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Environment for innovation: exploring associations with individual disposition toward change, organizational conflict, justice and trust

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ENVIRONMENT FOR INNOVATION: EXPLORING ASSOCIATIONS WITH
INDIVIDUAL DISPOSITION TOWARD CHANGE, ORGANIZATIONAL
CONFLICT, JUSTICE AND TRUST

by

Daniel James Weinert

A thesis submitted in partial fulfillment of the requirements
for the Doctor of Philosophy degree in
Educational Policy and Leadership Studies
in the Graduate College of The University of Iowa

December 2013

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CERTIFICATE OF APPROVAL

PH.D. THESIS

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To Neleigh, Easley and Haydn

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CHAPTER I

INTRODUCTION

The immortal Yogi Berra said, “The future ain’t what it used to be.” This colloquial but insightful statement has value when considering the viability of organizations. An organization may thrive for decades using a known strategy, yet begin to decline using the same strategy that had previously served it well. Just because a certain way of doing things led to a successful outcome in the past does not guarantee it will in the future. Challenges to organizations emanate from many sources. There may be new rivals that enter the market or new and more efficient means of conducting business. There may be environmental circumstances that impact the demand for an organization’s product or service. Continued success depends upon the ability of the organization to adapt to changing conditions in ever-changing environments. West and Anderson (1996) stated: “To maintain or enhance effectiveness within rapidly changing and challenging environments, organizations have to adapt appropriately and innovation is the process through which this is often achieved” (p. 680). Rogers (2003) defined innovation as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (p. 12). The ability to adopt innovations and change to meet environmental demands allows organizations to persist and thrive over time. Therefore, it is important to examine variables that are integral to the development of an organizational climate where innovation is encouraged.

Given ever-present economic uncertainties, it is not difficult to identify examples of once-successful organizations that fail as a consequence of an inability or unwillingness to adjust and innovate. Netflix’s model and success may be contrasted with Blockbuster’s demise in an exemplar of successful adoption of innovation, on one hand, verses failure associated with unwillingness and/or inability to adjust on the other. Netflix Inc. (NFLX) is a subscription service streaming movies and television shows over the internet and delivering DVDs by mail to more than 35 million subscribers.

Blockbuster Inc. (BBI) is a provider of rental and retail movie and game entertainment, which at one time had over 6,500 stores in the United States. Netflix adopted a new means of delivering a product, while Blockbuster continued to use the established practice of store-front rental. The price of one share of Netflix stock has risen over 879 percent since January of 2009 (Google, 2013). On the other hand, Blockbuster has declared bankruptcy, and has been forced to sell the majority of its stores (Google, 2013).

Organizations exist within changing environments. Organizational ecology is the study of interactions between organizations and their environment. Perrow (1986) posited that “environments act, organizations respond; environments select some organizations for extinction and allow others to survive” (p. 209). In the previous example, the environment changed with the availability of new technology. Framing this as *natural selection*, Blockbuster was negatively selected by the environment, failed to adapt and is now extinct. In addition to the environmental change, a new competitor emerged within the environment and competed for the same resource. Netflix’s adoption of new technology created a distinctive strategic advantage and allowed them to take over Blockbuster’s customers. Organizational inertia may have been another strike against Blockbuster. Inertia implies a body in motion stays in motion unless acted on by another force. The more massive the body, the more force need to change its motion. In other words, oil tankers do not turn easily. Blockbuster was a massive, more established organization with perhaps more organizational inertia. Hannan and Freeman (1977) stated, “Inertial pressures arise from both internal structural arrangements and environmental constraints” (p. 931). Blockbusters enormous investment in thousands of storefronts was a sunk cost that represented an asset that did not easily transfer to other functions. Organizational change means redistribution of resources to subunits within the organization. Negative political responses from subunits may be enough where managers resist reorganization efforts. An organization’s history can also be an inertial constraint. Hannan and Freeman (1977) stated, “Once standards of procedure and the allocation of

tasks and authority have become the subject of normative agreement, the costs of change are greatly increased” (p. 931). A rapidly changing environment with new competitors spells disaster for organizations with significant inertia. Tushman and O’Reilly (1996) stated, “Many managers have learned (to their stockholders’ chagrin) that slow evolutionary change in a fast-changing world is, as it was for the dinosaurs, a path to the boneyard” (p. 15).

There is no guarantee that innovation will lead to success. April 23, 2013, marked the 28th anniversary of the launch of New Coke. New Coke was pulled from store shelves on July 11, 1985, after an overwhelmingly negative consumer response (M. E. Ross, 2005). At the time, Coca-Cola had significant competition from Pepsi. Coca-Cola attempted to adopt a new idea in order to better position the company within the marketplace. There are always risks in attempting to introduce something new and/or something different. The capacity to embrace innovation and learn from failure are considered sources of strategic advantage. Cannon and Edmondson (2005) stated that organizations “should learn to fail intelligently as a deliberate strategy to promote innovation and improvement” (p. 300).

The development of an organizational climate supportive of innovation, where employees are comfortable with change and the possibility of failure, is a formidable challenge. Most individuals prefer to distance themselves from failure. Bechtoldt, De Dreu, Nijstad, and Zapf (2010) stated, “Humans generally strive for a positive self-view. They seek to affirm self-views through a variety of cognitive and behavioral tactics and strategies, including promotion and enhancement of the self” (p. 541). If someone recognizes that an attempt to innovate may lead to failure, they may avoid it. The person’s perception of how the organization views failed innovation will influence his or her willingness to try. Research on top management teams in hospitals (West & Anderson, 1996), for example, showed that characteristic social processes predict the overall level of innovation within work-teams. The social processes that promoted

innovation included task orientation (team clarity on the desired outcome), team participation, and perceived support for innovation from team-members. Dee, Henkin, and Pell (2002) found that teachers in large urban school districts were more likely to perceive support for innovation when they confirmed high levels of autonomy, uninhibited communication with colleagues, and clear, delineated responsibilities. Evidence suggests that work-contextual factors influence employee perceptions about organizational innovation (Dee et al., 2002; Holt, Armenakis, Feild & Harris, 2007; Oreg, 2006; Song & Thieme, 2006; West & Anderson, 1996).

Framework

The purpose of this study was, in part, to explore variables associated with a climate for innovation. Prior to consideration of variables that may affect an organizational climate, it is necessary to define the term organizational climate. Patterson et al. (2005) defined it as “employees’ shared perceptions of organizational events, practices, and procedures” (p. 380). This implies a shared psychology within the organization where employees share perceived meaning of what happens at the workplace. In other words, the organizational climate is derived from the employees’ interpretation of what happens at work. Two primary factors shape this interpretation; pre-existing attributes of the individual and daily work contexts. Each person brings her/his pre-existing dispositions to the organization. Each person’s perception will also be shaped by the daily activities within the work environment. The variable *trust* can be used to illustrate how climate is influenced by personal disposition and work context. If individuals have a disposition toward trust, it will influence how they perceive the environment and their subsequent actions. For example, high trusters have been shown to react to an opponent’s cooperative messages by increasing cooperation, while low trusters were unaffected by cooperative messages (Parks, Henager, & Scamahorn, 1996). In this experiment, participants enacted a prisoner’s dilemma scenario. The dispositions of the high trusters influenced their perception of an opponent’s actions, and their

subsequent reaction. Conversely, low trusters were unaffected by an opponent's cooperative message (Parks et al., 1996). Low-trusters engaged in competitive behavior, despite a cooperative message. People with a trusting nature perceived cooperative messages as honest and reciprocated in return. People with a non-trusting nature perceived cooperative messages differently, and continued competitive behaviors. The pre-existing disposition, high-trust or low-trust, influenced the way the individual perceived his or her environment. Carrying this example forward, both high and low trusters were found to be influenced by work contexts. High trusters moved from cooperative to competitive behavior when others repetitively behaved competitively (Parks et al., 1996). Low trusters turned to cooperation, if they experience unconditional cooperation from a competitor. Yet, low trusters turned to exploitation when opponents cooperated for five consecutive trials. In this example (Parks et al., 1996), individuals changed their perception and behavior as a result of repeated environmental experiences. Each person enters the organization with pre-existing attributes and is subject to the influence of work context.

Others have distinguished between attributes of an individual versus work context, when exploring employee perceptions of organizational events, practices, and procedures. Wanberg and Banas (2000) labeled predictor variables as either *individual difference variables* or *context specific variables* when studying openness to organizational change. They studied two state chapters of the National Association of Housing and Redevelopment Officials, and found that information, participation, and task-specific self-efficacy were significant predictors of openness toward change. Holt, Armenakis, Feild, and Harris (2007) described predictor variables as either *attributes of the individual* or *attributes of the environment* when studying readiness for change in public and private sector organizations. Van Dam, Oreg, and Schyns (2008) showed both individual-level characteristics and the characteristics of the daily work context were related to employees' resistance to change. The authors examined a large housing

company undergoing several organizational changes. They found information that participation, and trust in management were the most influential work context variables related to resistance to change. The two individual-level characteristics related to resistance to change were openness to job changes and organizational tenure. The above examples illustrate a framework for examining employee perceptions associated with organizational climate. Employee perception and the resulting organizational climate are products of what the employee brings to the organization (pre-existing disposition) and what happens to the employee at the organization (work context).

Chiropractic Colleges

This study focuses on organizational climate for innovation at United States chiropractic colleges, United States health sciences universities offering a doctor of chiropractic program, and Canadian Memorial Chiropractic College. Chiropractic is the largest, most established complementary and alternative medical profession in the United States. Reported utilization of chiropractic services varies, but has been found to be near 11% of the United States population (Lafferty et al., 2006). The cost of spine-related health care is increasing with a growing number of calls for evidence of efficacy (Brook et al., 2008). In addition to chiropractic programs, colleges offering training related to spinal health include programs in medicine, osteopathy, and physical therapy. Growing healthcare costs, competitive programs and the call for evidence-based care is driving the need for innovation at health care institutions. While empirical evidence exists for the efficacy and cost-efficiency of chiropractic care (Hass, Sharma, & Stano, 2005; Legorreta et al., 2004; Manga, Papadopoulos, & Swan, 1993), the chiropractic profession is facing significant challenges.

According to Davis, Davis, Luan, and Weeks (2009), "From 1996 to 2005, relative expenditures on chiropractic care increased; however, the number of chiropractic graduates, the rate of growth of chiropractors, and the incomes of chiropractors have declined" (p. 36). Data from the Integrated Postsecondary Educational Data System

(IPEDS) (United States Department of Education, 2011) and the National Center for Educational Statistics (United States Department of Education, 2011) reveal a significant decline in enrollment at chiropractic colleges over the past 15 years. Enrollment had totaled over 16,000 in the late 1990s, but has declined to less than 11,000 today. In addition, chiropractic colleges are experiencing significant competition from other health care professions and emerging international chiropractic colleges. For example, in 1999 there were eight accredited Doctor of Physical Therapy (DPT) programs in the United States (Plack & Wong, 2002). According to the Commission for the Accreditation for Physical Therapy Education, there are now 218 such programs (CAPTE, 2013). Doctors of physical therapy (DPT) offer similar services to that of doctors of chiropractic. DPT programs offer an alternative choice for prospective students considering enrollment in a doctor of chiropractic program (DCP). The list of countries outside the United States that have chiropractic colleges includes Australia, Brazil, Canada, Denmark, France, Japan, Malaysia, Mexico, New Zealand, South Africa, South Korea, Spain, Sweden, Switzerland, and the United Kingdom. United States' DCPs now have considerable competition when recruiting international students.

Organizations experience constant pressure. Porter (1998) identified five industry forces impacting the viability of organizations: threat of new entrants into the market, bargaining power of customers, bargaining power of suppliers, threat of substitute products or services, and price competition or other forms of rivalry. Chiropractic colleges are currently experiencing many, if not all, of these pressures. For example, DPTs are a relatively new entrant to the market and offer prospective students an alternate career choice. The addition of many more chiropractic colleges give bargaining power to customers and create price competition. Federal regulations increasingly limit the bargaining power of the supplier, the chiropractic college.

Given smaller enrollments, chiropractic colleges could be considered to be experiencing an organizational decline. Organizational decline has been defined as “a

condition in which a substantial, absolute decrease in an organization's resource base occurs over a specified period of time" (Cameron, Kim, & Whetten, 1987, p. 224). Students, and connected tuition dollars, represent a resource for institutions of higher education. When student numbers go down, institutional dollars go down. Decreased revenue impacts the organization in many ways. Cameron et al.(1987) theorized a inverse relationship between decreased organizational resources and organizational effectiveness. As organizational resources dwindle, organizational effectiveness decreases. Empirical evidence suggests a different relationship between organizational resources and effectiveness, placing organizational effectiveness more under the control of management. A study of 334 colleges and universities (Cameron & Smart, 1998) revealed that poor leadership leads to poor organizational effectiveness. The authors concluded, "The major predictors of effectiveness are under the control of management" (p. 81). When examining institutions of higher education experiencing decline, they found both high and low performance. Yet, declining resources did not directly cause poor performance. Variables predicting poor performance included increased conflict, strong resistance to change, declining innovation, and administrators with low credibility (Cameron & Smart, 1998).

Chiropractic colleges are facing intense competition for students, and must respond to increasing demands for evidence-based care. In this environment, many chiropractic colleges are confronted with formidable challenges that may threaten their survival. Chiropractic colleges seek alternative strategies to assure a secure future that, necessarily, require significant departures from traditional modus operandi. The capacity for significant organizational change depends, in part, on organizational environments conducive to innovation.

Evidence-Based Management as a Strategy

Alfred (2006) defined strategy as "a systematic way of positioning the institution with stakeholders in its environment to create value that differentiates it from competitors

and leads to a sustainable advantage” (p. 6). Traditional strategic plans focus on competitive pricing, product differentiation, or making it difficult for others to enter the market. One overlooked element of strategy is the use of available evidence related to organizational climate.

An organization can differentiate itself from competitors by developing an organizational climate allowing it to better adapt to changing environments. Rousseau and McCarthy (2007) stated, “Contemporary managers and management educators make limited use of the vast behavioral science evidence base relevant to effective organizational practice” (p. 84). The authors (Rousseau & McCarthy, 2007) labeled this type of management as “evidence-based management” and offered the following definition: “managerial decisions and organizational practices informed by the best available scientific evidence” (p. 84). The strategic use of evidence may give organizations a sustainable advantage in being able to adapt during environmental uncertainty.

There are several models of strategy. Alfred (2006) listed processual, rational, resource-based, systematic, non-linear, and adaptive as strategic models. Bess and Dee (2008) categorized strategic models as linear, adaptive, emergent symbolic and postmodern. The strategy that may offer the best fit for chiropractic colleges is an adaptive strategy. Bess and Dee (2008) stated, “The adaptive model would be appropriate when the organization is highly dependent on the environment but also perceives that it has choice (agency) regarding how to respond” (p. 739). Many chiropractic colleges are attempting to adapt to a changing environment. They are choosing to redefine themselves as *Health Sciences Universities* and have begun to offer different services such as instruction in acupuncture or degrees in naturopathy. Northwestern College of Chiropractic is now Northwestern Health Sciences University. National College of Chiropractic is now National University of Health Sciences. Los Angeles College of Chiropractic is now Southern California University of Health

Sciences. Parker College of Chiropractic is now Parker University. Western States Chiropractic College is now the University of Western States.

Freeman and Hannan (1983) define niche-width as “a population’s tolerance for changing levels of resources, its ability to resist competitors, and its response to other factors that inhibit growth” (p. 1118). The expansion of offerings at traditional chiropractic colleges may represent an attempt to expand niche width. Freeman and Hannan (1983) label organizations with limited ranges of tolerances as “specialists” and organizations with broad niches as “generalists” (p. 1118). Specialists have all their eggs in one basket, whereas generalists avert risk with diversity. Chiropractic educational institutions are trying to adapt, yet have very little or no evidence from their profession to inform their tactics. Evidence related to organizational climate and innovation at chiropractic colleges can help chiropractic colleges formulate effective strategy when navigating a turbulent environment.

Study Context

The dependent variable in this study is climate for innovation at United States chiropractic colleges, United States health sciences universities offering a doctor of chiropractic degree, and Canadian Memorial Chiropractic College. A positive climate for innovation increases organizational performance when work demands are high (King, Chermont, West, Dawson, & Hebl, 2007). Burningham and West (1995) found the perception of organizational support for innovation was the most consistent factor related to externally rated team innovativeness. Research involving 33 research and development teams (Eisenbeiss, Van Knippenberg, & Boerner, 2008) demonstrated that transformational leadership works through support for innovation to enhance team innovation. Henkin and Holliman (2009) studied urban teachers and found higher perceptions of support for innovation are related to higher levels of organizational commitment. These and other research efforts demonstrate there is a growing body of empirical evidence related to the importance of organizational innovation.

Attitude toward Change

Perceptions regarding innovation and attitudes toward change are not completely distinct entities. Despite being similar variables, a full body of literature is associated with innovation, and a separate body of literature is devoted to attitudes and behaviors associated with organizational change. Whether adopting an innovation or experiencing an organizational change, employees have a perception associated with change, and that perception may be influenced by individual attributes and work context. This framework aligns well with organizational climate; specifically, an organizational climate for innovation. Organizational climates are derived from shared employee perceptions. Climates for innovation are derived from shared employee perceptions about change.

Smith (2002) listed many forms of organizational change: strategy deployment, restructuring and downsizing, technology change, total quality management change, mergers and acquisitions, re-engineering, and process design or culture change. Chiropractic colleges are currently experiencing many of these changes. A number of chiropractic colleges have downsized their faculty and staff in response to decreasing enrollment. The adoption of electronic health care records represents a significant technology change. Changes in the curricula include the incorporation of evidence-based clinical practice learning outcomes.

The study of change, like those identified above, has been approached by researchers from different perspectives. Different labels given to adopting innovation or organizational change include diffusion of innovations (Rogers, 2003), intention to adopt new technology (Davis, 1989), coping with organizational change (Judge, Thoresen, Pucik, & Welbourne, 1999) openness to change (Fugate & Kinicki, 2008; Wanberg & Banas, 2000), commitment to change (Herscovitch & Meyer, 2002), resistance to change (Oreg, 2003), and readiness for change (Holt et al., 2007). Regardless of the classification, the study of innovation involves the study of change. Perceptions of innovation are similar to perceptions of change. Chapter II includes a review of the

literature related to innovation/organizational change and its relationship to organizational climate for innovation.

Conclusion

It appears viable to view antecedents of a climate for innovation using the previously described structure. Antecedents may be labeled as either attributes of the individual or work context variables. In other words, the organizational climate for innovation may be seen as a product of employee dispositions toward innovation and how the work environment shapes perceptions of innovation. This framework has been applied to both innovation (Bunce & West, 1995; Burningham & West, 1995; Hulsheger, Anderson, & Salgado, 2009) and attitude toward change (Oreg, 2003, 2006).

Within work context, relationships have been established between many social variables and innovation. For example, researchers have uncovered relationships between innovation and trust (Clegg, Unsworth, Epitropaki, & Parker, 2002), justice (Tjosvold, Wong, & Wan, 2010) and conflict (De Dreu, 2002; Henkin & Holliman, 2009; Song, Dyer, & Thieme, 2006). Research has also revealed relationships between perceptions about organizational change and trust (Lusch, O'Brien, & Sindhav, 2003; Oreg, 2006), justice (Chawla & Kelloway, 2004; Oreg, 2006) Van Dam et al., 2008; Wanberg & Banas, 2000), and conflict (Bernerth, Armenakis, Feild, & Walker, 2007; De Dreu, 2006; McAdam, 2005). A thorough review of the empirical evidence related to climate for innovation must include an analysis of related variables, including organizational change, trust, justice, and conflict.

Research Questions

Research Question 1: Is personal disposition toward change associated with organizational climate for innovation?

Research Question 2: Are higher levels of justice associated with organizational climate for innovation?

Research Question 3: Is the faculty's perception of the level of organizational conflict associated with organizational climate for innovation?

Research Question 4: Are higher levels of supervisor trust associated with organizational climate for innovation?

Research Question 5: Are higher levels of organizational trust associated with organizational climate for innovation?

Research Question 6: Are faculty demographic variables associated with organizational climate for innovation?

Definitions of Terms

Organizational climate is the "employees' shared perceptions of organizational events, practices, and procedures" (Patterson et al., 2005, p. 380).

Conflict is a state of opposition between persons or groups.

Innovation refers to "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12).

Organizational justice is fairness in organizations. The three subcomponents involve fairness in outcomes (distributive justice), fairness in process (procedural justice) and fairness in social interaction (interpersonal justice) (Cohen-Charash & Spector, 2001).

Self-efficacy is defined as "beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations" (Bandura, 1997, p. 2).

Trust is, "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (Rousseau, Sitkin, Burt, & Camerer, 1998, p. 395).

Limitations of the Study

This study consists of a cross-sectional survey of all United States chiropractic colleges, United States health sciences universities offering a doctor of chiropractic program, and Canadian Memorial Chiropractic College. The results of this study may

not be generalizable to all international chiropractic colleges or other institutions of higher education. Because the study includes the entire population of chiropractic faculty in the United States, the results are generalizable only to chiropractic faculty in the United States. The survey instrument provides a measure of observed variables that are not the same as the latent variables. Actual resistance to change is not the same as a score on a questionnaire. The score is the observed variable that represents, but is not the same as, the social variable. The survey involves structured items and limited responses and will not provide the same information as an open-ended interview or a focus group. Those responding to the survey may differ from those choosing not to complete the survey. The cross-sectional design implies an examination at a single point in time.

CHAPTER II

LITERATURE REVIEW

This chapter reviews the literature related to organizational climate for innovation. Organizational climate is a more inclusive term than climate for innovation. Organizational climate was previously defined as “the employees’ shared perceptions of organizational events, practices, and procedures” (Patterson et al., 2005, p. 380). The variable of interest here is not the overall organizational climate, but the climate for innovation. This review will examine variables shown to influence employee perceptions about innovation at the workplace.

Theoretical Framework

The theoretical framework for studying organizational climate for innovation consists of three primary categories: pre-existing attributes of the individual, work context, and perceived outcomes of adopting innovation. In other words, individuals will bring to the organization pre-existing attributes that shape their perception of innovation. In addition, their perception of innovation may be shaped by their experiences at the workplace. For example, the employees may experience fairness or unfairness in their interactions, processes, and outcomes. They may experience cooperative or competitive behaviors. They may experience various levels of conflict. Each of these experiences helps shape employee perceptions of the organization and, in turn, influences the climate for organizational innovation. Finally, employee perceptions may be influenced by what they feel will happen as a result of adopting innovation. For example, employees may feel that adopting innovation will impress their supervisor and doing so will gain favor. Or they may feel that adopting innovation will allow them to be more productive. In either case, a favorable perception of outcome will influence how the employees perceive innovation. Conversely, employees may predict adopting innovation will result in being ostracized by coworkers. Choosing to do something differently may be seen as breaking tradition and having the potential to make others look bad. The predicted outcome of

adopting innovation, good or bad, is another important variable having the potential to impact an organization's climate for innovation. It is important to consider all three categories, pre-existing attributes of the individual, work context, and perceptions of outcome, because each has the power to influence the climate for innovation.

Although the theoretical framework of pre-existing attributes of the individual, work context, and perception of outcome helps to conceptualize what influences a climate for innovation, not all predictor variables fit neatly into a single category. For example, conflict may be a work contextual variable and/or a perceived outcome of adopting innovation. Trust may be part of personal disposition or part of the work context.

Climate for Innovation

An organizational climate is the "employees' shared perceptions of organizational events, practices, and procedures" (Patterson et al., 2005, p. 380). Innovation is defined as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12). A climate for innovation is one where the shared psychological meanings present within an organizational climate manifest in behaviors that influence creativity and innovation in the organization. Litwin and Stringer (1968) believed an organizational climate consisted of measurable variables within the work environment. Many have attempted to measure properties within an organization that predict innovative behavior (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Litwin & Stringer, 1968; Scott & Bruce, 1994; Siegel & Kaemmerer, 1978). Siegel and Kaemmerer (1978) created the Siegel Scale of Support of Innovation for measuring the dimensions of organizational climate present in innovative organizations. Their 61-item instrument was established with teachers and students in secondary schools. The result was a three-factor model including support for creativity, tolerance of differences, and personal commitment. The most influential factor was support for creativity. Based on the work of Siegel and Kaemmerer (1978), Scott and Bruce (1994) developed a modified

instrument for measuring climate for innovation. They believed perceptions of a climate for innovation are influenced by leadership, group transactions, and the processes used to solve problems. Their analysis of engineers, scientists, and technicians in a large research and development company yielded a two-factor model. The two factors were support for innovation and resource supply. Personal commitment, a factor in Siegel and Kaemmerer's model, was omitted from their model, as the authors reasoned that personal commitment is an outcome rather than a dimension of climate. The climate for innovation instrument showed a strong relationship between support for innovation and innovative behavior. This model explained approximately 37% of the variance in innovative behavior. Amabile et al. (1996) created the KEYS instrument for assessing the climate for creativity. This 78-item instrument has factors for encouragement of creativity, autonomy, resources, pressures, and impediments to creativity. Encouragement from coworkers, supervisors, and the organization were all positively related to a climate for creativity with organizational encouragement being the most influential predictor.

The primary determinant in Siegel and Kaemmerer's (1978) model was support for creativity, while the primary determinant in Scott and Bruce's (1994) model was support for innovation. Amabile et al. (1996) showed the major determinants of a climate for creativity were challenging work and organizational encouragement. The evidence indicated a shared perception of organizational support is critical for promoting a climate for innovation.

Organizational Change

A parallel topic to climate for innovation is organizational change. If adopting innovation is an organizational change, then climate for innovation is what employees think about organizational change. In other words, the shared meaning given to organizational change is akin to an organizational climate for innovation. In addition to a large body of literature surrounding climate for innovation, there is also a significant

body of empirical evidence related to organizational change. Organizational change has been studied from many angles, including but not limited to diffusion of innovation (Rogers, 2003), resistance to change (Oreg, 2003), readiness for change (Holt et al., 2007), and commitment to change (Meyer, Srinivas, Lal, & Topolnytsky, 2007). In his model of resistance to change, Oreg (2006) characterized predictor variables to resistance as either personal disposition or work-related contextual variables. This is consistent with the previously described theoretical framework. In Holt et al.'s (2007) model of readiness for change, they characterized predictor variables to readiness for change as individual attributes, content, context, or process variables. Again, this is consistent with the previously described framework. Although not completely black and white, many variables that influence climate for innovation or perceptions about change can be categorized as either pre-existing attributes of the individual, work contextual variables, or perceptions of outcome.

Reaction to organizational change has surfaced in several forms. Empirical evidence showed resistance to change manifesting as a cognitive state, an emotional state, and/or a behavior (Piderit, 2000). The three forms of resistance were labeled affective, cognitive, and behavioral resistance (Oreg, 2006). The affective component is how one feels about the change. The cognitive component is what one thinks about the change in terms of its necessity or ability to offer a benefit or positive outcome. The behavioral component involves the actions or intended actions in response to the change, such as convincing others about how the change will result in a negative or positive outcome.

An alternative perspective has reaction to change manifesting as affective, continuance, and/or normative commitment to change (Herscovitch & Meyer, 2002). Affective commitment (AC) was defined as behavior due to relative strength of an individual's identification with and involvement in a particular change (Allen & Meyer, 1990). Continuance commitment (CC) was defined as behavior due to a belief that profit is associated with continued participation and cost is associated with leaving (Allen &

Meyer, 1990). Finally, normative commitment (NC) was defined as behavior due to a belief that it is the right or moral thing to do (Allen & Meyer, 1990). All three types of commitment are behaviors resulting from different meanings assigned to change. The most desirable for the employer is to have employees committed to the change because they personally identify with it. They advocate for it because it is right for them. Less desirable for the employer is to have employees committed to the change only because they must comply to keep their jobs.

Although commitment may have many potential objects, the object of the employees' commitment in this review is innovation or change. Meyer et al. (2007) have shown commitment to change is a distinct variable from commitment to an organization. When examining the implementation of a strategic initiative in a Canadian utility company, the authors controlled for commitment to the organization and found commitment to change was significant in accounting for behavioral support for the change initiative (Meyer et al., 2007). Meyer et al. (2007) found AC, NC, and CC to change all related positively to compliance behavior, but only AC and NC to change related to cooperative and championing change behaviors. Compliance was defined as "demonstrating minimum support for a change by going along with the change, but doing so reluctantly" (p. 194). Cooperation was defined as "demonstrating support for a change by exerting effort when it comes to the change, going along with the spirit of the change and being prepared to make modest sacrifices" (p. 194). Championing was defined as "demonstrating extreme enthusiasm for a change by going above and beyond what is formally required to ensure the success of the change and promoting the change to others" (p. 194). When individuals are affectively committed to a change, they go above and beyond what is required to support the change. Conversely, when individuals are only continuance committed, they merely comply. They reluctantly carry out only that which is necessary to continue their employment.

Commitment to change is similar but not identical to climate for innovation. Climate for innovation is a shared perception of organizational events, practices, and procedures as they relate to innovation, while commitment to change is behavior resulting from the perception of the change. In this sense, commitment to change is a reaction or outcome. Similarly, Oreg (2006) labeled reactions to change as affective, cognitive, and behavioral resistance. Again, reactions are outcomes and are not synonymous with climate for innovation.

Pre-existing Attributes of the Individual

Climate for innovation is influenced by pre-existing attributes of the individual. This influence is independent of the innovation/change; it concerns the person's general disposition toward change. Various authors have attempted to define and measure the individual attributes that relate to change (Holt et al., 2007; Judge, Thoresen, Pucik, & Welbourne, 1999; Oreg, 2003; Wanberg & Banas, 2000). Wanberg and Banas (2000) categorized openness to change antecedents into individual difference variables or context-specific variables. The individual variables consisted of self-esteem, optimism, and perceived control (Wanberg & Banas, 2000). Holt et al.'s (2007) four-factor model of readiness for change included appropriateness, management support, personal valence, and change efficacy. These factors did not isolate pre-existing attributes of the person. Appropriateness, assessing whether the change is good for the organization, has to do with organizational and environmental context. Perception of managerial support is a work-contextual variable. Change-specific efficacy relates to the work change and is not a pre-existing attribute of the person. Personal valence was intended by the authors to measure whether the change is personally beneficial. This relates to perception of outcome and is not a pre-existing attribute of an individual. The results of Holt et al.'s (2007) factor analysis yielded a factor labeled *personality variables* with negative affect, locus of control, rebelliousness, and general attitude toward change as individual variables.

An instrument to measure personal disposition to resistance to change has been developed and shown to have convergent, discriminant, and predictive validity (Oreg, 2003). Additionally, the instrument has been shown to have cross-national validity (Oreg et al., 2008). Oreg (2003) developed the resistance to change scale to “tap an individual’s tendency to resist or avoid making changes, to devalue change generally, and to find change aversive across diverse contexts and types of change” (p. 680). The exploratory factor analysis used to develop the instrument yielded a four-factor model including routine seeking, emotional reaction, short-term focus, and cognitive rigidity. Routine seeking measured the extent routines are incorporated into the person’s life. Emotional reaction measured the emotional reaction to imposed change. Short-term focus measured the perception of immediate inconvenience or adverse effect of change. Finally, cognitive rigidity measured the ease and frequency with which the person changes their mind. Total scale reliability coefficient alpha (Cronbach’s) was equal to .92 (Oreg, 2003). The reliability coefficient alphas for routine seeking, emotional reaction, short-term focus, and cognitive rigidity were 0.89, 0.86, 0.71, and 0.68, respectively (Oreg, 2003).

Using the resistance to change instrument, personal disposition to resist change negatively correlates with innovation. The relationship between resistance to change and innovation was specific to short-term focus factors and cognitive rigidity (Oreg, 2003). Personal disposition to resist change is also negatively associated with sensation seeking and tolerance for ambiguity, but positively associated with risk aversion (Oreg, 2003). In the same experiment, resistance to change was not associated with cognitive ability. Resistance to change also predicts people’s affective reactions to change and their functioning at work prior to the change (Oreg, 2003).

Dispositional resistance to change is seen as a stable personality trait which relates to emotional reactions to change. Dispositional resistance to change negatively relates to innovation.

Regulatory Focus

Regulatory focus theory is another perspective looking at how personal disposition impacts attitude and behaviors regarding change. The authors of the theory attempted to explain how people pursue goals (Markovits, Ullrich, Van Dick, & Davis, 2008). As part of personal disposition, they postulated there are two primary self-regulatory systems, promotion focus and prevention focus. People who have promotion focus represent goals as hopes and aspirations, whereas people who have prevention focus represent goals as duties and obligations. Using this filter, pre-existing attributes (self-regulatory systems) of the individual influence how people perceive change or innovation. Meyer, Becker and Vandenberghe (2004) proposed an integrative model of motivation and commitment. They posited, “Employees set or accept more difficult goals under conditions of autonomous regulation and promotion focus than under conditions of external regulation and prevention focus” (p. 999) and “because they choose more difficult goals, employees who experience autonomous regulation and a promotion focus are willing to exert more effort and persist longer in goal-directed behavior than employees who experience external regulation and a prevention focus” (p. 1000). Markovits, Ullrich, Van Dick, and Davis (2008) tested the relationship between regulatory focus and the components of commitment. They found both promotion and prevention focus positively correlated with all three commitment components. Promotion focus was more strongly related to affective commitment than prevention focus, and prevention focus was more strongly correlated to continuance commitment than promotion focus. Commitment is germane to this review because commitment to change has been identified as distinct from organizational commitment. (Herscovitch & Meyer, 2002).

Regulatory focus may not be the best measure of personal disposition for investigating a climate for innovation. Although it does attempt to identify a pre-existing attribute, promotion or prevention focus, a primary weakness in this approach is the

relatively low reliability of the measure. The prevention and promotion focus measures' Cronbach's alphas were 0.60 and 0.75, respectively. Another problem is the breadth of the measure. Markovits et al. (2008) stated, "Our measures of promotion and prevention focus reflect a mixture of dispositions and situational influences" (p. 487). In the previously described theoretical framework, there is a distinction between the pre-existing attributes of the individual and work context. This instrument blurs the distinction. In addition, other measures of personal disposition regarding change have demonstrated higher validity. The resistance to change instrument (Oreg, 2003) clearly separated out individual disposition as a separate variable. The resistance to change instrument has also been shown to have convergent, discriminant, and predictive validity (Oreg, 2003). Additionally, the instrument has been shown to have cross-national validity (Oreg et al., 2008).

Perceived Outcomes of Change

In addition to a person's pre-existing attributes, the predicted outcome of adopting change influences the climate for innovation. People hold opinions about how change impacts the organization and/or themselves. Oreg (2006) examined 800 employees in a defense-related organization. The employees were mostly well-educated males involved in a merger of the two core units within the organization. Oreg measured employee perceptions of power and prestige, job security, and intrinsic rewards. Power and prestige represented the extent to which the merger would change the level of influence the employee has within the organization. Job security was the extent to which the employee would have to look for a new job because of the merger. Finally, intrinsic reward was the extent to which the merger would change the employee's autonomy, challenge, and personal interest in his or her job. Each variable represented an employee's perception of the outcome(s) resulting from change. In other words, will the organizational change benefit or harm the employee? In this study, Oreg (2006) found each variable, power and prestige, job security, and intrinsic rewards, correlated to

resistance to change. These antecedents predict the affective, cognitive, and/or behavioral components of resistance to change.

In the Diffusion of Innovation theory put forth by Rogers (2003), many of the characteristics of innovation posited to improve the likelihood of adoption relate to perceived outcomes. Rogers (2003) listed the characteristics of innovation that improve the likelihood of adoption as relative advantage, compatibility, complexity, triability and observability. Relative advantage is “the degree to which an innovation is perceived as better than the idea it supersedes” (p. 15). For example, an iPad is smaller and lighter than a laptop, performs the functions of a laptop, and in fact offers functions beyond those of a laptop computer. It offers a relative advantage and is therefore likely to be adopted. Compatibility is “the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs for potential adopters” (p. 15). Complexity is “the degree to which an innovation is perceived as difficult to understand and use” (p. 16). If an innovation adds seven steps to get to the same outcome, adoption is doubtful. If doctors believe evidence-based care means every time you need to make a clinical decision you have to do a literature review, adoption is unlikely. Triability is “the degree to which an innovation may be experimented with on a limited basis” (p. 16). Employees given iPads for a month can check email, access the internet, and bring digital documents to meetings. They can experience the benefits and are therefore more likely to adopt the device. Finally, observability is “the degree to which the results of an innovation are visible to others” (p.16). Seeing someone use and benefit from an iPad increases adoption by others.

Relative advantage and complexity, two characteristics of innovation that increase the likelihood of adoption, are perceived outcomes. Innovation resulting in an improvement and less difficulty is desirable. Attaining greater utility with less difficulty equates to an outcome of greater efficiency. Most will value getting more from less.

Perceived Usefulness and Ease of Use

Efficiency is basically the ability to elicit more output from less input. If increased efficiency is a perceived outcome of adopting innovation, the likelihood of adoption increases. Contextually, the organizational change or innovation may be an idea, practice, or object. If the adopter/employee predicts the innovation will be easy and useful, the likelihood of adoption increases. Using Rogers' (2003) characteristics, the innovation would be seen as having low complexity and offering a relative advantage, therefore increasing the likelihood of adoption.

The Technology Acceptance Model (TAM) (Davis, 1989) is centered on the premise that intention to use new technology is determined by the person's perceptions of utility and ease. The TAM, supported by empirical evidence, posits that perception of how much the technology increases job performance and how effortless it is determine a person's intention to use the technology. In an example from the field of dentistry, the most common reason cited for not adopting new technology was that there was no perceived advantage in its use (Parashos & Messer, 2006). Venkatesh and Davis (2000) stated, "Perceived usefulness has consistently been a strong determinant of usage intentions, with standardized regression coefficients typically around 0.6" (p. 187). Cognitive processes that are significantly related to perception of usefulness included job relevance, output quality, results demonstrability, and perceived ease of use (Venkatesh & Davis, 2000). In other words, when a person perceives that new technology is related to his or her job, believes the technology does the job well, is able to see the difference in output when using the technology, and perceives less effort when using the technology, then perception of usefulness increases. This directly relates to a climate for innovation, as the climate for innovation is the employees' perceptions related to organizational events, practices, and procedures as they relate to innovations. In the previously described framework, variables impacting a climate for innovation were placed into categories of pre-existing attributes of the individual, perceived outcomes, and work

context. Efficiency, or the ease and utility related to an innovation, is best categorized as a perceived outcome.

Self-Efficacy

Perceived self-efficacy is “belief in one’s capabilities to organize and execute the courses of action required to manage prospective situations” (Bandura, 1997, p. 2). It is perception of ability, specific to a given circumstance. An employee may feel fully capable of performing in one situation, yet feel incompetent in another. The situation germane to this review is organizational innovation or organizational change. The focus is the employee’s perception of ability or self-efficacy related to innovation.

The previous section described how employee opinions about ease of use and utility may influence the perception of outcome, and ultimately the decision to adopt or resist innovation. Hill, Smith, and Mann (1987) found beliefs about self-efficacy influenced the decision to adopt innovation independent of the person’s beliefs about usefulness. It may be that perceptions of self-efficacy effect willingness to adopt or resist innovation by influencing opinions related to ease of use. If there is a perception of high self-efficacy associated with an innovation, employees believe the task at hand will be easy. In turn, they predict a positive outcome. Conversely, if employees think they are incapable of executing change, they predict a poor outcome as a result of trying.

In the previously described theoretical framework, perception of outcome is one of the major factors shown to influence change behavior (Oreg, 2006). Evidence indicates there is a relationship between self-efficacy and change behavior. Role breadth self-efficacy and autonomy are strong predictors of employee suggestions (Axtell, Holman, Unsworth, Waterson, & Harrington, 2000). Wanberg and Banas (2000) studied a group of professional individuals working in the areas of public housing and development and found change-specific self-efficacy was positively correlated to change acceptance. Holt et al. (2007) examined more than 900 practicing organizational managers and found change efficacy was strongly related to the manager’s perception of

whether the change was personally beneficial. Venkatesh (2000) showed perception of self-efficacy in a new technology positively related to perceived ease of use, which positively related to perception of usefulness and intention to use.

If shared perception of employees include beliefs related to self-efficacy, these beliefs may influence the larger perception related to a climate for innovation. Specifically, beliefs about self-efficacy impact employee perceptions of ease of use. If something is easy, employees predict better efficiency in achieving a work product. In addition, they predict gaining favor with colleagues and supervisors by showing greater aptitude. Self-efficacy, as shown by Venkatesh (2000), influences change behavior by affecting ease of use perceptions, which influence perception of utility and ultimately intention to use.

Self-efficacy may be influenced by work contextual variables such as leadership characteristics or information sharing. Schyns (2004) found that leaders can influence employee self-efficacy through mastery experience, vicarious experience, and social persuasion. Sharing information with employees and allowing them substantive participation in change process builds self-efficacy specific to the change. Jimmieson, Terry, and Callan (2004) stated, “When employees have a sense of prediction and understanding about impending organizational change, they are likely to appraise the situation as one in which they feel efficacious in their ability to cope with subsequent demands” (p. 23). This speaks to the value of sharing information since it allows a sense of prediction and understanding. Leadership and/or organizational practices, such as information sharing, are best defined as work context variables and are therefore more thoroughly discussed later in this review.

Social Outcomes

Work product, efficiency, and/or strategic advantage are not the only outcomes considered by employees when forming an opinion related to innovation. There are social ramifications. A person perceives either social gain or loss associated with

innovation. Adopting innovation is a way to gain favor with supervisors; conversely, resisting innovation is a way to gain favor or minimize conflict with a work group. For example, if a teacher adopts new technology supported by administration, he or she gains favor with administration, but loses favor with teachers having a vested interest in maintaining status quo. Adopting new technology may initiate conflict within the teacher's work group. Part of the perception calculation related to adopting innovation includes a prediction of social outcomes.

Rousseau (1989) defined psychological contracts as "individual beliefs in reciprocal obligations between employees and employers" (p. 123). A typical employer-employee contract may involve the exchange of hard work for monetary gain. Comparably, employees work to maintain work-team norms in exchange for favorable impression with team members. Employees' level of commitment to their work team impacts how they will respond to social context. If an organizational change is perceived to be a group-directed threat, the response from highly committed group members is anger and actions against those outside of the group (Ellemers, Spears, & Doosje, 2002). The social outcome manifests as anger and actions to strengthen the group. Oreg (2006) found, "Employees who were surrounded by colleagues who opposed the change tended to express more negative emotions towards the change" (p. 93). The climate for innovation is influenced by perceived outcomes, including social outcomes.

The previously described Technology Acceptance Model (TAM) (Davis, 1989) is centered on the premise that intention to use new technology is determined by the person's perceptions of utility and ease. An expansion of TAM, called TAM2, offers further explanation of variables impacting perception of usefulness by including a measure of social influence (Venkatesh & Davis, 2000). The measure of social influence was labeled subjective norm. The newer model explained up to 60% of the variance in perceptions of usefulness. When an individual believes people important to him or her expect utilization, he or she has higher perceived usefulness and intention to use. This

relates to impression motivation. Deutsch and Coleman (2000) stated, “Impression motives entail considering the interpersonal consequences of expressing a particular judgment in a given social context” (p. 152) and “the perceiver’s goal is to express attitudes and other judgments that satisfy his or her current social goals” (p. 152).

Subjective norm best fits within the perceived outcomes of change category because maintaining favorable standing with others is a social outcome. Using TAM2, subjective norm was significantly related to intention to use only in mandatory use settings (Venkatesh & Davis, 2000). If the use of new technology is voluntary, subjective norm added no predictive power to intention to use over perception of utility and perceived ease of use. As experience with new technology is gained, subjective norm influence waned. Experience replaced social influence in determining perceptions of utility.

Employees are justified in expecting favorable treatment from supervisors when they adopt innovation. Empirical evidence (Shore, Bommer, & Shore, 2008; Yun, Takeuchi, & Liu, 2007) showed managerial perceptions of employee commitment correlate with managerial treatment of employees. The authors believed managers develop social exchange relationships with employees when they believe the employee demonstrates high affective commitment. Norms of reciprocity dictate that people should not harm the people that have helped them, and people should help the people that have helped them. Affective commitment behaviors are analogous to *help*. Managers believe they are helped by those they perceive as affectively committed. Shore et al.’s (2008) model explained a large amount of variance in manager-rated continuance and affective commitment ($R^2 = .43$ and $.67$ respectively). Manager-rated affective commitment was largely explained ($R^2 = .67$) by the employee’s job performance, employee-rated affective commitment, and supervisor impression management. Job performance, training and development, and side bets (age and tenure) are the biggest predictors of manager-rated continuance commitment. The authors established a relationship between managers’ perception of employee commitment and their treatment of employees. In

their model, non-contingent punishment was when the employee felt they were punished without knowing why. Manager-rated affective commitment positively correlated (.35) with contingent reward behavior and negatively correlated (-.28) with non-contingent punishment behavior. Manager-rated continuance commitment positively correlated (.18) with non-contingent punishment behavior and negatively correlated (-.13) with contingent reward behavior. Affective commitment to a managerial supported innovation may confer rewards from management and therefore fall into the category of an expected outcome of adopting innovation. Along with perceptions of utility and ease, perceived social outcomes play a role in predicting an organization's climate for innovation.

Social Identity

Social identity is "that part of an individual's self-concept which derives from his knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that membership" (Ricketta, 2005, p. 360). Essentially, it is the feeling a person gets from belonging to a group. Because people belong to numerous groups, it is possible they have several social identities. They may value membership in their family, a work team, an organization, or their church. The identity that is most salient at a particular time is dependent on social context.

The theoretical framework of this literature review placed antecedents of adoption of innovation into categories of pre-existing attributes of the individual, perceived outcomes, and work context. Social identity does not have an ideal fit within only one of these categories, but is perhaps best seen as either a pre-existing attribute of an individual or a perceived outcome. For example, innovation may pose a threat to an existing social identity. In this case, social identity acts as a pre-existing attribute increasing resistance to change. Conversely, adopting innovation may help create new social identities. The new social identity may offer value, such as prestige. In this case, social identity is a potential outcome of adoption. Therefore, social identity may play a dual role as an existing attribute or a potential outcome.

Response to change differs depending upon a person's level of commitment to a group (Ellemers et al., 2002). Ellemers et al. (2002) noted responses to change have perceptual, affective and/or behavioral reactions. This is similar to Piderit's (2000) finding that resistance to change manifested as cognitive, affective, and behavioral responses. The key features of a social group shown to influence commitment were the member's group stability status, legitimacy of current status relationships, and the permeability of group boundaries (Ellemers et al., 2002). When there was a group-directed threat and high commitment to the group, group members tended to emphasize in-group homogeneity and showed anger and contempt toward the out-group. There was an attempt to stick together and an inclination to move against the out-group. Those adopting innovation may be seen as an out-group challenging the in-group's value. Social identity derived from association with a group may, in this case, act as a pre-existing attribute predicting resistance to change.

Herscovitch and Meyer (2002) stated, "Affective commitment develops when individuals become involved in, recognize the value relevance of, or derive their identity from, association with an entity or pursuit of a course of action" (p. 484). If the course of action or entity is innovation, the derivation of a new social identity is an outcome. Oreg (2006) listed power and prestige, job security, and intrinsic reward as perceived outcomes of change. These variables are also associated with group affiliation. Being part of a prestigious, innovative group offers advantages. Social identity achieved by being part of a new group, in this case, acts as an outcome of adopting innovation.

Meyer, Becker, and Van Dick (2006) posited that social identity can be a precursor to the development of commitment. Organizational identification, a specific social identity, is distinct from organizational commitment (Knippenberg & Sleebos, 2006; Riketta, 2005). One difference was that commitment uniquely relates to perceived organizational support (Knippenberg & Sleebos, 2006). When commitment was examined while controlling for organizational identification, perceived organizational

support still had explanatory power. Self-reference was identified by the question, “When I think about myself, I often think about myself as a member of this organization” (Knippenberg & Sleebos, 2006, p. 577). When controlling for commitment, identification still had explanatory power. The authors (Knippenberg & Sleebos, 2006) concluded, “The self-referential nature of organizational membership that is uniquely reflected in organizational identification provides the basis for analyses of a variety of issues in organizational behavior (e.g., leadership, diversity, decision-making)” (p. 579). In addition, they stated, “The fact that commitment was uniquely related to POS whereas identification was not suggests that certain aspects of the relationship between the individual and the organization may be better understood in other terms than reciprocity in exchange” (p. 579). The authors suggested organizational prestige is a stronger antecedent to organizational identification than it is for organizational commitment. The organization’s prestige reflects on the employee’s self-identity. Organizations looking to support the adoption of innovation should recognize employees’ social identities as an important outcome variable impacting organizational innovation. If adopting innovation implies having a new, valuable social identity, resistance to change should lessen.

Conflict as an Outcome of Innovation

Conflict is a state of opposition between individuals or groups. It can be present within a course of action or an outcome of a course of action. Conflict can be part of the workplace context that influences willingness to adopt innovation or a perceived outcome of innovation. Conflict as a work context variable is discussed later in this review.

Organizational climates consist of employees’ shared perception of events. Part of this perception is the meaning assigned to organizational conflict. If conflict is perceived as harmful, engaging in activities resulting in conflict will be avoided. Relevant to this review, adoption of innovation has been shown to increase conflict (Janssen, 2003). Innovation means trying something new; it means breaking from what is traditionally believed and practiced. A decision to adopt innovation creates states of

opposition. The assigned meaning given to conflict determines resistance or willingness to change. Although conflict often carries a negative connotation, this is not always the case. It is possible conflict can be perceived as favorable.

Coser (1956, 1957) proposed the following positive functions of social conflict: group binding, group preserving, relationship stabilizing, and promotion of innovation. Coser (1957) stated, "Conflict not only generates new norms, new institutions, as I have pointed out elsewhere, it may be said to be stimulating directly in the economic and technological realm" (p. 198). Coser believed conflict served many positive functions and should not be viewed as solely negative.

Affective conflict, conflict emphasizing relationships and focused on emotion, is theorized to cause destructive outcomes, whereas cognitive conflict, conflict focused on the aspects of the task, is theorized to lead to constructive outcomes (De Dreu & Van De Vliert, 1997). Rahim (2002) advocated minimizing affective or emotional conflict while attaining and maintaining a moderate amount of substantive or task conflict. Jehn (1994) examined 88 work groups and found a negative association between emotional conflict and group performance and satisfaction. She also found a positive relationship between task conflict and group performance. De Dreu and Van Vianen (2001) found conflict avoidance was a more effective conflict management style when teams were dealing with relationship conflict. In a study involving 105 work groups and management teams, Jehn (1995) found task conflict in groups performing routine tasks to be detrimental, but task conflict in groups performing non-routine task to be beneficial. De Dreu (2006) showed conflict being related to innovation in a curvilinear fashion. High and low levels of task conflict were related to less innovation in work teams when compared to moderate levels of task conflict.

In a later review, De Dreu (2008) posited the benefits of work place conflict are minimal. He stated, "Positive functions of conflict are found only under an exceedingly narrow set of circumstances" (p. 14), and the "negative functions easily outweigh positive

functions, prohibiting the emergence of positive workplace conflict” (p. 14). If conflict diminishes satisfaction with team members, innovation may suffer. Nerkar, McGrath and MacMillan (1996) showed two facets of satisfaction, social and instrumental satisfaction, relate to innovation outcomes. When social dissatisfaction increased, team deftness or the ability to effectively carry out innovative work declined. If employees perceive destructive conflict as an outcome of organizational innovation or expect dissatisfaction as a result of conflict, more resistance to change is the probable result.

Work-Related Contextual Variables

In addition to personal disposition and expected outcomes, the change process influences adoption of innovation. The change process is part of the bigger work context. Work context encompasses the environment and happenings at work. It is not just the physical setting or work processes; it includes social interactions. It consists of interactions between people, perceptions of fairness, levels of trust, and interpersonal conflict. These contextual variables shape employee perceptions and help create the organizational climate for innovation.

Organizational climates can be conducive to or create resistance to change. One of the more popular models attempting to explain change behavior is the Diffusion of Innovation Theory. Rogers (2003) put forth the diffusion of innovation model in 1962 to explain why farmers were slow to adopt new technology. The new technology could have been profitable, yet farmers were slow to adopt innovation. The author stated, “Factors other than just economic explanations must have been at work” (Rogers, 2003, p. xv). Rogers (2003) went on to define diffusion of innovation as “the process by which an innovation is communicated through certain channels over time among the members of a social system” (p. 35). Rogers recognized a relationship between change behavior and the communication process within a social system. He recognized the importance of work context in relation to the adoption of innovation.

The social system at work includes the culture present within the organization. Culture is defined as, “a system of traditions, beliefs, values, norms, rituals, symbols, and meanings that are shared by a majority of interacting individuals in a community” (Lulofs & Cahn, 2000, p. 40). Part of acceptance or resistance to change is due to cultural acceptance. In other words, is there a goodness of fit between the proposed change and the existing culture?

Empirical evidence indicates work contextual variables play a large role in shaping perceptions of organizational change. Cunningham et al. (2002) examined over 600 hospital staff members and found work variables were the best predictors of readiness for organizational change. Chawla and Kelloway (2004) looked at two recently merged organizations and found participation and procedural justice strongly related to employee openness to change. Szabla (2007) found behavioral responses to leader initiated change depended upon perceptions of the change strategy. If the leadership strategy was perceived to be coercive, employees resisted change. On the other hand, if the leadership strategy was perceived to be rational and based upon evidence, employees were more accepting of change. Process variables tended to have higher correlations with innovation when measured at the team level compared with the individual level (Hulsheger et al., 2009). Work experience variables had much stronger correlations to organizational commitment than those involving personal characteristics (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002). Work context, including personal interactions, help shape perceptions and form organizational climates.

Organizational Size

The size of an organization is a work-contextual variable. Reviews of literature established a positive correlation between organizational size and innovation (Camison-Zornoza, Lapiedra-Alcami, Segarra-Cipres, & Boronat-Navarro, 2004; Damanpour, 1992). Higher perceived utility of conflict was also associated with larger organizations (Johnson, 1986). Coser (1956, 1957) theorized the promotion of innovation as a positive

function of conflict. Damanpour (1992) found size was more strongly related to implementation of innovation rather than the initiation of innovation. He also found the size of an organization was more positively related to innovation in manufacturing and profit-making businesses compared to service and non-profit-making businesses. In contrast, Camison-Zornoza et al.'s (2004) meta-analysis found size was more strongly correlated to innovation in service organizations than in industrial firms. This study also revealed while the method used to measure size (physical capacity of the organization, the number of employees, the volumes of input and output, and financial resources) exerted a significant effect, the method used to measure innovation and the type of innovation did not significantly influence the relationship between size and innovation.

Organizational Support

The norm of reciprocity predicts individuals experiencing favorable treatment by organizations feel morally obligated to return good treatment. Rousseau (1989) defined this as a psychological contract. High perceptions of organizational support (POS) were associated with increased job performance and innovation (Eisenberger, Fasolo, & Davis-LaMastro, 1990). When employees perceive support from the organization related to innovation, intention to use and use of innovation were more likely (Eisenberger et al. 1990; Venkatesh & Davis, 2000). When employees perceive strong organizational support, there is evidence of less absenteeism (Eisenberger, Huntington, Hutchison, & Sowa, 1986). In a meta-analysis, Meyer et al. (2002) found perception of organizational support had the strongest relationship with affective and normative commitment when compared to all other work experience variables. Rhoades, Eisenberger, and Armeli (2001) also found POS had a strong positive association with affective organizational commitment. Because commitment can have different foci, POS's positive impact on organizational commitment does not necessarily support POS's influence on commitment to change or innovation. Commitment to an organization is not the same as commitment to change.

Managerial support has been found to have greater impact on new idea implementation in the earlier stages of change (Axtell, Holman, & Wall, 2006). This may relate to impression management where employees use innovation in hopes of gaining supervisor favor. As previously stated, as experience with new technology is gained, social influence wanes (Venkatesh & Davis, 2000). High team support for innovation was a strong predictor of the implementation of new ideas (Axtell et al., 2000). If an individual feels team members accept innovation, there is diminished perception of destructive conflict associated with adoption. If the process supports innovation and the adoptor does not perceive destructive conflict as an outcome, the perception of outcome becomes more favorable.

POS may be more important in jobs where individuals are involved in more complex work and given greater decision-making latitude. POS has been more strongly tied to job favorability when the job involves higher discretion in decision making (Eisenberger, Cummings, Armeli, & Lynch, 1997). Related to the current study's sample, high discretion job assignment was associated with higher chiropractic faculty empowerment (Marchiori & Henkin, 2003). Meyer et al. (2002) found external locus of control was negatively correlated with affective commitment. When employees feel controlled from external sources, their affective commitment was less. Adopting innovation comes with an inherent risk of failure and conflict. Individuals given the power to make innovative decisions take on greater risk. POS is vital for employees during autonomous, higher risk situations that have the possibility of failure.

POS has complex relationships with other social variables. Empirical evidence has shown antecedents of POS include procedural justice, supervisor support and organizational rewards (Rhoades & Eisenberger, 2002; Rhoades et al., 2001). These and many other work-related contextual variables shape the organizational climate.

Organizational Justice

Fairness in organizations or *organizational justice* is categorized as distributive, procedural, or interactional (Cohen-Charash & Spector, 2001). Distributive justice deals with perceptions of fairness in the allocation of resources. Distribution of resources operates on three different principles: need, equity, and equality (Miller, 2001). Need-based distribution gives the resources to those with the greatest need. Equity-based distribution allots resources in proportion to the contribution of the individual or group. Those who make the biggest contribution receive the most and those who make the smallest contribution receive the least. Allocating resources this way (by merit) implies those who produce more are better. This process has the potential to compromise social harmony because it involves judgment about individuals or groups (Deutsch & Coleman, 2000). Finally, equality-based distribution gives everyone an equal share. All members share benefits equally. The second category of organizational justice, procedural justice, refers to fairness of the means used to determine outcomes. Procedural justice is perceived when the same process is applied to all individuals or groups. Deutsch and Coleman (2000) reported fair procedures are more important than fair outcomes. People assume fair process leads to fair outcomes, yet fair outcomes are sometimes ambiguous. The third type of justice, interactional justice, refers to forms of consideration that individuals feel they are due from others. People feel entitled to polite and respectful treatment and accountability. Miller (2001) stated, "People think they are entitled to explanations and accounts for any actions that have personal consequences for them" (p. 531).

Organizational justice is an important antecedent to organizational change and work outcomes. Organizational justice positively related to outcome satisfaction, rule compliance, and leader evaluation (Colquitt, 2001). Organizational justice also positively correlated to collective esteem, group commitment, and helping behaviors (Colquitt, 2001). A meta-analysis showed a positive correlation between interactional, procedural,

and distributive justices with normative organizational commitment (Meyer et al., 2002). Additionally, interactional, procedural, and distributive justices impacted the choice of conflict management style. Rahim, Magner, and Shapiro (2000) studied the relationship between 202 currently employed undergraduate students and their supervisors. When students perceived low distributive justice and high interactional justice, they demonstrated more integrative conflict management. In other words, when students did not get fair outcomes but sensed fair interaction, they sought collaboration with supervisors. In addition, distributive justice positively related to students avoiding conflict (Rahim et al., 2000). When outcomes were perceived to be fair, students avoided conflict.

A relationship exists between organizational justice and trust. Interactional justice has a strong positive relationship with trust in a supervisor (Ambrose & Schminke, 2003; Aryee, Budhwar, & Chen, 2002). When supervisors interact fairly with employees, the employees tend to trust supervisors. Ambrose and Schminke (2003) examined 102 departments of 68 organizations in the United States and found interactional justice was more strongly related to supervisor trust in less mechanistic organizations. Procedural justice was more influential in more mechanistic organizations. Colquitt (2001) discovered a positive relationship between interpersonal justice and favorable leader evaluation. Aryee et al. (2002) found procedural justice had a stronger correlation to trust in the organization than interactional justice. Colquitt (2001) found procedural justice had a stronger correlation to leader evaluation than interpersonal justice. Hubbell and Chory-Assad (2005) surveyed numerous organizations and found procedural justice was the strongest predictor of organizational and supervisor trust. The authors also found a positive relationship between distributive justice and supervisor trust. In contrast to other studies, they found no relationship between interactional justice and either supervisor or organizational trust. Organizational justice

appears to relate to organizational and supervisor trust, with procedural justice having the most influence.

Aryee et al. (2002) reported trust mediates the relationship between justice and work outcomes. They suggested organizational justice generates organizational trust, which leads to more favorable work outcomes. Korsgaard, Schweiger, and Sapienza (1995) examined middle- and upper-level management teams at Fortune 500 companies and linked procedural justice to the development of trust and commitment to change. The authors stated, “We found that when team leaders showed strong consideration of members' input, team members saw the process as fairer, and consequently, had greater commitment to the decision, greater attachment to the team, and greater trust in the leader” (p. 76). Similarly, Oreg (2006) showed trust in management negatively correlated to affective, cognitive, and behavioral resistance to change. Organizational justice led to trust, which led to less resistance to change.

Colquitt (2001) developed a valid and reliable measure for organizational justice. The measure was validated in two separate studies including a survey of 301 students in a junior-level undergraduate management program and 337 employees in two plants in an automobile parts manufacturing company. The best fitting model to describe justice was a four-factor model. The four factors were procedural, interpersonal, informational, and distributive justice. Reliability for each factor was 0.93, 0.92, 0.90, and 0.93, respectively. In this model, informational justice had a significant positive correlation to both procedural (.60) and interactional (.64) justice. Although Colquitt separated out informational justice as a distinct form of justice, it is likely part of both procedural and interactional justice.

Information and participation are critical change process variables impacting resistance to change and the adoption of innovation. They are part of just process. Sharing information positively related to openness to change (Chawla & Kelloway, 2004) and trust in management (Oreg, 2006). Wanberg and Banas (2000) found a significant

correlation between employees' acceptance of organizational change and the amount of information disseminated about proposed changes. In addition, Wanberg and Banas (2000) showed a positive correlation between employees' positive view of change and the amount of participation the employees had in manifesting the change. Axtell et al. (2000) found participation in decision making was one of the strongest predictors of idea implementation. In addition, substantive participation positively influenced performance outcomes of teams (Cohen & Bailey, 1997). Ruppel and Harrington (2000) found open communication among managers and employees positively related to levels of trust in the organization.

Information and participation, as part of organizational justice, relate to skepticism and cynicism. The terms are similar, yet distinct. Skeptics doubt the substance of a communication while cynics doubt the substance of the communication and the motives behind it (Stanley, Meyer, & Topolnytsky, 2005). Cynicism can be generalized to people, be directed at management or be about a specific change. Cynicism strongly relates to resistance to change (Stanley et al., 2005). Stanley et al. (2005) labeled the types of cynicism as dispositional cynicism, management cynicism, and change-specific cynicism. Change-specific cynicism was more strongly associated with a person's intention to resist change than global cynicism (Stanley, Meyer, & Topolnytsky, 2005). Change-specific cynicism significantly correlated to resistance to change even with trust and skepticism controlled (Stanley et al., 2005). Albrecht (2003) found involvement in change and trust in management directly influenced cynicism toward change; in addition, he found information about change and involvement in change directly influenced trust in management. Qian and Daniels (2008), when studying a large university undergoing change as part of a strategic plan, found perceived quality of information and trust in administration negatively correlated to employee change-specific cynicism. They also found the perceived quality of information positively related to trust in administration.

Sharing information and allowing substantive participation are part of a change process that impacts perceptions of procedural justice. Trust likely mediates the interaction of procedural justice and the adoption of innovation. In reference to procedural injustice, Oreg (2006) stated it is “particularly likely to arouse behavioral responses beyond the affective and cognitive reactions that arise in response to distributive perceptions which deal with outcomes” (p. 93). Tyler (1994) stated, “Procedural justice is the primary justice judgment influencing affect and the willingness to accept third-party decisions” (p. 857). Procedural justice interacts with outcome favorability and influences worker attitudes (Brockner, Siegel, Daly, Tyler, & Martin, 1997). Brockner et al. stated, “Procedural fairness was more strongly related to individuals’ support for their supervisor when outcome favorability was relatively low” (p. 566). Fair process, which effects trust, becomes more important if failure is possible. Attempting innovation inherently increases the risk of failure and makes procedural justice more important.

Trust

The relationship between trust and innovation exists, in part, due to vulnerability perceived by employees engaged in innovative activities. Rousseau et al. (1998) defined trust as “a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another” (p. 395). Attempts at innovation may fail and leave the employee feeling vulnerable. The employer may react unfavorably. Employees may be more willing to attempt innovation if they trust their employer will reward attempts at innovation, even if such attempts fail. Put simply, the employee may be more willing to attempt innovation if they trust the employer. Similarly, Clegg et al. (2002) defined *innovation trust* as, “an expectancy of reasonable and positive reactions by others in response to individual innovation attempts” (p. 410). Attempts at adopting innovation must be supported by the organization, and individuals

within the organization must trust that the organization will support their efforts, even when they fail.

Nooteboom (2002) described trust as a four-part predicate where “someone (1) trusts someone (or something) (2) in some respect (3) depending on conditions such as the context of action (4)” (p. 38). Objects of trust include people, organizations, institutions, and systems. Using this schema, employees trust the organization or their supervisor to support their attempts at innovation even if the attempt results in failure. In this case, the employees are the *trustor* and the organization or supervisor is the *trustee*. It is the employer who must be deemed trustworthy by the employee, and it is the employee who determines the level of trust. Personal disposition toward trust, perception of outcome, and work context help determine how much trust an employee has in his/her employer.

Although disposition toward trust, also labeled trust propensity, plays a role in interpersonal trust within organizations, it is likely minor compared to work context. McKnight, Cummings, and Chervany, (1998) believed dispositional trust plays a larger role in situations where other information is limited. The authors stated, “One’s disposition to trust assumes things will work out successfully, and will only be salient until situational or personal facts are uncovered” (p. 483). Generally, people will have other information from which to base trust decisions. It is unlikely trust decisions are made without interaction with the other party(s). Others, such as Colquitt, Scott, and LePine (2007), have shown trust propensity is significant in predicting trust but minor compared to context. In doctors of chiropractic, Marchiori (2005) found no significant association between patient propensity to trust and the level of patient-provider trust.

Perception of outcome from engaging in innovative behavior also plays a role in determining employee trust. Notably, trust appears to be more significant during change processes when employees perceive a poor outcome as a possible result of the change. In a survey of 354 employees, Brockner et al. (1997) found the interaction between

procedural justice and outcome favorability was mediated by the interaction between trust and outcome favorability. Related to this, Clegg et al. (2002) found that employees are more likely to make change suggestions when they believe they will share in the benefits of change. Perceived outcome appears to matter when employees decide to attempt innovation, and trust appears to matter when outcome favorability is questionable.

According to Rousseau et al. (1998), vulnerability is a prerequisite for needing trust. If the outcome of a situation is known in advance to be positive, there is no need for trust. Vulnerability does not exist. Trust is needed when the outcome of an action is unknown and has the potential to be negative. For example, if employees know their actions will result in a positive outcome, they do not need to trust a supervisor. The employees would need to trust the supervisor to support them if a negative outcome was possible. The more likely that innovative attempts result in failure, the greater the need for trust. Using Nooteboom's (2002) characterization, the employee trusts the employer to support the employee under the condition of failed organizational change. The need for trust is linked to risk of failure. Possible failure is inherent with innovation; therefore, trust appears necessary for climates for innovation.

Another outcome of innovation can be conflict. In fact, organizations that embrace innovation experienced more conflict (Janssen, 2003). Trust appears to influence both conflict management and resistance to change. People are more accepting of conflict resolution when they trust the decision maker's motives (Tyler, 1994). When examining resistance to change, Oreg (2006) stated, "Of all antecedents, trust in management was the only variable that presented significant effects on all three resistance components, and a particularly strong effect on employees' cognitive evaluation of the change" (p. 93). Trust has also been shown to mediate the relationship between justice and antisocial responses (Chory & Hubbell, 2008). Chory and Hubbell (2008) surveyed employees about performance evaluations and found that perceptions of

diminished trust predicted hostility. Again, an organizational climate with high levels of trust may positively relate to a climate for innovation.

Colquitt et al. (2007) reported trustworthiness is a combination of the trustor's belief in the ability and character of the trustee. Ability referred to the knowledge and skill needed to meet the expectation of the trustor. Character of the trustee had been defined as the product of trustor benevolence and integrity (Mayer, Davis, & Schoorman, 1995). Benevolence was the trustee's desire to do good for the trustor, regardless of profit. Integrity was the degree to which the trustee adheres to ethical and moral standards. In other words, the trustee must be seen as loyal, caring (benevolent), and fair (integrity). When this perception exists, the employee predicts support during failed attempts at innovation. Employees accept vulnerability when they trust the employer is fair and benevolent.

Work context is what happens at the workplace. This is where the employee experiences justice or injustice in interaction, process, and outcome. This is where the employee experiences conflict. This is where the employee determines whether the employer seems benevolent. Work context is a primary source used by the employee to gather evidence from which to determine the trustworthiness of the trustee. Process variables such as sharing information (Qian & Daniels, 2008) and allowing participation (Albrecht, 2003) have been shown to increase trust levels. Implementation of change is more likely when employees trust that the organization listens to them (Clegg et al., 2002). Perception of organizational support, distributive justice, procedural justice, and interactional justice are antecedents to trust in leadership (Dirks & Ferrin, 2002). Van Dam et al. (2008) demonstrated a relationship between information, participation, trust in management, and resistance to change. The authors stated, "The three change process characteristics fully mediated the relationships of leader-member exchange and perceived developmental climate with resistance to change" (p. 326). Sharing information and

giving employees participation were work-contextual variables that led to trust. In turn, higher trust decreased resistance to change (Oreg, 2006).

Empirical evidence links trust to the adoption of innovation. Ruppel and Harrington (2000) surveyed 111 managers and found perceptions of commitment and innovation were linked to trust. Ellonen, Blomqvist, and Puumalainen (2008) found a strong relationship between trust in the institution and innovativeness. This relationship between institutional trust and innovativeness held for various types of innovativeness including product innovativeness, behavioral innovativeness, strategic innovativeness, and process innovativeness. Trust in other facets (employees and leadership) was significant, but trust in the institution had the strongest relationship to innovation.

In summary, trust appears to mediate the relationship between work-contextual variables and the climate for innovation. Trust has been linked to many positive outcomes within organizations. Trust in leadership was found to be positively related to job performance, organizational commitment, and job satisfaction (Dirks & Ferrin, 2002). Interpersonal trust positively affected organizational commitment and productivity (Nyhan, 2000). Germane to this review, trust was related to organizational innovation (Ellonen et al., 2008; Ruppel & Harrington, 2000). Work-contextual variables, especially those related to justice, help establish trust. Trust is a requisite for employees to feel comfortable with risk taking and engaging in innovative behavior.

Conflict

Conflict is a state of opposition between individuals or groups. Interpersonal conflict within organizations is inevitable because individuals or groups work interdependently. Interdependence occurs whenever individual and group outcomes depend not only on an individual's actions, but also on the actions of others. This is often the case in complex organizations. If one party in an interdependent relationship elects change, the other party is impacted. Conflict is the result. Adoption of innovation implies change with conflict as a potential outcome. Over time, co-workers develop task

relationships and expectations of one another. Innovations, new ideas, or practices challenge the established practices of coworkers. Coworkers have a vested interest in maintaining status quo and may work to prevent change. Janssen (2003) examined secondary school teachers and found a significant positive relationship between innovative behavior and conflict with co-workers. In addition, Janssen (2003) found conflict with co-workers had a significant negative impact on satisfaction with co-workers.

As Janssen (2003) found, conflict can be an outcome of innovation. This literature review previously discussed conflict as an outcome. Yet, conflict is also a work context variable acting as an antecedent to innovation (Anderson, De Drue, & Nijstad, 2004; Coser, 1957; Tjosvold et al., 2010). The positive outcomes/functions of conflict have been theorized for quite some time (Coser, 1957). Innovation is one of these (Tjosvold et al., 2010). Anderson et al. (2004) suggested a “distress-related innovation model” (p. 147) as a new approach to researching organizational innovation. They stated, “Threat and conflict, perhaps through stress, can stimulate innovation at the individual, group, and organizational levels of analysis” (p. 166). In this model, conflict is part of work context and encourages innovation. This model placed conflict as an antecedent to innovation rather than an outcome of innovation.

Whether conflict works as an antecedent promoting innovation or as an outcome of innovation relates to the cognitive distance present during adoption of innovation. A new idea or practice creates a *cognitive distance* that challenges employees. Nooteboom (2002) described cognitive distance in this way: “To the extent that people have developed their knowledge in different environments, and have not been in communication with each other, cognition will differ: there will be greater or lesser cognitive distance” (p. 25). Cognitive distance offers an advantage when partners can tell each other something new; yet cognitive distance becomes dysfunctional when the distance is too large for comprehension. Nooteboom (2002) stated optimal cognitive

distance “has to be sufficiently large to yield novel insights, but not too large to preclude mutual understanding” (p. 201). Optimal cognitive distance allows mutual understanding and minimizes conflict. Cognitive distance that is too large produces conflict as a dysfunctional outcome.

Conflict management style can assuage dysfunctional outcomes and increase the utility of conflict (Song et al., 2006). Conflict management style is a strong predictor of procedural, interactional and distributive justice within organizations, which positively relate to innovation (Tjosvold et al., 2010). Many have attempted to categorize conflict management styles. Follett (1924) categorized conflict management styles as domination, compromise, or integration. Blake and Mouton (1964) listed conflict management styles as forcing, withdrawing, smoothing, compromising, and problem solving. Rahim (1983) simplified styles by categorizing conflict management into two areas: concern for self and concern for others. Each category gauges the degree to which a person endeavors to satisfy their desired outcomes. Singular concern occurs when a person demonstrates concern for only one party during conflict situations. Dual concern occurs when a person demonstrates concern for both parties in conflict situations.

Subcategories of conflict management result from different levels and combinations of self-concern and concern for others (Rahim, 2002). Integrating style implies high concern for self and high concern for others. Integrative conflict management style involves problem solving where there is openness and exchange of information. The desired outcome is an effective solution that is acceptable to both parties. This type of management style is analogous to a win/win strategy. Obliging style implies low concern for self and high concern for the other party. Obliging style attempts to minimize differences. This style occurs when one party essentially gives in and does not achieve their desired outcomes allowing the opposing party to attain their outcomes. This type of management style is analogous to a lose/win strategy. Dominating style implies a high concern for self and low concern for others. Forcing or

coercive behavior is associated with this style of conflict management. This type of management style is analogous to a win/lose strategy. Avoiding style implies low concern for self and low concern for the other party. Avoiding has the individual or group withdrawing from or ignoring the conflict situation. This type of management style is analogous to a lose/lose strategy. Compromising style implies intermediate concern for self and intermediate concern for the other party. Bargaining occurs where each party makes concessions in order to reach a mutually acceptable outcome.

The choice of conflict management style depends upon many variables. More masculine individuals use dominating style while more feminine individuals use avoiding style (Brewer, Mitchell, & Weber, 2002). Upper organizational status individuals were more likely to use integrative strategies while lower organizational status individuals are more likely to use avoiding and obliging strategies (Brewer et al., 2002). Desivilya and Yagil (2005) found negative emotions toward team members predicted dominating and avoiding conflict management style choices while positive emotions predicted integrating and compromising styles. The authors concluded, "The team members' perception of the nature of conflict issues they have encountered in the work group constitutes a significant antecedent of their emotional reactions, linking indirectly to their conflict management modes" (p. 66). Conflict management style also depends upon the parties in conflict. Rahim (1986) found organizational executives were more likely to use obliging with supervisors, integration with subordinates and compromising with peers. Individuals with higher self-efficacy tended to use integrative conflict management with peers, while individuals with low self-efficacy tended to use obliging and avoiding with supervisors (Ergenelli, Camgoz, & Karapinar, 2010). Rahim et al. (2000) found employees were more likely to use an integrative conflict management style when supervisors treated them fairly. The authors also found interactional justice was less important when distributive justice favored the employee and when employees perceived low levels of procedural justice. A person's level of moral development also predicts their choice of

conflict management style. Using Rest's Defining Issues Test to assess moral development, Rahim and Buntzman (1999) found the highest stage of moral development was associated with using an integrative style of managing interpersonal conflict. Moderate moral development was associated with using compromising. Low moral development was associated with using dominating and avoiding styles. Bechtoldt, De Dreu, Nijstad, and Zapf (2010) found individuals with high self-concept clarity demonstrated more cooperative problem-solving behavior than individuals with low self-concept clarity. The authors defined self-concept clarity as, "the extent to which the contents of an individual's self-concept (e.g. perceived personal attributes) are clearly and confidently defined, internally consistent, and temporally stable" (Bechtoldt et al., 2010, p. 141).

The effectiveness of conflict management depends upon work tasks, group characteristics, and type of conflict. Adopting innovation implies working with non-routine work tasks. Jehn (1995) found cognitive conflict beneficial in groups performing non-routine tasks but destructive in groups performing routine tasks. After studying 105 work groups and management teams, Jehn (1995) stated, "Results show that whether conflict was beneficial depended on the type of conflict and the structure of the group in terms of task type, task interdependence, and group norms" (p. 256). Alper, Tjosvold and Law (2000) found self-managed teams utilizing cooperative conflict management styles had greater conflict-efficacy and were rated as more effective by supervisors. When surveying members of a clinical medical department at a major Southeastern university, Friedman, Curral, and Tsai (2000) found a negative relationship between integrative conflict management and task conflict. In their review of literature, De Dreu and Van Vianen (2001) found avoidance was a more effective conflict management style when teams were dealing with relationship conflict. They found collaborating and contending responses to relationship conflict related negatively to team functioning. Teams using competitive conflict management styles had lower conflict efficacy and were rated as less

effective by supervisors. Johnson (1986) studied nurse administrators and found an average amount and intensity of conflict compared to a lower amount and intensity of conflict was associated with higher perceived conflict utility.

The type of conflict management style influences whether conflict is constructive or destructive, which in turn may predict innovative performance. Tjosvold et al. (2010) found a significant positive correlation between a cooperative approach to managing conflict and organizational justice. Song et al. (2006) examined 290 research, development, and marketing department managers and found integrating and accommodating conflict management styles were positively related to constructive conflict while forcing and avoiding conflict management styles were positively associated with destructive conflict. They also showed a significant negative relationship between destructive conflict and innovation performance and a significant positive relationship between constructive conflict and innovation performance.

The dynamic between conflict and innovation is complicated. Conflict is inevitable in organizations. It can be categorized as affective, dealing with emotion or relationships, or cognitive, dealing with tasks. Despite the distinction, task conflict strongly relates to relationship conflict (De Dreu & Weingart, 2003; Friedman et al., 2000). The choice of conflict management style is influenced by the type of conflict (Desivilya & Yagil, 2005), the characteristics of the parties involved (Rahim, 1986; Rahim & Buntzman, 1999) and perceptions of procedural justice (Rahim et al., 2000). Conversely, the type of conflict and perceptions of fairness are impacted by the choice of conflict management style (Friedman et al., 2000; Tjosvold et al., 2010).

Conflict may only be constructive under limited circumstances. Cognitive conflict that is managed in a cooperative, integrative manner within higher level autonomous workgroups may produce a constructive outcome. A meta-analysis by De Dreu and Weingart (2003) offered a pessimistic view of the utility of conflict. The authors stated, "No differences between the two types of conflict were detected, and both have a

moderate and negative correlation with team performance” (p. 748). The meta-analysis found task and relationship conflict were equally disruptive to team performance. This was true even when the complexity and non-routineness of the group task was considered.

Conflict is inevitable in organizations where people have interdependent relationships. It can be an outcome of innovation or it can be part of work context that shapes perceptions of innovation. As a contextual variable, the choice of conflict management style is critical in determining perceptions of justice and innovation. Tjosvold et al. (2010) surveyed 206 companies, including 103 customer organizations and 103 supplier organizations. They found cooperative conflict management style positively related to procedural justice, which in turn positively related to organizational innovation. Song et al. (2006) surveyed 800 firms and found compromising, forcing, and avoiding conflict management styles led to destructive conflict, which in turn led to decreased innovation. Conversely, they found integrative conflict management led to constructive conflict and higher innovative performance. The authors stated, “We find a strong positive association between constructive conflict and innovation performance and a strong negative association between destructive conflict and innovation performance” (Song et al., 2006, p. 352). Conflict and conflict management style are part of work context that shape perceptions of justice and influence the climate for innovation.

Leadership

Organizational leaders impact organizational climates. Van Dam et al. (2008) found a significant negative correlation between leader-member exchange relationship (LMX) and resistance to change. Better relationships between leaders and members can facilitate change. In this study, LMX had a significant positive correlation to information, participation, and trust in management. The authors stated, “The three change process characteristics fully mediated the relationships of LMX and perceived

developmental climate with resistance to change” (p. 326). A measurement of trust and procedural justice may be more telling than a measurement of leadership.

There are many classifications of leadership, but transformational leadership is most relevant when discussing organizational change or innovation. Transformational leadership is defined as “behaviors of leaders who motivate followers to perform and identify with organizational goals and interests and who have the capacity to motivate employees beyond expected levels of work performance” (Sarros, Cooper, & Santora, 2008, p. 146). Using a six-factor instrument to measure transformational leadership, Sarros et al. (2008) found the ability to articulate a vision was the most impactful variable associated with creating a climate for innovation. Earlier research by Scott and Bruce (1994) came to similar conclusions. They stated, “The study variable most highly related to dimensions of climate support for innovation and resource supply was leader-member exchange” (p. 594). In this study, characteristics of a LMX supportive of innovation were high levels of support, trust, and autonomy. Again, organizational justice and trust were important in establishing a climate for innovation.

Ross and Grey (2006) stated, “Organizational theorists attribute the effects of transformational leadership to social identification” (p. 184). Social identification implies establishing relationships with employees. Leaders have low and/or high quality relationships with employees. Low quality relationships involve simple interactions that fall under the basic employment contract. High quality relationships involve liking, loyalty, and professional respect. In addition, high quality relationships are characterized by higher goals, more feedback, and the integration of the employee into the leader’s personal network (Van Dam et al., 2008). Employees involved in high quality leader relationships may experience more impression motivation. In other words, employees in high quality relationships are motivated to keep a positive impression with leaders and preserve high quality relationships. Employees motivated to keep high quality relationships are more likely to support leader-supported organizational change.

Leaders likely impact the organizational climate for innovation. The most important leadership characteristics related to climate for innovation appear to be the ability to communicate a vision, assure organizational justice, and build/maintain employee trust. Empirical evidence (Van Dam, Oreg, & Schyns, 2008) (Scott & Bruce, 1994) indicated it is more appropriate to study the characteristics of leadership that impact innovation rather than leadership as a whole.

Summary

A climate for innovation is characterized by positive employee perceptions related to change. The shared perception surrounding innovation is influenced by what the employee brings to the organization, what happens to the employee at the organization and the change outcome predicted by the employee. In other words, climate for innovation is shaped by pre-existing attributes of employees, work context, and predicted change outcomes.

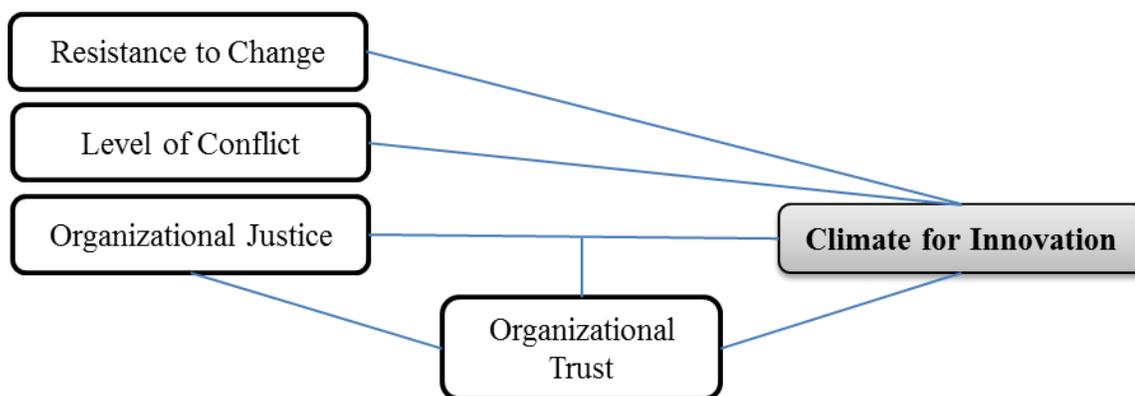


Figure II-1: Path Model of Climate for Innovation

The purpose of this study was to investigate the relationships between personal disposition toward change, level of organizational conflict, procedural justice, distributive justice, interpersonal justice, trust in the supervisor, organizational trust, and the climate

for innovation at chiropractic colleges. Figure II-1 depicts the proposed interaction between the variables.

Personal disposition toward change is predicted to directly relate to climate for innovation. Higher levels of conflict are predicted to negatively associate with climate for innovation. The relationship between justice and climate for innovation is expected to be mediated by trust. Higher perceptions of just processes, interactions, and outcomes are predicted to generate higher levels of trust in the organization, which is predicted to positively relate to the climate for innovation.

CHAPTER III

METHODOLOGY

This chapter includes a description of the methodology used to investigate faculty perceptions of organizational climate for innovation. The first section delineates the universe of participants and data collection. The second section includes a description of the measurement tools. The last section includes information on the statistical procedures used to analyze the survey results.

Threats to internal validity are minimized by study design. Subject history as a threat to internal validity is minimized because the study's framework includes a measure of personal disposition toward resistance to change. The singular measurement avoids any pre-test/post-test bias. The data were collected from college/university faculty, who may have unique cultural and environmental experiences.

Participants and Data Collection

Survey respondents for this study were full-time college faculty employed at United States chiropractic colleges, United States health science universities offering a doctor of chiropractic program, or Canadian Memorial Chiropractic College. A complete list of the chiropractic colleges and health science universities surveyed in this study can be found in Appendix A. The online survey was distributed using SurveyMonkey. Written permission to survey faculty was obtained from all chiropractic college and health science university administrations prior to launching the survey. Participants initially received an email informing them of the forthcoming survey. The survey contained an opening statement, which included the purpose of the study and the elements of informed consent. The first survey item was the option to consent or not to participate. Because online surveys typically have lower response rates than mail surveys (Cook, Heath, & Thompson, 2000; Nulty, 2008), efforts were made to boost the response rate. The difference in response rates between web-based and mail surveys averages about 10%, but there is considerable variation where web-based survey response rates

sometimes exceed mail survey response rates (Shih & Fan, 2008). Three repeat reminder emails were sent to non-respondents. Reminders have been shown to increase web survey response rates (Kaplowitz, Hadlock, & Levine, 2004). In combination with reminders, incentives have been shown to increase response rates to web surveys (Nulty, 2008). No incentives were given to participants in this study. Hart, Brennan, Sym, and Larson (2009) found personalized pre-notification did not affect the electronic survey response rates. Personalized pre-notification was performed for this survey.

Measurement Tools

The survey instrument containing all measures can be found in Appendix B.

Table III-1 provides a list of the study variables and their measurement tools.

Table III-1. Study Variables

Variable	Measurement Tool	Reference
Climate for Innovation (Dependent Variable)	Climate for Innovation Measure	(Scott & Bruce, 1994)
Disposition toward Change	Resistance to Change	(Oreg, 2003)
Procedural Justice	Dimensionality of Organizational Justice Measure	(Colquitt, 2001)
Distributive Justice	Dimensionality of Organizational Justice Measure	(Colquitt, 2001)
Interpersonal Justice	Dimensionality of Organizational Justice Measure	(Colquitt, 2001)
Level of Conflict	Non-established instrument	
Trust in the Supervisor	Organizational Trust Inventory Scale (OTI)	(Nyhan & Marlowe, 1997)
Organizational Trust	Organizational Trust Inventory Scale (OTI)	(Nyhan & Marlowe, 1997)

Climate for Innovation

Climate for innovation was measured using the Climate for Innovation measure developed by Scott and Bruce (1994). The instrument is a 26-item measure and is a

modification and extension of Siegel and Kaemmerer's (1978) Siegel Scale of Support for Innovation (SSSI). The SSSI is a three-factor model which involves support for creativity, tolerance of differences, and personal commitment. Scott and Bruce's instrument has two factors: support for innovation and resource supply. Personal commitment from the SSSI was omitted from the Climate for Innovation model as the authors reasoned that personal commitment is an outcome rather than a dimension of climate. Support for innovation measures employees' perception of the organization's openness to change, supportiveness of new ideas from employees, and tolerance for employee diversity. Resource supply measures employees' perception of the adequacy of resources (personnel, funding, time). Cronbach's alpha for support for innovation and resource supply were .92 and .77, respectively. Scott and Bruce's (1994) publication has been cited 1757 times in subsequent publications (Google Scholar, 2013).

Personal Disposition Toward Change

An instrument to measure personal disposition to resistance to change has been developed and has been shown to have convergent, discriminant, and predictive validity (Oreg, 2003). Additionally, the instrument has cross-national validity (Oreg et al., 2008). Oreg (2003) developed the resistance to change scale to "tap an individual's tendency to resist or avoid making changes, to devalue change generally, and to find change aversive across diverse contexts and types of change" (p. 680). The exploratory factor analysis used to develop the instrument yielded a four-factor model, including routine seeking, emotional reaction, short-term focus, and cognitive rigidity. Routine seeking measures the extent routines are incorporated into the person's life. Emotional reaction measures the emotional reaction to imposed change. Short-term focus measures the perception of immediate inconvenience or adverse effect of change. Finally, cognitive rigidity measures the ease and frequency with which the person changes his/her mind. Total scale reliability coefficient alpha (Cronbach's) was equal to .92 (Oreg, 2003). The

reliability coefficient alphas for routine seeking, emotional reaction, short-term focus, and cognitive rigidity were 0.89, 0.86, 0.71, and 0.68, respectively (Oreg, 2003).

Level of Organizational Conflict

Faculty perception of the level of conflict within their organizations was not measured by an established instrument. Faculty members were asked to subjectively rate the level of interpersonal conflict between faculty and between faculty and administrators.

Organizational Justice

Procedural, interpersonal, and distributive justices were measured using the Dimensionality of Organizational Justice measure developed by Colquitt (2001). The measure is a four factor model for measuring justice. The four factors are procedural, interpersonal, informational, and distributive justice. Reliability for each factor is 0.93, 0.92, 0.90, and 0.93, respectively. In this model, informational justice has a significant positive correlation to both procedural (.60) and interactional (.64) justice (Colquitt, 2001). The measure of procedural justice consists of seven questions. The measure for distributive (outcome) justice consists of four questions. The measure for interpersonal justice (interaction) consists of four questions.

Trust in the Organization/Trust in the Supervisor

Organizational trust and trust in the supervisor was measured with the Organizational Trust Inventory scale (Nyhan & Marlowe, 1997). Exploratory factor analysis yielded a two-factor model including trust in supervisor and trust in the organization. Cronbach's alphas ranged from .92 to .96. The model was shown to have both convergent and discriminant validity. Nyhan and Marlowe (1997) tested the instrument on three different groups and found the instrument to be reliable. The authors stated:

The results of these seven case studies demonstrate that the OTI is psychometrically adequate and stable and can be used as a reliable and valid two-dimensional measure of a person's trust in his or her supervisor and trust in the organization as a whole. (p. 629)

Control Variables

Age, gender, minority status, academic rank, years in higher education, years at their current institution, area of assignment, and union status served as control variables for this study. Area of assignment for chiropractic faculty is categorized as administrative, basic science, clinical science, patient care, or research assignment. Because these demographic variables may impact perception of organizational support for innovation, they are important to consider and need to be controlled when studying the potential impact of other proposed independent variables.

Even though commitment to an organization and commitment to change are distinct (Herscovitch & Meyer, 2002), the relationship between commitment and demographic variables is relevant. Meyer et al. (2002) found the correlation between demographic variables and organizational commitment was generally low. Their meta-analysis did reveal a weak positive correlation between organizational commitment and age and tenure (organization and position). Marchiori and Henkin (2004) found positive relationships between age, academic rank, years in higher education, years at their current institution, and chiropractic faculty commitment to their organizations. The relationship for all variables was stronger for continuance commitment versus affective commitment. In a separate study, Marchiori and Henkin (2003) found no impact on chiropractic faculty empowerment by age, sex, academic rank, employment status or area of assignment.

After performing a meta-analysis examining the relationships between age and job performance, Ng and Feldman (2008) stated, “Older workers appear to engage in fewer counterproductive work behaviors in general and exhibit less workplace aggression, on-the-job substance use, tardiness, and voluntary absence in particular” (p. 403). The same authors found a negative relationship between age and training performance. They believe the age–training performance relationship may have been confounded by different attitudes toward new technology. Including age in this study may provide additional insight into the relationship between age and job performance.

Statistical Methods

Statistical analysis was conducted to determine how the variables within this study interacted with an organizational climate for innovation at chiropractic colleges and health sciences universities offering a doctor of chiropractic program. This study included resistance to change, interpersonal conflict, justice, and demographics (age, gender, minority status, academic rank, years in higher education, years at their current institution, and area of assignment) as independent variables. Organizational trust and trust in the supervisor were hypothesized as intervening variables. Climate for innovation was the dependent variable.

Descriptive statistics including means, ranges, and standard deviations were calculated. The data set was first tested for multicollinearity and normality. Subsequently, existing factor structures for justice, resistance to change, trust, and climate for innovation were tested with confirmatory factor analysis (CFA). The instruments used to measure justice, resistance to change, trust, and climate for innovation were initially developed by other researchers using exploratory factor analysis (EFA). EFA establishes a small number of variables or *factors* that effectively convey the information present in a large number of variables (test or survey questions). The purpose of EFA is to reduce a large number of variables into a smaller number of factors for modeling purposes. The measures used within this study were developed and validated by prior research using exploratory and subsequent CFAs. CFA is used to verify that indicators (survey questions) sort themselves into factors corresponding to how the measurement tools had previously associated indicators into factors. In other words, CFA checks that data from the current research sort into factors in a similar manner as shown in the original research's EFA.

A review of literature was used to establish the path model illustrated by Figure II-1. The hypothesized model was tested using structural equation modeling (SEM) and goodness-of-fit (GIF) testing. Raykov and Marcoulides (2006) stated, "The models are

usually, and should best be, based on existing or proposed theories that describe and explain phenomena under investigation” (p. 6). Each variable in the model (latent variable) was represented by a measure (observed variable) with multiple indicators (survey questions). For example, justice is a latent variable represented by a number of responses to survey questions. SEM is used to determine if the pattern of variances and covariances in the data set was consistent with the structural model proposed. An advantage of SEM is that it allows modeling of mediating variables rather than being restricted to an additive model. Schumacker and Lomax (2004) stated, “Path models use correlation coefficients and regression analysis to model more complex relationships among observed variables” (p. 5). GFI testing was performed to determine if the model should be accepted or rejected. GFI testing measures how close observed values are to those predicted under the fitted model. Regression analysis was used to assess each of the independent variables for their explanatory power related to a climate for innovation.

Factor Analysis

Because the analysis within the current study focused on previously known established factor structures, CFA was performed. Best practices in CFA research indicate that in the event that the previously established factor structures fail to adequately explain the data, an EFA and subsequent CFAs are needed to cross-validate a new factor structure (Dimitrov, 2010, 2012). To achieve this, the starting sample was split into two random samples. The first random sample was used for CFA of the *a priori* factor structures. In the event of a poorly fitted model, the same random sample was used to conduct an EFA. Modification indices ≥ 10.0 from the robust maximum likelihood estimator (MLM) output were used to guide the EFA process in model revision toward appropriate specification. Because of the data’s violation of multivariate normality, the robust maximum likelihood estimator was used (Muthen, Muthen, & Muthen, 2010). Although typically used with continuous variables, an additional advantage of using the MLM estimator is its ability to estimate categorical variables with four or more response

levels (Rhemtulla, Brosseau-Liard, & Savalei, 2012). The goodness-of-fit indices were consulted to guide judgment of model specification. The second random sample was used to cross-validate any factor structures discovered during EFA.

Cronbach's alpha was utilized to assess the internal consistency of the factors once cross-validated. Factors measuring affective, non-aptitude data should meet or exceed a reliability threshold of .75 (Dimitrov, 2012). In accordance to best practices in psychometric reporting, along with each factor's alpha (α) the scale mean, variance, and number of items (k) are also reported (Shields & Caruso, 2003, 2004).

Goodness-of-Fit Indices

Following best practices in SEM research, a variety of GFI indices were used to assess model fit (Kline, 2005). Reported GFIs are Chi Square Model Fit Statistics (X^2), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Standardized Root Mean Square Residual (SRMR). A disadvantage of the chi square model fit test is the test's sensitivity to sample size. Larger sample sizes analyzed with chi square fit testing frequently yield significant p-values that can result in erroneous judgments of model misspecification (Kline, 2005). According to Kline (2005), large samples are those exceeding 200 cases. Although RMSEA is a function of chi square statistics, an advantage of RMSEA over other GFIs is decreased sensitivity to both variations in the number of indicators per factor and number of factors in the model. However, smaller models with fewer factors and observed indicators tend to produce larger RMSEA standard errors (Dimitrov, 2012). Smaller models may inflate the RMSEA estimates that may result in an erroneous judgment of model misspecification. An advantage of CFI is that it has been found to exhibit decreased sensitivity to sample size and increased sensitivity to model variance when compared to chi-square-based tests (Meade, Johnson, & Braddy, 2008). The TLI adds a penalty for the addition of freely estimated parameters that do not substantially improve model fit, while also compensating for model complexity (Dimitrov, 2012). One

disadvantage of SRMR is that as sample sizes and model parameters increase, SRMR values tend to decrease, which may lead the investigator to conclude an adequate model specification when the model may be misspecified.

Taking into consideration the strengths and weaknesses presented above, GFI examination focused on CFI and TLI. The following GFI guidelines were used to assess model fit. A good fitted model will exhibit a RMSEA of $\leq .06$, CFI and TLI $\geq .95$ and SRMR $\leq .08$ (Hu & Bentler, 1999). A reasonably fitted model would exhibit a RMSEA of $\leq .08$ and a CFI and TLI $\geq .90$ (Marsh, Hau, & Wen, 2004). For CFI and TLI, the following interpretation of scores were considered: $\leq .85$ is an inadequate fitted model, $.85$ to $.89$ is a mediocre fitted model, $.90$ to $.95$ is an adequate fitted model, $.95$ to $.99$ is a close fitted model, and a CFI or TLI equal to 1.00 is an exact fitted model (Dimitrov, 2012).

Path Analysis

After the appropriate specification of factor structures for resistance to change, trust, justice, and climate for innovation occurred, path analytics were used to examine the relationships between the study variables. Because the data for the current study represent a concurrent data collection, the path analytic models were guided by existing theoretical or experiential relationships (Kline, 2005). Assessment of the path analytic models occurred using GFI indices in conjunction with regression coefficients, and percent of variance accounted for by the model (R^2). Although MPlus does not directly report R^2 for dependent variables, it does report the total amount of unexplained variance, standardized residual variance (SRV). R^2 can be calculated by using the following formula $(1 - \text{SRV})$ (Kline, 2005). Examining both GFI and typical regression statistics allowed for a multifaceted examination of both model fit as well as the potential predictive power of factors within the model (Kline, 2005).

Just as theory guides CFA, path analysis is also guided by prior knowledge. The prior literature review helped guide the theorized path model. In addition, prior

knowledge should guide the interpretive validity of the model. Statistical analysis of the model may yield a good fit, yet the model may not make sense. In this case the model would lack interpretive validity. Kline (2005) explained that it is possible that a path model may adequately explain the data, but interpretively, it theoretically may make little sense.

In addition to GFIs named above, the Akaike Information Criterion (AIC) was inspected for comparison of path models. The AIC provides estimates of the predictive power for successively compared path models. When comparing multiple path models, the model with the smallest AIC is the one that exhibits the greatest predictive power (Kline, 2005).

CHAPTER IV

RESULTS

This chapter includes the data analysis and reports the findings of the study. First, descriptive statistics and the outcomes of normality and multicollinearity testing are reported. Second, the relationship between demographic variables and climate for innovation is reported. Third, the results of instrument validation and construction are described. Finally, the path analysis is interpreted. The study variables are represented by the following symbols as shown in Table IV-1.

Table IV-1: Symbols for Study Variables

Symbol	Name
Age	Age of Respondents
Gender	Gender of Respondents
Race	Race of Respondents
EDU	Education of Respondents
ASGN	Area of Assignment
Rank	Faculty Rank
Union	Union Status
RTC	Resistance to Change
ERxn	Emotional Reaction
RSeek	Routine Seeking
DJust	Distributive Justice
PJust	Procedural Justice
IJust	Interpersonal Justice
OTrust	Trust in the Organization
STrust	Trust in the Supervisor
FFcon	Conflict between Faculty
FAcon	Conflict between Faculty and Administration
CLFI	Climate for Innovation
SFI	Support for Innovation
RS	Resource Supply

Descriptive Statistics

The survey was sent to 1003 individuals employed at either United States chiropractic colleges, health sciences universities offering a doctor of chiropractic program, or Canadian Memorial Chiropractic College. The total number of individuals responding to the survey was 500, yielding a response rate of 49.9%. The majority of participants were above the age of 50. Males represented more than 60% of the participants. Over 90% of the participants were white. Over 90% of participants had doctoral-level education. A minority, 23% of participants, belonged to a union. Table IV-2 details the descriptive statistics.

Normality and Multicollinearity

Data were tested for multicollinearity by iteratively regressing all observed variables against all other observed variables (Schroeder, 1990) within the framework of each *a priori* factor structure (resistance to change, justice, and climate for innovation) and inspecting the variance inflation factors (VIF) for values over 10.0. The data did not violate the assumption of multicollinearity. The data were tested for normality in a stepwise process to satisfy all the prerequisites of multivariate normality. Assessment of univariate normality should be followed by testing for bivariate normality and finally multivariate normality (Burdenski, 2000) to assure normal distribution of the data. A review of Q-Q plots and corresponding Shapiro-Wilk tests for all variables indicated the data were not univariate normally distributed. Univariate normality is the first basic requirement for multivariate normality.

Table IV-2: Descriptive Statistics

	Overall Sample	RS1	RS2
Age			
20-30	2.8%	3.0%	2.5%
30-40	15.2%	18.7%	11.9%
40-50	26.4%	24.8%	28.0%
50-60	34.8%	32.6%	36.9%
Over 60	20.8%	20.9%	20.8%
Gender			
Male	61.9%	57.2%	66.5%
Female	38.1%	42.8%	33.5%
Race/Ethnicity			
Hispanic or Latino	1.7%	1.8%	1.7%
American Indian or Alaska Native	0.2%	--	0.4%
Asian	4.6%	4.8%	4.3%
African American	1.1%	1.8%	0.4%
White	92.4%	91.6%	93.1%
Education			
Associate's Degree	0.2%	0.4%	--
Bachelor's Degree	1.3%	1.3%	1.3%
Master's Degree	8.0%	7.4%	8.6%
Academic Doctorate	10.3%	12.6%	8.2%
Clinical Doctorate	72.8%	71.9%	73.8%
Both Clinical and Academic Doctorate	7.3%	6.5%	8.2%
Assignment			
Administrative	12.9%	13.0%	12.8%
Basic Science	16.5%	16.0%	17.0%
Clinical Science	46.6%	48.1%	45.1%
Patient Care	13.7%	10.4%	17.0%
Research	5.8%	6.9%	4.7%
Other	4.5%	5.6%	3.4%
Rank			
No Academic Rank	6.7%	6.6%	6.9%
Instructor	12.0%	14.0%	9.9%
Assistant Professor	26.1%	26.8%	25.4%
Associate Professor	30.4%	27.2%	33.6%
Professor	24.8%	25.4%	24.1%
Union			
Yes	23.0%	21.1%	24.9%
No	77.0%	78.9%	75.1%

Note: RS1 = Random Sample 1 and RS2 = Random Sample 2.

Demographic Variables and Climate for Innovation

Table IV-3 reports all regression beta weights, t statistics and p-values for the linear regressions completed for demographic variables and Climate for Innovation (CLFI) factors. Regression analysis indicated that none of the demographic variables significantly predicted the SFI factor of CLFI. Concerning the CLFI factor Resource Supply (RS), both age ($p < .05$) and gender predicted RS ($p < .05$). Age exhibited a positive relationship with RS, indicating as an employee's age increases, so does their positive appraisal of RS. Conversely, an inverse relationship for gender and RS indicates that women have a less positive appraisal of RS in comparison to men.

Table IV-3: Regression Coefficients (β), t Statistic (t) and p-values for Demographic Variables' Prediction of the Two Factors for Climate for Innovation

	β	t	p
Support for Innovation (SFI)			
Age	.115	1.923	.055
Gender	.039	.740	.460
Race	.011	.223	.824
Education	-.019	-.362	.718
Assignment	-.028	-.551	.582
Rank	-.085	-1.430	.154
Union	.019	.363	.717
Resource Supply (RS)			
Age	.144	2.440	.015*
Gender	-.108	-2.093	.037*
Race	-.022	-.430	.667
Education	-.079	-1.553	.121
Assignment	-.037	-.723	.470
Rank	-.087	-1.483	.139
Union	.045	.887	.376

Note: * $p < .05$

Instrument Validation and Construction

The first step in validating previously established instruments was to perform a confirmatory factor analysis (CFA) on each of the known factor structures. Resistance to change, justice, trust, and climate for innovation have all been shown to be second-order factor structures. Oreg (2003) had established a four-factor model representing resistance to change. The factors included routine seeking, emotional reaction, short-term focus, and rigidity. Colquitt (2001) established a four-factor model representing organizational justice. The 4 factors included: procedural justice, interpersonal justice, informational justice, and distributive justice. Nyhan and Marlowe (1997) developed the Organizational Trust Inventory scale and found a two-factor solution. The factors were trust in supervisor and trust in the organization. Scott and Bruce (1994) established a two-factor model representing climate for innovation. The factors included support for innovation and resource supply.

A Priori Confirmatory Factor Analyses

All *a priori* factors are second-order factor structures. Table IV-4 reports all CFA GFIs. When the four *a priori* factor structures were tested as second-order factor structures, the factor structures for trust and climate for innovation were not identified. A factor structure that is not identified, or underidentified, is one where there are multiple solutions, none of which is truly unique (Kline, 2005). Underidentification prevented model estimation techniques and indicated model misspecification. Examination of GFIs for the resistance to change factor structure indicated a mediocre model fit with CFI and TLI close to .90 and $RMSEA \leq .08$. The variance for the first order factor *short-term focus* was negative, indicating a problem with the model. Therefore, the proposed model for resistance to change was misspecified. Unidentified or underidentified factor structures represent a failure to confirm the prior EFA. Negative variance and model misspecification indicate a problem with the model. These findings prompted EFAs and new CFAs for cross-validation on resistance to change, trust, and climate for innovation.

Table IV-4: CFA GFI Statistics for all *a priori* Factor Structures

	χ^2	Df	<i>p</i>	RMSEA	CFI	TLI	SRMR
Resistance to Change**	237.945	132	.000	.069	.901	.885	.062
Justice	193.515	87	.000	.085	.943	.931	.046
Trust*	--	--	--	--	--	--	--
Climate for Innovation*	--	--	--	--	--	--	--

Note: *Model was not identified and model estimation terminated; **Variance for the factor *short-term focus* was negative, indicating model misspecification issues.

The final second-order factor structure was justice. Assessment of GFIs indicated a reasonably fitted model with CFI and TLI between the .90 and .95 cut points. As such, the current study failed to disconfirm the second-order factor structure. The factors confirmed for justice were Distributive Justice (DJust), Procedural Justice (PJust), and Interpersonal Justice (IJust). Table IV-5 reports the factor loadings for justice.

Exploratory Factor Analysis

Three *a priori* factor structures were misspecified within the prior CFAs and required exploration with the data of the current population. Table IV-6 details the GFI statistics for all new EFA factor solutions. Re-exploration of the resistance to change factor structure occurred by first removing the factor *short-term focus*, due to the negative variance it exhibited. This second-order factor structure was not identified and prevented model estimation techniques resulting in model misspecification. After removing this second-order factor, a two-factor correlated, first-order solution was examined and indicated an adequately fitted model with CFI and TLI between .90 and .95. The first factor was Routine Seeking (RSeek) and the second factor was Emotional Reaction (ERxn) ($r = .582, p < .001$).

Table IV-5: CFA Standardized Factor Loadings (λ) for the Second Order Justice Structure.

Items	First-Order Factors			Second-Order Factor
	Distributive Justice	Procedural Justice	Interpersonal Justice	Justice
DJUST1	0.900	--	--	--
DJUST2	0.936	--	--	--
DJUST3	0.924	--	--	--
DJUST4	0.820	--	--	--
PJUST1	--	0.723	--	--
PJUST2	--	0.741	--	--
PJUST3	--	0.858	--	--
PJUST4	--	0.853	--	--
PJUST5	--	0.874	--	--
PJUST6	--	0.745	--	--
PJUST7	--	0.730	--	--
IJUST1	--	--	0.908	--
IJUST2	--	--	0.960	--
IJUST3	--	--	0.905	--
IJUST4	--	--	0.766	--
Distributive Justice	--	--	--	0.568
Procedural Justice	--	--	--	0.896
Interpersonal Justice	--	--	--	0.681

Note: All p-values are $< .001$

Table IV-6: GFI Statistics for all EFA Factor Solutions

	χ^2	Df	p	RMSEA	CFI	TLI	SRMR
Resistance to Change* Two Factor Correlated Solution	140.34	76	.000	.071	.917	.901	.06
Trust** Two Factor Correlated Solution	135.04	53	.000	.096	.937	.922	.046
Climate for Innovation*** Two Factor Correlated Solution	187.29	88	.000	.082	.908	.890	.062

Note: *RSeek and ERxn ($r = .582$); **OTrust and STrust ($r = .710$); *** RS and SFI ($r = .562$, $p < .001$).

Because the original trust second-order factor was not identified, re-exploration of this factor structure was conducted. This occurred by first removing the second-order factor and examining a two-factor correlated, first-order factor solution. This two-factor correlated solution adequately explained the data with CFI and TLI falling between .90 and .95. The two factors were Organizational Trust (OTrust) and Supervisor Trust (STrust) ($r = .710, p < .710$). A similar distinction between organizational trust and supervisor trust was noted by Aryee et al.(2002).

The final misspecified *a priori* model was the second-order climate for innovation factor structure. As with the other models, the second-order factor was removed and a correlated two-factor solution occurred. This resulted in a mediocre model fit with CFI and TLI between .89 and .91. Further revisions of the model, using the modification indices as a guide, did not improve model fit beyond this model. The correlated factors were Resource Supply (RS) and Support for Innovation (SFI) ($r = .562, p < .001$).

Cross-Validation of EFA Factor Structures

When the original CFA failed to confirm the *a priori* factor structures for RTC, Trust and CLFI, EFA was used to revise the factor structures. CFA was used to cross-validate the revised factor structures found using EFA. The second random sample was used for cross-validation. Table IV-7 reports all CFA and GFI statistics for cross-validated factor structures. Tables IV-8 through IV-10 report CFA factor loadings for all cross-validated models.

The two-factor correlated solution for RTC adequately explained the data within the cross-validation sample ($r = .586, p < .001$). CFI and TLI scores were within the .90 to .95 range, which implies adequate model fit. The results failed to disconfirm the RTC factor structure. Next, the two-factor correlated solution for trust adequately explained the data within the cross-validation sample ($r = .704, p < .001$). CFI and TLI scores were within the .90 and .95 range, which implies adequate model fit. The results failed to disconfirm the trust factor structure. Finally, cross-validation of the CLFI two-factor

correlated solution indicated a mediocre model fit ($r = .783, p < .001$). CFI and TLI scores were within the .85 to .89 range implying a mediocre model fit. The results failed to disconfirm the CLFI factor structure.

Table IV-7: GFI Statistics for all CFA Cross-Validated Factor Solutions

	χ^2	Df	p	RMSEA	CFI	TLI	SRMR
Resistance to Change* Two Factor Correlated Solution	122.077	76	.000	.064	.931	.918	.057
Trust** Two Factor Correlated Solution	124.867	53	.000	.096	.940	.925	.051
Climate for Innovation*** Two Factor Correlated Solution	191.986	88	.000	.090	.895	.875	.066

Note: *RS and ERxn ($r = .586$); **OTrust and STrust ($r = .704$); *** RS and SFI ($r = .783, p < .001$).

Tables IV-8: Cross-Validation CFA Standardized Factor Loadings (λ) for the First-Order RTC Structure

	Routine Seeking (RS)	Emotional Reaction (ERxn)
R1	0.629	--
R2	0.494	--
R3	0.616	--
R4	0.558	--
R5	0.752	--
R6	0.705	--
R7	0.750	--
R8	0.672	--
R9	--	0.737
R10	--	0.775
R11	--	0.774
R12	--	0.726
R13	--	0.597
R14	--	0.583

Note: All p-values are $< .001$; Factor RS is correlated with ERxn ($r = .586, p < .001$)

Table IV-9: Cross-Validation CFA Standardized Factor Loadings (λ) for the First-Order Trust Structure

	Organizational Trust (OTrust)	Supervisor Trust (STrust)
OTrust 1	.690	--
OTrust 2	.670	--
OTrust 3	.795	--
OTrust 4	.871	--
STrust 1	--	.876
STrust 2	--	.871
STrust 3	--	.769
STrust 4	--	.907
STrust 5	--	.937
STrust 6	--	.920
STrust 7	--	.927
STrust 8	--	.891

Note: All p-values are $< .001$; Factor STrust is correlated with Factor OTrust ($r = .704$, $p < .001$)

Table IV-10: Cross-Validation CFA Standardized Factor Loadings (λ) for the First-Order CLFI Structure

	Support for Innovation (SFI)**	Resource Supply (RS) **
CFI1	.801	--
CFI2	.819	--
CFI3	.726	--
CFI6	.783	--
CFI10	.809	--
CFI13	.734	--
CFI14	.673	--
CFI15	.658	--
CFI21	.603	--
CFI22	.604	--
CFI16	--	.792
CFI20	--	.728
CFI17	--	.522
CFI18	--	.497
CFI19	--	.662

Note: All factor loadings were significant at $p < .001$; The Factors SFI and RS are correlated ($r = .783$, $p < .001$)

Reliability of Cross-Validated Factor Structures

Table IV-11 lists the Cronbach's alpha reliability coefficients for all cross-validated factor structures. All the factors within this study fell between .75 and 1.0, exceeding established thresholds for this type of data (Dimitrov, 2012).

Table IV-11: Cronbach's Alpha Coefficients for all Cross-Validated Factor Structures

		alpha	Mean	Variance	k
Justice	Distributive Justice	.949	14.31	13.347	4
	Procedural Justice	.915	20.87	37.002	7
	Interpersonal Justice	.934	15.95	13.694	4
Resistance to Change	Routine Seeking	.747	22.53	22.455	8
	Emotional Reaction	.837	20.49	23.513	6
Trust	Supervisor Trust	.969	42.47	87.593	8
	Organizational Trust	.849	18.71	17.264	4
Climate for Innovation	Support for Innovation	.933	32.28	71.302	10
	Resource Support	.771	13.12	16.030	5

Exploratory Path Analytic Modeling

Exploration of the path models yielded several significant results. Assessment of the path analytic models occurred using GFIs in conjunction with regression coefficients (β), and percent of variance accounted for by the model (R^2). GFIs are reported in Table IV-12. Betas, standard errors, and p-values are reported in Table IV-13. Finally, R^2 and corresponding p-values for all exploratory path analytic models are reported in Table IV-14.

Table IV-12: GFI Statistics for all Explored Path Analytic Models

Explored Path Analytic Models	χ^2	df	<i>p</i>	RMSEA	CFI	TLI	SRMR	AIC
Trust with CFLI	485.193	317	.000	.072	.912	.903	.062	--
Justice with Trust	601.422	318	.000	.069	.936	.929	.056	--
Justice with CFLI	713.213	398	.000	.067	.926	.919	.060	11519.08
Justice with Trust on CFLI	1408.972	807	.000	.066	.905	.899	.561	16505.21
RTC and CFLI	557.086	370	.000	.070	.877	.864	.076	7746.064
RTC and CFLI mediated by Trust	1178.111	769	.000	.072	.856	.846	.085	11019.02
Conflict with CFLI	282.989	114	.000	.087	.087	.887	.058	8189.05
Conflict with CFLI mediated by trust	722.354	363	.000	.072	.907	.896	.055	13676.07

Table IV-13: Regression Coefficients (β), Standard Error (S.E.) and p-values for Exploratory Path Analytic Models

Path Analytic Model	Independent Factor	Dependent Factor	β	S.E.	<i>p</i>
Trust with CFLI	STrust	SFI	-.057	.051	.270
	OTrust	SFI	.587	.071	.000
	STrust	RS	.077	.077	.319
	OTrust	RS	.425	.090	.000
RTC and CFLI	RSeek	SFI	-.067	.125	.590
	ERxn	SFI	-.170	.122	.163
	RSeek	RS	.216	.147	.141
	ERxn	RS	-.329	.132	.013
Justice with Trust	Justice	OTrust	.905	.033	.000
	Justice	STrust	.628	.055	.000
Justice with CFLI	Justice	SFI	.831	.040	.000
	Justice	RS	.615	.048	.000
Conflict with CFLI	FFcon	SFI	.093	.089	.299
	FAcon	SFI	-.544	.065	.000
	FAcon	RS	-.376	.075	.000
	FFcon	RS	.055	.090	.539

Table IV-14: Explained Variance and p-value for each Exploratory Path Analytic Model

	Dependent Factor	R ²	p
RTC predicting CLFI	SFI	4.6%	.000
	RS	7.4%	.000
Conflict predicting CLFI	SFI	25.0%	.000
	RS	12.3%	.000
Trust predicting CLFI	SFI	67.9%	.000
	RS	40.5%	.000
Justice predicting CLFI	SFI	69.0%	.000
	RS	37.9%	.000
Justice predicting Trust	OTrust	82.0%	.003
	STrust	39.5%	.000

Resistance to Change and Climate for Innovation

The path analytic model for RTC predicting CLFI resulted in mediocre model fit with CFI and TLI values between .85 and .89. The AIC for this model was 7746.06. The RTC factor ERxn exhibited an inverse relationship and significantly predicted the CLFI RS factor ($\beta = -3.29, p < .05$). This model accounted for a small amount of variance in SFI ($R^2 = 4.7\%, p < .001$) and RS ($R^2 = 7.4\%, p < .001$).

The path analytic model depicting trust mediating the impact of RTC on CLFI exhibited a mediocre to poor fit to the data with CFI and TLI values between .80 and .89. The AIC score for this model was 11,019.02. This was larger than the path model without trust mediating the relationship between RTC and CLFI. AIC compares the goodness-of-fit difference between two different models. Lower AIC values indicate a better fit. This finding indicated that the model depicting RTC predicting CLFI had more predictive power when compared to a model with trust mediating the relationship.

Conflict and Climate for Innovation

Perception of conflict between faculty members (FFcon) and conflict between faculty and administration (FAcon) were examined for their influence on CLFI. The path

model of conflict predicting CLFI had a mediocre fit to the data with CFI and TLI between .85 and .89, with AIC = 8189.05. FAcon had an inverse relationship with and significantly predicted both CLFI factors, SFI ($\beta = -.54, p < .001$) and RS ($\beta = -.37, p < .001$). This model accounted for a small amount of variance in SFI ($R^2 = 25\%, p < .001$) and RS ($R^2 = 12\%, p < .001$).

The path analytic model depicting trust mediating the impact of the conflict on CLFI exhibited a mediocre fit to the data with CFI and TLI between .85 and .91. However, the AIC (13676.07) was greater than the path model without trust as a mediating variable. Again, higher AIC scores indicate poorer model fit. This finding indicated conflict negatively impacts the CLFI and trust as a mediating variable does not add predictive power.

Trust and Climate for Innovation

The path model of trust predicting CLFI adequately explained the data with CFI and TLI between .90 and .95. OTrust significantly predicted both SFI ($\beta = .587, p < .001$) and RS ($\beta = .425, p < .001$). This path model accounted for a large amount of the variance in SFI ($R^2 = 68\%, p < .001$) and RS ($R^2 = 41\%, p < .001$).

Justice and Climate for Innovation

The path model for justice predicting CLFI resulted in adequately fitted model with CFI and TLI between .90 and .95. The AIC was equal to 11,519.08. Justice significantly predicted both SFI ($\beta = .83, p < .001$) and RS ($\beta = .615, p < .001$). This model accounted for over two-thirds of the variance in SFI ($R^2 = 69\% p < .001$) and over one-third for RS ($R^2 = 38\%, p < .001$).

The path analytic model depicting trust mediating the impact of justice on CLFI exhibited a mediocre model fit with CFI and TLI between .89 and .90. The model with trust mediating the relationship between justice and CLFI resulted in a higher AIC score (16,505.21). This finding indicated trust does not add predictive power as a mediating

variable. In other words, the model depicting justice predicting CLFI has more predictive power when compared to the model with trust mediating justice's prediction of CLFI.

Justice and Trust

The path model for the second-order factor structure justice significantly predicting trust also adequately explained the data with a CFI and TLI between .90 and .95. Justice significantly predicted both OTrust ($\beta = .905, p < .001$) and STrust ($\beta = .628, p < .001$). This model accounted for a large amount of the variance in OTrust ($R^2 = 82\%, p < .01$) and STrust ($R^2 = 40\%, p < .001$).

Cross-Validation of Path Analytic Modeling

Cross-validation of all path models revealed similar trends found in the exploratory models. For instance, the trust factor structure did not mediate any of the relationships between the independent factor structures (e.g., RTC, justice, or conflict) and the dependent structure CLFI. Table IV-15 reports the GIFs; Table IV-16 reports the betas, standard errors and p-values; Table IV-17 reports the R^2 and corresponding p-values for all cross-validated path analytic models.

Table IV-15: GFI Statistics for all Cross-Validated Path Analytic Models

Explored Path Analytic Models	χ^2	df	p	RMSEA	CFI	TLI	SRMR	AIC
Trust with CFLI	521.91	317	.000	.082	.886	.874	.067	--
Justice with Trust	531.51	318	.000	.060	.947	.942	.047	--
Justice with CFLI	786.64	398	.000	.074	.897	.887	.061	11872.70
Justice with Trust on CFLI	1394.91	807	.000	.065	.898	.891	.060	16089.90
RTC and CFLI	548.90	370	.000	.071	.867	.854	.080	7166.34
RTC and CFLI mediated by Trust	1209.06	769	.000	.078	.832	.821	.092	10229.74
Conflict with CFLI	316.14	114	.000	.095	.880	.858	.070	8291.91
Conflict with CFLI mediated by Trust	798.86	363	.000	.080	.888	.875	.059	13170.12

Table IV-16: Regression Coefficients (β), Standard Error (S.E.) and p-values for Cross-Validated Path Analytic Models

Path Analytic Model	Independent Factor	Dependent Factor	β	S.E.	p
Trust with CFLI	STrust	SFI	-.124	.081	.126
	OTrust	SFI	.871	.081	.000
	STrust	RS	-.036	.087	.683
	OTrust	RS	.647	.099	.000
RTC and CFLI	RSeek	SFI	-.068	.131	.605
	ERxn	SFI	-.091	.137	.506
	RSeek	RS	.170	.152	.265
	ERxn	RS	-.252	.142	.075
Justice with Trust	Justice	OTrust	.893	.031	.000
	Justice	STrust	.514	.070	.000
Justice with CFLI	Justice	SFI	.795	.035	.000
	Justice	RS	.690	.051	.000
Conflict with CFLI	FFcon	SFI	-.047	.082	.568
	FAcon	SFI	-.482	.069	.000
	FAcon	RS	-.346	.074	.000
	FFcon	RS	.020	.080	.799

Table IV-17: Explained Variance and p-value for each Cross-Validated Path Analytic Model

	Dependent Factor	R^2	p
Trust Predicting CLFI	SFI	62.3%	.000
	RS	38.8%	.000
RTC Predicting CLFI	SFI	2.0%	.000
	RS	4.2%	.000
Justice Predicting Trust	OTrust	79.8%	.000
	STrust	26.5%	.000
Justice Predicting CFI	SFI	63.1%	.000
	RS	47.6%	.000
Conflict Predicting CFI	SFI	25.3%	.000
	RS	11.4%	.000

In addition, all of the CFI and TLI fit indices exhibited similar model fit with three exceptions. Model fit for the trust structure predicting CLFI degraded slightly from an adequately fitted model to a mediocre fitted model. The model depicting justice's prediction of CLFI also exhibited a degraded model from an adequate to mediocre fit. Finally, the RTC model that predicted CLFI as mediated by the trust factor structure degraded from a mediocre/poor fit to a poorly fitted model.

All cross-validated path model outcomes were the same with one exception. In the model depicting RTC predicting CLFI, the exploratory model indicated a significant, inverse relationship between the ERxn and RS. The relationship was not significant during cross-validation ($\beta = -.252, p = .075$). All other relationships reported within the exploratory analyses remained similar in direction, significance, and variance accountancy with each dependent CLFI variable for the cross-validation models. Figures IV-1 and IV-2 illustrate the cross-validated path analytic models.

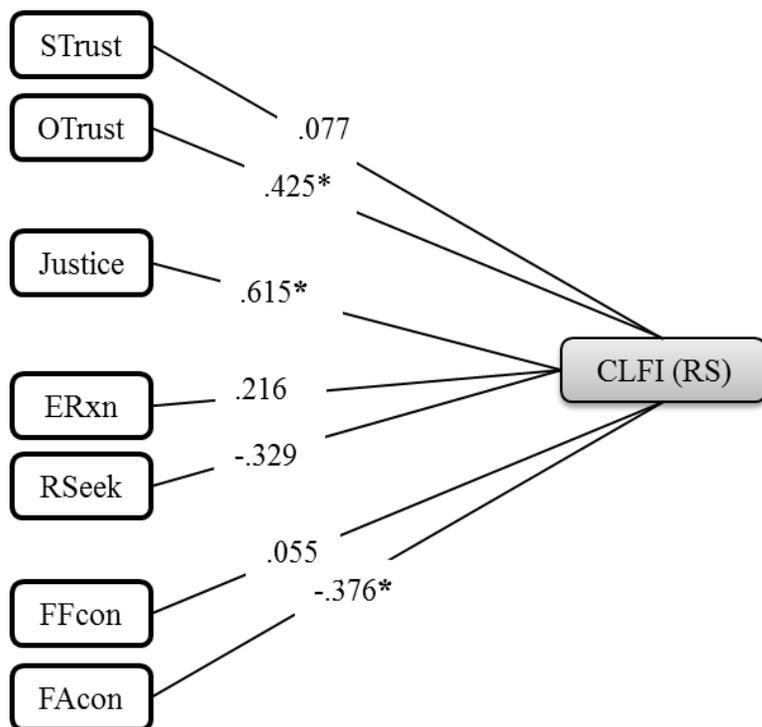


Figure IV-1: Regression Coefficients (β) for Exploratory Path Analytic Models with RS as the Dependent Variable

Note: * $p < .01$

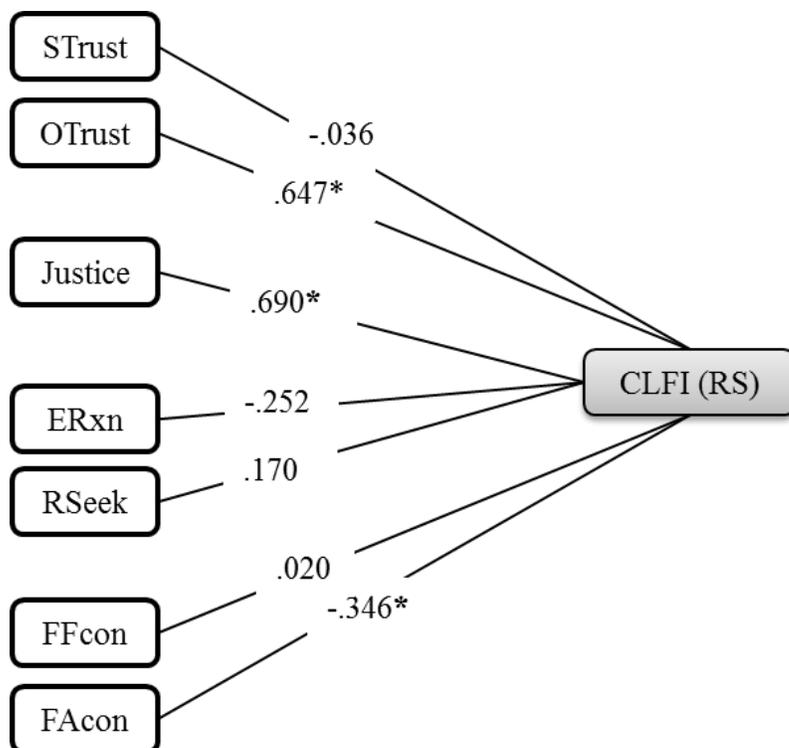


Figure IV-2: Regression Coefficients (β) for Cross-Validated Path Analytic Models with RS as the Dependent Variable

Note: * $p < .01$

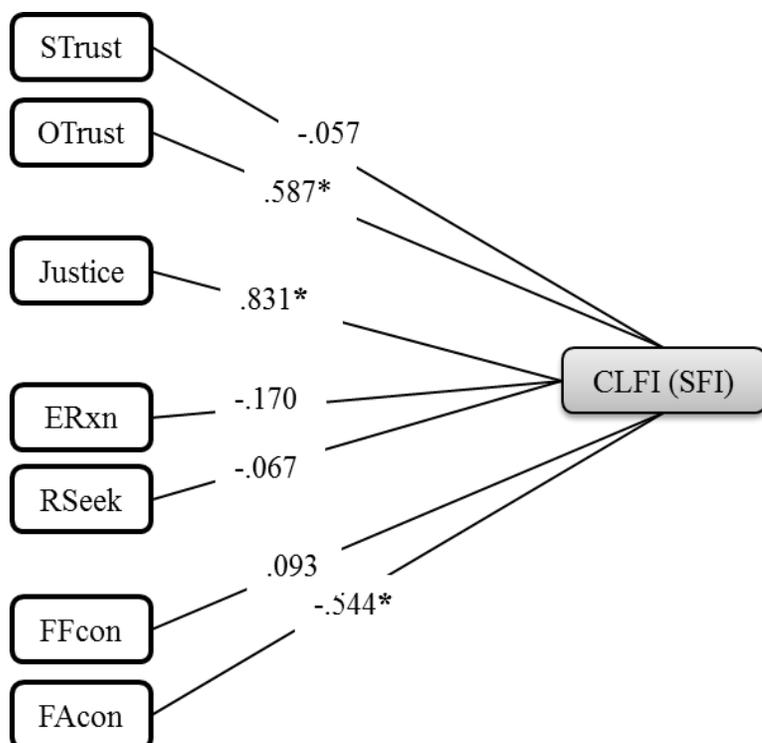


Figure IV-3: Regression Coefficients (β) for Exploratory Path Analytic Models with SFI as the Dependent Variable

Note: * $p < .01$

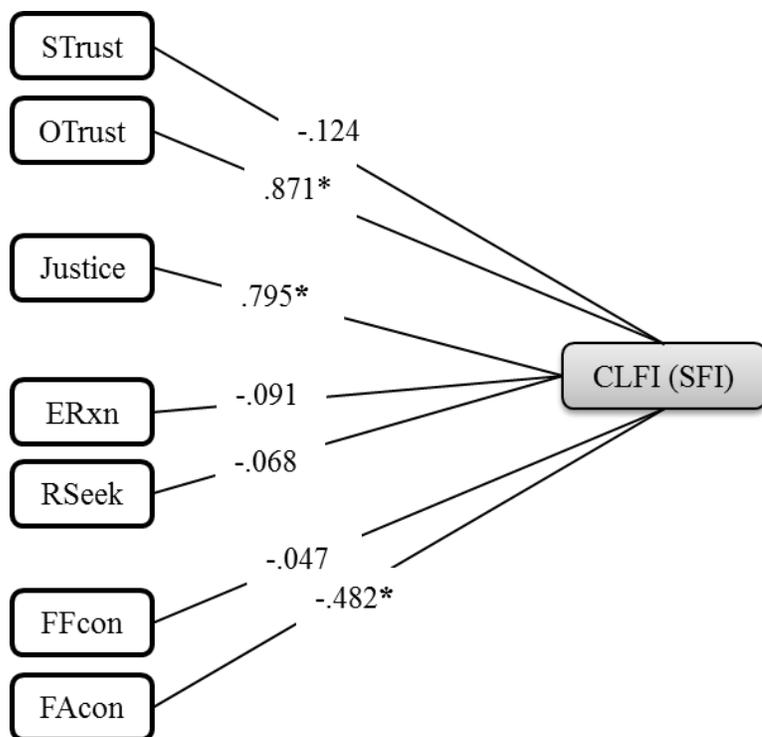


Figure IV-4: Regression Coefficients (β) for Cross-Validated Path Analytic Models with SFI as the Dependent Variable

Note: * $p < .01$

CHAPTER V

DISCUSSION

This chapter includes a summary and discussion of the findings. The research focused on faculty perceptions of an organizational climate for innovation, and the impact of faculty resistance to change, trust in the organization, trust in the supervisor, perception of organizational justice, and the perceived level of conflict within the organization. The initial research questions formed the bases for investigating relationships between these social variables and the climate for innovation at chiropractic educational institutions. The research questions were:

Research Question 1: Is personal disposition toward change associated with organizational climate for innovation?

Research Question 2: Are higher levels of justice associated with organizational climate for innovation?

Research Question 3: Is the faculty's perception of the level of organizational conflict associated with organizational climate for innovation?

Research Question 4: Are higher levels of supervisor trust associated with organizational climate for innovation?

Research Question 5: Are higher levels of organizational trust associated with organizational climate for innovation?

Research Question 6: Are faculty demographic variables associated with organizational climate for innovation?

Disposition toward Change

The theoretical framework for studying organizational climate for innovation placed antecedents into categories of attributes of the individual, work context and perception of outcome. Resistance to change has been described as an attribute of an individual and a stable personality trait (Oreg, 2003, 2006).

Faculty member's RTC was a significant and negative predictor of CLFI. This finding is consistent with prior research. Oreg (2003) found faculty members exhibiting higher resistance to change took longer to adopt innovation, and were less likely to use course web sites. Nov and Schechter (2012) found a negative relationship between physicians' resistance to change and use of electronic medical records. In this study, resistance to change functioned to negatively impact physicians' perception of utility and ease of use. Perceived utility and ease of use positively predicted attitude, where attitude predicted use of electronic medical records. Bhattacharjee and Hikmet (2007) studied a population of practicing physicians, and found that resistance to change had a negative correlation with intention to use health care information technology, in addition to negative relationships with perceived usefulness and ease of use.

In the current study, RTC accounted for only a small amount of variance in CLFI. Other variables likely offset the negative impact of RTC. This offset is consistent with the findings of others. Hon, Bloom and Crant (2011) examined a high-technology, manufacturing and service sector organization in Shanghai, China. The authors found that creative performance was negatively related to resistance to change, but significantly moderated by a modernity climate, elevated coworker support, and empowering leadership. Manager decisiveness has been shown to decrease employee resistance to change (Mulki, Jaramillo, Malhotra, & Locander, 2012). In this study, indecisiveness occurred when employees believed managers avoided decision making, deferred decisions, and demonstrated worry or regret over past decisions. Van Dam et al. (2008) studied a large housing corporation in the Netherlands, and found leader-member exchange and perceived development climate were negatively related to resistance to change, but the relationship was fully mediated by information sharing, participation, and trust.

RTC was shown to be an important variable having a negative impact on CLFI at chiropractic educational institutions. The small amount of CLFI variance accounted for

by RTC may be the result of other variables mediating its impact. The results appear generally consistent with prior research findings in which the impact of resistance to change is diminished by other variables (Hon et al., 2011; Mulki et al., 2012; Oreg et al., 2008).

Justice

Justice may be categorized as a work-context variable. Perceptions of fairness in distribution, process, and personal interactions take place within the work environment. Justice was a significant and positive predictor of CLFI, and accounted for over two-thirds of the variance in SFI, and over one-third of the variance for RS. The SFI factor included questions related to providing adequate resources, time, and funding to pursue creative ideas. Where an organization provides adequate resources, time, and funding as integral components of a climate for innovation, it may be perceived as an entity that fairly treats its members.

A relationship between justice and innovation is evident within the literature. In a meta-analysis of team-level predictors of innovation, Hulsheger et al. (2009) found external and internal communication particularly favorable to innovation. Tjosvold et al. (2010) studied 103 pairs of customer and supplier organizations in Shanghai, China, and found cooperative conflict management predicted higher perception of procedural justice. Procedural justice significantly predicted innovation. Data collected from two colleges in Southern Taiwan (Huang, Deggs, Jabor, & Machtmes, 2011) showed that managerial support for online technology exerted a positive effect on teachers' perceived usefulness and ease of use. Perceived usefulness and ease of use increased the likelihood of adopting online technology.

Communication and participation are important process variables predicting attitudes about adopting innovation. The justice instrument utilized in this research (Colquitt, 2001) inquired into individual perceptions in terms of having influence over outcomes, having accurate information, and being able to express views and feelings.

The findings, here, are consistent with prior research where communication and meaningful participation, consider as key components of organizational justice, heavily influenced perceptions about organizational change and innovation. Chawla and Kelloway (2004) surveyed employees from two organizations undergoing a merger, and found that communication and participation were positively associated with procedural justice. Procedural justice, in turn, was positively related to openness to change. Similarly, Oreg (2006) studied employees experiencing a merger in the defense industry, and found that information sharing was positively linked to trust in management. A study of middle management in an Italian national electricity company showed that involvement in change predicted attitudes toward change (Peccei, Giangreco, & Sebastiano, 2011). Qian and Daniels (2008) studied employees at a large Midwestern university in the United States, and found that the quality of information related to organizational change shared with the employees had a significant, negative relationship with employee change-specific cynicism. The authors also found that change-specific cynicism had a strong positive relationship to resisting change. Communication and participation as part of just process support a climate for innovation.

Taken in the aggregate, the findings of this study in terms of procedural justice support the conceptualization of this variable as an important condition that shapes respondent views and, most likely, impacts engagement in other productive behaviors that promote organizational effectiveness (Folger, Crapanzano, Timmerman, Howes, & Michell, 1996; Konovsky, 2000; O'Reilly & Chatman, 1986)

Conflict

Conflict may be an anticipated outcome of adopting innovation or a work context variable. Conflict can be internally or externally induced. It can be studied as a dependent variable with innovation as an antecedent or as an independent variable predicting innovation. This study tested whether or not perceptions of conflict function as an antecedent impacting the CLFI at chiropractic educational institutions. The data

from this study indicated that faculty perceptions of higher conflict levels did predict diminished CLFI. Specifically, FAcon was a significant and negative predictor of both factors within CLFI. FFcon did not have a significant relationship with CLFI. These findings contrast with prior research findings. Janssen (2003) studied secondary school teachers and found a significant and negative correlation between inter-coworker conflict and innovation. This study found that only conflict between faculty and administration negatively impacted CLFI. Inter-faculty conflict did not have a significant correlation to CLFI. DeDreu (2006) studied international postal service workers in the Netherlands, and found task conflict but not relationship conflict to have a curvilinear relationship with innovation. Moderate task conflict was found to increase innovation, whereas higher levels of conflict decreased innovation. Relationship conflict had a negative impact on innovation. Hulsheger et al.'s (2009) meta-analysis found that neither relationship conflict nor task conflict had a significant relationship with innovation. The present study did not contrast sources of conflict or types of conflict, but found a negative relationship between FAcon and CLFI.

Approaches to studying the relationship between conflict and innovation differ. McAdam (2005) posited that conflict is a result of differences arising as a consequence of the implementation of innovation. In this instance, conflict is an outcome, not an antecedent of innovation. Furthermore, McAdams believed that it is conflict management style that determines the utility of the conflict. Conflict management style has been shown to impact innovative performance (Song et al., 2006). Dee, Henkin and Holman (2004) examined catholic college and university presidents and found presidents used varying styles of conflict management including avoidance, smoothing over differences, compromise and collaboration. The authors advised use of more collaborative approaches to managing exogenously induced conflict. The fact that conflict management style was not examined is a limitation of this study. Future studies

should examine sources of conflict, types of conflict and conflict management style at chiropractic educational institutions.

Trust

Rotter (1967), Deutsch (1962) and other prominent scholars focused on trust agree that trusting choices are based on individual confidence in the other, and an assumption that “the event he desires rather than the event he fears, will occur” (Deutsch, 1962, p. 303). Trust is a psychological state of accepting vulnerability based on expectations of others (Rousseau, Sitkin, Burt, & Camerer, 1998). Trust can be examined in many ways. For example, people enter organizations with different propensities to trust (Colquitt, Scott, & LePine, 2007). Here, trust acts as a pre-existing attribute of the individual. Levels of trust may influence the work environment and/or work outcomes (Aryee, et al., 2002; Brockner, et al., 1997). From this perspective, trust is a work context variable. Trust may be a result of experiences within the organization. In this instance, trust is an outcome (Dirks & Ferrin, 2002; Hubbell, & Chory-Assad, 2005).

Within the framework of this study, trust was hypothesized to have a positive relationship with CLFI. It was also hypothesized that trust would mediate the relationship between justice and CLFI. Trust did predict CLFI. OTrust had a significant and positive correlation to both RS and SFI. STrust did not significantly correlate with either RS or SFI. SEM with trust mediating the relationship between justice and CLFI did not add predictive power as a mediating variable. Both trust and justice have significant and positive relationships with CLFI, but trust did not mediate the relationship between justice and CLFI.

The finding that trust predicted innovation is consistent with prior research. Ruppel and Harrington (2000) examined managerial perceptions of communication, trust, and innovation and found employee trust was significantly and positively related to innovation. Innovation was measured by a non-standardized three-question survey instrument. The analysis used in their research did not include SEM where trust was

tested as a mediating variable. Clegg, et al. (2002) researched design engineers from two large aerospace companies and found when employees trust that their voice is heard and trust they will benefit from a new idea, then the suggestion and implementation of new ideas increase. Again, increased trust was linked to increased innovation. Ellonen et al. (2008) examined trust in relation to organizational innovativeness. The authors found a strong positive correlation between institutional trust and greater organizational innovativeness. Institutional trust was stronger in predicting organizational innovativeness than interpersonal trust. The findings of the current study were similar in that OTrust predicted CLFI, whereas STrust did not.

Justice and Trust

Justice had a significant and positive relationship with both OTrust and STrust. Justice accounted for 82% of the variance in OTrust and 40% of the variance in STrust. The finding that trust did not mediate the relationship between justice and CLFI was not consistent with prior research. Ruppel and Harrington (2000) examined managerial perceptions of communication, trust, and innovation, and found that employee communication was significantly and positively related to employee trust and an atmosphere of trust. In addition, trust had a positive correlation with innovation. Aryee et al. (2002) examined full-time employees of a public sector organization in India. Using SEM, the authors found the best fitting model was one where trust acted as a mediating variable between organizational justice and work outcomes. Prior research (Hubbell & Chory-Assad, 2005) has shown that distributive, procedural, and interpersonal justice had significant and positive relationships with both organizational trust and managerial trust.

The theory guiding the hypothesis where trust mediates the relationship between justice and innovation was founded on the rationale that there must be a reason to trust. Colquitt et al. (2007) believed the basis for trust came from perceptions of benevolence, integrity and ability. Benevolence was the extent to which the trustee wants to do good

for the trustor. Integrity was the extent to which the trustee was fair and consistent. Finally, ability was whether or not the trustee possessed the knowledge and skills to do the job. In addition to these factors, Mayer, Davis, & Schoorman, (1995) theorized trust was also dependent on trust propensity and prior outcomes of engaging in trust. Captured within these components of trustworthiness and iterations of engaging in trust is the concept of fairness or justice. As trustors experience organizational and managerial fairness over time, the trustee is perceived as trustworthy. In turn, the trustors will more likely take risks trusting that their supervisor/organization will support them if attempts to innovate fail.

The results of this study showed a strong positive relationship between justice and trust. Yet, inserting trust as a mediating variable between justice and CLFI did not add predictive value. This study was limited in that only OTrust and STrust were measured. Trust in top management has been shown to have a stronger association with employee satisfaction and effectiveness in comparison to trust in an immediate supervisor (Ellis & Shockley-Zalabak, 2001). In addition, propensity to trust was not measured. Colquitt et al. (2007) demonstrated trust propensity has a significant and positive correlation with trust. The authors also found trust propensity moderated the effects of trustworthiness on trust.

Demographic Variables

Demographic variables had a limited impact on CLFI. Only age and gender demonstrated significant relationships with RS. Age exhibited a positive relationship with RS. Women had a less positive appraisal of RS in comparison to men.

Bunce and West (1995) studied United Kingdom health-care professionals and found no relationship between age or gender and innovation. Innovation was measured by respondents answering how many innovations they created and having respondents rate the effectiveness of the innovations. This measure differs from the CLFI instrument. The authors did find a significant and negative correlation between age and motivation.

Motivation was the health-care professional's wish to work to the best of his or her ability. Reviews of literature studied did not cite age or gender as antecedents to innovation (Damanpour, 1991; Hansen, 2011; Hulsheger et al., 2009; Lansisalmi, Kivimaki, Aalto, & Ruoranen, 2006).

Institutional and Professional Implications

The findings of this study have implications for institutions of chiropractic education and the chiropractic profession. This section focuses on the environment of chiropractic education, and how findings of this study may be applied to encourage innovation and/or the adoption of innovation. Additionally, variables associated with organizational innovation that were not included within the present study are discussed.

In the past decade, the number of students enrolled in doctor of chiropractic programs declined substantially (Bezold, Thompson, Arikan, & Grandjean, 2013). In the fall of 2000 there were 15,184 students enrolled in United States doctor of chiropractic programs. In the fall of 2010, there were only 9,946 students enrolled in United States doctor of chiropractic programs. This represents a 34.5% decline in enrollment within a decade. National Chiropractic Mutual Insurance Company (NCMIC), the United States largest provider of chiropractic malpractice insurance, recently commissioned the Institute for Alternative Futures group to develop future scenarios for the chiropractic profession. Four future scenarios were created (Bezold et al., 2013). Two of the four scenarios have chiropractic colleges closing. In one scenario, chiropractors remain isolated from integrated care, their care is limited by healthcare networks, and four chiropractic colleges close. In the second scenario where another recession hits in 2015, ten chiropractic colleges close. The two remaining scenarios paint more favorable pictures. These scenarios have chiropractors recognized as the spinal health experts in the healthcare system, chiropractors integrate into healthcare teams, and chiropractors produce substantial evidence through research. Even in the rosier scenarios, enrollment at chiropractic colleges has only marginal gains. Notably, the more positive scenarios are

linked to significant educational and professional change. The ability to innovate and/or to adopt innovation will play an important role in the survival of chiropractic educational institutions.

Chiropractic educators have had limited empirical evidence from their profession to guide strategic decisions. Compounding this issue, strategic planning often fails to adequately take advantage of available evidence. As cited earlier, Rousseau and McCarthy (2007) believe managers and management educators make limited use of behavioral science relevant to effective organizational practice. Leaders within chiropractic education should make use of available evidence to strategically create an organizational environment conducive to creativity and the adoption of innovation. The findings of this study indicate higher levels of justice, higher levels of organizational trust, along with lower levels of conflict between faculty and administration are integral to positive environments for innovation. Although path models found a significant negative relationship between RTC and CLFI, the CLFI variance accounted for by RTC was minimal. Prior research indicated resistance to change is moderated by organizational modernity, high coworker support and high empowering leadership (Hon et al., 2011). Others (Van Dam et al., 2008) found resistance to change to be fully mediated by information sharing, participation, and trust. If resistance to change is a personal disposition, addressing it directly is futile. Moderating its impact on other variables appears to be a better strategy.

There are many approaches to strategic planning within organizational categories in higher education. Alfred (2006, p. 27) classified strategic approaches in systematic, resource-based, rational, processual, adaptive and non-linear categories in an effort to conceptualize strategy in contemporary organizations. From a typology perspective, Birnbaum (1988) classified higher education institutions as collegial, bureaucratic, political, anarchical and cybernetic. Chiropractic institutions appear to be an admixture of types; some have become health sciences universities, some have unionized and some

remain collegial. Arguably, all chiropractic educational institutions are becoming more open systems with increasing connections to their larger social environments. Bess and Dee (2008) suggested an adaptive strategy for educational institutions under certain environmental conditions. They stated an adaptive strategy is best “when the organization is highly dependent on the environment but also perceives that it has choice (agency) regarding how to respond” (p. 739). Perrow (1986) described the population-ecology model of complex organizations by using an ecological setting for an analogy. He stated:

Independent of any of the individuals in these organizations or individuals directing them, they may be subject to laws governing the competition for resources; they may have the ability to adapt to changes in the pond, to retain adaptive forms or programs within them; and to grow complex as the pond grows complex. (p. 209)

Chiropractic educational institutions are now more highly dependent on an environment that is changing. The ability to adapt to the changing environment may determine which institutions survive. The adoption of technology, evidence-based clinical practices and use of electronic health care records are examples of necessary change within doctor of chiropractic programs. Adoption of these innovations may be met with resistance. Tushman and O'Reilly (1996) blame *cultural inertia* for many resource-rich organizations' failures to adapt to changing environments. They stated, “The more institutionalized these norms, values, and stories are, the greater the cultural inertia—the greater the organizational complacency and arrogance” (p. 18). Available empirical evidence can be applied to create a culture where adoption of innovation is more likely. Huang et al. (2011) examined full-time college teachers' intention to adopt online technology, and found that management support had a positive influence on teachers' perception of usefulness, ease of use, and subjective norm. In turn, utility, ease of use, and subjective norm positively influenced intention to adopt online technology. Most clinics at chiropractic colleges either have or are in the process of transitioning to

electronic health care records. Nov and Schechter (2012) found that physician's dispositional resistance to change was negatively related to perceived ease of use and perceived usefulness of electronic health care records. The findings of this study showed RTC was negatively associated with CLFI, but only accounted for a minor amount of variance. The variance was likely diminished by higher levels of organizational trust and justice. Chiropractic educators are challenged with the implementation of evidence-based clinical practice. Grol (2001) reviewed 10 years of experiences with the implementation and dissemination of evidence-based clinical guidelines for family medicine. The author stated, "Specific strategies designed to handle possible obstacles to implementation are needed to improve adherence" (p. 46). Lawrence, Polipnick, and Colby (2008) studied the implementation of evidence-based practices within chiropractic and concluded, "Our findings suggest that delivery capacity can be strengthened if the system as a whole is taken into consideration and a multifaceted strategy is used for the dissemination and implementation of the best practice recommendations" (p. 82).

The findings of this study may be useful as components of a multifaceted strategy to encourage innovation and/or the adoption of innovation. Leaders in chiropractic education should consider means to minimize conflict between administration and faculty. When conflict is complex and externally induced, Dee, Henkin and Holman (2004) advised avoid aggressive administrative forcing of perspectives, allow employees an opportunity to interpret environmental changes without undue administrative influence and allow employees to define role relationships. In addition, leaders in chiropractic education should endeavor to develop higher organizational trust. They should institute just practices, assure fair interpersonal communications, and deliver just outcomes. As a strategy to decrease college instructors' resistance to new teaching practices, McCrickerd (2012) stated:

Institutions should encourage risk taking and discourage the psychologically easier path of not changing. This can be done with institutional structures that support each individual—support that does not depend on the individual's continual success and embraces failures that are the result of considered risk taking. (p. 56)

Additional Factors

In addition to the attitudinal variables explored in this research, many structural variables effect organizational innovation. Attitudes involve what employees think and feel about the workplace. The variables within this study, perceptions of trust, justice, change and conflict, may best be described as attitudinal variables. The hierarchical structure within an organization, centralized versus decentralized decision-making, resources given to employees, employee workloads, employee expertise and diversity of expertise in work groups may best be described as structural variables. In a review of determinants to innovation, Mellahi and Wilkinson (2008) stated, “Innovation depends on the interaction of a variety of factors ranging from organizational factors such as availability of resources to individual behavioural factors” (p. 684). The authors list risk-aversion, intolerance of mistakes, lack of resources or slack, lack of employee morale and enthusiasm, unavailability of qualified personnel and excessive workload as obstacles to innovation. Empowering employees through decentralized structure and having a multi-skilled workforce are listed as innovation enhancers. Many attitudinal and structural factors influence innovation and should be considered when considering practical implications of empirical evidence.

Obstacles to Innovation

Organizations adopt different forms, including bureaucracies with more administrative layers and centralized decision-making. Subramanian and Nilakanta (1996) examined 350 United States banks and found higher levels of centralization and formalization were negatively related to adoption of innovation. Evidence indicates that a negative relationship exists between limited resources and innovation (Amabile & Conti, 1999; Mellahi & Wilkinson, 2008; Mellahi & Wilkinson, 2010). Nohria and Gulati (1996) studied multinational corporations and found an inverse U-shaped relationship between organizational slack and innovation. Organizational slack was defined as “the

pool of resources in an organization that is in excess of the minimum necessary to produce a given level of organizational output” (p. 1246). The authors stated:

Too little slack is inimical to innovation because it discourages any kind of experimentation whose success is uncertain. Equally, too much slack is inimical to innovation because it breeds complacency and a lack of discipline that makes it possible that more bad projects will be pursued than good. (p. 1260)

High workloads have been shown to inhibit creativity (Amabile & Conti, 1999). Conversely, high workloads have been shown to stimulate creativity (Ekvall & Ryhammar, 1999). The conflicting findings may be explained by the impact of attitudinal variables. Long (2013) examined four major high-tech companies in China, and found that employee perception of downsizing as a threat versus an opportunity moderated the relationship between workload and creativity. In this study, threat perception had a significant and negative impact on creativity, whereas perception of downsizing as an opportunity had a significant and positive impact on creativity. Higher workloads did not inhibit creativity when downsizing was perceived as an opportunity. Lower workloads were effective at reducing threat perception’s negative impact on creativity. The attitudinal component, what the employee thinks and feels about downsizing, was critical.

Practical Implications

Chiropractic educational institutions may benefit by incorporating evidence-based management into their strategic plan. Given the massive environmental change, failure to adapt could lead to the demise of many chiropractic colleges. Staw, Sandelands and Dutton (1981) proposed a threat-rigidity cycle to explain organizational behavior. The authors believed that when organizations interpret environmental change as a threat, they respond by restricting information, conserving resources, centralizing control and relying on routines. Within the threat-rigidity theory, the rigidity response can be appropriate when organizations experience slow, incremental change. The rigidity response is inappropriate for radical environmental change. Tushman and O’Reilly (1996) suggested

survival in environments where both incremental and radical environmental change exist “requires organizational and management skills to compete in a mature market (where cost, efficiency, and incremental innovation are key) and to develop new products and services (where radical innovation, speed, and flexibility are critical)” (p. 11).

Chiropractic educational institutions have lost over one-third of their enrollment in the past 10 years (Bezold, et al., 2013). Doctor of Physical Therapy programs have grown in number by over 2000% in the past 15 years (CAPTE, 2013). United States health care policy is changing rapidly with the implementation of the Patient Protection and Affordable Care Act. Insurance companies’ responses to the Act will change the environment for chiropractic care and chiropractic education. In addition, ongoing intraprofessional conflict prevents unity and impedes change within the chiropractic profession (Biggs, et al., 2002; Biggs, et al., 1997). Chiropractic educational institutions are faced with challenges associated with concurrently being efficient, managing cost and adapting to radical environmental change.

In response to decreasing enrollment, chiropractic educational institutions are restructuring and/or downsizing. Downsizing has been associated with lessened creativity (Amabile and Conti, 1999; Mellahi & Wilkinson, 2010; Long, 2013). Amabile and Conti (1999) examined a technology company with over 30,000 employees experiencing a major restructuring and downsizing. The authors found that “the relationship between downsizing and creativity can be largely accounted for by negative changes in an organization’s work environment” (p. 637). Long (2013) studied 500 research personnel from technology organizations, and found that when employees perceived downsizing as a threat, there was a negative effect on creativity, but when employees perceived downsizing as an opportunity, there was a positive effect on creativity. Employee perception was critical. Mellahi and Wilinon (2010) studied downsizing firms in the United Kingdom and found the impact on employee innovation was related to the speed and level of downsizing. The results showed downsizing over a

longer period of time had a significant and positive relationship to innovation, whereas downsizing over a shorter time period had a significant and negative relationship to innovation.

Amabile (1996) suggested a three component model of creativity where expertise, creative skills and task motivation combine to support creativity. Expertise and creative skills represent what the employee is capable of doing, and task motivation determines what the employee will do. Amabile (1996) posited that task motivation is primarily a product of the work environment. The results of this study can help leaders at chiropractic educational institutions strategically shape their work environments. The perception of justice, conflict, change and trust are part of the work environment. In addition to the findings of this study, others have recommended practical tactics for stimulating creativity. For enhancing creativity in work groups, Amabile (1996) suggested “clearly set overall project goals while allowing procedural autonomy” (p. 10). Amabile (1996) also advised, “constitute work groups that represent a diversity of skills and are made up of individuals who trust and communicate well with each other” (p. 10). Tushman and O’Reilly (1996) advised tolerance for certain types of failure and decentralization of decision-making. Amabile (2008) contrasted strategies appropriate for the discovery and implementation phases of a creative process. Amabile (2008) stated, “efficiency minded management has no place in the discovery phase” (p. 6). Tushman and O’Reilly (1996) gave similar advice. They stated, “Value the openness and consensus need to develop new technologies. Yet, when implementation is critical, managers recognize that this consensus can be fatal” (p. 26). Loose control is appropriate for creativity, while tighter control is important during implementation.

The impact of attitudinal antecedents should not be underestimated. After studying downsizing Fortune 500 high-technology companies, Amabile (1999) stated, “It is particularly interesting that actually experienced downsizing was a much weaker predictor of perceived work environment than was work group stability or anticipated downsizing” (p. 637). Rasulzada and Dackert (2009) examined high-tech employees in a multinational company and concluded, “Of the organizational factors included in the model, organizational climate and work resources were found to be significantly related to perceived creativity and innovation in the organization” (p. 191). Several researchers found tolerance for failure was an important antecedent to innovation (Amabile & Conti, 1999; Mellahi & Wilkinson, 2008; Tushman & O’Reilly, 1996). Yet, the employees’ perception of trust plays a pivotal role in tolerance for failure. The employee may be more willing to engage in risky, creative activities if they trust the employer will tolerate failure. Downsizing is a structural antecedent to creativity, yet it is the attitudinal variable of how the employee interprets the downsizing (threat or opportunity) that determines creativity (Long, 2013). Both structural and attitudinal antecedents to creativity should be considered when developing a strategy to increase creativity and the adoption of innovation. Strategic planning should account for different management of creative work groups versus implementation work groups.

Implications for Future Research

Organizational trust showed a significant and positive relationship with climate for innovation. The antecedents leading to trust intention, such as disposition to trust or trusting beliefs (McKnight et al., 1998), should be explored in future studies. Conflict between faculty and administration had a significant and negative relationship with climate for innovation. Conflict was measured by having faculty rate their level of perceived conflict on a Likert scale. Neither the type of conflict (task versus emotional) nor conflict management style (avoiding, obliging, dominating, asserting) was queried. Future exploration of conflict type and management style within this population is

warranted. Prior research indicates that resistance to change may be moderated by work contextual variables (Hon et al., 2011). Moderation of resistance to change was not examined in this research. Resistance to change was examined as an antecedent to climate for innovation. The relationships between trust, conflict, justice, and resistance to change should be explored in future research.

This study primarily examined attitudinal variables impacting innovation. While this study adds new evidence about antecedents to innovation at chiropractic educational institutions, the influences of many structural antecedents remain unexplored within this population.

Summary and Conclusions

This study explored the relationship between trust, justice, resistance to change, conflict, and climate for innovation at chiropractic educational institutions. The major findings of this study were that higher levels of organizational trust and justice were associated with a greater climate for innovation. In addition, higher perceived conflict between faculty and administration and higher resistance to change were associated with a lesser climate for innovation. The data analysis also indicated a distinction between inter-faculty conflict versus faculty-administrative conflict. Higher inter-faculty conflict did not exhibit a significant relationship with climate for innovation.

The findings of this study are largely consistent with the findings of prior research. The findings add support to the associations between conflict, trust, justice, resistance to change, and innovation. The finding that the relationship between justice and climate for innovation was not mediated by trust did contrast with prior research findings. This study does add to the very limited amount of empirical evidence associated organizational behavior within chiropractic educational institutions.

Chiropractic education began in 1898 (Peterson & Wiese, 1995, p. 76) and has experienced significant challenges over the past 115 years. In roughly the same period (2000-2010) where enrollment in chiropractic colleges decreased 35%, the number of

doctor of physical therapy programs have grown by over 2000%. The impact of the Patient Protection and Affordable Care Act is yet to be realized. Healthcare and educational environments are evolving. The findings of this study include empirical evidence related to climates for innovation at chiropractic educational institutions useful in strategic decision making in tumultuous times.

APPENDIX A

CHIROPRACTIC SCHOOLS

1. Life Chiropractic College West: Hayward, CA
2. Palmer College of Chiropractic West: San Jose, CA
3. Southern California University of Health Sciences, Los Angeles College of Chiropractic, CA
4. University of Bridgeport, College of Chiropractic: Bridgeport, CT
5. Palmer College of Chiropractic: Port Orange, FL
6. Life University: Marietta, GA
7. National University of Health Sciences: Lombard, IL
8. Palmer Chiropractic University: Davenport, IA
9. Northwestern Health Sciences University: Bloomington, MN
10. Cleveland Chiropractic College: Kansas City, MO
11. Logan College of Chiropractic: Chesterfield, MO
12. D'Youville College: Buffalo, NY
13. New York Chiropractic College: Seneca Falls, NY
14. University of Western States: Portland, OR
15. Sherman College of Straight Chiropractic: Spartanburg, SC
16. Parker University: Dallas, TX
17. Texas Chiropractic College: Pasadena, TX
18. Canadian Memorial Chiropractic College

APPENDIX B
SURVEY

Dear Colleague:

I am writing to invite you to participate in a research study. The purpose of this study is to examine the relationship between demographic variables, organizational trust, organizational justice, organizational conflict, individual resistance to change and the climate for innovation at chiropractic colleges/health sciences universities.

I am inviting you to be in this study because you are a faculty member at a chiropractic college/health sciences university. I obtained your name and email address from your college/university administration after requesting permission to conduct the survey. If you agree to participate, I would like you to spend 10-15 minutes completing an online survey. You are free to not answer any questions you would prefer not to answer. You will be asked to complete questions related to demographic information (e.g. age, gender, educational level). In addition, you will be asked to rate your level of agreement to multiple statements.

Your responses will be kept confidential and results will be presented only in aggregate form. There are no known risks from being in this study, and you will not benefit personally. However I hope that others may benefit in the future from what is learned as a result of this study.

Taking part in this research study is completely voluntary. If you decide not to be in this study, or if you stop participating at any time, you won't be penalized or lose any benefits for which you otherwise qualify.

If you have any questions about the research study itself, please contact
Dan Weinert D.C., M.S.
1000 Brady Street
Davenport, IA 52803
(563) 884-5761

Palmer College of Chiropractic IRB Assurance # X2012-3-7-W

If you have questions about the rights of human research subjects, please contact Dr. Dana Lawrence, the Human Protections Administrator of Palmer College of Chiropractic. 563-884-5302, or e-mail dana.lawrence@palmer.edu.

Thank you very much for your consideration. By completing the survey you are indicating your willingness to participate in the study.

1. I consent to participating in this survey.
 - Yes, I will consent.
 - No, I will not consent.

2. Which category below includes your age?
 - Between age 20-30
 - Between age 30-40
 - Between age 40-50
 - Between age 50-60

- 60 or older
3. Are you male or female?
- Male
 - Female
4. To what racial or ethnic group do you belong?
- Hispanic or Latino
 - American Indian or Alaska Native
 - Asian
 - African American
 - Native Hawaiian or Other Pacific Islander
 - White
5. What is the highest degree you have earned?
- Associate's degree
 - Bachelor's degree
 - Master's degree
 - Academic doctorate (ie Ph.D., Ed.D.)
 - Clinical doctorate (ie D.C., M.D., D.O.) degree
 - Both clinical and academic doctorate degrees
6. What is your primary area of assignment?
- Basic science
 - Administrative
 - Clinical science
 - Patient care
 - Research
 - Other (please specify)
7. What is your academic rank?
- Instructor
 - Assistant Professor
 - Associate Professor
 - Professor
 - No Academic Rank
8. As a member of the faculty at your college, do you belong to a union?
- Yes
 - No
9. Please answer these questions indicating your level of agreement to the statement.
- Scale:
- Strongly Disagree
 - Disagree
 - Somewhat Disagree
 - Somewhat Agree
 - Agree
 - Strongly Agree
- ❖ I'd rather be bored than surprised.
 - ❖ Generally, change is good.
 - ❖ I'll take a routine day over a day full of unexpected events any time.
 - ❖ Whenever my life forms a stable routine, I look for ways to change it.
 - ❖ I prefer having a stable routine to experiencing changes in my life.

- ❖ I generally consider changes to be a negative thing.
- ❖ I like to do the same old things rather than try new and different ones.
- ❖ I like to experience novelty and change in my daily routine.
- ❖ If I were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed.
- ❖ If I were to be informed that there is going to be a change in one of my assignments at work, prior to knowing what the change actually is, it would probably stress me out.
- ❖ When I am informed of a change of plans, I tense up a bit.
- ❖ When things don't go according to plans, it stresses me out.
- ❖ If my boss changed the criteria for evaluating employees, it would probably make me feel uncomfortable even if I thought I'd do just as well without having to do any extra work.
- ❖ If in the middle of the work year, I were to be informed that there's going to be a change in the schedule of deadlines, prior to knowing what the change actually is, I would probably presume that the change is for the worse.
- ❖ Changing plans seems like a real hassle to me.
- ❖ When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.
- ❖ Once I've made plans, I'm not likely to change them.
- ❖ Often, I feel a bit uncomfortable even about changes that may potentially improve my life.

11. Please indicate your level of confidence related to the following statements.

Scale:

- nearly zero
 - very low
 - low
 - 50-50
 - high
 - very high
 - nearly 100%
- ❖ My supervisor is technically competent at the critical elements of his or her job.
 - ❖ My supervisor will make well thought out decisions about his or her job.
 - ❖ My supervisor will follow through on assignments.
 - ❖ My supervisor has an acceptable level of understanding about his or her job.
 - ❖ My supervisor is able to do his or her job in an acceptable manner.
 - ❖ When my supervisor tells me something, I can rely on what they say.
 - ❖ My supervisor is able to do the job without causing other problems.
 - ❖ My supervisor will think through what he or she is doing on the job.
 - ❖ My level of confidence that the organization will treat me fairly is
 - ❖ The level of trust among people I work with on a regular basis is
 - ❖ The degree to which we can depend on each other in this organization is

12. The following items refer to the procedures used to arrive at a work action (ie policy change, curricular change). To what extent:

Scale:

- very small extent
- small extent
- moderate extent
- large extent
- very large extent

- ❖ Have you been able to express your views and feelings during those procedures?
- ❖ Have you had influence over the (outcome) arrived at by those procedures?
- ❖ Have those procedures been applied consistently?
- ❖ Have those procedures been free of bias?
- ❖ Have those procedures been based on accurate information?
- ❖ Have you been able to appeal the (outcome) arrived at by those procedures?
- ❖ Have those procedures upheld ethical and moral standards?

13. The following items refer to the outcomes of work actions. To what extent:

Scale:

- very small extent
- small extent
- moderate extent
- large extent
- very large extent

- ❖ Does your (outcome) reflect the effort you have put into your work?
- ❖ Is your (outcome) appropriate for the work you have completed?
- ❖ Does your (outcome) reflect what you have contributed to the organization?
- ❖ Is your (outcome) justified, given your performance?

14. The following items refer to interpersonal interactions with your college's administration. To what extent:

Scale:

- very small extent
- small extent
- moderate extent
- large extent
- very large extent

- ❖ Have the members of your administration treated you in a polite manner?
- ❖ Have the members of your administration treated you with dignity?
- ❖ Have the members of your administration treated you with respect?
- ❖ Have the members of your administration refrained from improper remarks or comments?

15. Please indicate your level of agreement with the following statements.

Scale:

- strongly disagree
- disagree
- neutral
- agree
- strongly agree

- ❖ Creativity is encouraged here.
- ❖ Our ability to function creatively is respected by the leadership.
- ❖ Around here, people are allowed to try to solve the same problems in different ways
- ❖ The main function of members in this organization is to follow orders which come down through channels.
- ❖ Around here, a person can get in a lot of trouble by being different.
- ❖ This organization can be described as flexible and continually adapting to change.
- ❖ A person can't do things that are too different around here without provoking anger.
- ❖ The best way to get along in this organization is to think the way the rest of the group does.

- ❖ People around here are expected to deal with problems in the same way.
- ❖ This organization is open and responsive to change.
- ❖ The people in charge around here usually get credit for others.
- ❖ In this organization, we tend to stick to tried and true ways.
- ❖ This place seems to be more concerned with the status quo than with change.
- ❖ Assistance in developing new ideas is readily available.
- ❖ There are adequate resources devoted to innovation in this organization.
- ❖ There is adequate time available to pursue creative ideas here.
- ❖ Lack of funding to investigate creative ideas is a problem in this organization.
- ❖ Personnel shortages inhibit innovation in this organization.
- ❖ This organization gives me free time to pursue creative ideas during the workday.
- ❖ The reward system here encourages innovation.
- ❖ This organization publicly recognizes those who are innovative.
- ❖ The reward system here benefits mainly those who don't rock the boat.

16. Please indicate the level of interpersonal conflict between the following groups within your organization.

Scale:

- zero
 - very small amount
 - small amount
 - moderate amount
 - large amount
 - very large amount
-
- ❖ Between faculty members
 - ❖ Between faculty and administration

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