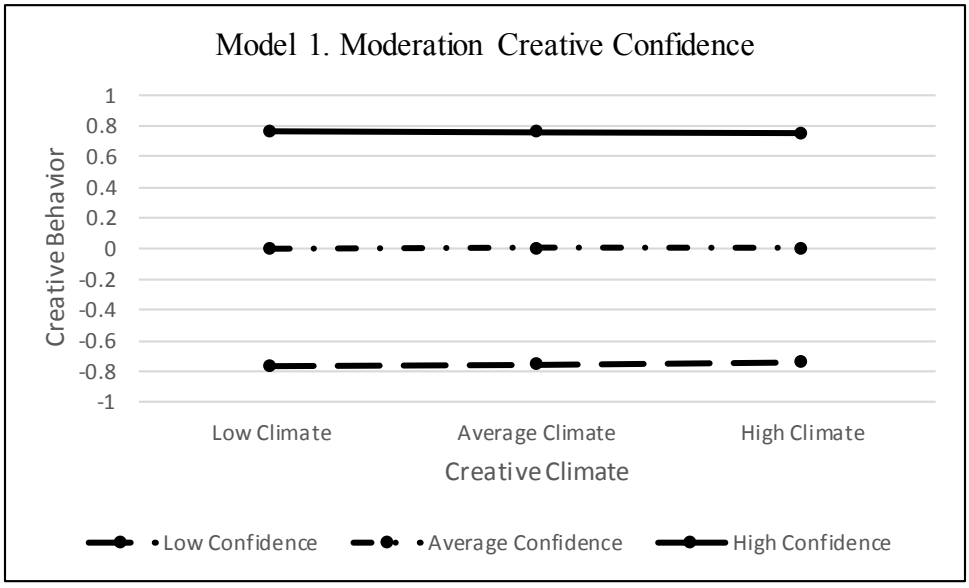
Conditional effect of X on Y $=i_1 + b\ X + b\ M + b\ XM$

$Y = .0031\ X + -.0091\ M + .7573\ XM$

Next, the interaction term between creative climate and knowledge sharing was added to the regression model, which accounted for a not significant proportion of the variance in creative behavior, X*W: $\Delta R^2 = .0001$, $\Delta F\ (1, 154) = .031$, $p = .860 > .05$, interaction: $b = -.0091$, $t\ (154) = -$

.1767, $p > .05$. The sign of the regression coefficient expresses whether the case one unit higher on X_i is estimated to be higher on Y (when bi is positive) or lower on Y (when b_i is negative)(Andrew F. Hayes, 2013). Figure 17 is a graphical representation of the model.

Figure 17: Interaction Plot.



Examination of the interaction plot showed there is no effect that as climate increased, creative behavior and creative confidence increased, creative behavior increased. When creative confidence is high, creative behavior is higher and it decrease slightly when the climate is good for creativity. Individuals show average creative behavior with average creative confidence, and with a low level of creative confidence they show less creative behavior. In all three levels of creative confidence, individuals' behavior changed slightly when creative climate is higher but not significantly.

HYPOTHESIS 8: DOUBLE MODERATION

For double moderation analysis with knowledge sharing and creative confidence we hypothesized that:

H_{70} = Knowledge sharing and creative confidence do not significantly jointly moderate the relationship between creative climate (independent) and creative (dependent variable)

H_{7a}= Knowledge sharing and creative confidence significantly jointly moderate the relationship between creative climate (independent) and creative behavior (dependent variable)

Figure 18: Double moderation model

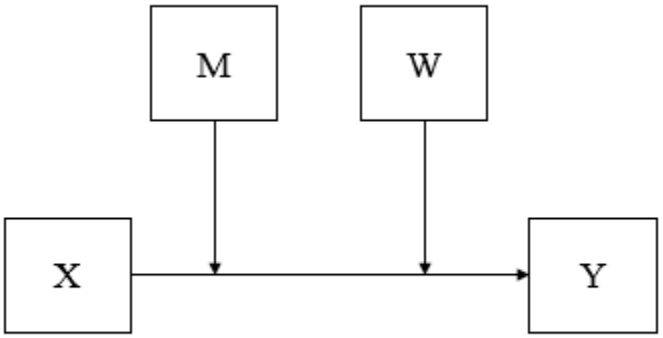
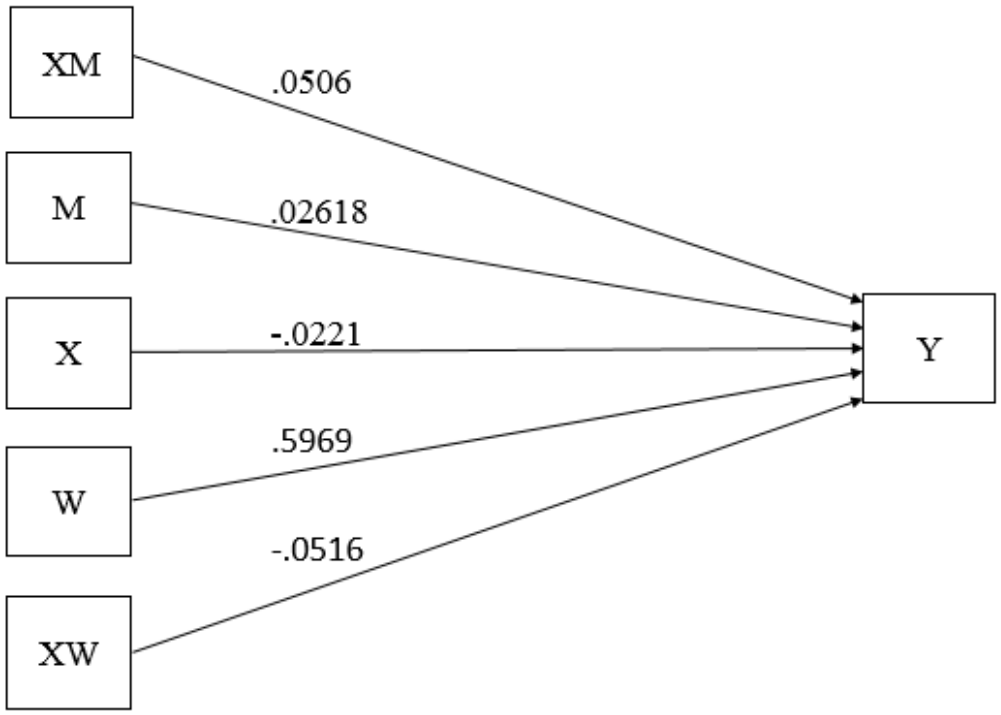


Figure 18 shows double moderation model. M represents knowledge sharing and W represents creative confidence. Following is the statistical diagram of the model (figure 19) and statistical equation of this model can be written as:

$$Y = i_1 + b_1 X + b_2 M + b_3 X\,\mathrm{M} + b_4\,\mathrm{W} + b_5\,\mathrm{XW} + e_j$$

Figure 19: Double moderation model depicted as a statistical diagram

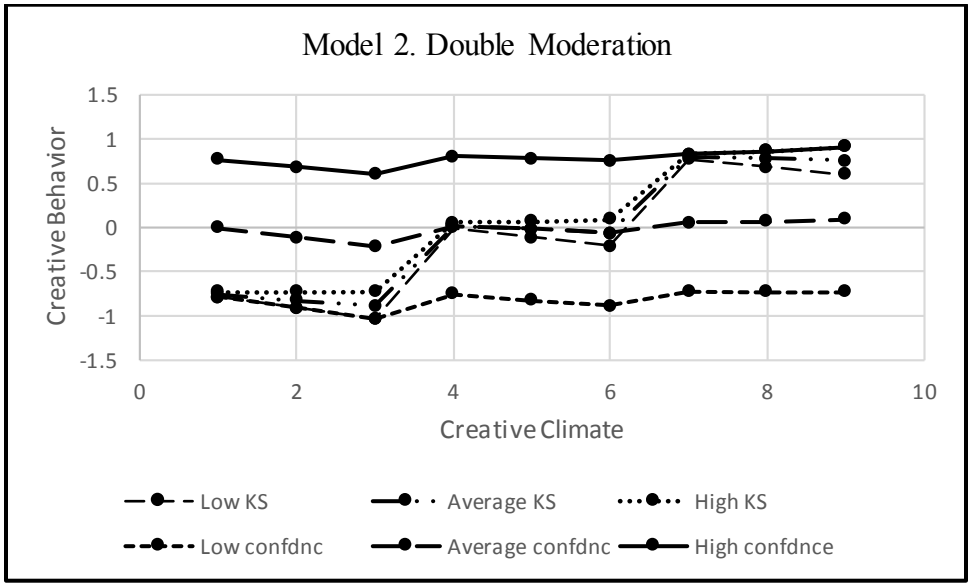


Step 1: (Overall model) these variables accounted for a significant amount of variance in creative behavior, $R^2 = .6189$, $F= 49.36$, $p< .001$.

Next, the interaction term between creative climate and knowledge sharing was added to the regression model, which accounted for a not significant proportion of the variance in creative behavior, $\Delta R^2= .0015$, $\Delta F (1, 152) = .60$, $p >.001$, $b = .0506$, $t (152) = .7798$, $p > .01$

Also, the interaction term between creative climate and creative confidence was added to the regression model, which accounted for a not significant proportion of the variance in creative behavior, $\Delta R^2 = .0018$, $\Delta F\ (1, 152) = .71$, $p > .001$, $b = -.0516$, $t\ (152) = -.8439$, $p > .01$

Figure 20: Interaction Plot



Examination of the graph in figure 20 shows a more meaningful representation of the overall pattern between the creative behavior and creative confidence and double moderation. It shows that the individual shows higher creative behavior when they share more knowledge in high creative climate, however, their creative behavior slightly decrease when there is low knowledge sharing especially in high creative climate. Also creative behavior is low when the individual has low confidence in both high and low creative climate and they show higher creative behavior when their confidence is high even in an environment with low creative climate.

However, high and average confidence decrease in high creative environment. Individuals with average confidence and high knowledge sharing show almost the same level of creative behavior as climate gets better for creativity. People with high creative confidence show higher creative behavior, however, their confidence, and behavior decrease in high creative climate. With low knowledge sharing, creative behavior decrease regardless of the creative climate level. Individuals with average confidence and average knowledge sharing showed almost the same level of creative behavior as the climate gets better for creativity.

V. CONCLUSION

This chapter summarizes the research findings from the statistical analysis of the collected data through surveys. The summary of the research study is provided with a discussion of the findings and recommendations. This study aimed to contribute to the literature on individual creativity by suggesting possible effects of an organization's creative climate, knowledge sharing, and employees' creative confidence determinants that may influence employees' creativity and innovation efforts.

SUMMARY OF THE STUDY

This section reviews the research questions, summarizes the results of the approach taken, and reports the successes of the research study.

The first research question asked: *how does an organization's creative climate impact employee creative behavior?* The simple regression analysis was conducted to answer this question. For the next two research questions: *How does knowledge sharing strengthen/influence the effect of the organization's creative climate on employees' creative behavior? How does creative confidence strengthen/ influence the effect of the organization's creative climate on employees' creative behavior?* Mediation and moderation analyses were conducted using SPSS version 25. The PROCESS macro for SPSS (Andrew F. Hayes, 2013), was used to determine that knowledge sharing and creative confidence explains part of the relationship between the organizations' creative climate and employees' creative behavior.

Two simple mediation analysis were conducted to examine if the results can be different

than they are for the multiple mediation because different mediators were entered in the model (i.e., two separate mediators versus one combined mediator) that account for a different proportion of the total effect. Table 15 represents all hypothesis test results.

Table 15: Hypothesis Test Results.

Hypothesis	Result
H_1: There is no relationship between creative climate and creative behavior H_{1a}: A nonzero relationship between creative climate and creative behavior could exist	Failed to reject null hypothesis
H_2: Knowledge sharing does not significantly mediate the relationship between creative climate (independent) and creative behavior (dependent variable) H_{2a}: Knowledge sharing significantly mediates the relationship between creative climate (independent) and creative behavior (dependent variable)	Reject null hypothesis
H_3: Creative confidence does not significantly mediate the relationship between creative climate (independent) and creative behavior (dependent variable) H_{3a}: Creative confidence significantly mediates the relationship between creative climate (independent) and creative behavior (dependent variable)	Reject null hypothesis
H_4: Knowledge sharing and creative confidence do not significantly jointly mediate (influence) the relationship between creative climate (independent) and creative behavior (dependent variable) H_{4a}: Knowledge sharing and creative confidence significantly jointly mediate the relationship between creative climate (independent) and creative behavior (dependent variable)	Reject null hypothesis
H_5 : Knowledge sharing does not significantly moderates the relationship between creative climate (independent) and creative behavior (dependent variable) H_{5a}: Knowledge sharing significantly moderates the relationship between creative climate and creative behavior (dependent variable)	Failed to reject null hypothesis
H_6 : Creative confidence does not significantly moderates the relationship between creative climate (independent) and creative behavior (dependent variable) H_{6a}: Creative confidence significantly moderates the relationship between creative climate (independent) and creative behavior (dependent variable)	Failed to reject null hypothesis

DISCUSSION OF FINDINGS

This section discuss the findings of the data analysis. The findings indicate that knowledge

sharing and creative confidence affect the relationship between creative climate and creative behavior.

Multiple regression analyses were conducted to assess each element of the proposed mediation model. First, a regression model was fitted to predict the mediation effect of knowledge sharing and creative confidence. It was also found that creative climate was positively related to knowledge sharing (a_1: B= .1978, t (156) =2.52, p=.012<.05), and the creative climate was positively, but not significantly related to creative confidence (a_2: B=.0751, t (155) =1.1644, p=.246>.05). Then, the dependent variable was used analyze the predictive power of both the independent variable and the mediators.

The results showed that there is no significant relationship between creative climate and creative behavior (c': B= -.0195, t (154) =-.3813, p= .7035). Also, knowledge sharing was a positively and statistically significant predictor of creative confidence (d: B=.5976, t (155) =9.2653, p=.000<.001), and knowledge sharing was a significant predictor and was positively related to creative behavior (b_1: B=.2564, t (154) =4.0426, p=.000<.001). Lastly, the path from creative confidence to creative behavior was significant (b_2: B=.6058, t (154) =9.5585, p=.000<.001). Since path d, b_1, and b_2 showed positive and statistically significant association, mediation analysis was conducted using the bootstrapping method with bias-corrected confidence estimates (David P MacKinnon, Chondra M Lockwood, & Jason Williams, 2004; Kristopher J. Preacher & Hayes, 2004). In addition, 5000 bootstrap resamples were used with the 95% confidence interval of the indirect effect (Kristopher J Preacher & Hayes, 2008).

Outcome of the test displayed that zero falls outside of the lower and upper bound of the confidence interval (positive values) which means the mediation occurred in the mediating role of knowledge sharing and creative confidence in the relationship between creative climate and

creative behavior (Effect size=.0716, CI .0156, .1453). Furthermore, results of indirect or total effect (c: B.1483, t (156) =1.8732 p=.0629) indicated that mediators operate as suppressors as the direct effect was smaller than the total effect. The reason why the effect of mediator is small most likely is because the direct effect and indirect effect tend to cancel each other out. Therefore, there is still mediation, however, the mediation is inconsistent because the sign of c' is different than the sign of c (Blalock 1969, Davis 1985, MacKinnon et al. 2000).

It was found that creative confidence has a higher effect than knowledge sharing on creative behavior. It was also higher for engineers than non-engineers. Moreover, engineers reported higher creative behavior than non-engineers when both mediators were included in the analysis. Nevertheless, knowledge sharing and creative confidence together did not mediate the relationship between creative climate and creative behavior for the non-engineer population (see table 16).

Table 16: Engineers and Non-Engineers Mediation Test Result Comparison.

Engineers (Double Mediation)	Non-Engineers (Double Mediation)
C path [b= .1790 , p= .1013] C' path [b= -.0231, p=.6962]	C path [b=.1297, p=.3501] C' path [b= -.0547, p=.5526]
BCa CI Total [.2020, .0201 to .3901] Ind1 [.0279, -.0174 to .0736] Ind2 [.0440, -.0983 to .1927] Ind3 [.1301, .0350 to .2502]	BCa CI Total [.1844, -.0243 to .4270] Ind1 [.0557, -.0487 to .1632] Ind2 [.0953, -.0054 to .2389] Ind3 [.0334, -.0219 to .1368]

Likewise, in double moderation analysis (see table 17), the interaction term between creative climate and creative confidence was added to the regression model, which accounted for

a not significant proportion of the variance in creative behavior, ΔR2= .0018, ΔF (1, 152) = .71, p >.001, b = -.0516, t (152) = -.8439, p > .01.

Data analysis for engineers and non-engineers showed a significant amount of variance in creative behavior in the overall model, but when the interaction term between creative climate and moderators were added to the model the proportion of the variance in creative behavior was not significant for neither of the groups. Therefore, we concluded that moderator variables did not influence the strength of the relationship between creative climate and creative behavior.

Table 17: Engineers and Non-Engineers Moderation Test Result Comparison.

Engineers (Double Moderation)	Non-Engineers (Double Moderation)
R-sq = .7456, F= 46.303, p = .0000 < .001.	R-sq=.6341, F= 16.6392, p = .0000 <.001
X*W R2-chng= .0019, ΔF(1,79)= .5837, p= .4471> .01 X*Z R2-chng= .0003, ΔF(1,79)= .0778, p= .7810 > .01	X*W R2-chng=.0058, ΔF(1,48)= .7565, p=.3888 > .01 X*Z R2-chng= .0193, ΔF(1,48)= 2.5335, p= .1180 > .01

Accordingly, creative climate in the organization does not necessarily predict that employees will produce creative behavior. In a climate that supervisors encourage employees to be creative and employees have the resources they need, and are free about how they work, they still need to have colleagues that help them to encounter problems. In the presence of creative climate, individuals exhibit more creative behavior once they receive knowledge or when their

colleague encourages them to bring up good ideas and suggestions so they feel more confidence in their ability to invent new products or processes, and as a result they show higher creative behavior.

CONCLUSION

The results of this study successfully demonstrate a clear mediation effect of knowledge sharing and creative confidence in the relationship between individuals' creative work environment and individuals' creative behavior. The research contributes to the empirical confirmation of previously tested hypotheses regarding the influence of creative climate on individuals' creativity and innovation. The analysis of the collected sample implies that employees in a positive climate, where new ideas and risk-taking are encouraged within their work group and by a supportive leader, tend to show higher creative behavior. Likewise, statistical analysis of the data that were collected from engineers showed that engineers tend to exhibit change in creative behavior where the creative environment is presented and their confidence is supported. It would suggest that engineers tolerate their fear of creative thinking, are more internally motivated and believe in their creative abilities slightly more than non-engineers. However, we believe knowledge sharing change is not a significant predictor of creative behavior because engineers may define creativity differently. Non-engineers may perceive a lack of knowledge as a barrier to creativity and that is why their response to creative behavior questionnaire was different in compared to engineers.

Also, this study may suggest academia to modify the engineering curriculum to effectively educate students' creativity that may be useful in allowing engineering students to take risks, develop an adequate plan to implement new ideas, and make decisions about where they invest

time and effort in their education. Learning the basics of creativity theory would be useful in helping engineers identify different aspects of creativity. Creative processes increase engineers' recognition of opportunities to engage creatively in engineering course work and projects.

Additionally, organizations should identify, implement, and continuously facilitate this behavior by promoting individual autonomy and self-organization within teams, remove unnecessary barriers, and provide necessary resources to employees to support their ability to innovate. Also, organizations should promote knowledge sharing with creating a climate and culture in which employees have all the resources, time, technology, and space to demonstrate how to do something or take action to help colleagues to find solutions and express their ideas. Likewise, organizations may promote learning, personal development, and encourage autonomy within employees to support their confidence regarding creativity. Individuals who have resources and support from the organization are more willing to come up with new ideas to improve performance.

IMLICATION FOR ENGINEERING MANAGERS AND PRACTITONERS

This research study produced results that inform the practice of both management professionals and scholars. Findings provide information to the managers in engineering professions and other forms of management. From a practical perspective, managers should try to support their subordinate about their creative confidence. Creative confidence inspires individua ls to successfully produce wanted change and intended outcomes (Phelan & Young, 2003). As organizations are faced with more complex and novel challenges, viable solutions are difficult to obtain, and the currently existing organizational knowledge may not apply to the unique, unfamiliar aspects of an unexpected crisis.

This study marks the importance of reinforcing creative confidence, and building a creative environment for employees, so that organizations can benefit from improved products and innovative processes. The result of this research may assist managers and organizations to better understand the importance of empowering employees by encouraging them to take the initiative, building confidence and self-actualization, and by giving control over the work to employees through recognition, socialization, mentoring, and development. Findings also indicated that to provide support for knowledge sharing and idea creation it is required to reduce the presence of unnecessary distractions and other barriers to employee communication and utilize effective channels of communication

The foundation of the theoretical contributions flowing from this study is similar to the investigation of organizational climate and innovation background. Considering that most related studies focus on the innovative performance of organizations or organizational climate, the study contributes to the lack of knowledge of individuals' perceived creativity and their creative confidence in their work environment. The primary theoretical contribution emerges from statistically significant mediation effect of knowledge sharing on the relationship between creative climate and creative behavior. Also, studies using creative confidence as the variable to explain the creative behavior are so limited.

Additionally, this study used variables to examine both mediation and moderation, the effect of knowledge sharing, and creative confidence. Specifically, the statistical effect of both mediators was so high and significant on creative behavior. These results have not been previously reported in the literature, specifically not at the individual level. The terms moderator and mediator are two different concepts that require different statistical procedures (Baron & Kenny, 1986).

This study is a good example for researchers who want to understand the difference

between mediation and moderation analysis. Moreover, research helps engineering managers increase understanding about how knowledge sharing and creative confidence are influential in organizational ability to produce innovative outcomes. Results showed that desirable creative environmental conditions lead to creative behavior. This study answered how knowledge sharing and creative confidence contribute or play a role in this effect.

RESEARCH LIMITATIONS

First, the results of this study emerge from a specific national context, America; results may be different for individuals or organizations in different cultural, political, economic, and environmental conditions. Secondly, the sample size was relatively small (n=158). Number of data for engineers (n=85) were higher than the non-engineer population (n=54). The results can be generalized and the study can be strengthened by increasing the sample size as the findings and results may differ significantly when the sample size is increased. Thirdly, we gathered the data from employees operating in different industrial sectors; results can be different from one specific sector to another. Finally, the research focused on the self-reporting measures on assessing all four variables.

Results can be influenced by the accuracy of the informant interpretations of organizational reality. Thus, this must be taken into consideration while interpreting the findings based on the individual's perception, as method variance might inflate the relationship between variables. However, self-report instruments used in this study have a good construct validity and internal consistency. Possibly, the use of self-report measures, as good measures, can be partly justified, considering that self-recognition of confidence or ability to share knowledge by the individuals themselves could be an initial step toward the development of creative behavior. Moreover,

judgments or observations of the indicators of creative behavior or creative confidence by different supervisors in the field might not be the solution (Chan, 2000).

SUGGESTIONS FOR FUTURE RESEARCH

The findings of this study may be used to formulate recommendations aimed at promoting creativity in engineers and overcoming barriers and fears that hinder engineers' engagement in employees' creative behavior. Mostly, engineers had low levels of factors characterizing essential creative motivation, which suggests that the presence of moderating external/environmental barriers results in a lack of engagement in engineering creativity.

For future studies, although determining variables in terms of self-perception can provide a set of meaningful data, researchers might consider another objective, performance or product-based measures such as having externally verifiable measure additional to self-report to assess cognitive and behavioral changes. These measures might include individuals' creative products or other evidence of creative productivity. While more research must be done to understand the complex concept of creative behavior completely, findings from this study can be used to continue the investigation into developing new and innovative processes in the organization.

Thus far, theoretical frameworks have identified creative personal identity factors. This study focused on the effect of knowledge sharing and creative confidence on the difference between engineers and non-engineers groups creative behavior. This should be explored to fully understand the cause and motive of difference, and the effect that may have on different groups of individuals' creative motivation and output. To further explore employees' creative behavior, future research can be done using both quantitative and qualitative methods. Combination of focus groups, interviews, and surveys on engineers may result in a different explanation of perception,

attitude, and understanding of the creative confidence and creative behavior.

REFERENCES

Al-Busaidi, K. A. (2013). A framework of critical factors to knowledge workers' adoption of inter-organizational knowledge sharing systems. *Journal of Organizational Knowledge Management, 2013*, 1.

Amabile, T. (2012a). Componential theory of creativity [Harvard Business School Working Paper No. 12-096]. *Encyclopedia of management theory. Cambridge, MA: Sage. doi, 10*(9781452276090), n42.

Amabile, T. (2012b). Working papers: componential theory of creativity. *UK: Harvard Business School*.

Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in organizational behavior, 10*(1), 123-167.

Amabile, T. M. (1996). *Creativity in context: Update to "The Social Psychology of Creativity."*. Boulder, CO, US: Westview Press.

Amabile, T. M. (1996). *Creativity in context: Update to the social psychology of creativity*: Hachette UK.

Amabile, T. M. (1997). Motivating creativity in organizations: On doing what you love and loving what you do. *California management review, 40*(1), 39-58.

Amabile, T. M., & Conti, R. (1999). Changes in the work environment for creativity during downsizing. *Academy of Management journal, 42*(6), 630-640.

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the Work

Environment for Creativity. *The Academy of Management Journal, 39*(5), 1154-1184. doi:10.2307/256995

Amabile, T. M., & Gryskiewicz, N. D. (1989). The creative environment scales: Work environment inventory. *Creativity research journal, 2*(4), 231-253.

Anderson, N. R., & West, M. A. (1998). Measuring climate for work group innovation: development and validation of the team climate inventory. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 19*(3), 235-258.

Argote, L. (1993). Group and organizational learning curves: Individual, system and environmental components. *British Journal of Social Psychology, 32(1)*, 31-51. doi:http://dx.doi.org/10.1111/j.2044-8309.1993.tb00984.x

Aulawi, H., Sudirman, I., Suryadi, K., & Govindaraju, R. (2009). Knowledge sharing behavior, antecedent and their impact on the individual innovation capability. *Journal of Applied Sciences Research, 5*(12), 2238-2246.

Axelsson, P., & Sardari, N. (2012). A framework to assess organizational creative climate. *Master of Science Thesis, Chamers University of Technologi, Göteborg, Sweden.*

Axtell, C. M., Holman, D. J., Unsworth, K. L., Wall, T. D., Waterson, P. E., & Harrington, E. (2000). Shopfloor innovation: Facilitating the suggestion and implementation of ideas. *Journal of Occupational and Organizational Psychology, 73*(3), 265-285.

Baer, J. (1998). The case for domain specificity of creativity. *Creativity research journal, 11*(2), 173-177.

Bain, P. G., Mann, L., & Pirola-Merlo, A. (2001). The innovation imperative: The relationships between team climate, innovation, and performance in research and development teams.

Small group research, 32(1), 55-73.

Bandura, A. (1986). Social foundations of thought and action. *Englewood Cliffs, NJ, 1986*.

Bandura, A. (1994). Self-Efficacy. *Encyclopedia of Human Behavior, 4*, 71-81. doi:http://doi.org/10.1002/9780470479216.corpsy0836

Bandura, A. (1997). *Self-efficacy: The exercise of control*: Macmillan.

Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1): Prentice-hall Englewood Cliffs, NJ.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology, 51*(6), 1173.

Barrett, L. E. (2016). *The Effect of Workspace Layout on Individual Perceptions of Creativity Across Generational Cohorts*. Walden University.

Barron, F. (1963). Creativity and psychological health.

Barron, F., & Harrington, D. M. (1981). Creativity, intelligence, and personality. *Annual review of psychology, 32*(1), 439-476.

Bartol, K. M., & Srivastava, A. (2002). Encouraging knowledge sharing: The role of organizational reward systems. *Journal of Leadership & Organizational Studies, 9*(1), 64-76.

Basher, L., Botha, N., Dodd, M., Douglas, G., Lynn, I., Marden, M., . . . Smith, W. (2008). Hill country erosion: a review of knowledge on erosion processes, mitigation options, social learning and their long-term effectiveness in the management of hill country erosion. *Landcare Research Contract Report: LC0708/081. Prepared for MAF Policy (POL/INV/0708/03)*.

Beghetto, R. A. (2006). Creative self-efficacy: Correlates in middle and secondary students. *Creativity research journal, 18*(4), 447-457.

Beghetto, R. A., & Kaufman, J. C. (2010). *Nurturing creativity in the classroom*: Cambridge University Press.

Bembenutty, H. (2007). The last word: An interview with Frank Pajares: God, the devil, William James, the Little Prince, and self-efficacy. *Journal of advanced Academics, 18*(4), 660-677.

Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of management review, 28*(2), 238-256.

Berikkhanova, A., Zhussupova, Z. A., & Berikkhanova, G. Y. (2015). Developing creative potential of future teachers: research and results. *Procedia-Social and Behavioral Sciences, 171*, 1142-1146.

Berman, S. (2010). Capitalizing on complexity. *IBM Global Business Services, Somers, USA*.

Bernard, H. R., & Bernard, H. R. (2012). *Social research methods: Qualitative and quantitative approaches*: Sage.

Brown, J. S., & Duguid, P. (1998). Organizing knowledge. *California management review, 40*(3), 90-111.

Burningham, C., & West, M. A. (1995). Individual, climate, and group interaction processes as predictors of work team innovation. *Small group research, 26*(1), 106-117.

Burrell, G., & Morgan, G. (1979). Sociological Paradigms and Organizational. *Analysis. London: Heinemann*.

Cabrera, A., Collins, W. C., & Salgado, J. F. (2006). Determinants of individual engagement in knowledge sharing. *The International Journal of Human Resource Management, 17*(2),

245-264.

Castelle, K. M. (2017). *An investigation into perceived productivity and its influence on the relationship between organizational climate and affective commitment.* (Ph.D.), Old Dominion University ODU Electronic Theses and Dissertations.

Černe, M., Nerstad, C. G., Dysvik, A., & Škerlavaj, M. (2014). What goes around comes around: Knowledge hiding, perceived motivational climate, and creativity. *Academy of Management journal, 57*(1), 172-192.

Chan, D. W. (2000). Exploring Identification Procedures of Gifted Students by Teacher Ratings: Parent ratings and student self-reports in Hong Kong. *High Ability Studies, 11*(1), 69-82. doi:10.1080/713669176

Chiu, F.-C. (2015). Improving your creative potential without awareness: Overinclusive thinking training. *Thinking Skills and Creativity, 15*, 1-12.

Choi, J. N. (2004). Individual and Contextual Predictors of Creative Performance: The Mediating Role of Psychological Processes. *Creativity research journal, 16*(2-3), 187-199. doi:10.1080/10400419.2004.9651452

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. 2nd: Hillsdale, NJ: erlbaum.

Connell, J., & Travaglione, T. (2004). Emotional intelligence: a competitive advantage in times of change? *Strategic Change, 13*(2), 55-59.

Costello, A. B., & Osborne, J. (2005). Practical assessment, research & evaluation. *The Journal of Consumer Marketing, 10*(7), 1-9.

Creative, N. A. C. o., & Education, C. (1999). *All Our Futures: Creativity, Culture & Education: Report to the Secretary of State for Education and Employment, the Secretary of State for*

Culture, Media and Sport: DfEE Sunbury-on-Thames, Surrey, England.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*: Sage publications.

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*: Sage.

Csikszentmihalyi, M. (1999). 16 implications of a systems perspective for the study of creativity. *Handbook of creativity, 313*.

Dario, E. (2017). *Creative Confidence in Organizational Knowledge Creation: A Synthesis of the Literature*. Paper presented at the Proceedings of the International Annual Conference of the American Society for Engineering Management.

Davenport, T. H. (1994). Saving IT's soul: Human-centered information management. *Harvard business review, 72*(2), 119-131.

Davies, D., Jindal-Snape, D., Digby, R., Howe, A., Collier, C., & Hay, P. (2014). The roles and development needs of teachers to promote creativity: A systematic review of literature. *Teaching and Teacher Education, 41*, 34-41.

Decker, B., Landaeta, R. E., & Kotnour, T. G. (2009). Exploring the relationships between emotional intelligence and the use of knowledge transfer methods in the project environment. *Knowledge Management Research & Practice, 7*(1), 15-36.

Dehlavi, N. S. (1980). Relationship between creativity and personality characteristics in an Iranian sample. *Perceptual and Motor Skills*.

Dul, J., & Ceylan, C. (2011). Work environments for employee creativity. *Ergonomics, 54*(1), 12-20.

Dweck, C. S. (2013). *Self-theories: Their role in motivation, personality, and development*:

psychology press.

Ekvall, G. (1991). The organizational culture of idea-management: A creative climate for the management of ideas. *Managing innovation*, 73-79.

Ekvall, G. (1996). Organizational climate for creativity and innovation. *European journal of work and organizational psychology, 5*(1), 105-123.

Ekvall, G., & Ryhammar, L. (1999). The creative climate: Its determinants and effects at a Swedish university. *Creativity research journal, 12*(4), 303-310.

Erceg-Hurn, D. M., & Mirosevich, V. M. (2008). Modern robust statistical methods: An easy way to maximize the accuracy and power of your research. *American Psychologist, 63*(7), 591-601. doi:10.1037/0003-066X.63.7.591

Eysenck, H. J. (1995). *Genius: The natural history of creativity* (Vol. 12): Cambridge University Press.

Fang, Y., Wade, M., Delios, A., & Beamish, P. W. (2007). International diversification, subsidiary performance, and the mobility of knowledge resources. *Strategic management journal, 28*(10), 1053-1064.

Feist, G. J. (1998). A meta-analysis of personality in scientific and artistic creativity. *Personality and social psychology review, 2*(4), 290-309.

Field, A. (2009). *Discovering statistics using SPSS*: Sage publications.

Fong, L., & Wu, C. (2007). The research of the relationships among employee job satisfaction, knowledge sharing and organization innovation capability. *Journal of Technology Management, 12*(4), 1-34.

Ford, C. M., & Gioia, D. A. (2000). Factors influencing creativity in the domain of managerial decision making. *Journal of Management, 26*(4), 705-732.

French Jr, J. R., & Kahn, R. L. (1962). A Programmatic Approach to Studying the Industrial Environment and Mental Health 1. *Journal of social issues, 18*(3), 1-47.

Freund, P. A., & Kasten, N. (2012). How smart do you think you are? A meta-analysis on the validity of self-estimates of cognitive ability. *Psychological bulletin, 138*(2), 296.

Frost, A. (2014). A synthesis of knowledge management failure factors. Retrieved July 2005 from⟨ www. *Knowledge-management-tools. net/failure. html*.

Furnham, A., Batey, M., Anand, K., & Manfield, J. (2008). Personality, hypomania, intelligence and creativity. *Personality and Individual Differences, 44*(5), 1060-1069.

George, J. M., & Zhou, J. (2001). When openness to experience and conscientiousness are related to creative behavior: an interactional approach. *Journal of applied psychology, 86*(3), 513.

Gilson, L. L., Lim, H. S., Luciano, M. M., & Choi, J. N. (2013). Unpacking the cross-level effects of tenure diversity, explicit knowledge, and knowledge sharing on individual creativity. *Journal of Occupational and Organizational Psychology, 86*(2), 203-222.

Gisbert-López, M. C., Verdú-Jover, A. J., & Gómez-Gras, J. M. (2014). The moderating effect of relationship conflict on the creative climate–innovation association: the case of traditional sectors in Spain. *The International Journal of Human Resource Management, 25*(1), 47-67. doi:10.1080/09585192.2013.781525

Gong, Y., Huang, J.-C., & Farh, J.-L. (2009). Employee learning orientation, transformational leadership, and employee creativity: The mediating role of employee creative self-efficacy. *Academy of Management journal, 52*(4), 765-778.

Gong, Y., Zhou, J., & Chang, S. (2013). Core knowledge employee creativity and firm performance: The moderating role of riskiness orientation, firm size, and realized

absorptive capacity. *Personnel Psychology, 66*(2), 443-482.

Gurteen, D. (1998). Knowledge, creativity and innovation. *Journal of knowledge Management, 2*(1), 5-13.

Hamel, G. (1991). Competition for competence and interpartner learning within international strategic alliances. *Strategic management journal, 12*(S1), 83-103.

Han, K. S. (2003). Domain-Specificity of Creativity in Young Children: How Quantitative and Qualitative Data Support It. *The Journal of Creative Behavior, 37*(2), 117-142.

Hansen, M. (2012). Parallel Mediation: Ordering the Chaos of Multiparty Mediation. *International Negotiation, 17*(2), 237-263. doi:10.1163/157180612X651430

Harrison, A. W., Rainer Jr, R. K., Hochwarter, W. A., & Thompson, K. R. (1997). Testing the Self-Efficacy—Performance Linkage of Social—Cognitive Theory. *The Journal of social psychology, 137*(1), 79-87.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication monographs, 76*(4), 408-420.

Hayes, A. F. (2013). Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach. New York, NY: The Guilford Press. *Journal of Educational Measurement, 51*(3), 335-337. doi:doi:10.1111/jedm.12050

Hennessey, B. A., & Amabile, T. M. (1998). Reality, intrinsic motivation, and creativity.

Hof, M. (2012a). Questionnaire evaluation with factor analysis and Cronbach's Alpha: an example.

Hof, M. (2012b). *Questionnaire evaluation with factor analysis and Cronbach's Alpha: an example*. Paper presented at the Seminar in Methodology and Statistics.

Hollingsworth, J. R., & Gear, D. M. (2012). The rise and decline of hegemonic systems of

scientific creativity. *Templeton Press, Forthcoming*.

Horne, J., Lincoln, N. B., Preston, J., & Logan, P. (2014). What does confidence mean to people who have had a stroke?–A qualitative interview study. *Clinical rehabilitation, 28*(11), 1125-1135.

Hu, B., & Zhao, Y. (2016). Creative self-efficacy mediates the relationship between knowledge sharing and employee innovation. *Social Behavior and Personality: an international journal, 44*(5), 815-826.

Huang, L., & Tsai, H.-T. (2003). The study of senior traveler behavior in Taiwan. *Tourism Management, 24*(5), 561-574.

Hunter, S. T., Bedell, K. E., & Mumford, M. D. (2007). Climate for Creativity: A Quantitative Review. *Creativity research journal, 19*(1), 69-90. doi:10.1080/10400410709336883

Ipe, M. (2003). Knowledge sharing in organizations: A conceptual framework. *Human resource development review, 2*(4), 337-359.

Isaksen, S. G., & Isaksen, E. (2010). The climate for creativity and innovation: and its relationship to empowerment, consumer insight and ambiguity. *A CRU technical reprt*.

Isaksen, S. G., & Lauer, K. J. (2002). The Climate for Creativity and Change in Teams. *Creativity and Innovation Management, 11*(1), 74-86. doi:10.1111/1467-8691.00238

Isaksen, S. G., Lauer, K. J., Ekvall, G., & Britz, A. (2001). Perceptions of the best and worst climates for creativity: Preliminary validation evidence for the situational outlook questionnaire. *Creativity research journal, 13*(2), 171-184.

Ismail, M. (2005). Creative climate and learning organization factors: their contribution towards innovation. *Leadership & Organization Development Journal, 26*(8), 639-654.

Jaiswal, N. K., & Dhar, R. L. (2015). Transformational leadership, innovation climate, creative

self-efficacy and employee creativity: A multilevel study. *International Journal of Hospitality Management, 51*, 30-41.

Janssen, O. (2000). Job demands, perceptions of effort-reward fairness and innovative work behaviour. *Journal of Occupational and Organizational Psychology, 73*(3), 287-302.

Jantunen, A. (2005). Knowledge-processing capabilities and innovative performance: an empirical study. *European Journal of Innovation Management, 8*(3), 336-349.

Judge, T. A., Bono, J. E., & Locke, E. A. (2000). Personality and job satisfaction: The mediating role of job characteristics. *Journal of applied psychology, 85*(2), 237.

Kadijevic, G. M. (2015). TIMSS 2011: Relationship between self-confidence and cognitive achievement for Serbia and Slovenia. *REDIE: Revista Electrónica de Investigación Educativa, 17*(3), 109-115.

Kane, L., & Ashbaugh, A. R. (2017). Simple and parallel mediation: A tutorial exploring anxiety sensitivity, sensation seeking, and gender. *The Quantitative Methods for Psychology, 13*, 148-165.

Kang, Y.-J., Kim, S.-E., & Chang, G.-W. (2008). The impact of knowledge sharing on work performance: An empirical analysis of the public employees' perceptions in South Korea. *Intl Journal of Public Administration, 31*(14), 1548-1568.

Karwowski, M., Lebuda, I., Wisniewska, E., & Gralewski, J. (2013). Big Five Personality Traits as the Predictors of Creative Self-Efficacy and Creative Personal Identity: Does Gender Matter? *The Journal of Creative Behavior, 47*(3), 215-232.

Kaufman, J. C., & Sternberg, R. J. (2010). *The Cambridge handbook of creativity*: Cambridge University Press.

Keller-Mathers, S. (2004). A qualitative study of women of extraordinary creative achievement.

Kelley, D., & Kelley, T. (2013). *Creative confidence: Unleashing the creative potential within us all*: Crown Pub.

Kelley, T., & Kelley, D. (2012). Reclaim your creative confidence. *Harvard business review, 90*(12), 115-118, 135.

Khalili, A. (2016). Linking transformational leadership, creativity, innovation, and innovation-supportive climate. *Management Decision, 54*(9), 2277-2293.

Kim, S.-J., & Park, M. (2015). Leadership, knowledge sharing, and creativity: The key factors in nurses' innovative behaviors. *Journal of Nursing Administration, 45*(12), 615-621.

King, N., & Anderson, N. (1995). *Innovation and change in organizations*: Routledge.

King, N., & Anderson, N. (2002). *Managing innovation and change: A critical guide for organizations*: Cengage Learning EMEA.

Kline, P. (2013). *Handbook of psychological testing*: Routledge.

Koenig, M. E. (2012). What is KM? Knowledge management explained. *KM World, 4*.

Koestler, A. (1989). The Act of Creation, Arkana. *Reading. Gt. Britain, 281*.

Kucharska, W., & Kowalczyk, R. (2016). Trust, Collaborative Culture and Tacit Knowledge Sharing in Project Management–a Relationship Model.

Latour, B. (1999). Pandora's hope Harvard University Press. *Cambridge MA*.

Lee, J.-N. (2001). The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success. *Information & Management, 38*(5), 323-335.

Levin, D. Z., & Cross, R. (2004). The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management science, 50*(11), 1477-1490.

Lin, H.-F. (2007). Knowledge sharing and firm innovation capability: an empirical study. *International Journal of manpower, 28*(3/4), 315-332.

Lin, R. S.-J., & Hsiao, J.-K. (2014). The relationships between transformational leadership, knowledge sharing, trust and organizational citizenship behavior. *International journal of innovation, management and technology, 5*(3), 171.

Lin, T.-C., & Huang, C.-C. (2010). Withholding effort in knowledge contribution: The role of social exchange and social cognitive on project teams. *Information & Management, 47*(3), 188-196.

Lin, W.-B. (2008). The effect of knowledge sharing model. *Expert systems with applications, 34*(2), 1508-1521.

Luu, M. (2017). The Moderating Role of Transformational Leadership and Perceived Organizational Support in the Relationship Between Openness to Experience and Creativity.

Luu, T. T. (2017). CSR and organizational citizenship behavior for the environment in hotel industry: The moderating roles of corporate entrepreneurship and employee attachment style. *International Journal of Contemporary Hospitality Management, 29*(11), 2867-2900.

Ma, Y., Cheng, W., Ribbens, B. A., & Zhou, J. (2013). Linking ethical leadership to employee creativity: Knowledge sharing and self-efficacy as mediators. *Social Behavior and Personality: an international journal, 41*(9), 1409-1419.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annu. Rev. Psychol., 58*, 593-614.

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behav Res, 39*(1), 99-128.

Mackinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence Limits for the Indirect Effect: Distribution of the Product and Resampling Methods. *Multivariate Behav Res, 39*(1), 99. doi:10.1207/s15327906mbr3901_4

MacKinnon, D. W. (1962). The personality correlates of creativity: A study of American architects.

Madjar, N., Oldham, G. R., & Pratt, M. G. (2002). There's no place like home? The contributions of work and nonwork creativity support to employees' creative performance. *Academy of Management journal, 45*(4), 757-767.

Mafabi, S., Munene, J. C., & Ahiauzu, A. (2015). Creative climate and organisational resilience: the mediating role of innovation. *International Journal of Organizational Analysis, 23*(4), 564-587.

Maley, A., & Bolitho, R. (2015). Creativity. *Elt Journal, 69*(4), 434-436.

Manaf, H. A., & Marzuki, N. A. (2013). The roles of personality in the context of knowledge sharing: A Malaysian perspective. *Asian Social Science, 10*(1), 138.

Martins, E. C., & Terblanche, F. (2003). Building organisational culture that stimulates creativity and innovation. *European Journal of Innovation Management, 6*(1), 64-74.

Mathisen, G. E., & Bronnick, K. S. (2009). Creative self-efficacy: An intervention study. *International Journal of Educational Research, 48*(1), 21-29.

Mayfield, M., & Mayfield, J. (2010). Developing a scale to measure the creative environment perceptions: A questionnaire for investigating garden variety creativity. *Creativity research journal, 22*(2), 162-169.

Mead, G. H., & Mind, H. (1934). Self and society. *Chicago: University of Chicago*, 173-175.

Michael, L. H., Hou, S. T., & Fan, H. L. (2011). Creative self-efficacy and innovative behavior

in a service setting: Optimism as a moderator. *The Journal of Creative Behavior, 45*(4), 258-272.

Moghimi, S., & Subramaniam, I. D. (2013). Employees' creative behavior: The role of organizational climate in Malaysian SMEs. *International Journal of Business and Management, 8*(5), 1.

Neuman, W. L. (2013). *Social research methods: Qualitative and quantitative approaches*: Pearson education.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization science, 5*(1), 14-37.

Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*: Oxford university press.

Nonaka, I., & Von Krogh, G. (2009). Perspective—Tacit knowledge and knowledge conversion: Controversy and advancement in organizational knowledge creation theory. *Organization science, 20*(3), 635-652.

Oldham, G. R., & Cummings, A. (1996). Employee creativity: Personal and contextual factors at work. *Academy of Management journal, 39*(3), 607-634.

Paavola, S., & Hakkarainen, K. (2005). The knowledge creation metaphor–An emergent epistemological approach to learning. *Science & education, 14*(6), 535-557.

Pajares, F. (2002). Overview of social cognitive theory and of self-efficacy.

Paolillo, J. G., & Brown, W. B. (1978). How Organizational Factors Affect R&D Innovation. *Research Management, 21*(2), 12-15. doi:10.1080/00345334.1978.11756463

Perry-Smith, J. E. (2006). Social yet creative: The role of social relationships in facilitating individual creativity. *Academy of Management journal, 49*(1), 85-101.

Perry-Smith, J. E., & Shalley, C. E. (2003). The social side of creativity: A static and dynamic social network perspective. *Academy of management review, 28*(1), 89-106.

Peyman, A., Mohamad, E. S., Jalal, R., & Hamed, O. (2014). Examining the relationships between organizational culture, knowledge management and environmental responsiveness capability. *VINE, 44*(2), 228-248. doi:doi:10.1108/VINE-07-2012-0026

Phelan, S., & Young, A. M. (2003). Understanding creativity in the workplace: An examination of individual styles and training in relation to creative confidence and creative self-leadership. *The Journal of Creative Behavior, 37*(4), 266-281.

Plucker, J. A. (2004). Generalization of creativity across domains: Examination of the method effect hypothesis. *The Journal of Creative Behavior, 38*(1), 1-12.

Polanyi, M. (1966). The logic of tacit inference. *Philosophy, 41*(155), 1-18.

Politis, J. D. (2005). QFD, organisational creativity and productivity. *International journal of Quality & Reliability management, 22*(1), 59-71.

Prahalad, C., & Hamel, G. (1990). The Core Competence of the Corporation>, Harvard Business Review. 173.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*(4), 717-731. doi:10.3758/bf03206553

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods, 40*(3), 879-891.

Radaelli, G., Lettieri, E., Mura, M., & Spiller, N. (2014). Knowledge sharing and innovative work behaviour in healthcare: A micro-level investigation of direct and indirect effects.

Creativity and Innovation Management, 23(4), 400-414.

Rahimi, G., Seyyedi, M. H., & Damirchi, Q. (2012). *The role of tacit knowledge in innovation of public management.* Paper presented at the 2012 International Conference on Education and Management Innovation [IPEDR].

Rauth, I., Köppen, E., Jobst, B., & Meinel, C. (2010). *Design thinking: an educational model towards creative confidence*. Paper presented at the DS 66-2: Proceedings of the 1st international conference on design creativity (ICDC 2010).

Reiter-Palmon, R., Robinson-Morral, E. J., Kaufman, J. C., & Santo, J. B. (2012). Evaluation of self-perceptions of creativity: Is it a useful criterion? *Creativity research journal, 24*(2-3), 107-114.

Rhodes, M. (1961). An analysis of creativity. *The Phi Delta Kappan, 42*(7), 305-310.

Richardson, A. G. (1985). Personality correlates of creativity among a sample of Jamaican adolescents. *Personality and Individual Differences, 6*(6), 771-774.

Robinson, K., Minkin, L., & Bolton, E. (1999). National Advisory Committee on Creative and Cultural Education, All our futures: Creativity, culture and education. *DfEE Report, 16*, 1-243.

Runco, M. A. (1989). The creativity of children's art. *Child Study Journal, 19*(3), 177-189.

Saunders, M. N., & Bezzina, F. (2015). Reflections on conceptions of research methodology among management academics. *European management journal, 33*(5), 297-304.

Schein, E. H. (2004). *Organizational Culture and Leadership (Jossey-Bass business & management series)*: Jossey Bass Incorporated.

Schulz, M. (2001). The uncertain relevance of newness: Organizational learning and knowledge flows. *Academy of Management journal, 44*(4), 661-681.

Schumpeter, J. A. (1934). *The Theory of Economic Development* (Vol. 46). Cambridge, MA Harvard University Press.

Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management journal, 37*(3), 580-607.

Selby, E. C., Shaw, E. J., & Houtz, J. C. (2005). The creative personality. *Gifted Child Quarterly, 49*(4), 300-314.

Shalley, C. E., & Gilson, L. L. (2004). What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. *The Leadership Quarterly, 15*(1), 33-53.

Simonton, D. K. (2004). Creativity as a Constrained Stochastic Process.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological methodology, 13*, 290-312.

Sobel, M. E. (1986). Some new results on indirect effects and their standard errors in covariance structure models. *Sociological methodology, 16*, 159-186.

Spardello, M. E. (2012). Creativity Beliefs of Elementary Students: Self-efficacy, Self-esteem and Beliefs in Between.

Sternberg, R. J. (2012). The assessment of creativity: An investment-based approach. *Creativity research journal, 24*(1), 3-12.

Sternberg, R. J., & Lubart, T. I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity*: Free Press.

Sternberg, R. J., & Lubart, T. I. (1999). The concept of creativity: Prospects and paradigms. *Handbook of creativity, 1*, 3-15.

Sternberg, R. J., & Williams, W. M. (1996). *How to develop student creativity*: ASCD.

Stevens, C. K., & Gist, M. E. (1997). Effects of self-efficacy and goal-orientation training on negotiation skill maintenance: what are the mechanisms? *Personnel Psychology, 50*(4), 955-978.

Suliman, A. M. T. (2001). Are We Ready to Innovate? Work Climate-Readiness to Innovate Relationship: The Case of Jordan. *Creativity and Innovation Management, 10*(1), 49-59. doi:10.1111/1467-8691.00190

Sweet, C., Blythe, H., & Carpenter, R. (2015). *Developing Creative Confidence*. Paper presented at the The National Teaching & Learning Forum.

Tabachnick, B. G., & Fidell, L. S. (2001). Using multivariate statistics (Vol. 5). *Nedham Heights, MA: Allyn & Bacon*.

Tavani, J. L., Caroff, X., Storme, M., & Collange, J. (2016). Familiarity and liking for music: The moderating effect of creative potential and what predict the market value. *Learning and Individual Differences, 52*, 197-203.

Taylor, C. W. (1964). Creativity: Progress and potential.

Thomas H. Davenport, L. P. (1998). *Working knowledge: how organizations manage what they know*: Harvard Business School Press.

Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management journal, 45*(6), 1137-1148.

Tierney, P., Farmer, S. M., & Graen, G. B. (1999). An examination of leadership and employee creativity: The relevance of traits and relationships. *Personnel Psychology, 52*(3), 591-620.

Torrance, E. P. (1962). Guiding creative talent.

Treffinger, D. J., Young, G. C., Selby, E. C., & Shepardson, C. (2002). Assessing Creativity: A Guide for Educators. *National Research Center on the Gifted and Talented.*

Tsoukas, H., & Vladimirou, E. (2001). What is organizational knowledge? *Journal of management studies, 38*(7), 973-993.

Tushman, M. L. (1997). Winning through innovation. *Strategy & Leadership, 25*(4), 14-19.

Ulibarri, N., Cravens, A. E., Royalty, A., Cornelius, M., & Nabergoj, A. S. (2014). Research as design: Developing creative confidence in doctoral students through design thinking. *International Journal of Doctoral Studies, 9*, 249-271.

Urbancova, H. (2013). Competitive advantage achievement through innovation and knowledge. *Journal of Competitiveness, 5*(1).

Van den Hooff, B., & De Ridder, J. A. (2004). Knowledge sharing in context: the influence of organizational commitment, communication climate and CMC use on knowledge sharing. *Journal of knowledge Management, 8*(6), 117-130.

Van Nguyen, T. (2002). *Knowledge management: literature review and findings about perceptions of knowledge transfer in collaborative and process-oriented teams.* Pepperdine University.

Von Krogh, G., Ichijo, K., & Nonaka, I. (2000). *Enabling knowledge creation: How to unlock the mystery of tacit knowledge and release the power of innovation*: Oxford University Press on Demand.

Wang, J., Spitz, M. R., Amos, C. I., Wu, X., Wetter, D. W., Cinciripini, P. M., & Shete, S. (2012). Method for evaluating multiple mediators: mediating effects of smoking and COPD on the association between the CHRNA5-A3 variant and lung cancer risk. *PLoS*

One, 7(10), e47705.

Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. *Human resource management review, 20*(2), 115-131.

Wang, Y., & Wang, L. (2016). Self-construal and creativity: The moderator effect of self-esteem. *Personality and Individual Differences, 99*, 184-189.

Williams, J., & MacKinnon, D. P. (2008). Resampling and distribution of the product methods for testing indirect effects in complex models. *Structural Equation Modeling: A Multidisciplinary Journal, 15*(1), 23-51.

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and psychological measurement, 73*(6), 913-934.

Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of management review, 18*(2), 293-321.

Wu, C.-S., Lee, C.-J., & Tsai, L.-F. (2012). Influence of creativity and knowledge sharing on performance. *Journal of Technology Management in China, 7*(1), 64-77.

Yeh-Yun Lin, C., & Liu, F.-C. (2012). A cross-level analysis of organizational creativity climate and perceived innovation: The mediating effect of work motivation. *European Journal of Innovation Management, 15*(1), 55-76.

Yi, J. (2009). A measure of knowledge sharing behavior: scale development and validation. *Knowledge Management Research & Practice, 7*(1), 65-81.

Yu, C., Yu, T.-F., & Yu, C.-C. (2013). Knowledge sharing, organizational climate, and innovative behavior: A cross-level analysis of effects. *Social Behavior and Personality: an international journal, 41*(1), 143-156.

Zampetakis, L. A., Bouranta, N., & Moustakis, V. S. (2010). On the relationship between individual creativity and time management. *Thinking Skills and Creativity, 5*(1), 23-32.

Zhou, J., & Shalley, C. E. (2008). Expanding the scope and impact of organizational creativity research. *Handbook of organizational creativity, 28*, 125-147.

Zhou, Q., Hirst, G., & Shipton, H. (2012). Promoting creativity at work: The role of problem-solving demand. *Applied psychology, 61*(1), 56-80.

APPENDICES

A. CREATIVE CLIMATE SCALE

Creative Climate Measure (Mayfield & Mayfield, 2010). Please respond using 5-point Likert scale with respect to how much you agree the statement is true: Strongly disagree- Disagree -Neutral -Agree -Strongly Agree

1	My supervisor encourages me to be creative
2	My work group is supportive of new ways of doing things.
3	My organization encourages me to work creatively.
4	I have the resources I need to do my job.
5	My work is challenging
6	I have control over how I do my work.
7	My organization's politics makes it difficult to be creative.
8	My organization's policies impedes spontaneity in the workplace.
9	It is difficult to be creative with the work deadlines I have.

B. KNOWLEDGE SHARING SCALE

Knowledge Sharing (Yu et al., 2013). Please respond using 5-point Likert scale with respect to how much you agree the statement is true: Strongly disagree- Disagree -Neutral -Agree -Strongly Agree

1	When I am preparing a document, I am willing to write down what I know for my colleagues to refer to
2	I will demonstrate how to do something when things are difficult to explain.
3	I often help colleagues with problem solving
4	I will take action to help if colleagues encounter a problem.
5	I often assist colleagues in communicating with customers in order to establish a good relationship with customers
6	I often encourage colleagues to bring up good ideas and suggestions so as to enhance the overall service standards at work.

C. CREATIVE CONFIDENCE SCALE

Creative Confidence (Phelan & Young, 2003). Please respond using 5-point Likert scale with respect to how much you agree the statement is true: Strongly disagree- Disagree -Neutral - Agree -Strongly Agree

1	I set high goals for myself with an element of risk involved
2	My expectations for success are normally very high
3	I stick with ambiguous or difficult projects to the end
4	I get completely absorbed when working toward goals
5	I feel confident in my ability to solve problems creatively
6	I am certain I can overcome difficult challenges
7	I feel confident in my ability to choose the best alternative
8	I feel confident in my ability to get my ideas implemented
9	I feel confident in my ability to create desired changes effectively
10	I feel confident in my ability to improve products or services
11	I feel confident in my ability to invent new products or processes
12	When I take on a project, I am certain I can create great outcomes

D. CREATIVE BEHAVIOR SCALE

Creative Behavior (M. Luu, 2017). Please respond using 5-point Likert scale with respect to how much you agree the statement is true: Strongly disagree- Disagree -Neutral -Agree -Strongly Agree

1	I am a good source of creative ideas.
2	I am not afraid to take risks
3	I will search out new technologies, processes, techniques, and/or product ideas.
4	I will promote and champion ideas to others.
5	I will develop adequate plans and schedules for the implementation of new ideas
6	I will exhibit creativity on the job when given.
7	I will come up with new and practical ideas to improve performance.
8	I will suggest new ways to increase quality.
9	I will suggest new ways to achieve goals or objectives.
10	I often have a fresh approach to problems.
11	I will suggest new ways of performing tasks.
12	I will come up with creative solutions to problems.
13	I often have new and innovative ideas.

E. GENERAL INSTRUCTIONS AND DEMOGRAPHIC QUESTIONS

In this anonymous, web-based research survey you will respond to a set of 47 questions related to your work environment and your creative behavior. The survey does not collect any personal identification information. You should be currently employed to participate in this survey. The survey will take approximately 20 minutes to complete.

Your participation in this research study is voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time. Your responses will be confidential and we do not collect identifying information such as your name, email address or IP address.

We will do our best to keep your information confidential. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The results of this study will be used for scholarly purposes only.

If you have any questions later on, then the researchers should be able to answer them: Dr. Resit Unal 757-683-4554, Elnaz Dario 757- 683- 4558

If at any time you feel pressured to participate, or if you have any questions about your rights or this form, then you should call Dr.Stacie I. Ringleb, the current IRB chair, at 757-683-5934, or the Old Dominion University Office of Research, at 757-683-3460.

Clicking on the "agree" button below indicates that:

• You have ready the above information

• You voluntarily agree to participate

• You are at least 18 years of age

If you do not wish to participate in the research study, please decline participation by clicking on the "disagree" button. By clicking next, you agree to participate in this study

Demographic questions:

1. What is your gender? (Male, Female)

2. Please select your age range: 18-24, 25-34, 35-44, 45-54, 55-64, 65+

3. How long have you been employed at your organization? Less than 1 year, 1-5 years, 5-10 years, 10-20 years, 20+ years

4. Do you possess an engineering degree (e.g. electrical, mechanical, industrial, civil, etc.)? Yes, No. What kind of degree do you have?

5. How many years of engineering experience do you have? Less than 1 year, 1-5 years, 5-10 years, 10-20 years, 20-30 years, 30+ years

6. What is your job title?

7. What is the highest level of education you have completed? (High school, Associate's, Bachelor's, Master's, Doctoral degree)

F. IRB APPROVAL DOCUMENTATION

OLD DOMINION UNIVERSITY

OFFICE OF THE VICE PRESIDENT FOR RESEARCH

aacsb INTERNATIONAL
PROUDLY, AN AAALAC ACCREDITED PROGRAM

Physical Address
4111 Monarch Way, Suite 203
Norfolk, Virginia 23508
Mailing Address
Office of Research
1 Old Dominion University
Norfolk, Virginia 23529
Phone(757) 683-3460
Fax(757) 683-5902

DATE: September 20, 2018

TO: Resit Unal
FROM: Old Dominion University Engineering Human Subjects Review Committee

PROJECT TITLE: [1295098-3] Dissertation on Creative behavior
REFERENCE #: 18_19-01
SUBMISSION TYPE: Revision

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: 9/20/18

REVIEW CATEGORY: Exemption category # *6.2*

Thank you for your submission of Revision materials for this project. The Old Dominion University Engineering Human Subjects Review Committee has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact Stacie Ringleb at 757-683-6363 or sringleb@odu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Old Dominion University Engineering Human Subjects Review Committee's records.

G. SPSS OUTPUT FROM THE LINEAR REGRESSION ANALYSIS

Regression for all:

		CClm	KShrng	CConf	CBhvr
CClm	Pearson Correlation	1	.198**	.193**	.148*
	Sig. (1-tailed)		.006	.007	.031
KShrng	Pearson Correlation	.198**	1	.612**	.624**
	Sig. (1-tailed)	.006		.000	.000
CConf	Pearson Correlation	.193**	.612**	1	.759**
	Sig. (1-tailed)	.007	.000		.000
CBhvr	Pearson Correlation	.148*	.624**	.759**	1
	Sig. (1-tailed)	.031	.000	.000	
**. Correlation is significant at the 0.01 level (1-tailed).					
*. Correlation is significant at the 0.05 level (1-tailed).					

Correlations

		CBhvr	CClm
Pearson Correlation	CBhvr	1.000	.148
	CClm	.148	1.000
Sig. (1-tailed)	CBhvr	.	.031
	CClm	.031	.
N	CBhvr	158	158
	CClm	158	158

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.148[a]	.022	.016	.99210477	.022	3.509	1	156	.063	1.824
a. Predictors: (Constant), CClm										
b. Dependent Variable: CBhvr										

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	-8.881E-17	.079		.000	1.000	-.156	.156			
	CClm	.148	.079	.148	1.873	.063	-.008	.305	.148	.148	.148
a. Dependent Variable: CBhvr											

Regression for Engineers:

Correlations			
		CBhvr	CClm
Pearson Correlation	CBhvr	1.000	.179
	CClm	.179	1.000
Sig. (1-tailed)	CBhvr	.	.051
	CClm	.051	.
N	CBhvr	85	85
	CClm	85	85

Model Summary[b]										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.179[a]	.032	.020	.989	.032	2.746	1	83	.101	1.798
a. Predictors: (Constant), CClm										
b. Dependent Variable: CBhvr										

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.690	1	2.690	2.746	.101[b]
	Residual	81.310	83	.980		
	Total	84.000	84			
a. Dependent Variable: CBhvr						
b. Predictors: (Constant), CClm						

Coefficients[a]											
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	4.474E-17	.107		.00	1.000	-.214	.214			
	CClm	.179	.108	.179	1.6	.101	-.036	.394	.179	.179	.17
a. Dependent Variable: CBhvr											

Regression for Non-Engineers:

Correlations			
		CBhvr	CClmt
Pearson Correlation	CBhvr	1.000	.130
	CClmt	.130	1.000
Sig. (1-tailed)	CBhvr	.	.175
	CClmt	.175	.
N	CBhvr	54	54
	CClmt	54	54

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.130[a]	.017	-.002	1.00104	.017	.889	1	52	.350	2.291

a. Predictors: (Constant), CClmt

b. Dependent Variable: CBhvr

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	-2.993E-18	.136		.000	1.000	-.273	.273			
	CClmt	.130	.138	.130	.943	.350	-.146	.406	.130	.130	.130

H. SPSS OUTPUT FROM SIMPLE MEDIATION ANALYSIS FOR KNOWLEDGE SHARING

```
Model: 4
    Y: Creative Behavior
    X: Creative climate
    M: Knowledge Sharing

Sample
Size:  158

**************************************************************************
OUTCOME VARIABLE:
Knowledge Sharing
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1978	.0391	.9670	6.3506	1.0000	156.0000	.0127

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0782	.0000	1.0000	-.1545	.1545
CClmt	**.1978**	**.0785**	**2.5200**	**.0127**	**.0428**	**.3528**

Covariance matrix of regression parameter estimates:

	constant	CClm
constant	.0061	.0000
CClmt	.0000	.0062

```
OUTCOME VARIABLE:
Creative Behavior
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6241	.3895	.6184	49.4414	2.0000	155.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0626	.0000	1.0000	-.1236	.1236
CClm	**.0260**	**.0640**	**.4062**	**.6852**	**-.1005**	**.1525**
KShrng	**.6184**	**.0640**	**9.6591**	**.0000**	**.4919**	**.7449**

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1483	.0220	.9843	3.5088	1.0000	156.0000	.0629

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0789	.0000	1.0000	-.1559	.1559
CClmt	**.1483**	**.0792**	**1.8732**	**.0629**	**-.0081**	**.3047**

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI

KShrng	**.1223**	**.0474**	**.0324**	**.2145**

Partially standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
KShrng	.1223	.0463	.0335	.2127

Completely standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
KShrng	.1223	.0472	.0323	.2146

I. SPSS OUTPUT FROM SIMPLE MEDIATION ANALYSIS FOR CREATIVE CONFIDENCE

```
Model: 4
    Y: Creative Behavior
    X: Creative Climate
    M: Creative Confidence

Sample
Size:  158

**************************************************************************
OUTCOME VARIABLE:
Creative Confidence
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1933	.0374	.9688	6.0541	1.0000	156.0000	.0150

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0783	.0000	1.0000	-.1547	.1547
CClmt	**.1933**	**.0786**	**2.4605**	**.0150**	**.0381**	**.3485**

```
OUTCOME VARIABLE:
 Creative Behavior
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7590	.5762	.4293	105.3486	2.0000	155.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0521	.0000	1.0000	-.1030	.1030
CClm	**.0017**	**.0533**	**.0313**	**.9751**	**-.1036**	**.1070**
CConf	**.7587**	**.0533**	**14.2356**	**.0000**	**.6534**	**.8640**

```
OUTCOME VARIABLE:
 Creative Behavior
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1483	.0220	.9843	3.5088	1.0000	156.0000	.0629

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0789	.0000	1.0000	-.1559	.1559
CClm	**.1483**	**.0792**	**1.8732**	**.0629**	**-.0081**	**.3047**

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
CConf	**.1466**	**.0630**	**.0265**	**.2760**

Partially standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
CConf	.1466	.0600	.0286	.2641

Completely standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
CConf	.1466	.0605	.0282	.2650

J. SPSS OUTPUT FROM THE SERIAL MEDIATION ANALYSIS

```
Model: 6
    Y: Creative Behavior
    X: Creative Climate
   M1: Knowledge Sharing
   M2: Creative Confidence

Sample
Size:  158
**************************************************************************

OUTCOME VARIABLE:
Knowledge Sharing
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1978	.0391	.9670	6.3506	1.0000	156.0000	.0127

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0782	.0000	1.0000	-.1545	.1545
CClm	**.1978**	**.0785**	**2.5200**	**.0127**	**.0428**	**.3528**

```
OUTCOME VARIABLE:
Creative Confidence
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6168	.3805	.6275	47.5965	2.0000	155.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0630	.0000	1.0000	-.1245	.1245
CClm	**.0751**	**.0645**	**1.1644**	**.2461**	**-.0523**	**.2025**
KShrng	**.5976**	**.0645**	**9.2653**	**.0000**	**.4702**	**.7250**

```
OUTCOME VARIABLE:
Creative Behavior
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7854	.6168	.3906	82.6321	3.0000	154.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0497	.0000	1.0000	-.0982	.0982
CClm	**-.0195**	**.0511**	**-.3813**	**.7035**	**-.1205**	**.0815**
KShrng	**.2564**	**.0634**	**4.0426**	**.0001**	**.1311**	**.3817**
CConf	**.6058**	**.0634**	**9.5585**	**.0000**	**.4806**	**.7310**

```
OUTCOME VARIABLE:
```

Creative Behavior

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1483	.0220	.9843	3.5088	1.0000	156.0000	.0629

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0789	.0000	1.0000	-.1559	.1559
CClm	**.1483**	**.0792**	**1.8732**	**.0629**	**-.0081**	**.3047**

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	**.1678**	**.0642**	**.0433**	**.2959**
Ind1	.0507	.0238	.0090	.1007
Ind2	.0455	.0423	-.0318	.1350
Ind3	**.0716**	**.0326**	**.0156**	**.1453**

Indirect effect key:

Ind1 CClm -> KShrng -> CBhvr

Ind2 CClm -> CConf -> CBhvr

Ind3 CClm -> KShrng -> CConf -> CBhvr

K. SPSS OUTPUT FROM THE PARALLEL MEDIATION ANALYSIS

```
Model: 4
    Y: Creative Behavior
    X: Creative Climate
   M1: Knowledge Sharing
   M2: Creative Confidence

Sample
Size:  158

**************************************************************************
OUTCOME VARIABLE:
 Knowledge Sharing
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1978	.0391	.9670	6.3506	1.0000	156.0000	.0127

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0782	.0000	1.0000	-.1545	.1545
CClm	**.1978**	**.0785**	**2.5200**	**.0127**	**.0428**	**.3528**

```
OUTCOME VARIABLE:
 Creative Confidence
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1933	.0374	.9688	6.0541	1.0000	156.0000	.0150

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0783	.0000	1.0000	-.1547	.1547
CClm	**.1933**	**.0786**	**2.4605**	**.0150**	**.0381**	**.3485**

```
OUTCOME VARIABLE:
 Creative Behavior
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7854	.6168	.3906	82.6321	3.0000	154.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0497	.0000	1.0000	-.0982	.0982
CClm	**-.0195**	**.0511**	**-.3813**	**.7035**	**-.1205**	**.0815**
KShrng	**.2564**	**.0634**	**4.0426**	**.0001**	**.1311**	**.3817**
CConf	**.6058**	**.0634**	**9.5585**	**.0000**	**.4806**	**.7310**

```
OUTCOME VARIABLE:
```

Creative Behavior

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1483	.0220	.9843	3.5088	1.0000	156.0000	.0629

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0789	.0000	1.0000	-.1559	.1559
CClm	**.1483**	**.0792**	**1.8732**	**.0629**	**-.0081**	**.3047**

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	**.1678**	**.0644**	**.0433**	**.2943**
KShrng	.0507	.0238	.0091	.1015
CConf	.1171	.0542	.0191	.2317
(C1)	-.0664	.0534	-.1829	.0245

Specific indirect effect contrast definition(s):
(C1) Knowledge Sharing minus Creative Confidence

L. SPSS OUTPUT FROM THE MODERATION ANALYSIS FOR KNOWLEDGE SHARING

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	61.149	2	30.574	49.441	.000[b]
	Residual	95.851	155	.618		
	Total	157.000	157			
2	Regression	61.149	3	20.383	32.749	.000[c]
	Residual	95.851	154	.622		
	Total	157.000	157			
a. Dependent Variable: Creative Behavior						
b. Predictors: (Constant), Knowledge Sharing, Creative Climate						
c. Predictors: (Constant), K.Sharing, C.Climate, Creative Climate x Knowledge Sharing						

```
Model: 1
    Y: Creative Behavior
    X: Creative Climate
    W: Knowledge Sharing

Sample
Size:  158
**************************************************************************
OUTCOME VARIABLE:
Creative Behavior
Model Summary
```

R	R-sq	MSE	F	df1	df2	p
.6241	**.3895**	**.6224**	**32.7488**	**3.0000**	**154.0000**	**.0000**

Model

	coeff	se	t	p	LLCI	ULCI
constant	-.0004	.0641	-.0058	.9954	-.1269	.1262
CClm	.0256	.0656	.3906	.6966	-.1039	.1552
KShrng	.6185	.0643	9.6226	.0000	.4915	.7455
Int_1	**.0019**	**.0653**	**.0290**	**.9769**	**-.1271**	**.1309**

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	**.0000**	**.0008**	**1.0000**	**154.0000**	**.9769**

M. SPSS OUTPUT FROM THE MODERATION ANALYSIS FOR CREATIVE CONFIDENCE

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	90.456	2	45.228	105.349	.000[b]
	Residual	66.544	155	.429		
	Total	157.000	157			
2	Regression	90.469	3	30.156	69.804	.000[c]
	Residual	66.531	154	.432		
	Total	157.000	157			
a. Dependent Variable: Creative Behavior						
b. Predictors: (Constant), Creative Confidence, Creative Climate						
c. Predictors: (Constant), CConf, CClm, Creative Climate x Creative Confidence						

```
Model: 1
    Y: Creative Behavior
    X: Creative Climate
    W: Creative Confidence

Sample
Size:  158
**************************************************************************
OUTCOME VARIABLE:
 Creative Behavior
```

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7591	.5762	.4320	69.8039	3.0000	154.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0017	.0532	.0327	.9740	-.1034	.1069
CClm	.0031	.0541	.0574	.9543	-.1037	.1099
CConf	.7573	.0541	14.0097	.0000	.6505	.8641
Int_1	**-.0091**	**.0512**	**-.1767**	**.8600**	**-.1102**	**.0921**

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	**.0001**	**.0312**	**1.0000**	**154.0000**	**.8600**

N. SPSS OUTPUT FROM THE DOUBLE MODERATION ANALYSIS

Model: 2
Y: Creative Behavior
X: Creative Climate
W: Knowledge Sharing
Z: Creative Confidence

Sample

Size: 158

****

OUTCOME VARIABLE:

Creative Behavior

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7867	**.6189**	**.3936**	**49.3685**	**5.0000**	**152.0000**	**.0000**

Model

	coeff	se	t	p	LLCI	ULCI
constant	.0000	.0511	-.0005	.9996	-.1010	.1010
CClm	-.0221	.0524	-.4214	.6741	-.1257	.0815
KShrng	.2618	.0640	4.0926	.0001	.1354	.3882
Int_1	**.0506**	**.0649**	**.7798**	**.4367**	**-.0776**	**.1787**
CConf	.5969	.0647	9.2319	.0000	.4691	.7246
Int_2	**-.0516**	**.0612**	**-.8439**	**.4000**	**-.1725**	**.0692**

Product terms key:

Int_1 : Creative Climate x Knowledge Sharing

Int_2 : Creative Climate x Creative Confidence

	R2-chng	F	df1	df2	p
X*W	**.0015**	**.6082**	**1.0000**	**152.0000**	**.4367**
X*Z	**.0018**	**.7122**	**1.0000**	**152.0000**	**.4000**

O. SPSS OUTPUT FROM THE DOUBLE MEDIATION ANALYSIS FOR ENGINEERS

```
Model: 6
    Y: Creative Behavior
    X: Creative Climate
   M1: Knowledge Sharing
   M2: Creative Confidence

Sample
Size:  85

**************************************************************************
OUTCOME VARIABLE:
 Knowledge Sharing

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .2710      .0734      .9377     6.5771     1.0000    83.0000      .0121

Model
              coeff         se          t          p       LLCI       ULCI
constant      .0000      .1050      .0000     1.0000     -.2089      .2089
CClm          .2710      .1057     2.5646      .0121      .0608      .4811

Covariance matrix of regression parameter estimates:
           constant       CClm
constant      .0110      .0000
CClm          .0000      .0112

**************************************************************************
OUTCOME VARIABLE:
 Creative Confidence

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .6187      .3828      .6323    25.4238     2.0000    82.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant      .0000      .0862      .0000     1.0000     -.1716      .1716
CClm          .0551      .0901      .6111      .5428     -.1242      .2344
KnwlShr       .6015      .0901     6.6731      .0000      .4222      .7808

Covariance matrix of regression parameter estimates:
           constant       CClm    KnwlShr
constant      .0074      .0000      .0000
CClm          .0000      .0081     -.0022
KnwlShr       .0000     -.0022      .0081

**************************************************************************
OUTCOME VARIABLE:
 Creative Behavior
```

```
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .8607      .7407      .2689    77.1339     3.0000    81.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant      .0000      .0562      .0000     1.0000     -.1119      .1119
CClm         -.0231      .0589     -.3918      .6962     -.1403      .0941
KnwlShr       .1031      .0730     1.4126      .1616     -.0421      .2484
CConf         .7984      .0720    11.0862      .0000      .6551      .9416

Covariance matrix of regression parameter estimates:
           constant       CClm    KnwlShr      CConf
constant      .0032      .0000      .0000      .0000
CClm          .0000      .0035     -.0008     -.0003
KnwlShr       .0000     -.0008      .0053     -.0031
CConf         .0000     -.0003     -.0031      .0052

************************ TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 Creative Behavior

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .1790      .0320      .9796     2.7460     1.0000    83.0000      .1013

Model
             coeff         se          t          p       LLCI       ULCI
constant      .0000      .1074      .0000     1.0000     -.2135      .2135
CClm          .1790      .1080     1.6571      .1013     -.0358      .3937

Covariance matrix of regression parameter estimates:
           constant       CClm
constant      .0115      .0000
CClm          .0000      .0117

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI       c_ps
c_cs
      .1790      .1080     1.6571      .1013     -.0358      .3937      .1790
.1790

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI      c'_ps
c'_cs
     -.0231      .0589     -.3918      .6962     -.1403      .0941     -.0231
-.0231




Indirect effect(s) of X on Y:
```

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	.2020	.0943	.0201	.3901
Ind1	.0279	.0224	-.0174	.0736
Ind2	.0440	.0736	-.0983	.1927
Ind3	**.1301**	**.0547**	**.0350**	**.2502**
(C1)	-.0160	.0753	-.1731	.1253
(C2)	-.1022	.0597	-.2478	-.0146
(C3)	**-.0861**	**.0926**	**-.2892**	**.0803**

P. SPSS OUTPUT FROM THE DOUBLE MODERATION ANALYSIS FOR ENGINEERS

```
Model: 2
    Y: Creative Behavior
    X: Creative Climate
    W: Knowledge Sharing
    Z: Creative Confidence

Sample
Size:  85

**************************************************************************
OUTCOME VARIABLE:
 Creative Behavior

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .8635      .7456      .2705    46.3034     5.0000    79.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     -.0208      .0589     -.3528      .7252     -.1380      .0965
CClm         -.0420      .0613     -.6847      .4956     -.1641      .0801
KnwlShr       .0906      .0746     1.2150      .2280     -.0579      .2392
Int_1         .0609      .0797      .7640      .4471     -.0978      .2196
CConf         .7974      .0745    10.6981      .0000      .6491      .9458
Int_2         .0208      .0744      .2790      .7810     -.1274      .1689

Product terms key:
 Int_1    :        Creative Climate   x    Knowledge Sharing
 Int_2    :        Creative Climate   x    Creative Confidence

Covariance matrix of regression parameter estimates:
           constant       CClm    KnwlShr      Int_1      CConf      Int_2
constant      .0035      .0003      .0002     -.0009      .0000     -.0002
CClm          .0003      .0038     -.0006     -.0004     -.0004     -.0007
KnwlShr       .0002     -.0006      .0056      .0001     -.0033     -.0009
Int_1        -.0009     -.0004      .0001      .0064     -.0012     -.0037
CConf         .0000     -.0004     -.0033     -.0012      .0056      .0013
Int_2        -.0002     -.0007     -.0009     -.0037      .0013      .0055

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0019      .5837     1.0000    79.0000      .4471
X*Z      .0003      .0778     1.0000    79.0000      .7810

********** BOOTSTRAP RESULTS FOR REGRESSION MODEL PARAMETERS **********
```

OUTCOME VARIABLE:
Creative Behavior

	Coeff	BootMean	BootSE	BootLLCI	BootULCI
constant	-.0208	-.0176	.0603	-.1337	.1044
CClm	-.0420	-.0329	.0607	-.1419	.1017
KnwlShr	.0906	.0909	.0791	-.0769	.2360
Int_1	**.0609**	**.0830**	**.0887**	**-.0459**	**.2984**
CConf	.7974	.7961	.1059	.5871	1.0084
Int_2	**.0208**	**.0148**	**.0859**	**-.1780**	**.1707**

Q. SPSS OUTPUT FROM THE DOUBLE MEDIATION ANALYSIS FOR NON-ENGINEERS

```
Model: 6
    Y: Creative Behavior
    X: Creative Climate
   M1: Knowledge Sharing
   M2: Creative Confidence

Sample
Size:  54

************************************************************************
OUTCOME VARIABLE:
 Knowledge Sharing

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .1294      .0167     1.0022      .8851     1.0000    52.0000      .3512

Model
             coeff         se          t          p       LLCI       ULCI
constant      .0000      .1362      .0000     1.0000     -.2734      .2734
CClmt         .1294      .1375      .9408      .3512     -.1466      .4053

Covariance matrix of regression parameter estimates:
           constant      CClmt
constant      .0186      .0000
CClmt         .0000      .0189

************************************************************************
OUTCOME VARIABLE:
 Creative Confidence

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .6195      .3838      .6404    15.8830     2.0000    51.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant      .0000      .1089      .0000     1.0000     -.2186      .2186
CClmt         .2060      .1109     1.8587      .0688     -.0165      .4286
KShrng        .5582      .1109     5.0357      .0000      .3357      .7808

Covariance matrix of regression parameter estimates:
           constant      CClmt     KShrng
constant      .0119      .0000      .0000
CClmt         .0000      .0123     -.0016
KShrng        .0000     -.0016      .0123

************************************************************************



OUTCOME VARIABLE:
```

```
 Creative Behavior

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .7841      .6147      .4084    26.5945     3.0000    50.0000      .0000

Model
             coeff         se          t          p       LLCI       ULCI
constant      .0000      .0870      .0000     1.0000     -.1747      .1747
CClmt        -.0547      .0915     -.5980      .5526     -.2384      .1290
KShrng        .4304      .1083     3.9735      .0002      .2128      .6480
CCon          .4625      .1118     4.1356      .0001      .2378      .6871

Covariance matrix of regression parameter estimates:
           constant      CClmt     KShrng       CCon
constant      .0076      .0000      .0000      .0000
CClmt         .0000      .0084      .0004     -.0026
KShrng        .0000      .0004      .0117     -.0070
CCon          .0000     -.0026     -.0070      .0125

************************ TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 Creative Behavior

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .1297      .0168     1.0021      .8892     1.0000    52.0000      .3501

Model
             coeff         se          t          p       LLCI       ULCI
constant      .0000      .1362      .0000     1.0000     -.2734      .2734
CClmt         .1297      .1375      .9429      .3501     -.1463      .4056

Covariance matrix of regression parameter estimates:
           constant      CClmt
constant      .0186      .0000
CClmt         .0000      .0189

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI       c_ps
c_cs
      .1297      .1375      .9429      .3501     -.1463      .4056      .1297
.1297

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI      c'_ps
c'_cs
     -.0547      .0915     -.5980      .5526     -.2384      .1290     -.0547
-.0547

Indirect effect(s) of X on Y:
         Effect     BootSE   BootLLCI   BootULCI
TOTAL     .1844      .1146     -.0243      .4270
Ind1      .0557      .0526     -.0487      .1632
Ind2      .0953      .0641     -.0054      .2389
```

Ind3	**.0334**	**.0407**	**-.0219**	**.1368**
(C1)	-.0396	.0791	-.1985	.1149
(C2)	.0223	.0459	-.0824	.1136
(C3)	**.0619**	**.0640**	**-.0668**	**.1880**

Indirect effect key:
Ind1 CClmt -> KShrng -> CBhvr
Ind2 CClmt -> CCon -> CBhvr
Ind3 CClmt -> KShrng -> CCon -> CBhvr

********** BOOTSTRAP RESULTS FOR REGRESSION MODEL PARAMETERS **********

OUTCOME VARIABLE:
Knowledge Sharing

	Coeff	BootMean	BootSE	BootLLCI	BootULCI
constant	.0000	-.0044	.1353	-.2710	.2549
CClmt	.1294	.1316	.1213	-.1018	.3786

OUTCOME VARIABLE:
Creative Confidence

	Coeff	BootMean	BootSE	BootLLCI	BootULCI
constant	.0000	-.0058	.1072	-.2265	.2007
CClmt	.2060	.2016	.1132	-.0144	.4314
KShrng	.5582	.5722	.1346	.3247	.8537

OUTCOME VARIABLE:
Creative Behavior

	Coeff	BootMean	BootSE	BootLLCI	BootULCI
constant	.0000	.0058	.0872	-.1776	.1699
CClmt	-.0547	-.0526	.0753	-.1982	.0981
KShrng	.4304	.4215	.1321	.1361	.6674
CCon	.4625	.4601	.1706	.1003	.7833

R. SPSS OUTPUT FROM THE DOUBLE MODERATION ANALYSIS FOR NON-ENGINEERS

```
Model: 2
    Y: Creative Behavior
    X: Creative Climate
    W: Knowledge Sharing
    Z: Creative Confidence

Sample
Size:  54

**************************************************************************
OUTCOME VARIABLE:
 Creative Behavior

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .7963      .6341      .4040    16.6392     5.0000    48.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant       .0311      .0896      .3469      .7302     -.1490      .2111
CClmt         -.0704      .0955     -.7370      .4647     -.2624      .1217
KShrng         .4168      .1089     3.8268      .0004      .1978      .6358
Int_1          .1190      .1368      .8698      .3888     -.1561      .3940
CCon           .4528      .1151     3.9343      .0003      .2214      .6842
Int_2         -.1691      .1062    -1.5917      .1180     -.3827      .0445

Product terms key:
 Int_1    :        Creative Climate    x       Knowledge Sharing
 Int_2    :        Creative Climate    x       Creative Confidence

Covariance matrix of regression parameter estimates:
           constant      CClmt     KShrng      Int_1       CCon      Int_2
constant      .0080      .0002      .0000      .0000     -.0005     -.0020
CClmt         .0002      .0091      .0009     -.0039     -.0033      .0012
KShrng        .0000      .0009      .0119     -.0022     -.0072      .0010
Int_1         .0000     -.0039     -.0022      .0187      .0029     -.0087
CCon         -.0005     -.0033     -.0072      .0029      .0132      .0004
Int_2        -.0020      .0012      .0010     -.0087      .0004      .0113

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0058      .7565     1.0000    48.0000      .3888
X*Z      .0193     2.5335     1.0000    48.0000      .1180



OUTCOME VARIABLE:
```

Creative Behavior

	Coeff	BootMean	BootSE	BootLLCI	BootULCI
constant	.0311	.0357	.0859	-.1449	.1912
CClmt	-.0704	-.0623	.0893	-.2426	.1135
KShrng	.4168	.3973	.1252	.1318	.6315
Int_1	.1190	.0742	.1626	-.2663	.3486
CCon	.4528	.4542	.1740	.1005	.7855
Int_2	-.1691	-.1380	.1388	-.3805	.1516

VITA

Elnaz Dario

Research Interest

Organizational climate, organizational behavior, knowledge management, innovation and creativity.

Education

Ph.D. Engineering Management & Systems Engineering, May 2019
Old Dominion University, Norfolk, VA
Dissertation: *KNOWELDGE SHARING AND CREATIVE CONFIDENCE IN PROMOTING EMPLOYEES' CREATIVE BEHAVIOR*

M.B.A. Production Management & Marketing, Marmara University, Istanbul, Turkey, 2014
Thesis: *Brand image and customer perception: A study in international market*

M.E. Engineering Management, Old Dominion University, Norfolk, VA, 2013

B.A. Marmara University School of Law, Istanbul, Turkey, 2008

Teaching Appointments

Graduate Instructor, Old Dominion University, spring 2017- Present
- Ethics and Philosophy in Engineering
- Project Management

Graduate Teaching Assistant, Old Dominion University, fall 2013- Present
Project Management, Operations Research, Leadership for Engineering Managers Course