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THE RELATIONSHIP BETWEEN BUSINESS PROCESS IMPROVEMENT AND LEADERSHIP: AN EMPIRICAL STUDY EXPLORING THE INFLUENCE OF PROCESS MATURITY ON LEADER BEHAVIOR

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Abstract

Business processes are embedded within organizational culture, behavior and ultimately leadership actions, so why aren't researchers studying the effects of process improvement initiatives from aspects other than improved quality, speed and lower cost? Can an organization's structure and underlying process framework influence leader behaviors essential to organizational success and overall employee satisfaction? This study considers the influence of the organization on the behaviors of its leaders and supersedes the traditional leadership study which studies the influence of the leader on the organization. The objective of the study is to evaluate and compare specific leader behaviors in organizations that have been awarded a staged, CMMI process maturity level, specifically either a Maturity Level 2 or a Maturity Level 5 award. The study explores the relationship between the organizations process maturity and six dimensions of leader behavior and suggests that changes to structure and design instituted during the course of developing an organizations process maturity level present contingencies which over time lead to changes in leader behavior. The goals of the study include: 1) clarifying uncertainties regarding the value and benefits of adopting process improvement models and methodologies and 2) providing data to empirically support the influence of organizational process frameworks on leader behavior. MANCOVA and ANOVA comparisons support a significant group difference in certain leader behaviors between ML 2 and ML 5 organizations. The findings of this study provide evidence that cultural changes occurring during the course of maturing an organizations business processes do have an influence on leadership behaviors.

CHAPTER ONE: INTRODUCTION TO THE STUDY

Focus and Rationale of Research Study

Why is it that some organizational leaders seem overly burdened with attending meetings and trying to solve the latest crisis and other leaders seem to be more concerned with the human aspect of the organization? What causes some leaders to consistently reinvent the wheel, run around in circles, and seemingly never accomplish anything tangible or enduring? What is it that affords leaders the time to integrate with and socialize among their employees? Why is it that some leaders spend time getting to know their employees and others seem to be only concerned with production? Bonn & Fiedler (1976) stated that an everyday occurrence in organizational life is the change in the organizational environment. As we reflect upon this statement, a question emerges in regard to organizational leadership; should we extend more effort in considering the influence of the organizations environment in our studies of leader behavior?

If it has been successfully established that situation accounts for much of leader behavior (Argyris, 1999; Fiedler, 1957; Bons, 1974; & House, 1968) then why don't more leadership studies concentrate on the situations and characteristics presented by the organization instead of the influence of its leaders? Can an organization's structure and underlying process framework influence leader behaviors essential to organizational success and employee satisfaction? Leadership studies are full of theories testing and supporting the influence of leaders and leadership styles on organizations, but there are very few studies, if any, that consider the influence of the organization on the behaviors of its leaders (Evans, 1978; Ford, 1981). In most theories of organizational leadership, leadership is, "hierarchical and considered without

adequate regard for the structural considerations" in the organization (Zaccaro & Klimoski, 2001), as a result scholars have called for additional research examining causality and linking culture and success with business best practices and improvements (Gore, 1999; Korman, 1966 & 1971; Kerr & Jermier, 1978).

There is demand for evidence about the impact and benefits of process improvement models and methodologies. The value and benefits of process improvement methodologies are usually weighed against time, expense, and the level of difficulty required implementing them. Studies justifying the expense of improvement initiatives often concentrate on return on investment (ROI) goals such as: lower production costs, timely production schedules, and higher quality products. Why aren't there more studies researching the effect of process improvement initiatives from aspects other than quality, speed and cost? Are there more benefits of business process improvement?

Business Process Improvement Defined

Business Process Improvement (BPI) is an intentional act made by an organization to address systemic problems (Carnall, 1995) and to understand the root cause of inefficiencies and ineffectiveness by employing techniques that identify steps and deliverables that are not value-added and result in waste and variance. One of the goals of BPI frameworks and methodologies is to show organizations how to satisfy customer requirements while reducing resource requirements. Business process frameworks, models, and methodologies present overall process areas or phases that provide structure and define the particular areas an organization should focus on in the implementation of successful business improvement initiatives. There are scores of

business process frameworks, models, and methodologies available to assist organizations in achieving desired characteristics and emplacing foundational business operating structures; for example, frameworks such as: Microsoft Operations Framework (MOF) and Project Management Body of Knowledge (PMBOK); models such as: IT Infrastructure Library (ITIL), Business Process Maturity Model (BPMM), Capability Maturity Model (CMM), and Capability Maturity Model Integrated (CMMI); or process improvement methodologies such as Lean Six Sigma (LSS). This study will use the staged representation of CMMI because it represents the assessment of an entire organization or division and provides process-improvement results in a single organizational maturity-level i.e. CMMI Level 2, 3, 4, or 5.

Meeting the rigorous demands of leading, managing or simply working in organizations today requires an understanding of what makes them profitable, effective and efficient (Gore, 1999). In today's competitive and challenging environment, organizations must manage their resources efficiently by focusing on waste and variance. Most leaders understand clear and direct business processes are needed, but the importance of their role in regard to the organizational embracement of business process improvement initiatives is often overlooked. Commitment and the ability to infuse it, is what makes the difference in the embracement of process improvement, not strategy, equipment, or training (Rainey & Bozeman, 1998; Rusaw, 2001). Often, leaders spend too much time fighting fires, applying band aids and fixing what is perceived as broken when their role should be infusing experiences, building strengths, and making what is good even better (Kanter, 1983). Embarking on process improvement is extremely costly, private and public sector organizations spend millions

of dollars annually on frameworks and methodologies and in making these huge investments often fail to recognize the value and benefit gained outside the realm of improved quality, speed and cost. Little research has focused on examining the effects of implementing best business practices in organizations on leadership. It has been proposed that relationships between leader behavior and subordinates are influenced by a wide array of individual, task, and organizational characteristics and that these characteristic can actually neutralize the need for leadership emphasis in certain areas by acting as substitutes for leadership (Kerr & Jerimer, 1978; Yukl, 2006). The outcome of business process improvement is important to the study of organizational leadership and a study examining that relationship is in order to ascertain if environmental conditions can lead to changes in behavior over time (Korman, 1966 & 1976).

Purpose of the Study

The purpose of this study is to explore the relationship between organizational process maturity and leader behavior. Specifically, the intent of this study is to explore the relationship between the organization process maturity and six dimensions of leader behavior. The study suggests, through its proposed organizational maturity leadership theory, that changes to structure and design instituted during the course of developing an organizations process maturity level presents contingencies which over time lead to changes in leader behavior. The objective of the study is to evaluate specific leader behaviors in organizations with a common CMMI environment, but that have been awarded varying degrees of organizational process maturity i.e. Maturity Level (ML) 2 vs. ML 5. This study hypothesizes that some leader behaviors in ML level 2

organizations will be significantly different than leader behaviors in ML level 5 organizations. To determine if a difference exists the researcher selected public and private sector organizations with decidedly different process maturity level assessments and compared respondent data within and between the groups. The goals of the study include: 1) clarifying uncertainties regarding the value and benefits of adopting process improvement models and methodologies by substantiating that an increasing organizational maturity level affects not only standard Return On Investment's (ROIs) such as quality, speed and cost, but also leader behaviors and 2) providing data to empirically support the influence of organizational process frameworks on leader behavior.

Importance of the Study

This study is important because it will determine if there is a significant positive relationship between process maturity and leader behavior. The organizational maturation theory presented in this research proposes that the conditions presented by developing and improving an organization's business processes create changes in organizational culture that can lead to changes in leader behaviors over time. This study theorizes that an increasing organizational maturity assessment can have a significant effect on leader behaviors such as, tolerance of uncertainty, initiation of structure, consideration, production, predictive accuracy and integration behaviors. The empirical study intends to provide empirical data that will assist in clarifying uncertainties regarding the value and benefit of adopting process improvement models and methodologies by testing the discrete benefits of process maturity. Benefits such as: organized and structured work content; leader representation of subordinate

interests; the ability to tolerate uncertainty and postponement without anxiety or upset; foresight and ability to predict outcomes; resolution of personnel conflicts; ability to inject experiences and knowledge; and assessable work procedures. This research should be of great interest and of considerable importance to: the study of leadership, the Software Engineering Institute (SEI), other leadership studies, public and private sector organizations investing in CMMI and other improvement frameworks, models or methodologies.

CHAPTER TWO: A REVIEW OF THE LITERATURE

The literature reviewed in this chapter contains the theories and studies related to: organization behavior, process improvement frameworks, leadership theories, and organizational change and culture aspects critical to this study.

Capability Maturity Model Integrated (CMMI)

Cost savings are always good reasons to implement process improvement initiatives, but it is important to understand that not all improvement programs produce cost savings nor should they all be cost justified (Kotter, 1995 & 2005; George, Rowlands, & Kastle, 2003). For example, if an organization can show that a proposed process will improve schedule accuracy, process effectiveness, predictability, and/or reduce cycle times, the process should probably be implemented even if it does not clearly project hard dollar savings. Organizations that endeavor to improve their business processes do so for a multitude of reasons, many start improvement initiatives simply to be more competitive in global markets and to evolve immature, inconsistent business activities into mature, disciplined processes and some do because organizational maturity levels are often used as acquisition award criteria by public and private organizations to ascertain and evaluate the reliability and production capabilities of a vendor. Quality goals and performance should align with strategy and be of importance to all of the organizations employees. Continuous Process Improvement (CPI) initiatives are not the holy-grail and can be implemented badly (Dutton, 2010). Make no mistake business process improvement has become big business in the global market and even though process perfection does not exist (including CMMI maturity

level 5) organizations that remain flexible stand a better chance of making it in these tough economic times.

CMMI defined and types

Stated generically CMMI is a process improvement approach. The Software Engineering Institute (SEI) states that CMMI is a collection of best practices that enable organizations to: link management activities to business objectives; comply with relevant standards; delineate organizational functions; implement robust practices; meet customer expectations; manage risk; identify engineering activities in product lifecycle; and incorporate lessons learned. In addition to the Standard CMMI Appraisal Method for Process Improvement (SCAMPI) used in this research study there are several types of measurement technologies and CMMI models available such as:

- Software Engineering Measurement and Analysis (SEMA)- Analysis and measurement activities allow organizations to: gain an understand of environments, evaluate, understand relationships, and improve effectiveness and efficiencies by identifying waste and variance.
- Smart Grid Maturity Model—SEI's new framework for the improved management of electric generation, transmission, and distribution.
- CMMI for Acquisition (CMMI-ACQ)- The Acquisition CMMI contains 22 process areas to help an organizations improve relationships with suppliers
- CMMI for Development (CMMI-DEV)- CMMI DEV is a process improvement framework specifically for organizations that develop products.

- CMMI for Services (CMMI-SVC)- CMMI-SVC is a process improvement framework specifically for organizations that deliver services.
- CMM for People (P-CMM)- The People CMM is a maturity framework that is defined on the SEI website as a framework that, "describes the key elements of managing and developing the workforce of an organization."

According the SEI, an organization may choose to approach process improvement from either a process area capability perspective (continuous) or an organizational maturity perspective (staged). This study utilizes the staged representation because it represents the assessment of an entire organization or division and provides process-improvement results in a single organizational maturity-level i.e. CMMI Level 2, 3, 4, or 5.

CMMI purpose

Since 1984, the Software Engineering Institute (SEI), as part of Carnegie Mellon University, has worked with government organizations, industry, and academia to improve software-intensive systems (SEI, 2007). To accomplish this, the SEI explores solutions to engineering problems by setting enterprise-level objectives, conducting pilot programs, and disseminating solutions through training, licensing, and publication of best practices (McLoone & Rohd, 2007). In Sept 2007 the SEI reported, in its Class A appraisal report, that only 4.4% of the reporting CMMI organizations and agencies were affiliated with the military/government. The Capability Maturity Model Integrated (CMMI) is used by organizations to guide process improvement across projects,

divisions, or the entire organization by providing a reference point for appraising current processes. The intended goal and purpose of the CMMI is process improvement, but CMMI models are not processes or process descriptions (Weber, Paulk, Wise, & Withey, 1991); Paulk, Weber, Curtis & Chrissis, 1994; Royce, 2002). CMMI specifies what policies, procedures, and guidelines have to be clearly defined to include key process areas (Shere, 2003). Although CMMI projects the idea that well defined processes are instrumental and necessary, it does not provide procedures for defining how individual processes are implemented or improved. All CMMI models assist organizations in integrating functions, setting process goals, determining improvement priorities, and providing guidance for quality processes. To implement improvement and focus on real business performance goals CMMI integrates with individual process improvement methodologies; such as, Lean Thinking, Six Sigma, and ITIL to become a CMMI-based integrated framework (Dutton, 2010).

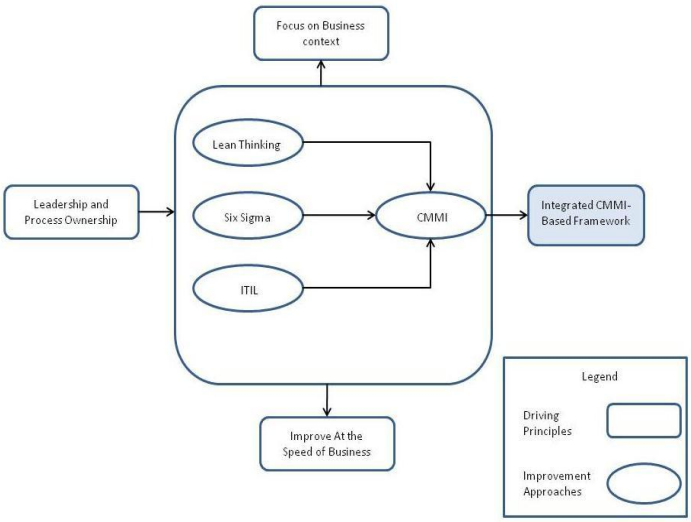

Figure 2.1: The Four Approaches in an Integrated Framework by Dutton

Process Maturity Levels

A process maturity level is defined as quantitative representation of an organizations ability to reliably, repeatedly, continually and efficiently develop quality products and services; the Capability Maturity Model Integrated (CMMI) depicts five levels of process maturity of which level 1 (Initial) is the lowest and level 5 (Optimized) is the highest (SEI, 2007). Organizations that create processes on the fly with success coming only through the heroic efforts of its staff are in the initial phase of the model. Organizations with well-established processes are in the more established maturity levels i.e. 4 and 5. In assessments, benchmark-quality is provided by the Standard CMMI Appraisal Method for Process Improvement (SCAMPI). SCAMPI enables an assessment sponsor to: prioritize improvement plans; identify current process strengths and weaknesses; use the CMMI reference model(s) to relate weaknesses and strengths; focus on improvements; derive a maturity level rating; and identify risks. Since 1987 the SEI has maintained benchmarking data from organizations in industry maturity profiles. Profiles are updated twice annually and based on appraisal data provided by SEI-trained professionals. During an appraisal an organization may elect to have a maturity level determined as part of the process. The Software Engineering Institute (SEI) provides a public service to organizations that wish to publicize their maturity rating by publishing a list of assessed organizations and their maturity level at http://sas.sei.cmu.edu/pars/pars.aspx. The maturity levels and their key process areas are as follows:

Level 1: Initial- A level 1 organization elicits a commitment to perform process improvement. Leadership typically makes attempts at establishing initial organizational

policies, commitment and gaining employee buy-in. The organization is characterized by: chaos, reliance on specific key people, unpredictable results, ad-hoc approaches, unreliable methods, primitive tools, and reactive management (Weber et al., 1991; Paulk et al., 1994; Royce, 2002). There are few, if any, established and documented key process areas. Process completion is often achieved only because of team skills and/or specific employee experience. An organization is not assessed as a level 1 organization, these organizations are typically not structured enough to undergo even the most minimum of CMMI assessments.

Level 2: Repeatable- A level 2 organization is characterized by the ability to perform practices establishing the necessary conditions for implementing process improvement. Typically, this involves plans, resources, organizational structures, and training (Weber et al., 1991; Paulk et al., 1994; Royce, 2002). Key process areas are established and may include: requirements development; project planning; project monitoring and control; supplier agreement management; product and process quality assurance; configuration management and measurement/analysis.

Level 3: Defined- A level 3 organization implements process improvement and improves project performance by distinguishing process areas and establishing activities and practices (Weber et al., 1991; Paulk et al., 1994; Royce, 2002). Key process areas may include: requirements management, technical solution, product integration, verification, validation, risk management, training, decision analysis, resolution, organizational process definition, intergroup coordination and integrated project management.

Level 4: Managed- A level 4 organization can exploit other projects to make trade offs, with predictable results, among cost, quality, and timeliness (Weber et al., 1991; Paulk et al., 1994; Royce, 2002). Predictability occurs when practices are commissioned that monitor and control the performance of the process. Key process areas may include: configuration management, monitoring and controlling the performance of the process against the plan, defect management, organizational process performance and quantitative project management.

Level 5: Optimized- A level 5 organization verifies it own organizational practices by conducting reviews and audits. Level 5 organizations represent a process maturity characterized by rapidly reconfigurable organizational performance as well as quantitative, continuous process improvement (Weber et al., 1991; Paulk et al., 1994; Royce, 2002). Key process areas may include: technology innovation, change management, and causal analysis.

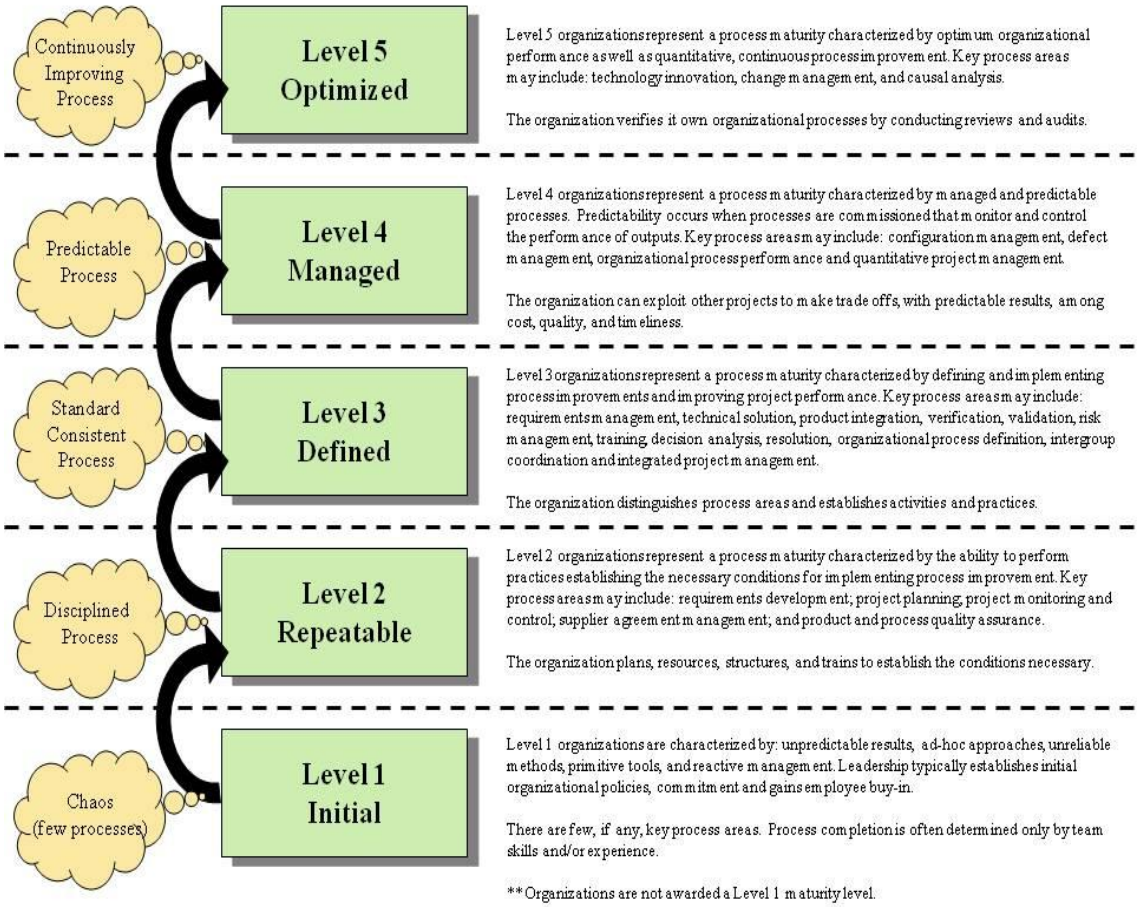

Figure 2.2: Capability Maturity Levels Defined

Theories in Organizational Behavior

Organizational behavior theories began to evolve during the last century when factory owners and managers began to realize the importance of the relationship between work environment and employee productivity (Bass, 1990; Natemeyer & McMahon, 2001; Robbins, 2005; Putnam, 2000). The study of organizational behavior generally revolves around three main behavior aspects: individual, groups, and structure and claims to assist with understanding how and why people feel, think and act the way they do in organizational settings (Poole & Hollingshead, 2004). Organizational

behavior studies have given rise to interest in how structure, technology and the environment can affect the management of organizations (Keller, Slocum, & Susman, 1974). Although there are many theories and approaches to organizational behavior this literary review will concentrate on the three main approaches: scientific management, classical school, and human relations.

Scientific Management

Scientific management is often described as discipline that purports the complete explanation and validation of all processes involved in the production of a product. Scientific management is described as concentrating on technical research and standardization and involves both in the explanation and validation of business process. These two aspects were the foundational features that caused such fundamental changes in the study of organizational behavior and were adopted throughout industry. It is the human aspects of the scientific management theory that have been highly criticized and that have endured considerable disagreement. The theory is often misunderstood and criticized for having a dehumanizing effect on labor due to the monotonous job routines, emphasis on larger output or reduced pay, the absolute control of employees, and the idea that management were the thinkers and the workers were the easily replaceable doers. In regard to organizational behavior theories, the scientific management approach is often associated with leaderships focus on the productivity of individuals rather than the individuals themselves.

Frederic Winslow Taylor was instrumental to this approach as he was one of the first researchers to attempt to, "methodically analyze human behavior in work settings" (Carnevale, 2003. p4). In the 1920's the scientific management theory described

management as a science with employees having specific but different responsibilities and the ability to harness human capital, complete tasks, remain productive, and produce in mass quantities. The scientific management theory placed great emphasis on production and listed the duties of a manager as planning, organizing, commanding employees and controlling performance; basic principles called for specialization of work, unity of command, scalar chain of command, application of pressure for productive output, and coordination of activities (Yukl, 2006; Vroom & MacCrimmon, 1968). The managerial duties as stated above became the fundamental traits of production emphasis behaviors. Production emphasis behaviors are commonly associated to leaders who work in organizations that rely on the ability to complete tasks. These behaviors are closely associated to task-orientated styles of leadership and are proven to be more effective than consideration behaviors in some situations. Production oriented leaders encourage more work, higher effort, drive hard for completion, and urge competition to beat previous output times or numbers. This research study addresses the theory of scientific management and its associated leadership competencies by hypothesizing that organization can have an affect on leader behavior in the realm of production emphasis behaviors.

Hypothesis One: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly lower production emphasis behaviors than leaders in organizations with a capability maturity level assessment of level 2. Hypothesis One implies that leaders in organizations with an assessment level of 5 will exhibit lower scores on production emphasis behaviors than leaders in organizations assessed at level 2. The hypothesis is made under the basis that

leaders in level 5 organizations should exhibit less of a need to apply pressure for productive output because the process metrics are in place; such as: work in progress, input, output, and throughput and that the metrics effectively gauge production. The LBDQ includes a 10-item subscale measuring production emphasis behaviors. This study will use the LBDQ-Form XII as the measurement scale in determining if there is a significant difference in employee perceptions in regard to leadership's production emphasis behaviors in level 2 and level 5 organizations.

Classical school

The classical school approach to organizational behavior claimed to lead to equitable treatment for all employees (Stogdill, Goldner, & Stinchcombe, 1967) by asserting that effective organizations are highly structured and concentration is not only on management but on the organizational entities as a whole. The duties of management are commonly listed as planning, organizing, commanding employees, coordinating activities, and controlling performance. Specialization of work, command unity, division of work, centralization, authority, responsibility, equity, and discipline are basic principles of this approach. The bureaucracy approach to organizational behavior is an example of the classical theory of organizational structure. The bureaucratic approach is often described as embodying the basic principles of the classical school by placing emphasis on: order, systems, rationality, uniformity, and consistency in management. It argues that structural formalization is accompanied by decentralization (Donaldson, 2001). Max Weber (1968) was instrumental to the bureaucracy approach and argued that organizations should exist as formal rule systems.

He thought that employees should be loyal to the organization and not to individual supervisors, for this reason, he believed that an organization should manifest itself in a formal structure. Weber claimed to outline the characteristics of bureaucratic approach to organizational behavior in its purest form. He stated that bureaucracy efficiency was characterized by division into distinct functions; clearly defined hierarchy; adherence to documented rules and policies; a stable system of conduct; free selection of appointed officials; defined career structure; a system of promotion based on seniority or merit; and strict, systematic discipline and control (Weber, 1968). In his principles of management he distinguished between authority and power by defining power as the ability to impose will in a relationship regardless of resistance and authority as the right. Weber maintained that there are three methods for legitimization of authority: charismatic authority, obeying because of some extraordinary personal quality implies that the individual has a right to the power; traditional authority, power often sanctioned by code or custom, i.e. right, inheritance, passing down; and bureaucratic authority, power legitimized by established rules and regulations.

Human relations

The human relations approach represents a critical yet historic change in organizational behavior theories because it dared to challenge the cultural norms of factory work in the 1920's by focusing on the importance of worker attitudes, roles and feelings. The approach represents an era when factory owners, managers and ultimately researchers began to appreciate the organizations ability to harness performance in human capital by valuing human development states, needs, abilities and relations. Factory owners began to understand that skilled labor was valuable and that human

capital should not be considered cheap and interchangeable (Oetzel & Ting-Toomey, 2006). The human relations approach suggested that workers had deeper interests at work than just paychecks; therefore it gave considerable consideration to the socio-psychological factors of workers; such as, reward, communication, camaraderie between workers and managers, and even punishment. The human relations approach is best supported by two theories; the Hawthorne studies and Douglas McGregor's Theory X and Theory Y.

Hawthorne Studies

The Hawthorne studies were a series of experiments, conducted in the late 1920's and early 30's, on Western Electric factory workers at the company's Hawthorne Works plant outside of Chicago. The purpose of the studies was to determine if there was a relationship between work environment and productivity, basically, researchers wanted to identify how and if certain variables could affect productivity and were intended to generate, not verify, researcher hypotheses (Sonnenfeld, 1985). The studies became instrumental to the human relations approach because they helped managers and factory owners see that an organization was more than a "formal arrangement of functions but also a social system" (Sonnenfeld, 1985, p119). The studies were a direct attempt to identify a relationship between productivity and work environment and displayed how work groups provide mutual support and effective resistance to management schemes to increase output. The studies resulted in two significant findings: 1) the social effect, employees increased productivity but also developed close bonds and camaraderie with each other; and 2) the experimenter effect, experiments were perceived as signs of management care and concern by the company's employees.

The studies initially focused on the effect of lighting on productivity and then moved to study social effects. Overall the studies found that workers not only responded to classical motivational approaches such as bigger paycheck as suggested in the Scientific Management and Taylor approaches, but that they were also interested in satisfying social and physiological needs. The Hawthorne studies gave rise to the term Hawthorne effect which is generally defined as intentional human behavior modification as a result of knowingly being studied. The results of the Hawthorne studies were extremely valuable to the study of organizational behavior because they showed researchers that they were dealing with socio-psychological factors that were not explained by classic theory which stressed the formal organization and formal leadership.

McGregor's Theory X and Theory Y

Douglas McGregor is considered one of the founders of the human relations approach with his human motivation theories, Theory X and Theory Y. Essentially, McGregor stated that company management projected general attitudes of their work force and would generally follow one of the two approaches. In his research McGregor indicated that managers made assumptions in regard to subordinates that he labeled Theory X and Theory Y (McGregor, 1960). He described theory X managers as the more traditional managers of the time. He depicted theory x managers as people that assumed the following of their employees: they worked only for money; were motivated by security; they generally disliked work; they had little capacity to solve problems in the organization; and that it was their nature to need direction and control in the work environment (Nadler& Nadler, 1998; Northouse, 2004; Natemeyer & McMahon, 2001). McGregor described theory Y managers as the non-traditional managers of the time.

He depicted theory Y managers as people that assumed the following of their employees: they desire work; they have self control and are self-directive; they will remain committed to objectives if rewards are in place addressing higher needs such as self-direction, self-control, creativity, affiliation and self-fulfillment. McGregor's work was based on Maslow's hierarchy of needs and suggested that people could be motivated by both need and desire (Vroom, 1964). McGregor's human motivation theory gave rise to the contingency theory of leadership as he concluded that a theory X or theory Y manager may not be best in all situations and that management style should depend on the purpose of the organization (Maslow, 1965; McMahon & Perritt, 1973).

Contingency Theory

Contingency theory is a class of behavioral theory that assumes that the effectiveness of one variable is contingent on the existence of another variable (Vecchio, 1979; Mitchell, Biglan, Oncken, & Fiedler, 1970; Smith, 1984). Contingency theory states that there are several factors that can have an influence on organizational leadership (Fishbein, Landy & Hatch, 1969) some of these factors are organization: size, environment, activities, employee attitudes, strategies, and the technologies being utilized. Contingency theory is extremely important to this research study because it presents the possibility that leadership behavior can be different given certain situations and that successful leaders must be able to identify clues in an environment and adapt their behavior to meet the needs of their followers and of the particular situation. It has been stated that no matter how one looks at leadership there exists the presence and influence of contingencies (Antonakis, Cianciolo, & Sternberg, 2004) and even with the right skills, leaders may not be effective unless they can adapt their leadership style to

meet the demands of their environment. In regard to contingency theory this research will concentrate on the studies that supported different leader behaviors in different situations, the theory in regard to leadership, and the theory in regard to the structure of the organization.

Ohio State Leadership Studies

In the 1950's, studies on effective leadership behavior were conducted at Ohio State University, directed by Dr. Carroll L. Shartle. The Ohio State staff questioned the value of a single dimension in regard to leader behavior and set out to identify various independent behavioral categories (Yukl, 2006; Barrow, 1977). The intent of the Ohio State studies was to describe active leader behavior, not to judge it, however all three of the questionnaires: the Supervisory Behavior Description Questionnaire (SBDQ) (Fleishman, 1957); the initial Leader Behavior Description Questionnaire (LBDQ) (Halpin, 1957); and the revised Leader Behavior Description Questionnaire (LBDQ-Form XII) (Stogdill, 1963) developed during the course of the studies clearly contained items that were interpreted as good or bad leader behaviors (Tracy, 1987; Szilagyi & Keller,1976). The Ohio State studies found, through use of the LBDQ, leader behaviors could be reduced into twelve overall leadership behavior dimensions and two broadly defined subscales, consideration and initiation of structure (Stogdill & Shartle, 1948; Stogdill, 1955; Halpin & Winer, 1957; Stogdill, Goldner, & Stinchcombe, 1967; Stogdill, 1969; Lowin, Hrapchak, & Kavanagh, 1969; Bons, 1974; and Yukl, 2006). The Ohio University studies were instrumental in adding to the leadership body of knowledge at a time when leadership theories, definitions and empirical studies were limited. The studies concluded that leadership behaviors varied; some leaders were

high in task, others were high in relationship, others seem to be high in both task and relationship, and some leaders were low in both (Yukl, 2006).

Consideration Behaviors

Consideration is one of the broad subscales described by the Ohio State studies through the use of the LBDQ. The behaviors associated to consideration are often categorized as human oriented. These behaviors characterize a leader who looks out for the welfare of the group (House & Miner, 1969; Lowin, Hrapchak, & Kavanagh, 1969). Consideration behaviors are described as human-oriented or relationship behaviors, such as: friendliness, camaraderie, respect, trust, representation of subordinate interests, supportiveness, rapport, communication and personal liking they are generally regarded as desirable behaviors (Tracy, 1987). The study of leadership has focused heavily on consideration behaviors. There have been many studies focused on the effect of consideration behaviors on the morale of employees, leader gender studies, and the fact that some leaders are better at displaying these behaviors. However, when one searches for studies researching organizations and their influence on leader and employee behaviors no specific research exists. This research study will address this lack of empirical research and data by hypothesizing that organizational structure can have an influence on leader behavior in the realm of consideration behaviors.

Hypothesis Two: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly higher consideration behaviors than leaders in organizations with a capability maturity assessment level of level 2.

Hypothesis Two suggests that leaders in organizations with an assessment level of 5 will exhibit higher scores on consideration behaviors than leaders in

organizations assessed at level 2. This hypothesis proposes that a leader's degree of consideration behaviors can be a function of the organizations culture. The suggestion is that leaders in more mature organizations i.e. level 5 organizations have more time to portray behaviors that are essentially consideration based because they spend less time conducting and overseeing all of the tasks involved in the management of the organization. The LBDQ includes a 10-item subscale measuring consideration behaviors. This study uses the LBDQ-Form XII as the measurement scale in determining if there is a significant difference in employee perceptions in regard to leadership's consideration behaviors in level 2 and level 5 organizations.

Initiation of structure behaviors

Initiation of structure is the other broad subscale described by the Ohio State studies through the use of the LBDQ. The behaviors associated to initiation of structure are often categorized as task-oriented behaviors and are delineated by the amount of structure the leader initiates over subordinates to achieve goals (House, 1971; House & Mitchell, 1974). Examples of initiating of structure behaviors are: organizing work, planning, coordinating, problem-solving, discipline, giving structure to work content, defining roles and responsibilities, and scheduling work activities. For example, leaders with high initiating of structure behaviors play active roles in directing every-day activities and common tasks (Tracy, 1987). In mature organizations (organizations with highly defined business processes) structured work content and procedures benefit organizations by defining the roles of the business in order to provide the needed products and/or services to the customers. Internal work flow models provide

employees with workflow schematics so they know what they are supposed to do and what the process and procedures are supposed to look like. Proper workflow management encompasses the hierarchical organizational structure, the behavior of services, the interaction between organizational departments, the integration of sub-processes, and defines the steps necessary to achieve the overall business goal. This research study hypothesizes that organizational structure imposed in and during process maturity initiatives can have an influence on initiation of structure leader behaviors.

Hypothesis Three: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly lower initiation of structure behaviors than leaders in organizations with a capability maturity level assessment of level 2.

Hypothesis three implies that leaders in organizations with an assessment level of 5 will exhibit lower scores on initiation of structure behaviors than leaders in organizations assessed at level 2. The suggestion is that in level 5 organizations the optimized processes reduce the need for a leader to exhibit high initiation of structure behaviors. Optimized processes identify required procedures and define individual tasks, decision points, input/output specifications, deliverables and acceptable tolerance levels. These processes commonly define quality control procedures, activities, resources, critical path, dependencies, costs, timing, and risks. The LBDQ-Form XII defines initiation of structure behaviors as task-oriented behaviors, such as organizing work, planning, coordinating, problem-solving, discipline, giving structure to work content, defining roles and responsibilities, and scheduling work activities. The LBDQ includes a 10-item subscale measuring initiation of structure behaviors. This hypothesis suggests

that leaders in level 5 organizations should have lower scores in initiation of structure behaviors because they have emplaced foundational organization structures that remove the need to directly and physically supervise the completion of every-day activities and common tasks. This study uses the LBDQ-Form XII as the measurement scale in determining if there is a significant difference in employee perceptions in regard to leadership's initiation of structure behaviors in level 2 and level 5 organizations.

Contingency Theory and Leadership

During the past seventy-five years how we define leadership has not changed all that much; however, the characteristics that society identifies as embodying a leader have changed immensely. Arthur Jago (1982) claimed that leadership was dynamic, evolving and both process and property. He defined process as getting others to accomplish what the leader wants done and property as the qualities, characteristics, style and behaviors the leader employs to achieve process. Jago states that for years leadership was studied informally by observing the lives and personality traits of great leaders. Leadership theories can be classified in a multitude of ways; such as, trait, skills, emotional, contingency, transactional and transformational (Yammarino & Avolio, 2002). Early leadership theories assumed the primary source of leadership effectiveness lay in the personal traits of the leaders. In the 1930's, organizational behavior and culture began to become more human oriented by focusing on the importance of worker attitudes and feelings instead of just production numbers. As organizations placed an emphasis on social structures the trait theory of leadership began to be challenged because it could not explain the differences in leadership

effectiveness. The emphasis of leadership research began to shift from an identification of personal traits to a search for behavior and characteristics. To study these differences, researchers shifted their focus to the leadership skills deployed when dealing with subordinates and employees. The shift away from trait theory (nature) gave rise to the idea that leadership skills could be learned and developed (nurture). This shift also gave rise to contingency theories of leadership and the idea that effective organizational performance is not only contingent on the leader, but also the situations presented within the organization. Early contingency theories accomplished what they intended and contributed to the leadership body of knowledge by proving that a leader could improve employee participation and motivation by varying his/her behavior dependent on the situation. These theories contend that there is no one best way to lead and that situations influence leader style. The theories hypothesize that leader task performance hinges on a proper match between organizational structure and control (Leister, Borden, & Fiedler, 1977). Since the 1960's the study of leadership has developed and tested contingency theories. In 1985, Knight and Holen declared that even though the study of leadership lacked a global definition there was agreement on two overall emphases: task oriented leadership and people oriented leadership. Through scholarship, the definition of leadership has become more than just inspiring another to accomplish an objective it has grown to include words such as: efficient, effective, versatile, and flexible and also incorporates behaviors such as: adaptability, consideration, empathy, transformational, and transparent (Stogdill & Shartle, 1948; Stogdill, 1955; Stogdill, Goldner, & Stinchcombe, 1967; Stogdill, 1969).

The contingency theory of leadership proposes that the success and effectiveness of a leader is contingent upon the demands imposed by the situations they face and how well the situation fits the leader's style (Northouse, 2004). The theory holds that various situational factors such as, the leader's preferred style, capabilities and the behaviors of followers (Fiedler, 1957; Fiedler, 1968; Fiedler, 1972; Northouse, 2004) influence a leaders ability to lead effectively. Several scholars and their contingency theories of leadership (Zaccaro, 1998) have provided significant results in regard to the knowledge of leadership; such as: Fred Fiedler's contingency theory of leadership effectiveness; Ken Blanchards and Paul Herseys situational theory; and Robert Houses: Path-Goal theory.

Fiedler's Contingency Theory of Leadership Effectiveness

Although there are many scholars related to the contingency model of leadership; Fred Fiedler is often the scholar that is most closely associated with contingency theory. Fiedler was instrumental in developing the leadership body of knowledge in many ways. (Fiedler, 1968) argued that it mattered how easy it was (Vecchio, 1979) for leaders to influence; especially since leadership is a process of influencing other people to work together. Fiedler conducted a lot of his work with military groups at a time when combining task-oriented and quasi therapeutic roles; such as, personnel problems was not considered wise (Hutchins & Fiedler, 1960). His studies often tested: leadership training, behaviors, sociometrics, attitudes, effectiveness, and experience (Smith, 1984). He was instrumental in challenging the 'familiarity-breeds-contempt' position of the mid 1900's (Fiedler, 1957); this position assumed that superiors and subordinates shouldn't mix socially. Using his assumed

similarity studies, (McMahon & Perritt, 1973), Fiedler was known to test the preferences of followers in regard to their leader and vice versus. Leadership, in the mid 1900s, was often characterized by traits instead of skill. Leaders were generally characterized by popular, white, strong, intelligent and charismatic. Fielders' work was a major contribution to leadership studies because it uncorrelated many great-man and trait-like attributes to effective leadership by providing alternative interpretations of leader and group behaviors (Blanchard, 1967). Fred Fiedler's leadership contingency model attempted to tell how leadership depends on the situation (Mitchell, Biglan, Oncken, & Fiedler, 1970). The basic premise of Fiedler's theory is that group performance is a result of interaction of two factors. These factors are known as leadership style and situational favorableness. The contingency theory (Fiedler, 1967; Fiedler & Chemers, 1974) postulates that the performance of groups depends on two interacting factors: the leaders' motivational structure and situational favorableness, the degree to which the situation gives the leaders power, control, and influence (Bonn & Fiedler, 1976, p.455).

Fiedler states that leadership involves power and influence and he hypothesized that situational favorableness directly affected group performance (Fiedler, 1972). He predicted leadership effectiveness resulted from the leader interactions and the characteristics of the environment in which the leader works (Fiedler, 1968). To substantiate his belief, Fiedler developed the Least Preferred Co-Worker (LPC) assessment for leaders. He conducted his assessment by asking the leader to think of a person, with whom they work, that they would like least to work with again. The leader then scored the person on positive factors such as, friendly, helpful, and cheerful

(Fiedler, 1968). Also, the leader scored his least liked employee on negative factors such as, unfriendly, unhelpful, and gloomy (Fiedler, 1968). Fiedler suggested that a high LPC leader generally scores the other person as positive and a low LPC leader scores them as negative. Fiedler (1968) claimed a high LPC approach is best when leader-member relations are poor, except if the leader was weak, in which a low LPC style is better. Fiedler concluded his research by maintaining the best LPC approach consisted of a combination of three factors: leader-member relations, task structure, and leader position-power. He claimed that it was these three factors that determine situational favoritism and most contingency models classify leadership on these three dimensions.

1. Leader-member relations - Degree to which a leader is accepted and supported by the group members. The more they are liked and supported, the more power and influence they have.
2. Task structure – Highly structured tasks supported by well defined procedures give the leader more influence.
3. Position power - The ability to reward, punish, hire and fire gives the leader more influence and control.

Hersey-Blanchard Situational Theory

Ken Blanchard and Paul Hersey began creating the Hersey-Blanchard Situational Leadership model in the 1960's. The models basic premise was similar to other contingency models in that a leader adopts the most appropriate leadership style to handle different organization situations and it presumes that situations affect behavior (Hersey & Blanchard, 1993). Situational theory says leaders consciously change their behavior to deal with organizational situations; whereas, other contingency theory says behaviors may be indirectly influenced by organizational culture. The difference between this model and other contingency models of the time was the incorporation of subordinate maturity. This theory postulates that effective leaders must match their leadership style to the maturity of his/her subordinates by using traditional categories of leader behavior, such as, initiating structure and consideration (Hersey & Blanchard, 1969, & Graeff, 1983). Maturity is assessed in two parts: psychological maturity, i.e. subordinate self-confidence and readiness to accept responsibility and job maturity, i.e. subordinate skills and technical expertise. The theory (Hosking & Schriesheim, 1978) is based on the amount of direction, task behavior, and amount of socio-emotional support, relationship behavior, a leader must provide given the situation and maturity level of the followers (Hersey & Blanchard, 1974). The four leadership styles are telling, selling, participating, and delegating (Hersey & Blanchard, 1977).

1. Telling: High task/low relationship behavior. The leader provides clear instructions and specific direction, best used with low follower readiness level.
2. Selling: High task/high relationship behavior. The leader encourages two-way communication and builds follower confidence and motivation.

Leader still has responsibility and controls decision making, best used with moderate follower readiness level.

3. Participating: High relationship/low task behavior. The leader and followers share decision making, best used with a moderate follower readiness level.

4. Delegating: Low relationship/low task behavior. Followers are ready to accomplish a particular task and are both competent and motivated to take full responsibility, best used with a high follower readiness level.

As followers mature the leader should decrease task and relationship behavior. This theory has had a huge impact on the leadership body of knowledge because it's simple to understand, it is practical, applies to everyone, and it works in most environments.

Robert House and the Path-Goal Theory

In 1971, Robert House extended Victor Vroom's expectancy theory by examining the contingencies under which leader behavior might affect each of the elements of motivation. House argued that leaders in certain situations will engage in different types of leadership behavior regardless of over-all leadership style. The Path-Goal theory proposes that effective leaders harmonize their behaviors with subordinates by enhancing their psychological state and clarifying paths to help followers achieve their goals (Greene, 1979). The need for leadership is moderated by characteristics of the environment as well as by characteristics of the subordinates by concentrating on exploring relationships between consideration and initiating structure behaviors and outcome measures such as employee satisfaction, expected outcomes, and possible satisfaction ((Dessler, 1977); Mawhinney & Ford, 1977; House & Mitchell, 1974;

Schriesheim & Neider, 1996). Environmental forces determine the type of leader behavior required if follower outcomes are to be maximized; for instance, organizations with work teams might not necessitate directive leadership. Follower characteristics are contingency variables such as the locus of control, experience, and perceived ability. They determine how the environment and leader are interpreted. House & Mitchell (1974) proposed four styles of leadership: supportive leadership, a supportive leader creates a friendly work environment by considering the needs of his/her follower and showing concern for their welfare; directive leadership, a directive leader lets followers know what specific work needs to be done and at what specific times, directive leaders provide schedules, guidance and rewards as incentive to get tasks accomplished; participative leadership, a participative leader takes the ideas and recommendation of followers into account when making organizational decisions; and achievement-oriented leadership, an achievement oriented leader demonstrates the ability to accomplish complex tasks by setting high standards and challenging goals for his followers both in work and in self-improvement.

Structural Contingency Theory

The assumption that there is no one best way to organize (Yammarino & Avolio, 2002) has made contingency theory extremely popular in the study of organizational leadership. In contrast to a focus on leadership and the skills of the leader, structural contingency theory concentrates more on the design of the organization and its subsystems and began when theorists attempted to identify variables that were perceived to influence organizational performance (Ginsberg & Venkatraman, 1985). It is important that structural contingency theory not be interpreted as being mechanized

and rigid, but rather a theory that provides a blueprint and rational structure using multiple images to capture the dimensions of an organization (Pennings, 1975; Morgan, 1998). Structural contingency theory claims that organizational structure needs to be aligned with those performing the work internally and externally; that it is influenced by aspects of the internal and external environment; and that direct attention should be paid to structure, as it is the organizations social architecture (Pugh, Hickson, Hinings, & Turner, 1968). Dalton, Todor, Spendolini, Fielding, & Porter (1980) believed that organization structure affected the behaviors and performance of organization members and that empirical research dealing with organizational structure and its relationships was among the most interesting and least studied topics in the field of management and organizational behavior. When organizations have good fit between contingencies and situation, performance is increased (Donaldson, 2001). In 1974, Campbell, Bownas, Peterson & Dunnette, suggested that a distinction be made between the structural and structuring characteristics of an organization and proposed labeling the structural qualities of an organization as physical characteristics, such as size, span of control, and hierarchy and its structuring characteristics as the policies and activities occurring within the organization, such as: specialization, formalization, and centralization. Organizations embarking on a mission to implement business process frameworks often do so because they purport improved prediction in quality, speed and costs. Prediction is commonly defined as a statement, based on observation or experience, of what will happen given specific conditions (Donaldson, 2001). The more information a person possesses in regard to the conditions the better, or more accurate, their prediction. In his book, *Out of the crisis*, Dr. Edward Deming (1986) stated that you should expect

what you inspect. He emphasized that when an organization inspects its inputs and processes more, its outputs can be better predicted. Predictive accuracy behaviors are commonly referred to as the foresight and ability to predict trends, problems and outcomes accurately. This research study addresses this leadership competency by hypothesizing that organizational structure can have an influence on leader behavior in the realm of predictive accuracy behaviors. Level 5 organizations are assessed with an additional four process areas: Organizational Process Performance (OPP), Quantitative Project Management (QPM), Organizational Innovation and Deployment (OID), and Causal Analysis and Resolution (CAR) these process areas involve making decisions about projects and processes based on numbers, not opinions. Performance baselines and models provide leadership with a quantitative idea of how their processes are really performing. CMMI boasts that by setting performance baselines, "an organization becomes better adept at estimating resource consumption, time delays, effectiveness, and efficiency; therefore, the quantitative predictions involving a particular production process are likely to be more competent." The importance of structural contingency theory to this research is paramount as this research study focuses on the human related impact of contingencies presented through the adoption of CMMI, a structural framework.

Hypothesis Four: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly higher predictive accuracy behaviors than leaders in organizations with a capability maturity assessment level of level 2.

Given the characteristics of level 5 organizations, this hypothesis implies that leaders in organizations with an assessment level of 5 will exhibit higher scores

on predictive accuracy behaviors than leaders in organizations assessed at level 2. The LBDQ includes a 5-item subscale measuring predictive accuracy behaviors. This study will use the LBDQ-Form XII as the measurement scale in determining if there is a significant difference in employee perceptions in regard to leadership's predictive accuracy behaviors in level 2 and level 5 organizations.

Organizational Change

Change seems to be the topic of the year; everywhere one looks the word change is prevalent. Change is being demanded in politics, gas prices, global awareness, education, economics, and in private and public sector organizations. The situations that drive change in everyday life (Reichers, Wanous & Austin, 1997) can be the same situations that drive change in an organization. No organization is immune from change and for some it is long overdue (McConnell, 1991). Most studies regarding change in organizations (Greiner, 1967) propose steps for implementing such change, these steps often include processes such as: setting the stage, creating a vision, deciding what to do, setting goals, institutionalizing the change, making change happen, managing the resistance to change with education, communication, negotiation, agreement, support and sometimes even coercion (Tichy and DeVanna, 1990; Latham & Yukl, 1975; Deming, 1986 & 2000; Kouzes & Posner, 2007; Nadler & Nadler, 1998; Kotter & Schlesinger, 1979; and Kotter, & Rathgeber, 2006). No matter what one is changing, they will always encounter some form of resistance (Morris, 1992). In reviewing organizational change it is important to understand fundamentals, methods, and means to manage change in the organization.

Change Strategies

There have been many strategies proposed and written about for implementing change in organizations and most all of them consist of methods and techniques to handle the predictable reactions to change and minimize resistance to change efforts. In 1994, Jaffe, Scott, and Tobe introduced a four-stage model of how organizational members interpret change events. They proposed that organizations members begin the four-stage process by denying and resistance and then if the change strategy is successful move onto exploration and commitment. Denial is the refusal to recognize that change is necessary, resistance is withholding or postponing participation, exploration is attempting new behaviors as a test of their effectiveness, and commitment is embracing the changes. In 1993, Pettigrew & Whipp proposed managing change by building the right climate for change by linking strategic and operational change through continuous monitoring of both the internal and external environment. John Kotter (2005 & 2006) identified three key tasks imperative for leaders when implementing change: manage multiple time lines, build coalitions, and create a vision. Arnold Judson (1991) introduced his model for implementing change it was comprised of five phases: (a) analyzing and planning the change; (b) communicating the change; (c) gaining acceptance of new behaviors (d) changing from the status quo to a desired state; (e) consolidating and institutionalizing the new state.

The Change Management Iceberg of Wilfried Krüger provides a strong visualization of the difficulties involved in introducing change in organizations (Beitler, 2003). According to Krüger most leaders only consider dealing with the things like: cost, quality and time, i.e. the obvious dangers at the top of the change management

iceberg. Krüger identifies four categories of people (Beitler, 2003) each with their own attitudes and behaviors toward change: opponents, promoters, hidden opponents, and potential promoters. Opponents are the people with both a negative attitude and behavior toward change; promoters have both a positive attitude and behavior toward change; hidden opponents have a negative attitude towards change, but superficially pretend to support the change, these are the people that pretend to support what the leaders tell them to, but their actions portray behaviors that discretely squelch change efforts; and finally the potential promoters the personnel with a positive attitude towards change, but that lack the commitment required to bring about the change. Krüger's theory presents one of the most logical theories for conducting change efforts in organizations, in that it is what is below the surface that sinks ships and often there are many more threatening aspects to change efforts than quality, speed and cost.

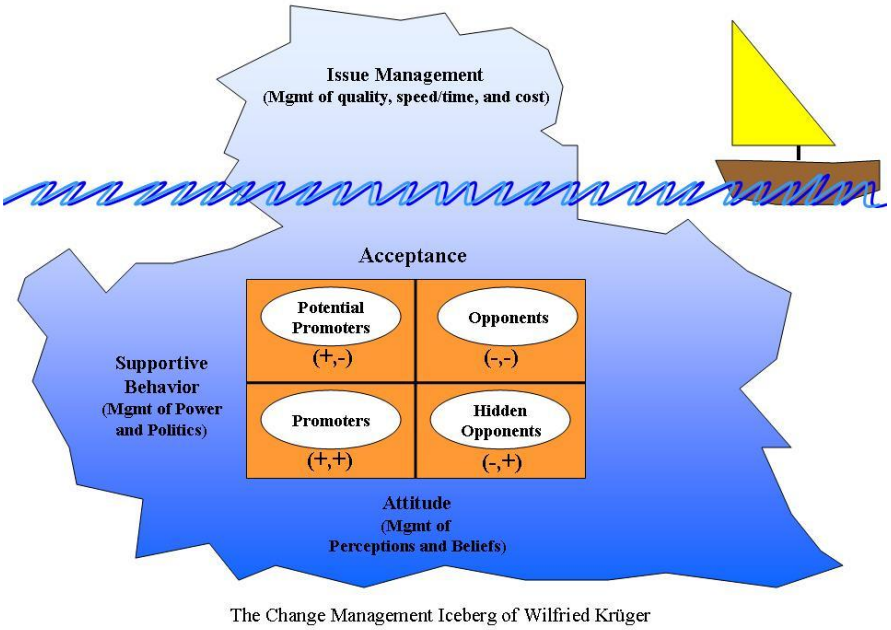

Figure 2.3: The Change Management Iceberg by Wilfried Krüger (Interpreted by Beitler)

Importance of Change

For this research it is important that the reader understand the difference between effectiveness and efficiency. For example, the United States Department of Defense (DoD) is undeniably one of the most operationally effective and powerful organization's on this planet. However, the flip-side of this effectiveness (Rainey & Pandey, 2006) is that it is habitually inefficient and chronically wasteful. Simply stated, effectiveness is the quality of process output and efficiency is the time and cost associated with executing process. Inefficiency is usually a result of: stovepipe systems and processes; poor project prioritization; unpredictable performance; unreliable reporting; disparate business processes and data; a substantial number of redundant and outdated systems; and more importantly a resistance to change (Carnevale, 2003; Rainey & Bozeman, 1998; Rainey & Thompson, 2006). Given today's economy, leaders must not only assess the capability of their organizations to achieve objectives under constrained budgets, but also their ability to collaborate with and support other organizational elements in the fulfillment of business objectives. Meeting these demands requires understanding the root causes of inefficiency before addressing possible solutions (Bozeman & Straussman, 1982; Rainey & Pandey, 2006). Understanding the root cause requires the implementation of business processes that are rigorous, flexible, repeatable, reproducible and robust (George, Rowlands, & Kastle, 2003). There is no longer an enormous and seemingly endless proliferation of dollars; leaders are now forced to intensely justify every dollar put forth for program and budget submission. In today's rapidly changing business environment, the ability to tolerate uncertainty is emerging as a characteristic that often differentiates (Falbe & Yukl, 1992)

between effective and ineffective organizations. Ineffective organizations consist of environments often characterized by poor project prioritization, unpredictable performance, ambiguous tasks and conflicting demands. Given these contingencies, coping with and managing uncertainty are quickly evolving as central leadership competencies. Lane & Klenke (2004) in their Ambiguity Tolerance Interface (ATI) studies claim that people with a higher tolerance for ambiguity and uncertainty are better adept at achieving change-oriented goals because they possess behaviors such as: flexibility, adaptability, and entrepreneurship. Although the ability to tolerate uncertainty and ambiguity is often a focus in organizational design, to date, it has been insufficiently addressed in leadership research. This research study will address this leadership competency by hypothesizing that organizational structure can have an affect on leader behavior in the realm of tolerating uncertainty.

Hypothesis 5: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly higher tolerance of uncertainty behaviors than leaders in organizations with a capability maturity assessment level of ML level 2.

Hypothesis 5 implies that leaders in organizations with an assessment level of 5 will exhibit higher scores on tolerance of uncertainty behaviors than leaders in organizations assessed at level 2. This study argues that a leader's ability to tolerate uncertainty can be a function of the culture in which the behavior is performed. The hypothesis suggests that leaders in level 5 organizations should be better adept at tolerating uncertainty and postponement because they have emplaced foundational organization structures influencing their organizations culture; therefore the organizations business processes assist in controlling for

ambiguity, uncertainty, prioritization, performance, and offer a variety of solutions that aid in the mitigation of business risks. The Leader Behavior Description Questionnaire (LBDQ-Form XII) defines tolerance of uncertainty as the ability to tolerate uncertainty and postponement without anxiety or upset. The LBDQ includes a 10-item subscale measuring tolerance of uncertainty. This study will use the LBDQ-Form XII as the measurement scale in determining if there is a significant difference in employee perceptions in regard to leadership's ability to tolerate uncertainty in level 2 and level 5 organizations.

Effective and efficient management practices often remain elusive because of: indecisive leaders, resistant mentalities, ignorance, budget constraints, rotational leadership, and the lack of controls, metrics and processes. It is important to remember that process maturity is not a magic potion (Burke, 2002); simply adopting process improvement models and methodologies is not a solution. Serious process improvement initiatives require a considerable investment of time and money on the part of the organization (Goldenson & Gibson, 2003). Rainey (1988) states that in an era of increasing public pressure and dwindling budgets, the challenge of leadership in organizations grows more difficult each day, they must create innovative environments, work smarter and devise better ways to do things. Change is important to this research because it implies that through changing and adopting a structural process framework organizational leaders become better adept at tolerating the uncertainty due to business and environmental changes and can therefore be more predictive in their expected business outcomes. Organizations with process cultures in place create structures that

generate high reliability, accountability, reproducibility, stability, and the ability to account rationally for organizational actions (Singh, Tucker, & House, 1986).

Organization Culture

Culture in an organization is defined as a pattern of shared basic assumptions (Schien, 2004). It has been stated that innovation is more difficult in organizations that do not have external pressure to improve performance; lack executive control; do not rely on profit incentives; and in which business processes are not clearly defined (Rusaw, 2001; Rainey & Fernandez, 2006). People are naturally innovative, but in organizations where morale is low and people are disgruntled it often becomes easier to hunker down, play it safe, and stick with the cultural norms (Collins, 2001; Hutchins & Fiedler 1960; Kotter & Rathgeber, 2006; Rainey & Perry, 1988; Dixit, 1997). When being a top performer simply means fitting in or surviving long enough for the leader to rotate to another assignment, the desire to think outside of the box is often squashed. Good leaders know it takes dedicated employees to complete the organization's mission (Rusaw, 2001; Kotter & Rathgeber, 2006). Leaders also know that to motivate employees, they need to fulfill their intrinsic needs; such as: reward, friendliness, camaraderie, respect, trust, supportiveness, and recognition. For some leaders, the culture of the organization makes it difficult for them to portray these types of behaviors; for example, it is hard to engage employee needs when your time and resources are dedicated to establishing foundational business processes and procedures. Leaders in chaos organizations (organizations lacking baseline processes) become immersed in production oriented issues. In unstructured organizations, leaders often spend much of their time fighting fires, applying band aids and trying to fix what's

broken when their role should be infusing experiences, building strengths, and making what is good even better (Carnevale, 2003).

Culture Defined

Leader philosophy, values, vision and goals are all attributes on which on organization rests. These attributes drive the organizational culture which is composed of the formal organization, informal organization, and the social environment. Culture is often defined as the organizations personality and how things are done; it determines the type of leadership, communication, and group dynamics within the organization. To employees, culture is the quality of work life that directly affects their degree of motivation. Although there is not a single best culture, some organizational cultures are decidedly better than others in regard to effectiveness, efficiency and employee satisfaction (Farh, Podsakoff, & Cheng, 1987). As today's business leaders place more and more emphasis on healthy organizational cultures, the study of culture and how to achieve a healthy one becomes imperative to an within the study of leadership and management. Avolio & Bass (2002) conclude that if an organization changes its communication frameworks it inevitably changes its relationships, structure and ultimately its leadership. "If scholars are to accurately analyze culture-performance links, they must combine more appropriate measures of culture's impact with careful attention to intrinsically cultural performance-related organizational processes (Saffold, 1988, p546)." This is significant because scholars such as Deal and Kennedy (1982) and Peters and Waterman (1982) have suggested that organizational culture could exert a considerable influence in organizations, particularly in areas such as performance and commitment.

Culture Research

Edgar Schein (2004) describes three levels of organizational cultural analysis: artifact, espoused values, and basic assumptions and values. The artifact level includes the elements of the organizations culture which are hard to decipher, but can be easily discerned. Artifacts may be verbal, behavioral, and physical; they are the tangible aspects of culture shared by members of an organization. Artifacts include: physical structure, sounds, sights, language, mannerisms, dress, technology, published values, rituals, ceremonies, and most importantly to this research, it includes the organizational processes, work flow, and structural elements. The level beneath artifact is espoused values. Espoused values are the organizations conscious strategies, goals and philosophies. The third layer of cultural analysis is basic assumptions and values. In his participative management linking pin model Rensis Likert (1967) described a healthy organization as a system where groups related to groups and individual managers perform the role of linking pins (Oetzel & Ting-Toomey, 2006). Likert stated that managers in an organization must belong to two groups in order to encourage a healthy culture: the group led by their supervisor and the group in which they participate openly with their subordinates i.e. successful managers become the organizations cultural linking pins (Likert, 1967).

The establishment of core business processes benefits organizations by creating conformity that often alleviates employee frustration and poor morale (Carnevale, 2003). Personnel with poor morale are often frustrated, disgruntled, non-productive, and poisonous to an organizations culture. Poor morale will never be alleviated in the organizational environment (Carnall, 1995), but when it runs rampant in an organization

this is a glaring symptom of a poor organizational culture and process failure somewhere. Problems such as rework, complaints, bottlenecks, missed or extended suspense dates, last minute crunches, spiraling costs, and the fact that the methods of completion change from one day to the next can all be resolved by implementing business processes. The time spent attending every meeting and guiding every simple decision in a chaos organization is huge, as an unnamed public sector leader once said, "I feel as though one foot is nailed down and all I do is go around in circles." Organizations benefit from good structure because their leaders have more time to display behaviors that are essentially human-oriented or relationship behaviors, such as: friendliness, camaraderie, respect, trust, representation of subordinate interests, supportiveness, and liking. This research proposes that leaders in more mature organizations have more time to portray integration behaviors such as; maintaining a closely knit organization, resolving inter-member conflicts, and addressing individual employee concerns. Integration behaviors are behaviors oriented toward unity. Organizations display integration behaviors by working together as a team to achieve the mission and common goals. Personnel display integration behaviors by interacting with others regardless of organization status, working in teams, communicating within and across functional areas, achieving unity, and settling intergroup conflicts. This research study addresses this leadership competency by hypothesizing that organizational structure can have an influence on leader behavior in the realm of integration behaviors.

Hypothesis 6: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly higher integration behaviors than leaders in organizations with a capability maturity assessment level of level 2.

This hypothesis suggests that leaders in organizations with an assessment level of 5 will exhibit higher scores on integration behaviors because they have more time to focus on and address behaviors such as, team cohesion and intergroup conflict. The LBDQ includes a 5-item subscale measuring integration behaviors. This study will use the LBDQ-Form XII as the measurement scale in determining if there is a significant difference in employee perceptions in regard to leadership's integration behaviors in level 2 and level 5 organizations.

CHAPTER THREE: STUDY DESIGN AND METHODOLOGY

Research Design

A two condition, mixed group quasi-experimental design was used to determine if a relationship existed between organizational process maturity and certain leader behaviors. The researcher selected public and private sector organizations with decidedly different process maturity level assessments and compared respondent data, from two scales, within and between the groups. The study was conducted over a four (4) month period in sixteen (16) different private and public sector organizations with measurable differences in cultural environments i.e. Maturity Level (ML) level 2 and level 5 organizations. The researcher realizes that the influence of process maturity on leader behavior may be delayed i.e. newly assessed organizations may exhibit a weaker relationship between process maturity levels and leader behavior than organizations that have held the same maturity level for years and may be seeking the next, or higher, maturity level assessment. Due to the non-random sample and because population subsets have been systematically excluded due to their ability to achieve a successful maturity level appraisal i.e. survivorship, the researcher recognizes that final results could be flawed and that sample selection bias exists in this study.

Research Population

The target population included volunteer participants employed in private and public sector organizations that had achieved a process maturity assessment level using the SEI's Capability Maturity Model Integration (CMMI). The population of available organizations is available to the public and listed on the Software Engineering Institutes website at: http://sas.sei.cmu.edu/pars/pars.aspx. Organizations were arbitrarily

solicited and were provided with the study title and intent (See Appendix 1: Organization Solicitation Email). Upon receiving the organizations support the organizations were provided with study demographics i.e. purpose; importance of study; risks; benefits; procedures; and informed consent (See Appendix 2:Web Survey Participant Information).

Research Measures

This research study gathered data by employing a researcher developed supplemental survey (See Appendix 3: Supplemental Survey Questions) and the Leader Behavior Description Questionnaire (LBDQ) Form XII (See Appendix 4: LBDQ Form XII).

The supplemental survey was developed by the researcher to identify potentially influential confounding variables such as: Org_Size- organization size; Org_MLT- the amount of time organization has held maturity level; P_Age- participant age; P_Years- participants number of years in organization; P_Gender- participant gender; P_Satisfaction- participant satisfaction; L_Gender- leader gender, and L_Time_In_Org- leader time in position and L_Position- overall position. The supplemental survey also collected data on employee perceptions; such as, Per_L_Engagement- perception on how engaged the leader was in satisfaction of employee interests; Per_L_Emp Focus- perception on how focused the leader was in engaging with group camaraderie; and Per_L_Work Focus- perceptions on the main focus of the leader. For this study the supplemental survey was deployed via the web by using the toolsets available at www.surveymonkey.com.

This research also employed the LBDQ Form XII as an instrument to measure leader behavior across organizations that had been assessed and awarded a process maturity level. As marketed, the LBDQ Form XII provides group members with a technique to describe the behavior of the leader in any type of organization, providing they have had the opportunity to observe the leader in action (Northouse, 2004). The LBDQ does not measure situational factors; simply put, it utilizes twelve subscales to describe leader behavior, in regard to current organization, but not overall belief or experiences. Dr. Carroll L. Shartle, the director of the Ohio State studies, declared that the LBDQ was not a normative device for estimating leadership skills across cultures, but had relevance in comparing ratings of leadership behaviors across cultures (Stogdill, 1963). The LBDQ measures leader behaviors associated with task-oriented and relationship-oriented aspects of leadership. The LBDQ Form XII is a one-hundred (100) question questionnaire that identifies two broad categories of leader behavior: consideration and initiation of structure (Fleishman 1957; Halpin, 1957; Halpin & Winer, 1957; Hemphill & Coons, 1957). Although some items may appear similar, each item describes a specific kind of behavior and expresses differences that are important in the description of leadership.

For this study the LBDQ was deployed via the web by using the toolsets available at www.surveymonkey.com. Participants were instructed to go to a specific link (corresponding with their organizations maturity level) and to read each item carefully, think about how frequently the leader engages in the behavior described by the item, and indicate their response by clicking on the corresponding answer: (A) Always, (B) Often, (C) Occasionally, (D) Seldom or (E) Never. Items are scored as

follows: A yields a score of 5; B yields a score of 4; C yields a score of 3, D a score of 2, and E a score of 1. On the some items the scoring is reversed; for example, A yields a score of 1, B a score of 2, etc. The LBDQ manual and several forms are assessable to all researchers and available at: http://fisher.osu.edu/offices/Fiscal/LBDQ. This research was concerned with six behaviors: ((tolerance of uncertainty (TU), initiation of structure (IS), consideration (C), production emphasis (PE), predictive accuracy (PA), and integration (I)) of the subscales, but collected data on all twelve subscales of leader behavior identified and measurable through the LBDQ: ((representation (REP), demand reconciliation (DR), persuasiveness (PER), tolerance of freedom (TOLF), role assumption (RA), superior orientation (SO)).

Research Administration

This study was administered using the web based administration technique offered by Surveymonkey. Surveymonkey offered the researcher the following benefits: data were automatically secured by Verisign and delivered over a Secure Sockets Layer (SSL) channel; delivery method drastically decreased the time and costs associated to the study; data collection was easy, convenient and accessible in real-time; data were downloadable in spreadsheet format; the delivery method provided quick access to a large sample size; non-intrusive research; and the web tool offered built-in charting capabilities and access to individual responses. Consenting organizations provided participants a web link specific to the type of organization they were in i.e. maturity level 2 or maturity level 5. At the link provided, participants were provided with a complete description of the research study to include: risks, benefits, procedures and consent (See Appendix 5: Survey Monkey Pages). Consenting participants were

asked to complete a thirteen (13) question supplemental survey and the LBDQ Form XII. The web links were available for sixteen (16) weeks when the researcher concluded that sufficient quantitative data had been collected.

General Information

Basic information was collected from participants to include: organization size; the amount of time the organization had held maturity level; participant age; participant number of years in organization; participant gender; participant satisfaction; leader gender; leader position; and the leader's time in position.

Pilot Test

Prior to the pilot test a ten (10) question supplemental survey was developed and the LBDQ Form XII was converted to web format. A CMMI ML 3 organization volunteered to deploy the study to its personnel and provide feedback to the researcher. The pilot test yielded the following conclusions:

- The CMMI community does not use Roman numerals any longer, use numeric numerals.
- They liked the use of the Survey Monkey for privacy and ease.
- A need to add questions to the supplemental survey that address the number of years in the organization, the amount of time the organization has held current assessed ML, and the amount of time leader has been in organization.

Research Study Stages

Upon receiving IRB approval the following stages were implemented:

Stage I- Contacting the organizations & participants.

Stage II- Deploying the measurements.

Stage III- Collecting quantitative data from secure survey site.

Stage IV- Analyzing data.

Stage V- Presenting findings and conclusion in dissertation.

Research Method

The Statistical Package for the Social Sciences (SPSS), Version 17.0 was used to analyze the data in this research study. Statistical treatment of the data utilized Multivariate GLM. Multivariate GLM is the version of the general linear model used in SPSS to implement Multivariate Analysis of Variance (MANOVA) and Multivariate Analysis of Covariance (MANCOVA). MANOVA was used to to identify interactions among the dependent variables and the independent variables and to determine if there was an overall difference in leader behaviors in organizations with decidedly different maturity levels. MANCOVA allowed the researcher to analyze the twelve (12) dependent variables and one or more independent variables while supporting the use of continuous control of nine (9) of the extraneous variables identified in the supplemental survey supplemental variables. The extent of the relationship between variables was determined by employing Pearson and Spearman correlation coefficients. Data analysis also incorporates bivariate and individual univariate tests such as: Analysis of Variance (ANOVA) for group comparison between ML level 2 and ML level 5 organizations, independent samples t-tests to determine how ML level 2 and ML level 5 organizations were different, and Cronbach's alpha to determine the internal consistency and average correlation of the items in the survey instruments.

Independent Variables

The Independent Variables (IVs) manipulated in this research study are: Organization Maturity Level Org_ML 2, or Org_ML 5. This study also assigned each of the one hundred (100) LBDQ Form XII questions its own variable name (See Appendix 6: Code Book). The variables were individually named and assigned to one of twelve leader behaviors subscales. The scale factors were created in the Statistical Package for the Social Sciences (SPSS) and are associated with the original subscales assignments as indicated in the LBDQ Form XII Record Sheet (see Table 3.1).

LBDQ Form XII – RECORD SHEET											
Behavior	**Question Number and Scoring Value**										**Total**
Representation	1)___	11)___	21)___	31)___	41)___						
Demand Reconciliation						51)___	*61)___	*71)___	81)___	*91)___	
Tolerance of Uncertainty	2)___	*12)___	22)___	32)___	*42)___	52)___	*62)___	72)___	82)___	*92)___	
Persuasiveness	3)___	13)___	23)___	33)___	43)___	*53)___	63)___	73)___	83)___	93)___	
Initiation of Structure	4)___	14)___	24)___	34)___	44)___	54)___	64)___	74)___	84)___	94)___	
Tolerance and Freedom	5)___	15)___	25)___	35)___	45)___	55)___	*65)___	75)___	85)___	95)___	
Role Assumption	*6)___	*16)___	*26)___	*36)___	*46)___	*56)___	*66)___	76)___	86)___	96)___	
Consideration	7)___	17)___	27)___	37)___	47)___	*57)___	67)___	77)___	*87)___	*97)___	
Production Emphasis	8)___	18)___	28)___	38)___	48)___	58)___	*68)___	78)___	88)___	98)___	
Predictive Accuracy	9)___		29)___		49)___		59)___		89)___		
Integration		19)___		39)___			69)___	79)___		99)___	
Superior Orientation	10)___	20)___	30)___	40)___	50)___	60)___	70)___	80)___	90)___	100)___	

* Starred items are scored (1 2 3 4 5)
All other items are scored (5 4 3 2 1)

Table 3.1: Original LBDQ Form XII Record Sheet

Leader Behavior Subscales

- Representation=(REP1_5+REP2_5+REP3_5+REP4_5+REP5_5)/5
- Demand_Reconciliation=(DR1_5+DR2_5+DR3_5+DR4_5+DR5_5)/5
- Tolerance_of_Uncertainty=(TU1_10+TU2_10+TU3_10TU4_10+TU5_10+TU6_10+TU7_10+TU8_10+TU9_10+TU10_10)/10
- Persuasion=(PER1_10+PER2_10+PER3_10+PER4_10+PER5_10+PER6_10+PER7_10+PER8_10+PER9_10+PER10_10)/10
- Initiation_of_Structure=(IS1_10+IS2_10+IS3_10+IS4_10+IS5_10+IS6_10+IS7_10+IS8_10+IS9_10+IS10_10)/10
- Tolerance_of_Freedom=(TOLF1_10+TOLF2_10+TOLF3_10+TOLF4_10+TOLF5_10+TOLF6_10+TOLF7_10+TOLF8_10+TOLF9_10+TOLF10_10)/10
- Role_Assumption=(RA1_10+RA2_10+RA3_10+RA4_10+RA5_10)/5
- Consideration=(C1_10+C2_10+C3_10+C4_10+C5_10+C6_10+C7_10+C8_10+C9_10+C10_10)/10
- Production_Emphasis=(PE1_10+PE2_10+PE3_10+PE4_10+PE5_10+PE6_10+PE7_10+PE8_10+PE9_10+PE10_10)/10
- Predictive_Accuracy=(PA1_5+PA2_5+PA3_5+PA4_5+PA5_5)/5
- Integration= (I1_5+I2_5+I3_5+I4_5+I5_5)/5
- Superior_Orientation=(SO1_10+SO2_10+SO3_10+SO4_10+SO5_10+SO6_10+SO7_10+SO8_10+SO9_10+SO10_10)/10

Dependent Variables

The leader behavior subscales as defined above represent twelve (12) of the dependent variables measured in this study. The behavior subscales are defined as follows:

1. (TU)- Tolerance of Uncertainty behaviors-- allows followers scope for initiative, decision and action. (10 items)

2. (IS)- Initiation of Structure behaviors—leader actively engages behaviors that are essentially "task-oriented" behaviors; such as, organizing work, planning, coordinating, problem-solving, discipline, giving structure to work content, defining roles and responsibilities, and scheduling work activities. (10 items)

3. (C)- Consideration behaviors—leader actively engages in relationship behaviors; such as, building friendships, camaraderie, respect, trust, representation of subordinate interests, supportiveness, and liking between leaders and followers. (10 items)

4. (PE)- Production Emphasis behaviors—leader applies pressure for productive output. (10 items)

5. (PA)- Predictive Accuracy behaviors—leader exhibits foresight and ability to predict outcomes accurately. (5 items)

6. (I)- Integration behaviors—leader maintains a closely knit organization; resolves inter-member conflicts. (5 items)

7. (REP)- Representation behaviors—leader speaks and acts as the representative of the group. (5 items)

8. (DR)- Demand Reconciliation behaviors—leader reconciles conflicting demands and reduces disorder to system. (5 items)

9. (PER)- Persuasiveness behaviors—leader uses persuasion and argument effectively; exhibits strong convictions. (10 items)

10. (TOLF)- Tolerance of Freedom behaviors—leader allows followers scope for initiative, decision and action. (10 items)

11. (RA)- Role Assumption behaviors—leader actively exercises the leadership role rather that surrendering leadership to others. (10 items)

12. (SO)- Superior Orientation behaviors-- leader maintains cordial relations with superiors; has influence with them; is striving for higher status. (10 items)

Extraneous Variables

In the design of this study precaution was taken to organize the experiment properly and to ensure that the right type of data were collected. The supplemental survey was developed by the researcher to identify the potentially influential variables regarding organizational process maturity levels and leadership behaviors. Those variables are identified as follows:

1. P_Years- Participants number of years in organization
2. Org_ML- Assessed Maturity Level
3. Org_MLT- Time the organization has held current assessed ML.
4. Org_Size- Organization size
5. P_Gender- Participant gender
6. P_Age- Participant age
7. P_Satisfaction- Participant satisfaction
8. L_Gender- Leader gender
9. Per_L_Engagement- Perceived Leader engagement
10. L_Time_In_Org- Time leader has been in organization
11. Per_L_Emp Focus- Perceived Leader Employee Focus
12. Per_L_Work Focus - Perceived Leader Work Focus
13. L_Position- Leader position

LBDQ Reliability and Validity

Reliability of LBDQ Form XII

The reliability of the LBDQ Form XII subscales was determined using a modified Kuder-Richardson Formula 21, a standard for estimating internal consistency reliability for a single form of a test administered on a single occasion. According to the Kuder-Richardson Formula 21, the LBDQ questionnaire demonstrates good internal consistency with most coefficients falling around the .80's (Halpin & Winer, 1957; Bass & Stogdill, 1990). In his manual for the Leader Behavior Description Questionnaire-Form XII (1963), Stogdill reported that the Kuder-Richardson procedure also yielded a conservative estimate of subscale reliability. The reliability coefficients as reported by Stogdill are shown in Table 3.2.

Table 2 – Reliability Coefficients (Modified Kuder-Richardson)									
Subscale	Army Division	Highway Patrol	Aircraft Executives	Ministers	Community Leaders	Corporation Presidents	Labor Presidents	College Presidents	Senators
1. Representation	.82	.85	.74	.55	.59	.54	.70	.66	.80
2. Demand Reconciliation			.73	.77	.58	.59	.81		.81
3. Tolerance of Uncertainty	.58	.66	.82	.84	.85	.79	.82	.80	.83
4. Persuasiveness	.84	.85	.84	.77	.79	.69	.80	.76	.72
5. Initiation of Structure	.79	.75	.78	.70	.72	.77	.78	.80	.64
6. Tolerance and Freedom	.81	.79	.86	.75	.86	.84	.58	.73	.65
7. Role Assumption	.85	.84	.84	.75	.83	.57	.86	.75	.85
8. Consideration	.76	.87	.84	.85	.77	.78	.83	.76	.38
9. Production Emphasis	.70	.79	.79	.59	.79	.71	.65	.74	
10. Predictive Accuracy	.76	.82	.91	.83	.62	.84	.87		
11. Integration	.73	.79							
12. Superior Orientation	.64	.75	.81			.66		.60	

Table 3.2: LBDQ Form XII Reliability Coefficients (Modified Kuder-Richardson)

In his manual for the Leader Behavior Description Questionnaire- Form XII (1963), Stogdill reported the means and standard deviations for several highly selected samples as shown in Table 3.3- Means and Standard Deviations.

Table 1 – Means and Standard Deviations										
Subscale	Army Division		Highway Patrol		Aircraft		Ministers		Community Leaders	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Representation	20.0	3.0	19.9	2.8	19.8	2.8	20.4	2.4	19.6	2.4
Demand Reconciliation					19.2	2.8	19.8	3.1	19.7	3.3
Tolerance of Uncertainty	36.2	4.7	35.6	4.6	33.2	6.2	37.5	6.3	37.7	5.6
Persuasiveness	38.3	6.2	37.9	5.9	36.5	5.5	42.1	4.7	39.5	5.5
Initiation of Structure	38.6	5.7	39.7	4.5	36.6	5.4	38.7	4.9	37.2	5.7
Tolerance and Freedom	35.9	6.5	36.3	5.3	38.0	5.9	37.5	6.0	36.4	5.0
Role Assumption	42.7	6.1	42.7	5.3	40.9	5.6	41.5	5.4	39.8	5.6
Consideration	37.1	5.6	36.9	6.5	37.1	5.8	42.5	5.8	41.1	4.7
Production Emphasis	36.3	5.1	35.8	5.7	36.1	5.6	34.9	5.1	35.4	6.8
Predictive Accuracy	18.1	2.1	17.8	2.1	19.2	2.6	20.5	2.3	19.8	2.5
Integration	19.5	2.6	19.1	2.7						
Superior Orientation	39.9	4.9	39.1	5.1	38.6	4.2				
Number of Cases	235		185		165		103		57	

Table 1 – Means and Standard Deviations (continued)								
Subscale	Corporation Presidents		Labor Presidents		College Presidents		Senators	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Representation	20.5	1.8	22.2	2.2	21.4	1.9	20.7	2.5
Demand Reconciliation	20.6	2.7	21.5	3.2			20.7	3.5
Tolerance of Uncertainty	35.9	5.4	40.4	5.6	37.2	5.5	35.3	7.6
Persuasiveness	40.1	4.2	43.1	4.8	41.1	4.2	42.5	4.6
Initiation of Structure	38.5	5.0	38.3	5.6	37.7	4.2	38.8	5.5
Tolerance and Freedom	38.9	4.9	38.0	4.0	39.6	3.9	36.6	6.2
Role Assumption	42.7	3.5	43.3	5.5	43.5	4.5	41.0	5.7
Consideration	41.5	4.0	42.3	5.5	43.5	4.5	41.0	5.7
Production Emphasis	38.9	4.4	36.0	5.0	36.2	5.0	41.2	5.2
Predictive Accuracy	20.1	1.8	20.9	2.0				
Integration								
Superior Orientation	43.2	3.1			42.9	2.9		
Number of Cases	55		44		55		44	

Table 3.3: LBDQ Form XII Table 1 Means and Standard Deviations

Validity of LBDQ Form XII

Validity implies that a given subscale measures the pattern of behavior that it is intended to measure. It is a challenge to present convincing evidence of the validity of any sort of personality test or behavior description device (Stogdill, 1969). The LBDQ questionnaire offers strong statistical conclusion validity as it allows researchers to compare leaders in and between groups and quantify the strength of those relationships. The LBDQ was designed to measure leader behaviors associated with task-oriented and relationship-oriented aspects of leadership. Stogdill (1969) stated that an attempt toward validation was desirable, so he tested divergent validities on consideration, structure, representation, tolerance of uncertainty, superior orientation and production emphasis subscales and determined that the subscales indeed measured what they were designed to measure.

Conceptual Model

The intent of this study is to explore the relationship between the organization process maturity and six dimensions of leader behavior. The study will provide empirical support to determine if changes to structure and design instituted in the process of maturing an organizations process maturity level presents contingencies which over time lead to changes in leader behavior. The objective of the study is to evaluate specific leader behaviors given a common environment (CMMI) with varying degrees of organizational process maturity (Maturity Level (ML) 2 vs. ML 5). It has been determined that the implementation of process improvement frameworks, models and methodologies has a positive effect on Return On Investment's (ROIs) such as quality, speed and cost. This study will research the affect of process maturity

frameworks, models and methodologies on leader behaviors such as: tolerance of uncertainty, initiation of structure, consideration, production emphasis, predictive accuracy, and integration.

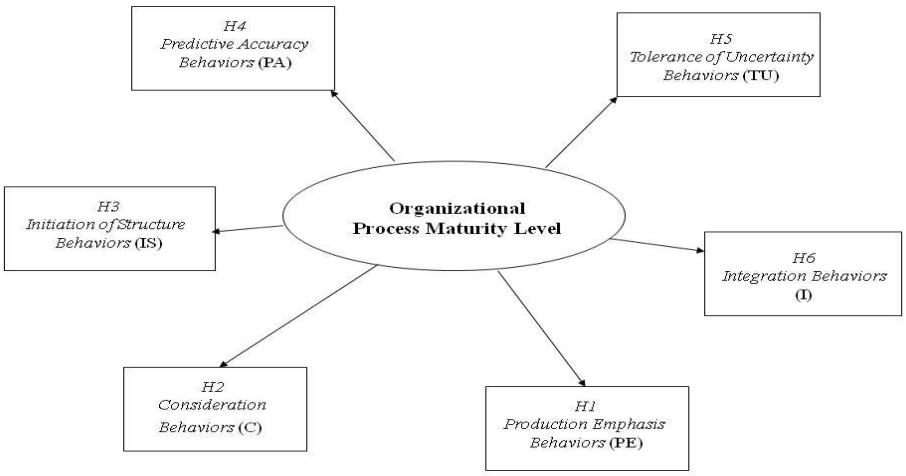

Figure 3.1: Conceptual Model of Research Study (Developed by Author)

CHAPTER FOUR: RESULTS OF THE STUDY

Review and Purpose of the Study

The study of organizational behavior advanced when factory owners and managers began to realize the importance of the relationship between work environment and employee productivity (Bass, 1990; Natemeyer & McMahon, 2001; Robbins, 2005; Putnam, 2000). The study of organizational behavior revolves around three main behavior aspects: individual, groups, and structure and there are three main approaches: scientific management, classical school, and human relations. Scientific management is described as the approach where leaderships focus was on the productivity of individuals rather than the individuals themselves. The classical school approach claimed to lead to equitable treatment for all employees by asserting that effective organizations are highly structured and concentration is not only on management but on the organizational entities as a whole. The classical school placed emphasis on: order, systems, rationality, uniformity, and consistency in management. And lastly, the human relations approach represented a critical yet historic change because it dared to challenge the cultural norms of factory work in the 1920's and focused on the importance of worker attitudes, roles and feelings. During this time leadership theories were also evolving and with the rise of contingency theories made the statement that there were many factors that could have an influence on the leadership in an organization, such as: organization size, environment, activities, employee attitudes, strategies, and the technologies being utilized.

This study suggests that changes to structure and design instituted during the course of developing an organizations process maturity level present contingencies

which over time lead to changes in leader behavior. The purpose of this study is to explore the relationship between organizational process maturity and leadership behavior and the objective of the study is to evaluate and compare specific leader behaviors in organizations that have been awarded a staged, CMMI process maturity level, specifically either a Maturity Level 2 or a Maturity Level 5 award. Study goals include: 1) clarifying uncertainties regarding the value and benefits of implementing expensive process improvement models and methodologies and 2) providing data to empirically support the influence of organizational process frameworks on leader behavior. In meeting the objective and achieving the goals of this study several methods of data analysis were utilized in the exploration of the overall structure and the individual salient features of the data.

Sample Descriptive Statistics

Twenty-seven organizations were asked to participate in this research study (eleven ML 5 and sixteen ML 2). Sixteen (16) organizations participated in this study indicating a 59% participation rate. The sample included nine (9) ML 5 organizations and seven (7) Maturity Level (ML) 2 organizations. One of the respondents from the ML 5 organizations was removed because of incomplete survey responses, i.e. they completed the thirteen (13) question supplemental survey, but not the LBDQ Form XII the removal yielded an overall data sample size of seventy-five (75). There were a total forty-two (42) representing ML 5 organizations and of thirty-three (33) participants representing the ML 2 organizations, n=75. The following demographic data were collected from the thirteen question supplemental survey.

Organization Demographics

The following frequency analysis tables provide summaries of the data related to the organizations collected in the supplemental survey.

What is the Maturity Level (II, III, IV, V) assessment of your current organization?	Frequency	Percent
ML 2	33	44.0
ML 5	42	56.0
Total	75	100.0
How long has your organization held its current Maturity Level Assessment?	**Frequency**	**Percent**
I don't know	5	6.7
Less than 1 year	15	20.0
1-3 years	29	38.7
3-5 years	10	13.3
Over 5 years	14	18.7
What is a Maturity Level Assessment?	2	2.7
Total	75	100.0
Approximately, how large is your organization?	**Frequency**	**Percent**
Less than 25 people	3	4.0
26-50 people	7	9.3
51-75 people	5	6.7
Over 75 people	60	80.0
Total	75	100.0

Table 4.1: Organization Demographics

Participant Demographics

The following frequency analysis tables provide summaries of the participants personal data collected in the supplemental survey. Of significance difference overall:

- respondents in ML 5 organizations had worked in their organizations longer than respondents in ML 2 organizations, F (1, 73) = 6.741, p =.011, ηp^2=.085;
- respondents in ML 5 organizations were older than respondents in ML 2 organizations, F (1, 73) = 12.752, p =.001, ηp^2=.149.

How many years have you been in your current organization?	Frequency	Percent
Less than 1 year	5	6.7
1-3 years	15	20.0
3-5 years	10	13.3
Over 5 years	45	60.0
Total	75	100.0
Are you male or female?	**Frequency**	**Percent**
Male	45	60.0
Female	30	40.0
Total	75	100.0
Which best categorizes your age group?	**Frequency**	**Percent**
18-25	2	2.7
26-35	11	14.7
36-45	12	16.0
46-60	39	52.0
61-70	11	14.7
Total	75	100.0
Overall, are you satisfied with your work environment?	**Frequency**	**Percent**
Yes	72	96.0
No	3	4.0
Total	75	100.0

In subsequent analysis of the original (3) 'Other' remarks the following responses were re-categorized Yes: very happy; Most of the time; and I am a process improvement zealot, always seeking improvement.

Table 4.2: Participant Demographics

Leader Demographics

This research recognized that there are differences between managers and leaders, but for the purpose of this research the term leader was synonymous with supervisor and manager. Respondents were told that they could use any leader in their current organization given the leader being evaluated was in a leadership position affording them the power to make, change and directly influence organizational decisions in regard to vision, goals, objectives, hiring, budget, profit and mission. Participants were instructed to choose any leader in their organization providing they have had direct experience observing the leader in work settings and he or she fit the study's criteria. Regardless of personal views, respondents were instructed to choose an organizational leader known in the organization and whose leadership position was not debatable. Figure 4.1- Leader Position Descriptions below was provided as an example:

Senior Management	The executive heads of the organization or departments, the top-level leadership team. For example, this would include individuals such as: (Directors, Deputy Director, Presidents, Vice Presidents)
Middle Management	Managers in middle-management positions who typically supervise one or more managers. For example, this would include individuals such as: (Division Chiefs, Section Managers)
Lower Management	Management positions who typically supervise employees, but not other managers. For example, this would include individuals such as: (Branch Chief, Team Chief, Team or Work Lead)

Figure 4.1: Leader Position Descriptions

The frequency analysis tables in this section provide summaries of the data related to leader demographics and the employee perceptions of leader behavior; these data were collected in the supplemental survey.

Which is the best estimate of position in regard to the leader which you will be evaluating?	Frequency	Percent

Senior Management (Director, Deputy Director, President, Vice President)	42	56.0
Middle Management (Division Chief, Section Manager)	20	26.7
Lower Management (Branch Chief, Team Chief, Team or Work Lead)	13	17.3
Total	75	100.0
Is the leader you are about to evaluate male or female?	Frequency	Percent
Male	62	82.7
Female	13	17.3
Total	75	100.0
Approximately, how long has the leader you are evaluating been in the organization?	Frequency	Percent
I don't know	3	4.0
Less than 6 months	2	2.7
6 months to 3 years	9	12.0
3-5 years	13	17.3
Over 5 years	48	64.0
Total	75	100.0

Table 4.3: Leader Demographics

Perceived Leader Engagement

Do you feel that the leader you are evaluating is actively engaged in making sure that employee interests are satisfied?	Frequency	Percent
Maturity Level 2 Organizations		
Yes	23	69.7
No	10	30.3
Total	33	100.0
In subsequent analysis the original (3) 'Other' remarks the following responses were re-categorized as No: Some employees but not all; Very busy; and No comment.		
Maturity Level 5 Organizations		
Other	1	2.4
Yes	37	88.1
No	4	9.5
Total	42	100.0
In subsequent analysis of the original (4) 'Other' remarks the following responses were re-categorized as Yes: Tries hard; sometimes; he empowers others, and becomes engaged himself if there is an issue. The following responses were re-categorized as No: we have a matrix leadership- the leader is client facing and works more on the contract was left coded as Other.		

Table 4.4: Perceived Leader Engagement

Perceived Leader Employee Focus

Do you feel that the leader you are evaluating has time to deal with the everyday business of their employees (i.e. camaraderie, group membership, career interests, conflict resolution)?	Frequency	Percent
Maturity Level 2 Organizations		
Other (please specify)	1	3.0
Yes	19	57.6
No	13	39.4
Total	33	100.0
In subsequent analysis of the original (3) 'Other' remarks the following responses were re-categorized as No: He is busy; no, but he makes time as needed, and no comment was left coded as Other.		
Maturity Level 5 Organizations		
Other (please specify)	0	0
Yes	28	66.7
No	14	33.3
Total	42	100.0
In subsequent analysis of the original (6) 'Other' remarks the following responses were re-categorized as Yes: Yes is the answer, however, he does this by working everyday till the days work is done, often late into the evening/night; yes, as time allows; he does the best he can- his plate is so full with urgent issues, they often overwhelm the important subjects of your query; sometimes, and (2) were coded as No: no, but he makes time for it; the leader is not my direct supervisor therefore, he doesn't seem to get that involved with by business.		

Table 4.5: Perceived Leader Employee Focus

Perceived Leader Work Focus

Which of the answers below best describes the main focus of the leader you are evaluating?	Frequency	Percent
Maturity Level 2 Organizations		
Other (please specify)	2	6.1
Work output /Production	15	45.5
The people in the workplace	2	6.1
Trying to keep up with job demands	10	30.3
Answering email or attending meetings	4	12.1
Total	33	100.0
Other Remarks (2): Not sure. I don't see her often enough to know; I feel like my manager does a good job of combining each of these as his main focus.		
Maturity Level 5 Organizations		
Other (please specify)	8	19.0
Work output /Production	18	42.9
The people in the workplace	2	4.8

Perceived Leader Work Focus

Trying to keep up with job demands	10	23.8
Answering email or attending meetings	4	9.5
Total	42	100.0

Other Remarks (8): Other Remarks: Building the business; making margins; business success through commitment to customers, involvement with people, integrity, and excellence; business Development and Sales; Work output / Production / Product Quality and striving for continual improvement and effectiveness; Trying to ensure customers are properly communicated with and engaged for new business; Both work output/production and the people; measuring/monitoring the client contract bonus criteria and company goals.

Table 4.6: Perceived Leader Work Focus

Data Cleaning and Normalization

All variables were analyzed for kurtosis, skewness and outliers. Kurtosis is the degree of peakedness of a distribution and lower values of kurtosis represent data with a larger degree of variance. Research data (overall) showed a platykurtic distribution i.e. overall lower peaks than a normal distribution, skinny tails, and a distribution concentrated toward the mean. Individual Kurtosis results are shown in table 4.7 below.

In a set of statistical data, skewness describes the asymmetry from the normal distribution i.e. a skewness of zero; if data points are skewed to the left of the of the data average they are negatively skewed or to the right positively skewed. The data in this research study are negatively skewed and are shown in table 4.7 below.

Descriptive Statistics

		Representation	Demand Reconciliation	Tolerance of Uncertainty	Persuasion	Initiation of Structure	Tolerance of Freedom	Role Assumption	Consideration	Production Emphasis	Predictive Accuracy	Integration	Superior Orientation
N	Valid	75	75	75	75	75	75	75	75	75	75	75	75
	Missing	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4.12	3.90	3.63	3.82	3.90	3.95	3.97	3.67	3.48	3.71	3.69	3.8080
Median		4.20	4.00	3.70	3.90	4.00	4.00	4.00	3.70	3.60	3.80	3.80	3.8000
Mode		4	4	4[a]	4	4	4[a]	5	3[a]	4[a]	4	4	3.80
Std. Deviation		.471	.701	.615	.546	.528	.514	.542	.621	.607	.582	.799	.43426
Variance		.222	.491	.378	.299	.279	.264	.293	.386	.368	.339	.638	.189
Skewness		-1.063	-.845	-.288	-.407	-1.025	-.718	-.680	-.593	-.275	-.590	-.448	-.597
Std. Error of Skewness		.277	.277	.277	.277	.277	.277	.277	.277	.277	.277	.277	.277
Kurtosis		3.029	.415	.401	-.115	2.005	.488	-.137	.698	.599	1.041	-.136	.551
Std. Error of Kurtosis		.548	.548	.548	.548	.548	.548	.548	.548	.548	.548	.548	.548
Range		3	3	3	3	3	3	2	3	3	3	4	2.20
Percentiles	25	4.00	3.60	3.20	3.40	3.60	3.80	3.60	3.30	3.10	3.20	3.20	3.6000
	50	4.20	4.00	3.70	3.90	4.00	4.00	4.00	3.70	3.60	3.80	3.80	3.8000
	75	4.40	4.40	4.10	4.30	4.20	4.30	4.40	4.10	3.80	4.00	4.20	4.1000

Table 4.7: Descriptive Statistics

In this research study data were screened for outliers using the box plot method. The box plot method was used as it allowed convenient display of the twelve (12) dependent variables and their differences between organization maturity levels. The maximum number of outliers found out of bounds in any one dependent variable was two (2): representation and tolerance of uncertainty ML2 organizations, and consideration behaviors ML5 organizations. Outliers were included in the analysis as there was not a theoretically compelling reason to exclude them. The outliers, respondents, and their differences between organizations are shown in table 4.8 below.

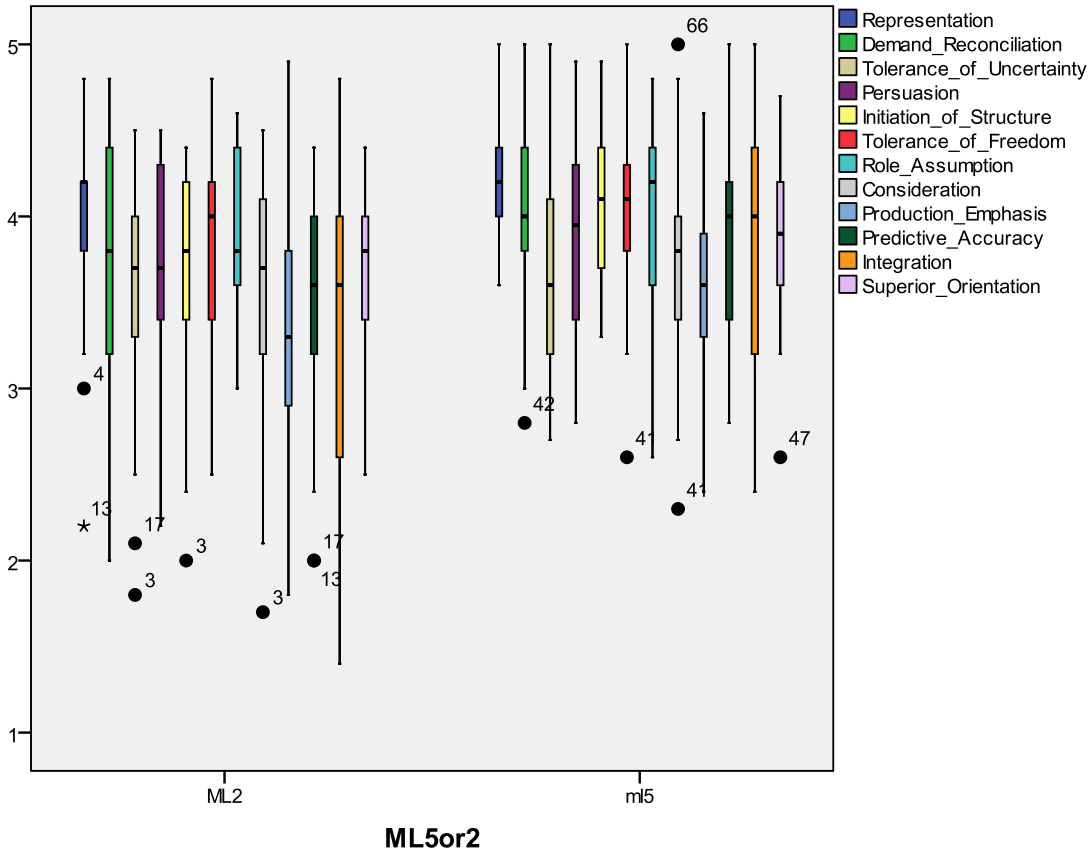

Table 4.8: Outliers

General Results

The Statistical Package for the Social Sciences (SPSS), Version 17.0 was used to analyze the data in this research study. The extent of the relationship between variables was determined by employing both the Pearson and Spearman correlation coefficients and Cronbach's alpha. Statistical treatment of the data utilized Multivariate GLM for omnibus tests and for covariate testing. Specifically, Multivariate GLM was utilized to implement Multivariate Analysis of Variance (MANOVA) and Multivariate Analysis of Covariance (MANCOVA) tests. Subsequent data analysis also incorporated individual univariate tests such as Analysis of Variance (ANOVA) and independent samples t-tests for ML level 2 and ML level 5 group comparisons.

Correlation among Variables

The extent of relationship between variables was determined by employing Pearson and Spearman correlation coefficients. The Pearson correlation indicates the degree of linear dependence between the variables. The closer the coefficient is to either −1 (decreasing) or 1 (increasing), the stronger the correlation between the variables. The correlation matrices reflect simple bivariate correlations and 1-tailed significance tests as well as tests of the confounding variables captured in the supplemental survey were conducted to provide a thorough assessment of variable relationships and to ensure that they were not overly correlated (e.g., multicollinearity= .90). Correlations are significant at the 0.01 level, 1 tailed, (**) and at the 0.05 level, 1 tailed, (*). For correlation coefficients see Appendix 7.

In measuring the correlation and internal consistency among the twelve scale items, and considering a good reliability to be around .80 and considering .60 + as the

acceptable value for reliability (Hatcher, 1994), the factors overall presented a relatively high level of internal consistency. Representation, Role Assumption, and Superior Orientation were the subscales with the least reliable scores with overall Cronbach's alpha scores between .60 and .80. Overall Cronbach's Alpha scores per dependent variable were: Representation = .617; Tolerance of Uncertainty = .865; Demand Reconciliation = .865; Persuasion = .861; Initiation of Structure = .840; Tolerance of Freedom = .851; Role Assumption = .779; Consideration = .879; Production Emphasis = .852; Predictive Accuracy = .887; Integration= .915; and Superior Orientation = .713.

Analysis of Variance

Two omnibus tests were conducted utilizing multivariate GLM: the first omnibus test assigned the nine (9) extraneous variables as the DV's and Org_ML (ML 2 and ML 5) as the fixed factors; the second omnibus test assigned the twelve (12) leader behavior subscales as the DV's and Org_ML (ML 2 and ML 5) as the fixed factors. Results were reported F, p, Partial Eta-squared (ηp^2), and β.

The results of the first omnibus test were significant, (F (9, 65) = 2.49, p =.016, ηp^2=.257, β = .90). Individual univariate ANOVA tests yielded significant between subjects effects in two (2) of the supplemental leader behaviors: Participant Age F (1, 73) = 12.752, p =.001, ηp^2=.149) and Perceived Leader Engagement F (1, 73) = 7.636, p =.007, ηp^2=.095).

The results of the second omnibus test, alpha=.05, were marginally significant, (F (12, 62) = 4.80, p =.075, ηp^2=.254, β = .82). In 1991, John Tukey suggested that results between p=.05 and p=.15 lean toward significance (Abelson, 1995), since the omnibus test result was, p=.075 I proceeded to analyze and evaluate the univarite

ANOVA tests. Subsequent ANOVA tests yielded statistical significance at alpha=.05 in five (5) of the twelve (12) leader behavior subscales:

Representation (F (1, 73) = 5.155, p =.026, ηp^2=.066);

Demand_Reconciliation (F (1, 73) = 8.957, p =.004, ηp^2=.109);

Initiation_of_Structure (F (1, 73) = 10.214, p =.002, ηp^2=.123);

Predictive_Accuracy (F (1, 73) = 10.425, p =.002, ηp^2=.125); and

Integration (F (1, 73) = 5.291, p =.024, ηp^2=.068).

Exploratory Analysis of Demographic Effects

To determine if there were any substantial demographic effects influencing the relationship between the dependent variables and the independent variables; analysis of covariance testing was conducted using MANCOVA. MANCOVA allowed the researcher to analyze the twelve (12) dependent variables and one or more independent variables while supporting the use of continuous control of nine (9) of the extraneous variables collected in the supplemental survey. MANCOVA tests were conducted by using all twelve (12) of the leader behavior subscales as DV's; Organization Maturity Level (Org_ML 2, Org_ML 5) as the fixed factors; and the nine (9) individual extraneous variables as covariates. The results of three: leader gender, perceived leader engagement, and perceived leader employee showed significant main effects. MANCOVA results were reported F, p, Partial Eta-squared (ηp^2), and β.

Leader Gender

Even though leadership studies have reported conflicting findings regarding gender stereotypes numerous studies have demonstrated significant leader gender influence; therefore, it becomes a good assumption that gender could possibly have a

confounding effect on study results. To address this assumption, the supplemental survey included a leader gender question in data collection.

- Is the leader you are about to evaluate male or female?

Not surprisingly, MANCOVA results showed an overall significant main effect for leader gender (L_Gender), (F (12, 61) = 4.80, p =.000, ηp^2=.49, β = 1.0). Individual univariate tests showed a significant effect of leader gender in nine (9) of the leader behavior subscales:

Representation (F (1, 73) = 8.790, p =.004, ηp^2=.109, β = .83);

Demand_Reconciliation (F (1, 73) = 21.169, p =.000, ηp^2=.227, β = 1.0);

Persuasion (F (1, 73) = 9.098, p =.004, ηp^2=.112, β = .85);

Initiation_of_Structure (F (1, 73) = 20.516, p =.000, ηp^2=.222, β = .99);

Consideration (F (1, 73) = 15.779, p =.000, ηp^2=.180, β = .98);

Production Emphasis (F (1, 73) = 33.468, p =.000, ηp^2=.317, β = 1.0);

Predictive_Accuracy (F (1, 73) = 22.773, p =.000, ηp^2=.240, β = .98);

Integration (F (1, 73) = 9.749, p =.003, ηp^2=.119, β = .87); and

Superior Orientation (F (1, 73) = 5.181, p =.026, ηp^2=.067, β = .61).

Perceived Leader Behaviors

It is safe to assume that questions regarding an employee's perceptions should be included in data collection, especially when an overly good or bad perception could have significant effect on how the employee responds to a questionnaire regarding the behavior of their leaders i.e. halo bias effect. To address this assumption, the supplemental survey included questions relating to the overall perceptions of the employee in regard to the leader in data collection.

- Do you feel that the leader you are evaluating is actively engaged in making sure that employee interests are satisfied? Perceived Leader Engagement (Per_L_Engagement)
- Do you feel that the leader you are evaluating has time to deal with the everyday business of their employees (i.e. camaraderie, group membership, career interests, conflict resolution)? Perceived Leader Employee focus (Per_L_Emp Focus)

MANCOVA results showed significant main effects in perceived leader engagement (Per_L_Engagement), (F (12, 61) = 3.37, p =.001, ηp^2=.40, β = .99) and perceived leader employee focus (Per_L_Emp Focus), (F (12, 61) = 4.18, p =.000, ηp^2=.45, β = 1.0). Individual univariate tests showed a significant main effect of perceived leader engagement (Per_L_Engagement) in seven (7) of the leader behavior subscales:

Demand_Reconciliation (F (1, 73) = 8.103, p =.006, ηp^2=.101, β = .80);

Tolerance_of_Uncertainty (F (1, 73) = 4.710, p =.033, ηp^2=.061, β = .58);

Initiation_of_Structure (F (1, 73) = 9.790, p =.003, ηp^2=.120, β = .87);

Tolerance_of_Freedom (F (1, 73) = 15.020, p =.000, ηp^2=.173, β = .97);

Consideration (F (1, 73) = 22.991, p =.000, ηp^2=.242, β = .98);

Predictive_Accuracy (F (1, 73) = 14.833, p =.000, ηp^2=.171, β = .97); and

Integration (F (1, 73) = 7.042, p =.010, ηp^2=.089, β = .75).

Individual univariate tests also showed a significant main effect of perceived leader employee focus (Per_L_Emp Focus) in all twelve (12) of the leader behavior subscales:

Representation (F (1, 73) = 13.456, p =.000, ηp^2=.157, β = .95);

Demand_Reconciliation (F (1, 73) = 15.205, p =.000, ηp^2=.174, β = .97);

Tolerance_of_Uncertainty (F (1, 73) = 5.047, p =.028, ηp^2=.065, β = .60);

Persuasion (F (1, 73) = 14.155, p =.000, ηp^2=.164, β = .96);

Initiation_of_Structure (F (1, 73) = 45.086, p =.000, ηp^2=.385, β = 1.0);

Tolerance_of_Freedom (F (1, 73) = 5.754, p =.019, ηp^2=.074, β = .66);

Role_Assumption (F (1, 73) = 4.767, p =.032, ηp^2=.062, β = .58);

Consideration (F (1, 73) = 28.378, p =.000, ηp^2=.283, β = 1.0);

Production Emphasis (F (1, 73) = 10.809, p =.002, ηp^2=.131, β = .90);

Predictive_Accuracy (F (1, 73) = 25.370, p =.000, ηp^2=.261, β = 1.0);

Integration (F (1, 73) = 9.295, p =.000, ηp^2=.211, β = .99); and

Superior Orientation (F (1, 73) = 4.125, p =.046, ηp^2=.054, β = .52).

Test of Hypothesis

Analysis of Variance ANOVA tells researchers if there is a significant difference between groups, but it does not show how the groups are significantly different. To address this shortfall, this research study utilized independent sample t-tests to test hypotheses and to determine how ML level 2 and ML level 5 organizations were different. Since ANOVA assumes that variances are equal across groups or samples the Levene test for equality of variances was used to verify the assumption. In Levene's equal variances were assumed unless significance was $p < .05$ in those cases (Demand_Reconciliation and Production_Emphasis) equal variances were not assumed.

Hypothesis One

Hypothesis 1: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly lower production emphasis (PE) behaviours than leaders in organizations with a capability maturity level assessment of level 2. Production emphasis (PE) behaviours are defined as pressures applied by the leader for production output. Production oriented leaders tend to encourage more work, higher effort, drive hard for completion, and urge competition in order to beat previous output times or production numbers. Research hypothesis one predicted an overall group difference between ML 5 and ML 2 leaders. It proposed that leaders in ML 5 organizations would have less need to apply pressure for productive output because of the process metrics in place that effectively gauge production; such as: work in progress, input, output, and throughput. Hypothesis 1 implies that leaders in organizations with an assessment level of 5 will exhibit lower scores on production emphasis behaviors than leaders in organizations assessed at level 2. Research findings did not support Hypothesis 1, PE= $t(73)= -1.470$, $p=.148$: ML 2 organizations had an average mean score, $M =3.36$ and ML 5 organizations had an average mean score, $M =3.57$ these findings did not support that leaders in ML 5 organizations exhibited significantly lower scores in production emphasis behavior than leaders in ML 2 organizations. Although both ML 5 and ML 2 employees assessed their leaders positively, i.e. as occasionally displaying production oriented behaviors, the insignificance of hypothesis one was somewhat surprising.

In considering why there was not a significant difference between the organizations the researcher took another look at how production emphasis (PE) behaviours are defined. Production emphasis behaviors are commonly associated to

leaders who work in organizations that rely on the ability to complete tasks. These behaviors are closely associated to task-orientated styles of leadership and are said to be more effective than consideration behaviors in some situations. Production oriented leaders encourage more work, higher effort, drive hard for completion, and urge competition to beat previous output times or numbers. The LBDQ Form XII has ten (10) production orientation questions to determine overall group difference in leader behaviors across cultures they are as follows: encourages overtime work, stresses being ahead of competing groups, needles members for greater effort, keeps the work moving at a rapid pace, pushes for increased production, asks the members to work harder, permits the members to take it easy in their work, drives hard when there is a job to be done, urges the group to beat its previous record, and keeps the group working up to capacity. In reflection, all of these questions define a leader style or personality that would essentially be displayed in both types of organizations because even though they may have achieved process optimization, leaders in ML 5 organizations still have to continuously maintain effort levels and drive for improvements and leaders in ML 2 organizations have to strive to meet the deliverables and milestones required to implement the process areas and processes required by the process improvement framework. Research that includes organizations that have not been involved in a Business Process Improvement (BPI) initiative or possibly the use of another measurement scale in future research studies may assist in clarifying if indeed a difference in production oriented behaviors exists.

Hypothesis Two

Hypothesis 2: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly higher consideration (C) behaviours than leaders in organizations with a capability maturity level assessment of level 2. The study of leadership has focused heavily on consideration behaviors and there have been many studies focused on the effect of consideration behaviors on the morale of employees, leader gender studies, and the fact that some leaders are better at displaying these behaviors. However, when one searches for studies researching organizations and their influence on leader and employee behaviors no specific research exists. This research study addressed the lack of empirical research and data by hypothesizing that organizational structure would have an influence on leader behavior in the realm of consideration behaviors. Hypothesis two suggested that leaders in more mature organizations i.e. level 5 organizations would have more time to portray behaviors that are essentially consideration based because they spend less time conducting and overseeing all of the tasks involved in the management of the organization. Research findings did not support hypothesis two, C= $t(73)= -1.223$, $p=.225$: ML 2 organizations had an average mean score, $M =3.57$ and ML 5 organizations had an average mean score, $M =3.74$ these findings did not support that leaders in ML 5 organizations exhibited significantly higher scores in consideration behaviors than leaders in ML 2 organizations. Although ML 5 and ML 2 employees assessed their leaders positively, i.e. as occasionally displaying consideration type behaviors; the insignificance of hypothesis two was surprising. In considering why there was not a significant difference between the organizations the researcher took another look at how consideration behaviors are

defined and how they were measured. Consideration (C) behaviours are described as engaging in relationship behaviors; such as, building friendships, camaraderie, respect, trust, representation of subordinate interests, supportiveness, and liking between leaders and followers. The LBDQ Form XII has ten (10) consideration questions in order to determine group difference in leader behavior across cultures; the questions are as follows: acts without consulting the group; refuses to explain his/her actions; is willing to make changes; looks out for the personal welfare of group members; keeps to himself/herself; gives advance notice of changes; treats all group members as his/her equals; puts suggestions made by the group into operation; does little things to make it pleasant to be a member of the group; and is friendly and approachable. Research that includes organizations that have not been involved in a Business Process Improvement (BPI) initiative or possibly the use of another measure in future research studies may assist in clarifying if process maturity has an effect on consideration behaviors.

Hypothesis Three

Hypothesis 3: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly lower initiation of structure (IS) behaviours than leaders in organizations with a capability maturity level assessment of level 2. Initiation of structure (IS) behaviours are often described as task-oriented behaviors; such as, organizing work, planning, coordinating, problem-solving, discipline, giving structure to work content, defining roles and responsibilities, and scheduling work activities. They are often explained by the amount of structure the leader initiates over subordinates to achieve goals (House, 1971; House & Mitchell, 1974). For example, leaders with high initiating of structure behaviors play active roles in directing every-day activities and common

tasks (Tracy, 1987). Hypothesis three implied that leaders in organizations with an assessment level of 5 would exhibit lower scores on initiation of structure behaviors than leaders in organizations assessed at level 2 because the optimized processes would reduce the need for a leader to exhibit high initiation of structure behaviors by identifying required procedures and defining individual tasks, decision points, input/output specifications, deliverables and acceptable tolerance levels. The suggestion behind hypothesis 3 was that more mature organizations i.e. ML 5 structure their work content and procedures by defining the roles of the business, workflow management, service diagrams, interaction between organizational departments, and the integration of sub-processes. Prediction for a difference in ML 5 and ML 2 was accurate in that leaders behaved significantly different in regard to initiation of structure behaviors; however, the direction of behavior was incorrect. Leaders in ML 5 organizations did not score lower in initiation of structure behaviors they actually scored significantly higher in these behaviors meaning leaders in ML 5 organizations actually reveal more initiation of structure behaviors than leaders in ML 2 organizations (F (1, 73) = 10.214, p =.002, ηp^2=.123, β = .42). In hindsight, the results make sense as process maturity is a continuous process and organizations only successfully achieve high process maturity levels by initiating the structure required for optimizing business processes. As this hypothesis was directional research findings are reported as non-significant. Data did not support Hypothesis 3, IS= t(73)= -3.196, p=.002: ML 2 organizations had an average mean score, M =3.69 and ML 5 organizations had an average mean score, M =4.06 these findings did not support that leaders in ML 5 organizations exhibited significantly lower scores in initiation of structure behaviors.

Hypothesis Four

Hypothesis 4: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly higher predictive accuracy (PA) behaviours than leaders in organizations with a capability maturity level assessment of level 2. Predictive accuracy behaviors are commonly referred to as the foresight and ability to predict trends, problems and outcomes accurately. Prediction is commonly defined as a statement, based on observation or experience, of what will happen given specific conditions (Donaldson, 2001). Organizations embarking on a mission to implement business process frameworks often do so because they purport improved prediction in quality, speed and costs and when an organization inspects its inputs and processes more, its outputs can be better predicted (Deming, 1986). Hypothesis four implies that organizational structure can have an influence on leader behavior in the realm of predictive accuracy behaviors. Characteristics of level 5 organizations include Organizational Process Performance (OPP), Quantitative Project Management (QPM), Organizational Innovation and Deployment (OID), and Causal Analysis and Resolution (CAR) these process areas involve making decisions in regard to projects and processes based on quantitative performance data, not opinions. These performance baselines and models provide an organizations leaders and employees with a quantitative idea of how their processes are really performing therefore it should provide them with the foresight and ability to predict outcomes more accurately. Hypothesis four suggested that leaders in organizations with an assessment level of 5 would exhibit higher scores on predictive accuracy behaviors than leaders in organizations assessed at level 2. Research findings supported Hypothesis 4, PA= $t(73)= -3.229$, $p=.002$: ML 2 organizations had an average

mean score, *M* =3.48 and ML 5 organizations had an average mean score, *M* =3.89 these findings did support that leaders in ML 5 organizations exhibited significantly higher scores in predictive accuracy behaviors.

Hypothesis Five

Hypothesis 5: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly higher tolerance of uncertainty (TU) behaviours than leaders in organizations with a capability maturity level assessment of ML level 2. Hypothesis five implied that leaders in organizations with an assessment level of 5 would exhibit higher scores on tolerance of uncertainty behaviors than leaders in organizations assessed at level 2. The hypothesis suggested that leaders in level 5 organizations should be better adept at tolerating uncertainty and postponement because they have emplaced foundational organization structures to assist in controlling for ambiguity, uncertainty, prioritization, performance, and offer a variety of solutions that aid in the mitigation of business risks. Research findings did not support Hypothesis 5, TU= t(73)= -.907, p=.368: ML 2 organizations had an average mean score, *M* =3.56 and ML 5 organizations had an average mean score, *M* =3.69 these findings did not support a significant difference in tolerance of uncertainty behaviors. Although ML 5 and ML 2 employees assessed their leaders positively, i.e. as occasionally displaying tolerance of uncertainty behaviors; the insignificance of hypothesis two was extremely surprising.

In considering why there was not a significant difference between the organizations the researcher took another look at how tolerances of uncertainty behaviors are defined and how they were measured. Tolerances of uncertainty (TU) behaviours are defined as the leader's ability to tolerate uncertainty and postponement

without anxiety or upset. The LBDQ Form XII utilizes ten (10) tolerance of uncertainty questions in order to determine group difference in leader behavior across cultures; the questions are as follows: waits patiently for the results of a decision; becomes anxious when he/she cannot find out what is coming next; accepts defeat in stride; accepts delays without becoming upset; becomes anxious when waiting for new developments; is able to tolerate postponement and uncertainty; can wait just so long, then blows up; remains calm when uncertain about coming events; is able to delay action until the proper time occurs; and worries about the outcome of any new procedure. The ability to tolerate uncertainty is emerging as a characteristic that often differentiates (Falbe & Yukl, 1992) between effective and ineffective organizations and managing uncertainty is quickly evolving as a central leadership competency. Ineffective organizations consist of environments often characterized by poor project prioritization, unpredictable performance, ambiguous tasks and conflicting demands. Lane & Klenke (2004) in their Ambiguity Tolerance Interface (ATI) studies claim that people with a higher tolerance for ambiguity and uncertainty are, "better adept at achieving change-oriented goals because they possess behaviors such as: flexibility, adaptability, and entrepreneurship p8." Research including organizations that have not been involved in a BPI initiative or possibly the use of another measurement scale in future research studies may assist in clarifying if process maturity has an effect on tolerance of uncertainty behaviors.

Hypothesis Six

Hypothesis 6: Leaders in Maturity Level (ML) level 5 organizations will exhibit significantly higher integration (I) behaviours than leaders in organizations with a capability maturity level assessment of level 2. Integration (I) behaviours are defined as

the leader's ability to maintain a close knit organization and resolve inter-member conflicts. Problems such as rework, complaints, bottlenecks, missed or extended suspense dates, last minute crunches, spiraling costs, and the fact that the methods of completion change from one day to the next are organizational problems that can be resolved by implementing better business processes. The establishment of core business processes benefits organizations by creating conformity that often alleviates employee frustration and poor morale (Carnevale, 2003). Integration behaviors are often described as behaviors oriented toward unity. Organizations display integration behaviors by working together as a team to achieve the mission and common goals. Personnel display integration behaviors by interacting with others regardless of organization status, working in teams, communicating within and across functional areas, achieving unity, and settling intergroup conflicts. Hypothesis six suggests that leaders in organizations with an assessment level of 5 will exhibit higher scores in integration behaviors because they have more time to focus on and address behaviors such as, team cohesion and intergroup conflict. Research findings supported a significant group difference between ML 2 and ML 5 organizations, I= $t(73)= -2.300$, $p=.024$ and findings also established that ML 5 organizations did score higher, more positively, in integration behaviors. ML 2 organizations had an average mean score, $M =3.69$ and ML 5 organizations had an average mean score, $M =4.06$. Hypothesis six is important because it supports a significant Return- on- investment (ROI) not previously marketed i.e. organizations benefit from process maturity in that their leaders have more time to display behaviors that are essentially human-oriented or relationship behaviors,

such as: friendliness, camaraderie, respect, trust, representation of subordinate interests, supportiveness, and liking.

Additional Findings

In the conception phase of this research study the researcher did not predict a significant difference in all twelve of the leader behaviors as assessed in the LBDQ Form XII even though data was collected on all twelve behaviors. During data analysis it was immediately apparent that there were two additional significant findings that empirically support the influence of organizational process frameworks on leader behavior. Additional significant group differences were reported for: Representation= $t(73)= -2.270$, $p=.026$ and Demand Reconciliation= $t(73)= -2.849$, $p=.006$ behaviors.

Representation Behaviors

Representation (REP) behaviors are defined as behaviors a leader displays when speaking and acting as the representative of the group. Even though the researcher did not formulate a hypothesis related to representation behaviors this finding is extremely interesting and significant to this research. Whether it is a democratic, laissez-faire, or autocratic leadership style and regardless of the leaders personality characteristics, leaders in ML 5 organizations showed significantly higher scores in representation behaviors than leaders in ML 2 organizations. What is it about the organization that is allowing leaders in ML 5 organizations to speak and act for their group and own up to business challenges, is it the establishment of core business processes? CMMI frameworks boast that benefits of process maturity include the ability to explicitly link organizational activities to objectives therefore increasing leadership visibility. This finding suggests that increased visibility into the organization's activities is affording

leaders in more mature organizations i.e. ML 5 the ability whether it be good solid information or just comfort in data provided from organizational entities.

Demand Reconciliation Behaviors

Demand Reconciliation (DR) behaviors are defined as behaviors a leader displays to reconcile conflicting demands and reduce disorder to system. During study conception and design the researcher did not formulate a hypothesis related to demand reconciliation behaviors; however the researcher did collect data related to demand reconciliation behaviors. Of all the research findings this finding, although not predicted, is the most interesting and should be of extreme interest to senior leaders and to those that study conflict management. What is about organizations that have optimized business processes i.e. ML 5 that afford their leaders to be so significantly different from leaders in ML 2 organizations in regard to conflict management? This finding confirms that process maturity does have a significant impact on human-oriented leader behaviors as employees in ML 5 organizations assessed their leaders much more positively at managing demand and disorder, handling complex problems efficiently, and reducing a madhouse to system and order? Employees in ML 2 organizations assessed their leaders as getting swamped by details and confused when too many demands were made.

Analysis Conclusion

The overall significance tests for each of the hypotheses were reported using one-tailed independent sample t-tests and not the MANCOVA test results. The research study deployed a supplemental survey to capture data that could possibly have a confounding effect and MANCOVA tests were conducted to control for these variables.

The researcher did not desire to remove the influence of each of the extraneous variables, but if had done so would have reported significance in all six of the hypotheses as reported in the exploratory analysis of demographic effects.

The organizational maturation theory introduced in this dissertation proposed that conditions presented during the development and improvement of an organization's business process could create changes in organizational culture and environment that lead to changes in leader behaviors over time. Organizations invest their time and money in CMMI frameworks to ensure that they are implementing a proven collection of industry best practices. CMMI frameworks and process integration does not come cheap and takes a continuous effort from a dedicated organization to achieve and sustain. Leaders in organizations embarking on improvement frameworks must be committed, capable, and inspirational. In a staged improvement approach all entities and aspects all the organization seeking the assessment must work together to achieve success. Process maturity is not achieved by simply allowing the organization to improve, it requires direct, active involvement from all members of the organization and it is everyone's job. This study proposes that process maturity has an influence on leader behavior because it integrates the three main aspects of organizational behavior: individual, groups, and structure within organizational functions which over time produces an organizational culture that fosters positive leader behaviors. The empirical data gathered and presented in this chapter certainly supports the theory that there are benefits to improving organizational business processes through other than improving quality, speed and reducing cost. Sample bias could have influenced the insignificance of some of the hypotheses as participating ML 2 organizations could have been less

representative of a true ML 2 organization; for example, a ML 2 organization that is close to achieving a higher maturity level has more business process areas in place and therefore is more like a ML 5 organization. It is important to remember all of the organizations participating in this study had achieved a staged maturity level ML 5 or ML 2 assessment. They all had made the commitment to invest significant resources to changing and evolving their business processes, so if the organizations were so similar and the only differentiation was the attainment of a higher process maturity, what is it about process maturity that makes leaders in ML 5 organizations so significantly different than leaders in ML 2 organizations? Chapter five Discussion and Implications will address these findings by collectively discussing the results of this research study.

CHAPTER FIVE: DISCUSSION AND IMPLICATIONS

Discussion of Study Results

Leadership studies are full of theories testing and supporting the influence of leaders and the effect of different leadership styles on organizations. However, there are very few studies that consider the influence of the organization on the behaviors of its leaders (Evans, 1978; Ford, 1981). Culture in an organization is described as a pattern of shared basic assumptions (Schein, 2004). An organizations culture is commonly defined as the common language; rewards and punishment; power and status; what the organization pays attention to; boundaries; how it reacts; norms of friendship and intimacy, and what actions take place. Edgar Schein often stated that once an organizations culture existed it determined the criteria of leadership; he also stated that a leader should be conscious of an organizations culture otherwise it would manage both the leader and the organization.

This study focused on considering the influence of the organization on the behaviors of its leaders; not the influence of the leader on the organization. The purpose of this study was to explore the relationship between organizational environment (i.e. business processes) and leader behavior. The goals of this study were to clarify uncertainties regarding the value and benefits of adopting process improvement models and methodologies by substantiating that an increasing organizational maturity level affects not only standard Return On Investment's (ROIs) such as quality, speed and cost, but also leader behaviors and to provide quantitative data to establish that an organization's underlying process frameworks can influence leader behavior. To conduct this study the researcher selected public and private sector

organizations with decidedly different process maturity level assessments and compared respondent data, from two scales, within and between the groups. This research study gathered data by employing a researcher developed supplemental survey (See Appendix 3: Supplemental Survey Questions) and the Leader Behavior Description Questionnaire (LBDQ) Form XII (See Appendix 4: LBDQ Form XII). The study was conducted over a four (4) month period in sixteen (16) different private and public sector organizations with measurable differences in cultural environments i.e. Maturity Level (ML) level 2 and level 5 organizations.

To determine if an organizations business process could have an influence on leader behavior this research study gathered data on all twelve (12) of the behaviors assessed by the LBDQ questionnaire. The researcher initially formulated six hypotheses based on work experience and observed leader behaviors. Each of the hypotheses presented a leader behavior as assessed by the LBDQ and predicted a directional relationship, based on observed patterns, between ML2 and ML 5 organizations. The six hypotheses and the additional significant findings reported in chapter four led to general conclusive support of the proposed organizational maturation theory as employees in ML 5 organizations assessed their leaders more positively than in employees in ML 2 organizations. There were significant group differences between ML 2 and ML 5 in five (5) of the twelve (12) leader behavior subscales: predictive accuracy, integration, representation, demand reconciliation, and initiation of structure behaviors.

Implications

Conduct a web search or query on the impacts a process improvement initiative has on an organization, its leaders, and its employees and you will receive many interpretations of the same information and data such as: improved efficiencies, quality, delivery time; what and how leaders need to prep and conduct the change initiative; the importance of leader buy-in; what employees need to do; that everyone needs to be involved; employee buy-in, but what you will not find is how process improvement initiatives influence the organizations personnel.

This study proposed that process maturity influences leader behavior because maturity frameworks incorporate the principles of the foundational approaches of the study of organizational behavior (scientific management, classical school, and human relation) and integrates them within process areas and organizational functions. Process frameworks when implemented correctly and continuously improved provide an organization environment where employee are empowered and know where to access information and emphasis is on: order, systems, rationality, uniformity, and consistency in management. Good business process frameworks recognize that continued improvement requires significant changes in the management of people and these frameworks build in the process areas necessary to address people in order to establish a culture of workforce excellence. As a business leader, if someone purported to have a framework that, if implemented correctly, could enable your business to improve its effectiveness, efficiencies, quality, and delivery time would you be intrigued? What if they could provide empirical evidence that by improving business effectiveness, efficiency, quality, and delivery time you would also be positively influencing

leadership behaviors fundamental to organizational success such as: predictive accuracy, integration, representation, demand reconciliation, and initiation of structure behaviors?

The implications of this research study are exciting, with such significant differences in five leader behaviors amongst similar organizations i.e. all had achieved a staged maturity level ML 5 or ML 2 assessment and each had made a commitment to invest important resources to change and evolve their business processes, what does this mean for organizations that operate daily in chaos environments? Organizations that operate in chaos are characterized by: unpredictable results, ad-hoc approaches, unreliable methods, primitive tools, and reactive management. These organizations tend to survive on the heroic efforts of a few employees and as a result create organization bottlenecks, instability, personnel un-rest, and daily operations in which completion is determined only by skills and experience. It is no secret that order in the daily lives of people creates a more calming and efficient environment hence the many businesses marketing personal organization tips, tools, systems, methods and routines. So why don't more management and organizational studies concentrate on the benefits and behaviors that orderliness brings to an organization? Business process improvement initiatives commonly assert that organizations must be structured to react, constantly improve, and continuously change to survive in today's complicated economic environment.

Business process improvement and frameworks are not new, but the evidence that they can have an influence on leader behavior is fresh and innovative. The results of this study indicate business process maturity, specifically process maturity levels

achieved through the implementation of CMMI frameworks, has a significant, positive influence on employee perceptions of leader behavior. Employees in ML 5 organizations assessed their leaders positively and as more prone to display the following leader behaviors: exhibit foresight and accurately predict outcomes; maintain a close knit organization and resolve inter-member conflicts; speak and act as the group representative; reconcile conflicting demands and reduce system disorder; and give structure to work content, define roles and responsibilities, and schedule work activities. This research study established that process maturity influences an organization in more ways than improving quality, speed and reducing cost and has provided data empirically supporting the influence of organizational process frameworks on five (5) leader behaviors. Now that there is empirical data and evidence that differences exists, each of these five behaviors provide ideas for future research studies.

Assumptions

The researcher made three assumptions with respect to this research study. The first assumption is that the participants surveyed were honest and unbiased in their evaluations of the observed leaders. The second assumption is that people reading this study have reasonable familiarity with business process improvement frameworks and methodologies, business process and Continuous Process Improvement (CPI) terminology, and Capability Maturity Models Integrated (CMMI). The third assumption is that research involving leadership, organizational behavior, business process, and return on investment is of some interest and value to the reader.

Limitations

Sample Limitations

The largest limitation to sample was the fact that all participants were arbitrarily solicited from organizations that had undergone a CMMI assessment. However this limitation was necessary because it was vital to the overall results that we control the overall process climate of the studied organizations i.e. we could not control for failed attempts and there could exist erratic differences between organizations that had not attempted any sort of process framework implementation and those that had successfully achieved a level 5 assessment rating. The researcher realizes that the influence of process maturity on leader behavior may be delayed i.e. newly assessed organizations may exhibit a weaker relationship between process maturity levels and leader behavior than organizations that have held the same maturity level for years and may be seeking the next, or higher, maturity level assessment. Because of the quasi-experimental design the researcher decided to control the groups being evaluated, i.e. all organizations had embarked on the same process maturity framework and methodology, but were differentiated by their overall maturity level. Due to the non-random sample and because population subsets have been systematically excluded due to their ability to achieve a successful maturity level appraisal i.e. survivorship, the researcher recognizes that final results could be flawed and that sample selection bias exists in this study. Sample bias could have also had an influence in the non-significance of some of the hypotheses as participating ML 2 organizations could have been less representative of a true ML 2 organization. Sample bias may have had a significant impact on study results because a ML 2 organization that is close to achieving a higher maturity level has more

business process areas in place and becomes more like a ML 5 organization. Organization similarities may have reduced the overall difference between ML 2 and ML 5 organizations. Another limitation to sample was that the influence of process maturity on leader behavior may be delayed i.e. newly assessed organizations may result in weak correlation/relationships between process maturity levels and leader behavior. To address this limitation all of the organizations participating in the study were asked, in the supplemental survey, how long their organization had held its current maturity level assessment (see Appendix 6).

Power Limitations

The next limitation in this study is concerned with statistical power. The relatively small sample size (N = 75), two condition design, number of variables included in the study, and the challenge of establishing sufficient effects over a sixteen (16) week longitudinal design all increased the chances that significant effects may have been missed due to type II errors.

Measurement Limitations

Another limitation in this study is measurement limitation. Although the LBDQ Form XII measurement scale assesses leadership differences between groups the data collected is limited to the respondent's answers to the LBDQ questionnaire.

Future Research

The findings of this dissertation afford several avenues for future research as the study has provided empirical data supporting the theory that an organizations culture, specifically its business process frameworks, can influence leader behavior. Future research studies should concentrate on the distinctiveness of the relationship between

organization business process, continuous process improvement, and the organizational personnel. Future research ideas are based on the results of this study, other ideas for organizational research, and ideas directly related to the self assessed behaviors of organizational leadership.

Research Based on Study Results

Based on the results and findings of this study future research should further analyze the influence of process maturity on individual leader behaviors such as: consideration, tolerance of uncertainty, production orientation, representation behaviors, and demand reconciliation behaviors. Future research should include organizations that have not undergone a BPI initiative and should also include other measurement scales.

Organizational Research

Future research studies should compare both leader and employee behaviors in organizations that have embarked on other CMMI frameworks such as: CMMI-SVC, CMMI-Acquisition and specifically the People CMM. The CMM- People framework would be particularly interesting as it is defined by the SEI on their website as,

> "a maturity framework that describes the key elements of managing and developing the workforce of an organization. It describes an evolutionary improvement path from an ad hoc approach to managing the work-force, to a mature, disciplined development of the knowledge, skills, and motivation of the people that fuels enhanced business performance."

It would also be extremely interesting to use other leadership models in future research; for instance, the Hershey Blanchard Situational Leadership model because of its incorporation of subordinate maturity and the suggestion that effective leaders must match their leadership style to the maturity of his/her subordinates by using traditional

categories of leader behavior, such as, initiating structure and consideration (Hersey & Blanchard, 1969, & Graeff, 1983).

Leader Behavior Research

Intentionally, this study did not concern itself with self assessment of the organizations leadership as it wanted to measure leader behavior from the perception of the organizations employees and adequately regard the structural considerations of the organization. However, this researcher has full intentions to conduct future research that will deal directly with self assessed leader behaviors. Of particular interest is comparing theory X and theory Y motivation behaviors and how management projects general attitudes in organizations that have not undergone CPI initiatives to organizations that have achieved optimized levels. Also future research will compare the differences in self-assessed leader behaviors using behaviors as identified in the LBDQ- Form XII- Self and leader development in regard to time in organization.

Conclusion

It has been proposed that relationships between leader behavior and subordinates are influenced by a wide array of individual, task, and organizational characteristics and that these characteristics can actually neutralize the need for leadership emphasis in certain areas by acting as substitutes for leadership (Kerr & Jerimer, 1978; Yukl, 2006). During this research study I was asked several times if I was proposing that maturing an organizations business processes would make an organization leader-proof, the answer to that was always absolutely not, but that I was proposing that changes to organization structure, culture, and design instituted during the course of developing an organizations process maturity level did present contingencies which over time lead to changes in

leader behavior. The intent of this study was to explore the relationship between the organization process maturity and six dimensions of leader behavior. The study did not attempt to separate out individual factors that affected each of the individual leader behaviors and based on the results of the analysis, it can be concluded that a positive relationship exists between process maturity and leader behavior.

All of the organizations participating in this study had made the commitment to invest resources to change and evolve their business processes and they all had achieved either maturity level ML 5 or ML 2 assessment. Organizational participation in this study was both phenomenal and inspirational. I had numerous phone conversations with area managers and those directly responsible for the CMMI processes. The participating organizations were extremely interested in receiving the findings and were eager to view the results. The ideas behind this research study were formulated from my own observations and brought to the foreground during this dissertation journey, I now think of business process and leadership very differently than I did four years ago. The goals of this research study exceeded my original expectations.

Typically, reports of CMMI performance results are summarized by six performance categories: cost, schedule, productivity, quality, customer satisfaction and return on investment and expressed either as percentage changes from an earlier baseline or as ratios of return on investment (ROI). This research study addressed the demand for evidence regarding the impact and benefits of process improvement models and methodologies on the organization outside the common returns on investment. In doing so, this study has revealed important, uncommonly studied, human-oriented implications for senior executives, leaders, managers and members of teams in

organizations involved in, embarking on, or considering a quest to maturity level assessment. This study has provided conclusive evidence that process maturity not only provides tangible results such as increased quality, speed, and reductions in costs, but that its structures also lead to changes in the perceived behaviors and focus of organizational leaders.

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Table 3.1: Original LBDQ Form XII Record Sheet

LBDQ Form XII – RECORD SHEET											
Behavior	**Question Number and Scoring Value**										**Total**
Representation	1)___	11)___	21)___	31)___	41)___						
Demand Reconciliation						51)___	*61)___	*71)___	81)___	*91)___	
Tolerance of Uncertainty	2)___	*12)___	22)___	32)___	*42)___	52)___	*62)___	72)___	82)___	*92)___	
Persuasiveness	3)___	13)___	23)___	33)___	43)___	*53)___	63)___	73)___	83)___	93)___	
Initiation of Structure	4)___	14)___	24)___	34)___	44)___	54)___	64)___	74)___	84)___	94)___	
Tolerance and Freedom	5)___	15)___	25)___	35)___	45)___	55)___	*65)___	75)___	85)___	95)___	
Role Assumption	*6)___	*16)___	*26)___	*36)___	*46)___	*56)___	*66)___	76)___	86)___	96)___	
Consideration	7)___	17)___	27)___	37)___	47)___	*57)___	67)___	77)___	*87)___	*97)___	
Production Emphasis	8)___	18)___	28)___	38)___	48)___	58)___	*68)___	78)___	88)___	98)___	
Predictive Accuracy	9)___		29)___		49)___		59)___		89)___		
Integration		19)___		39)___			69)___	79)___		99)___	
Superior Orientation	10)___	20)___	30)___	40)___	50)___	60)___	70)___	80)___	90)___	100)___	

* Starred items are scored (1 2 3 4 5)
All other items are scored (5 4 3 2 1)

Table 3.2: LBDQ Form XII Reliability Coefficients (Modified Kuder-Richardson)

Table 2 – Reliability Coefficients (Modified Kuder-Richardson)									
Subscale	Army Division	Highway Patrol	Aircraft Executives	Ministers	Community Leaders	Corporation Presidents	Labor Presidents	College Presidents	Senators
1. Representation	.82	.85	.74	.55	.59	.54	.70	.66	.80
2. Demand Reconciliation			.73	.77	.58	.59	.81		.81
3. Tolerance of Uncertainty	.58	.66	.82	.84	.85	.79	.82	.80	.83
4. Persuasiveness	.84	.85	.84	.77	.79	.69	.80	.76	.72
5. Initiation of Structure	.79	.75	.78	.70	.72	.77	.78	.80	.64
6. Tolerance and Freedom	.81	.79	.86	.75	.86	.84	.58	.73	.65
7. Role Assumption	.85	.84	.84	.75	.83	.57	.86	.75	.85
8. Consideration	.76	.87	.84	.85	.77	.78	.83	.76	.38
9. Production Emphasis	.70	.79	.79	.59	.79	.71	.65	.74	
10. Predictive Accuracy	.76	.82	.91	.83	.62	.84	.87		
11. Integration	.73	.79							
12. Superior Orientation	.64	.75	.81			.66		.60	

Table 3.3: LBDQ Form XII Table 1 Means and Standard Deviations

Table 1 – Means and Standard Deviations										
Subscale	Army Division		Highway Patrol		Aircraft		Ministers		Community Leaders	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Representation	20.0	3.0	19.9	2.8	19.8	2.8	20.4	2.4	19.6	2.4
Demand Reconciliation					19.2	2.8	19.8	3.1	19.7	3.3
Tolerance of Uncertainty	36.2	4.7	35.6	4.6	33.2	6.2	37.5	6.3	37.7	5.6
Persuasiveness	38.3	6.2	37.9	5.9	36.5	5.5	42.1	4.7	39.5	5.5
Initiation of Structure	38.6	5.7	39.7	4.5	36.6	5.4	38.7	4.9	37.2	5.7
Tolerance and Freedom	35.9	6.5	36.3	5.3	38.0	5.9	37.5	6.0	36.4	5.0
Role Assumption	42.7	6.1	42.7	5.3	40.9	5.6	41.5	5.4	39.8	5.6
Consideration	37.1	5.6	36.9	6.5	37.1	5.8	42.5	5.8	41.1	4.7
Production Emphasis	36.3	5.1	35.8	5.7	36.1	5.6	34.9	5.1	35.4	6.8
Predictive Accuracy	18.1	2.1	17.8	2.1	19.2	2.6	20.5	2.3	19.8	2.5
Integration	19.5	2.6	19.1	2.7						
Superior Orientation	39.9	4.9	39.1	5.1	38.6	4.2				
Number of Cases	235		185		165		103		57	

Table 1 – Means and Standard Deviations (continued)								
Subscale	Corporation Presidents		Labor Presidents		College Presidents		Senators	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Representation	20.5	1.8	22.2	2.2	21.4	1.9	20.7	2.5
Demand Reconciliation	20.6	2.7	21.5	3.2			20.7	3.5
Tolerance of Uncertainty	35.9	5.4	40.4	5.6	37.2	5.5	35.3	7.6
Persuasiveness	40.1	4.2	43.1	4.8	41.1	4.2	42.5	4.6
Initiation of Structure	38.5	5.0	38.3	5.6	37.7	4.2	38.8	5.5
Tolerance and Freedom	38.9	4.9	38.0	4.0	39.6	3.9	36.6	6.2
Role Assumption	42.7	3.5	43.3	5.5	43.5	4.5	41.0	5.7
Consideration	41.5	4.0	42.3	5.5	43.5	4.5	41.0	5.7
Production Emphasis	38.9	4.4	36.0	5.0	36.2	5.0	41.2	5.2
Predictive Accuracy	20.1	1.8	20.9	2.0				
Integration								
Superior Orientation	43.2	3.1			42.9	2.9		
Number of Cases	55		44		55		44	

Table 4.1: Organization Demographics

What is the Maturity Level (II, III, IV, V) assessment of your current organization?	Frequency	Percent
ML 2	33	44.0
ML 5	42	56.0
Total	75	100.0
How long has your organization held its current Maturity Level Assessment?	**Frequency**	**Percent**
I don't know	5	6.7
Less than 1 year	15	20.0
1-3 years	29	38.7
3-5 years	10	13.3
Over 5 years	14	18.7
What is a Maturity Level Assessment?	2	2.7
Total	75	100.0
Approximately, how large is your organization?	**Frequency**	**Percent**
Less than 25 people	3	4.0
26-50 people	7	9.3
51-75 people	5	6.7
Over 75 people	60	80.0
Total	75	100.0

Table 4.2: Participant Demographics

How many years have you been in your current organization?	Frequency	Percent
Less than 1 year	5	6.7
1-3 years	15	20.0
3-5 years	10	13.3
Over 5 years	45	60.0
Total	75	100.0
Are you male or female?	Frequency	Percent
Male	45	60.0
Female	30	40.0
Total	75	100.0
Which best categorizes your age group?	Frequency	Percent
18-25	2	2.7
26-35	11	14.7
36-45	12	16.0
46-60	39	52.0
61-70	11	14.7
Total	75	100.0
Overall, are you satisfied with your work environment?	Frequency	Percent
Yes	72	96.0
No	3	4.0
Total	75	100.0

In subsequent analysis of the original (3) 'Other' remarks the following responses were re-categorized Yes: very happy; Most of the time; and I am a process improvement zealot, always seeking improvement.

Table 4.3: Leader Demographics

Which is the best estimate of position in regard to the leader which you will be evaluating?	Frequency	Percent
Senior Management (Director, Deputy Director, President, Vice President)	42	56.0
Middle Management (Division Chief, Section Manager)	20	26.7
Lower Management (Branch Chief, Team Chief, Team or Work Lead)	13	17.3
Total	75	100.0
Is the leader you are about to evaluate male or female?	**Frequency**	**Percent**
Male	62	82.7
Female	13	17.3
Total	75	100.0
Approximately, how long has the leader you are evaluating been in the organization?	**Frequency**	**Percent**
I don't know	3	4.0
Less than 6 months	2	2.7
6 months to 3 years	9	12.0
3-5 years	13	17.3
Over 5 years	48	64.0
Total	75	100.0

Table 4.4: Perceived Leader Engagement

Per_L_Engagement

Do you feel that the leader you are evaluating is actively engaged in making sure that employee interests are satisfied?	Frequency	Percent
Maturity Level 2 Organizations		
Yes	23	69.7
No	10	30.3
Total	33	100.0
In subsequent analysis the original (3) 'Other' remarks the following responses were re-categorized as No: Some employees but not all; Very busy; and No comment.		
Maturity Level 5 Organizations		
Other	1	2.4
Yes	37	88.1
No	4	9.5
Total	42	100.0
In subsequent analysis of the original (4) 'Other' remarks the following responses were re-categorized as Yes: Tries hard; sometimes; he empowers others, and becomes engaged himself if there is an issue. The following responses were re-categorized as No: we have a matrix leadership- the leader is client facing and works more on the contract was left coded as Other.		

Table 4.5: Perceived Leader Employee Focus

Per_L_Emp Focus

Do you feel that the leader you are evaluating has time to deal with the everyday business of their employees (i.e. camaraderie, group membership, career interests, conflict resolution)?	Frequency	Percent
Maturity Level 2 Organizations		
Other (please specify)	1	3.0
Yes	19	57.6
No	13	39.4
Total	33	100.0
In subsequent analysis of the original (3) 'Other' remarks the following responses were re-categorized as No: He is busy; no, but he makes time as needed, and no comment was left coded as Other.		
Maturity Level 5 Organizations		
Other (please specify)	0	0
Yes	28	66.7
No	14	33.3
Total	42	100.0
In subsequent analysis of the original (6) 'Other' remarks the following responses were re-categorized as Yes: Yes is the answer, however, he does this by working everyday till the days work is done, often late into the evening/night; yes, as time allows; he does the best he can- his plate is so full with urgent issues, they often overwhelm the important subjects of your query; sometimes, and (2) were coded as No: no, but he makes time for it; the leader is not my direct supervisor therefore, he doesn't seem to get that involved with by business.		

Table 4.6: Perceived Leader Work Focus

Per_L_Work Focus

Which of the answers below best describes the main focus of the leader you are evaluating?	Frequency	Percent
Maturity Level 2 Organizations		
Other (please specify)	2	6.1
Work output /Production	15	45.5
The people in the workplace	2	6.1
Trying to keep up with job demands	10	30.3
Answering email or attending meetings	4	12.1
Total	33	100.0
Other Remarks (2): Not sure. I don't see her often enough to know; I feel like my manager does a good job of combining each of these as his main focus.		
Maturity Level 5 Organizations		
Other (please specify)	8	19.0
Work output /Production	18	42.9
The people in the workplace	2	4.8
Trying to keep up with job demands	10	23.8
Answering email or attending meetings	4	9.5
Total	42	100.0
Other Remarks (8): Other Remarks: Building the business; making margins; business success through commitment to customers, involvement with people, integrity, and excellence; business Development and Sales; Work output / Production / Product Quality and striving for continual improvement and effectiveness; Trying to ensure customers are properly communicated with and engaged for new business; Both work output/production and the people; measuring/monitoring the client contract bonus criteria and company goals.		

Table 4.7: Descriptive Statistics

Descriptive Statistics

		Representation	Demand Reconciliation	Tolerance of Uncertainty	Persuasion	Initiation of Structure	Tolerance of Freedom	Role Assumption	Consideration	Production Emphasis	Predictive Accuracy	Integration	Superior Orientation
N	Valid	75	75	75	75	75	75	75	75	75	75	75	75
	Missing	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4.12	3.90	3.63	3.82	3.90	3.95	3.97	3.67	3.48	3.71	3.69	3.8080
Median		4.20	4.00	3.70	3.90	4.00	4.00	4.00	3.70	3.60	3.80	3.80	3.8000
Mode		4	4	4[a]	4	4	4[a]	5	3[a]	4[a]	4	4	3.80
Std. Deviation		.471	.701	.615	.546	.528	.514	.542	.621	.607	.582	.799	.43426
Variance		.222	.491	.378	.299	.279	.264	.293	.386	.368	.339	.638	.189
Skewness		-1.063	-.845	-.288	-.407	-1.025	-.718	-.680	-.593	-.275	-.590	-.448	-.597
Std. Error of Skewness		.277	.277	.277	.277	.277	.277	.277	.277	.277	.277	.277	.277
Kurtosis		3.029	.415	.401	-.115	2.005	.488	-.137	.698	.599	1.041	-.136	.551
Std. Error of Kurtosis		.548	.548	.548	.548	.548	.548	.548	.548	.548	.548	.548	.548
Range		3	3	3	3	3	3	2	3	3	3	4	2.20
Percentiles	25	4.00	3.60	3.20	3.40	3.60	3.80	3.60	3.30	3.10	3.20	3.20	3.6000
	50	4.20	4.00	3.70	3.90	4.00	4.00	4.00	3.70	3.60	3.80	3.80	3.8000
	75	4.40	4.40	4.10	4.30	4.20	4.30	4.40	4.10	3.80	4.00	4.20	4.1000

Table 4.8: Outliers

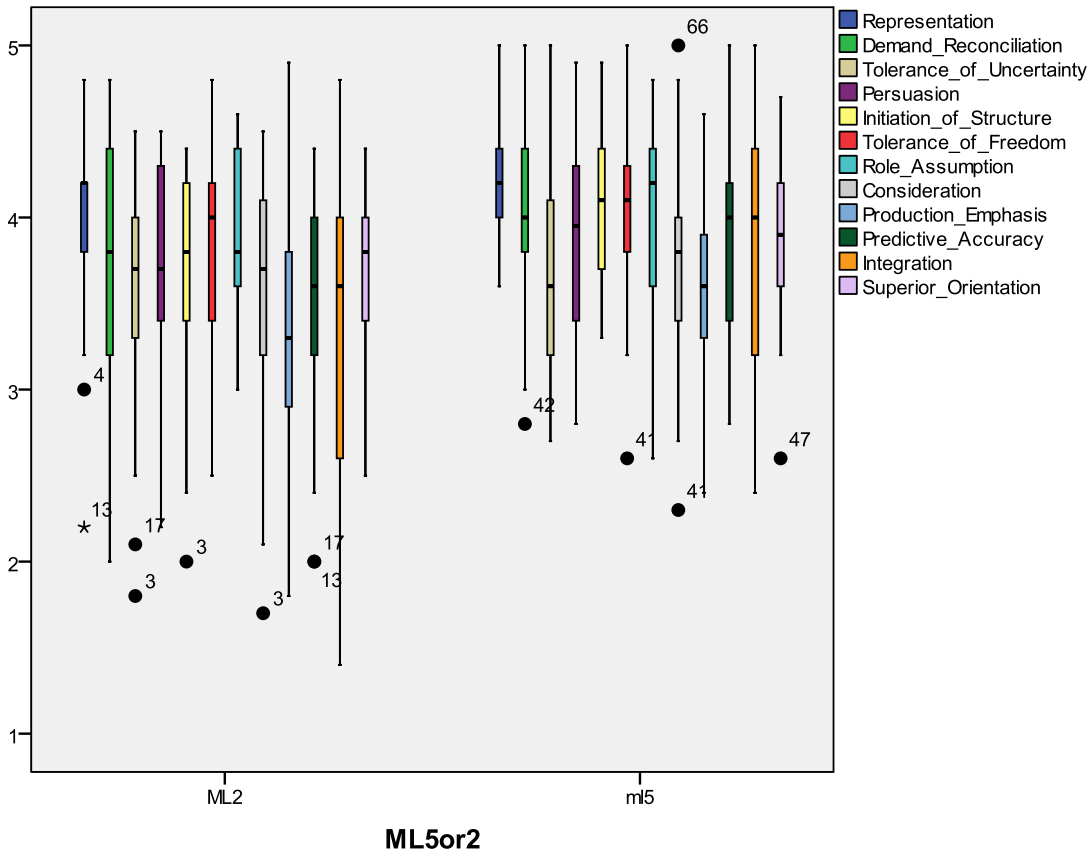


Figure 2.1: The Four Approaches in an Integrated Framework by Dutton

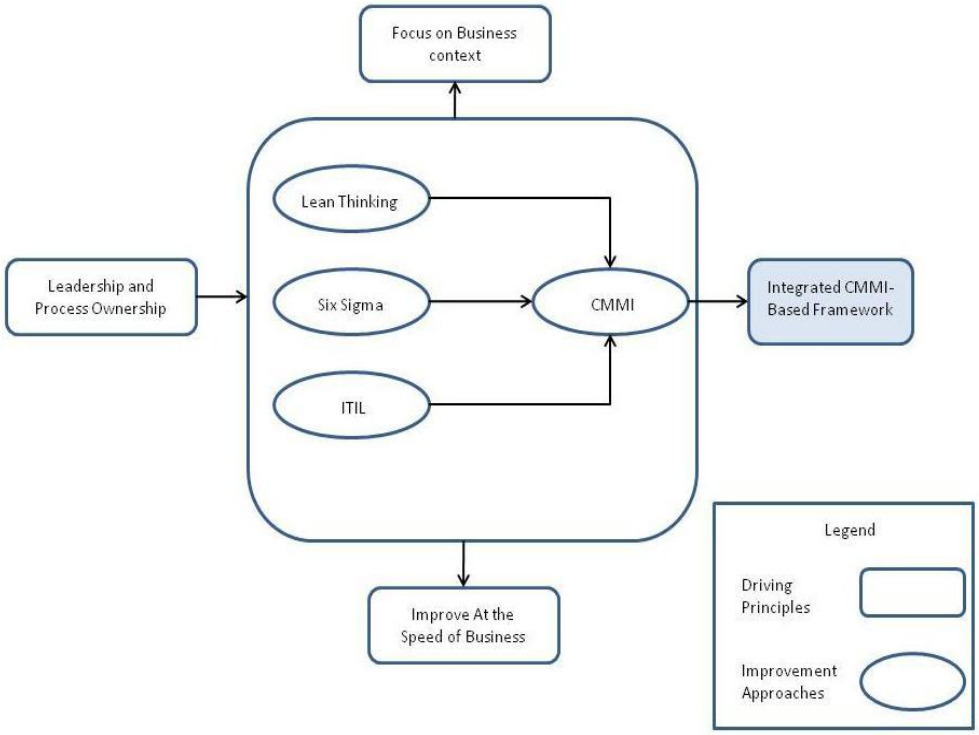


Figure 2.2: Capability Maturity Levels Defined

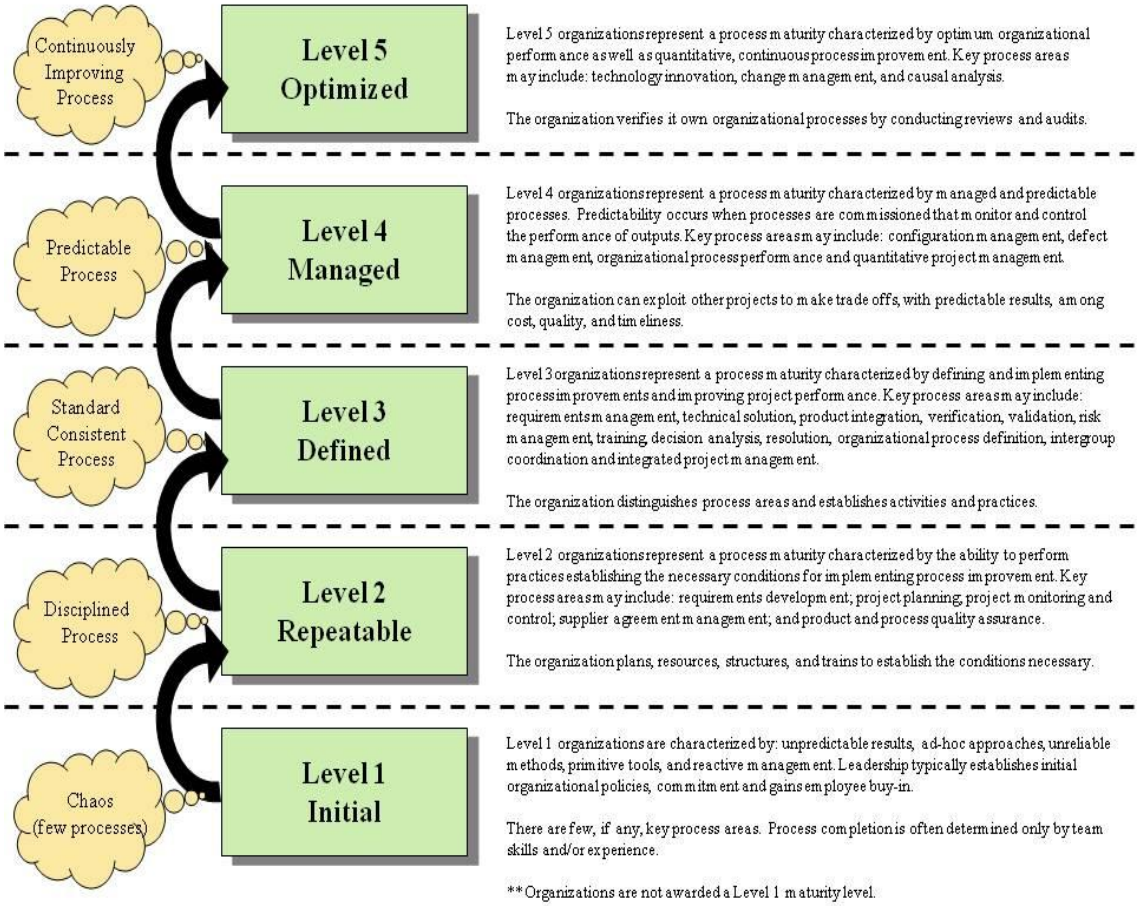
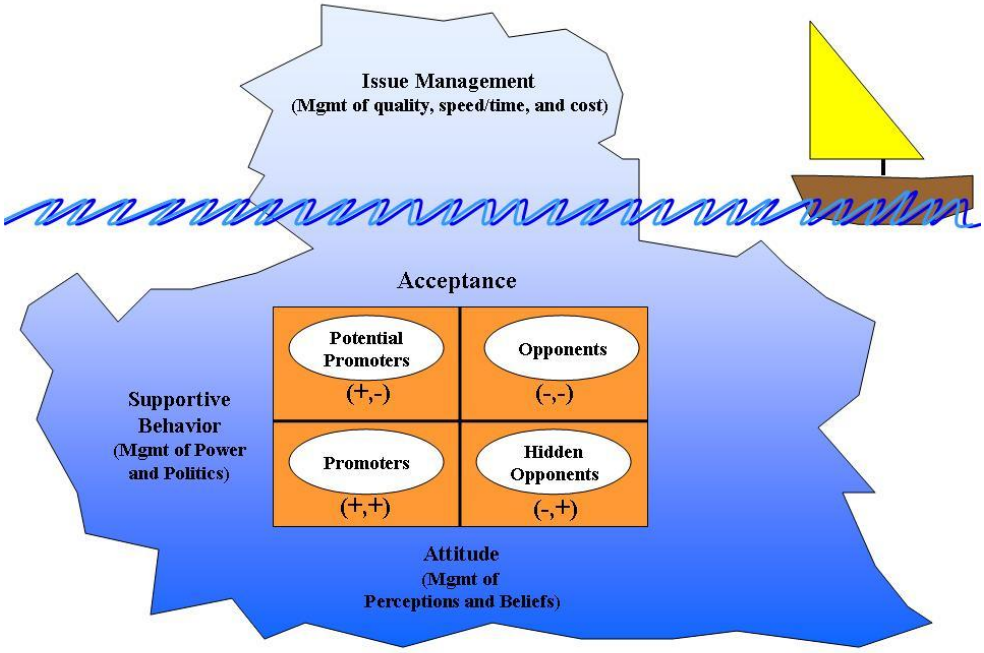


Figure 2.3: The Change Management Iceberg by Wilfried Krüger (Interpreted by Beitler)



The Change Management Iceberg of Wilfried Krüger

Figure 3.1: Conceptual Model of Research Study (Developed by Author)

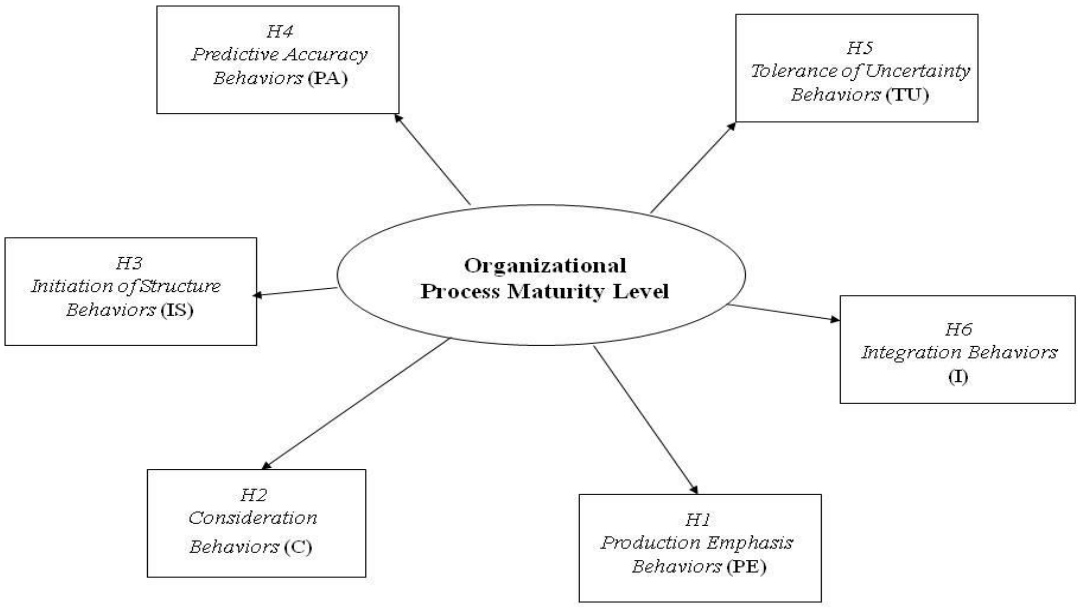


Figure 4.1: Leader Position Descriptions

Senior Management	The executive heads of the organization or departments, the top-level leadership team. For example, this would include individuals such as: (Directors, Deputy Director, Presidents, Vice Presidents)
Middle Management	Managers in middle-management positions who typically supervise one or more managers. For example, this would include individuals such as: (Division Chiefs, Section Managers)
Lower Management	Management positions who typically supervise employees, but not other managers. For example, this would include individuals such as: (Branch Chief, Team Chief, Team or Work Lead)

APPENDIX 1: ORGANIZATION SOLICITATION EMAIL

CMMI Research Inquiry _Level II

First, congratulations on your CMMI Level II Maturity certification! My name is Gina Eckles; I am a Ph.D. student and the principal investigator for a research study being conducted at the University of Oklahoma in Norman, OK. As a certified LSS Black-belt and former employee of a CMMI Level V organization, I am keenly aware of the work and commitment involved in process maturity and preparing an organization for a maturity level assessment.

I am conducting a research study entitled: "The relationship between business process improvement and leadership: an empirical study exploring the affect of process maturity on leader behavior" and it suggests that changes to organizational structure and design instituted in the process of maturing an organizations process maturity level presents contingencies, which over time, lead to changes in leader behavior. The objective of the study is to evaluate specific leader behaviors given a common environment, (CMMI), with varying degrees of organizational process maturity (Maturity Level (ML) II vs. ML V). The study hypothesizes that, regardless of overall leadership style, some leader behaviors in ML level II organizations will be significantly different than leader behaviors in ML level V organizations. To determine causality the researcher has selected public and private sector organizations with decidedly different process maturity level assessments and will compare respondent data within and between the groups. The goals of the study include: 1) clarifying uncertainties regarding the value and benefits of adopting process improvement models and methodologies by substantiating that an increasing organizational maturity level affects not only standard Return On Investment's (ROI)'s such as quality, speed and cost, but also leader behaviors such as: tolerance of uncertainty, initiation of structure, consideration, production emphasis, predictive accuracy, and integration; and 2) providing quantitative data to establish that an organization's underlying process frameworks can influence leader behaviors.

I am writing to solicit your organization's participation in this research study as yours has successfully completed the CMMI ML II assessment. The study is NOT time intensive, it is NOT intrusive (it is web-enabled), and it only requires approximately one (1) hour to complete. All results are completely confidential!

Since employee and leader identity is completely irrelevant to study results, all respondents will remain completely anonymous. I will not request/require any employee information. If you choose to participate, the only thing I ask of you and your organization is for you to provide some of your employees (working in the section/division with the CMMI level II assessment) the following survey link: https://www.surveymonkey.com/s.aspx?sm=1mwADnCD4_2bWx_2fmD9CwTtPQ_3d_3d

The survey link provides participants with complete disclosure and all study information, however, if would like to hear more about this research i.e. specific

hypothesis's, I can be reached at this email or at Gina.M.Eckles-1@ou.edu; phone 845-238-0806.

Thank you for your time!
V/R, Gina Eckles

CMMI Research Inquiry _Level V

First, congratulations on your CMMI Level V Maturity certification! My name is Gina Eckles; I am a Ph.D. student and the principal investigator for a research study being conducted at the University of Oklahoma in Norman, OK. As a certified LSS Black-belt and former employee of a CMMI Level V organization, I am keenly aware of the work and commitment involved in process maturity and preparing an organization for a maturity level assessment.

I am conducting a research study entitled: "The relationship between business process improvement and leadership: an empirical study exploring the affect of process maturity on leader behavior" and it suggests that changes to organizational structure and design instituted in the process of maturing an organizations process maturity level presents contingencies, which over time, lead to changes in leader behavior. The objective of the study is to evaluate specific leader behaviors given a common environment, (CMMI), with varying degrees of organizational process maturity (Maturity Level (ML) II vs. ML V). The study hypothesizes that, regardless of overall leadership style, some leader behaviors in ML level II organizations will be significantly different than leader behaviors in ML level V organizations. To determine causality the researcher has selected public and private sector organizations with decidedly different process maturity level assessments and will compare respondent data within and between the groups. The goals of the study include: 1) clarifying uncertainties regarding the value and benefits of adopting process improvement models and methodologies by substantiating that an increasing organizational maturity level affects not only standard Return On Investment's (ROI)'s such as quality, speed and cost, but also leader behaviors such as: tolerance of uncertainty, initiation of structure, consideration, production emphasis, predictive accuracy, and integration; and 2) providing quantitative data to establish that an organization's underlying process frameworks can influence leader behaviors.

I am writing to solicit your organization's participation in this research study as yours has successfully completed the CMMI ML V assessment. The study is NOT time intensive, it is NOT intrusive (it is web-enabled), and it only requires approximately one (1) hour to complete. All results are completely confidential!

Since employee and leader identity is completely irrelevant to study results, all respondents will remain completely anonymous. I will not request/require any employee information. If you choose to participate, the only thing I ask of you and your organization is for you to provide some of your employees (working in the section/division with the CMMI level V assessment) the following survey link: https://www.surveymonkey.com/s.aspx?sm=t4ya8Cs1ZpcnbFsZvZob1g_3d_3d

The survey link provides participants with complete disclosure and all study information, however, if would like to hear more about this research i.e. specific hypothesis's, I can be reached at this email or at Gina.M.Eckles-1@ou.edu; phone 845-238-0806.

Thank you for your time!
V/R, Gina Eckles

APPENDIX 2: WEB SURVEY SITE PARTICIPANT INFORMATION

Introduction and Purpose:

Hello! My name is Gina M. Eckles and I am the Principal Investigator for a research study being conducted in the Organizational Leadership Ph.D. Program at the University of the Oklahoma. I am requesting your participation in a research study entitled: "The relationship between business process improvement and leadership: an empirical study exploring the affect of process maturity on leader behavior." The purpose of this study is to explore the relationship between organizational process maturity and leader behavior. The study hypothesizes that leader behavior in Maturity Level (ML) level II organizations is significantly different than leader behavior in ML level V organizations. The study suggests that changes to organizational structure and design instituted in the process of maturing an organization's process maturity level presents contingencies which over time lead to changes in leader behavior. *Your leadership is aware of this study and they have agreed to allow it to take place within your organization.* They understand that they will not have access to nor will they be provided copies of any of the research data. Your identity in this study is anonymous to the researcher, your organization, and all resulting data will be stored in a secured facility and destroyed at the end of the study. Participation in this study is voluntary and should take one hour or less. You will not be compensated for participating in this research study. All resulting data will ONLY be used to compare organizational cultures and determine if leader behavior in Maturity Level (ML) level II organizations is significantly different than leader behavior in ML level V organizations in relation to behaviors such as: tolerance of uncertainty, initiation of structure, consideration, production emphasis, predictive accuracy, and integration. This study is important because it will determine if there is a significant positive relationship between process maturity and leader behavior. The University of Oklahoma's Institutional Review Board has approved this research, IRB#12376.

Risks:

As a research study, the principal investigator is required by law to identify any potential risks. This study has the following risk: disclosure of subjects' responses. To minimize this risk, data collection will be anonymous and specific names are not requested as they are irrelevant to the study results, all study data will be coded and participating organizations will not have access to study data. In published reports, there will be no information included that will make it possible to identify particular organizations or data specific to the participating organizations. Research records will be stored securely and only approved researchers will have access to the records. There are organizations that may inspect and/or copy research records for quality assurance and data analysis. These organizations include the University of Oklahoma (OU) Institutional Review Board (IRB). This research study does not involve physically invasive procedures with associated risk of physical harm and participants are not asked to provide their name or the names of organizational leaders.

Benefits of participating in the study:

Few studies, if any, have actually examined whether leader behaviors can be influenced by an organization's structure and process maturity. This study is important because it will determine if there is a significant positive relationship between process maturity and leader behavior. Your candid input is vital in determining whether or not a relationship exists.

Procedures:

Although the researcher agrees that there are many differences between managers and leaders, for the purpose of this research the term leader will be synonymous with supervisor and manager. For this research study participants are asked to evaluate one of their organizational leaders by answering thirteen (13) supplemental questions and then completing the LBDQ Form XII questionnaire. Regardless of your personal views, choose an organizational leader who is known in the organization and whose leadership position is not debatable. For example:

Senior Management	The executive heads of the organization or departments, the top-level leadership team. For example, this would include individuals such as: (Directors, Deputy Director, Presidents, Vice Presidents)
Middle Management	Managers in middle-management positions who typically supervise one or more managers. For example, this would include individuals such as: (Division Chiefs, Section Managers)
Lower Management	Management positions who typically supervise employees, but not other managers. For example, this would include individuals such as: (Branch Chief, Team Chief, Team or Work Lead)

This person **must be** in a position that is empowered to make, change and directly influence organizational decisions in regard to vision, goals, objectives, hiring, budget, profit and mission. You may choose any leader in your organization providing that you know and have had direct experience observing the leader in work settings. Your descriptions should be as fair and accurate as possible.

Informed Consent:

By continuing on to the following questions, you are agreeing to participate in this research study as described above. By continuing you are both: acknowledging your understanding and providing the principal investigator with your participation consent. Remember, you are allowed to stop the questionnaire at any time. However, the thirteen (13) preliminary questions and LBDQ questionnaire must be finished in one, single-phase sitting, which is expected to take about 1 hour. Please take a few minutes to prepare yourself to participate in the study!

Researcher information:

Again, I want to thank you for your candid responses and for participating in this research study! If you have concerns or complaints about the research, the researcher conducting this study can be contacted at:

Gina.M.Eckles-1@ou.edu

Phone: 845-238-0806

If you have any questions about your rights as a research participant, concerns, or complaints about the research and wish to talk to someone other than researcher or if you cannot reach the researcher, you may contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405-325-8110 or irb@ou.edu. IRB #12376

Your Participation in this research study is invaluable and greatly appreciated!

APPENDIX 3: SUPPLEMENTAL SURVEY QUESTIONS

1. How many years have you been in your current organization?
    a. Less than 1 year
    b. 1-3 years
    c. 3-5 years
    d. Over 5 years

2. What is the name and Maturity Level (II, III, IV, V) assessment of your current organization?

3. How long has your organization held its current Maturity Level Assessment?
    a. Less than 1 year
    b. 1-3 years
    c. 3-5 years
    d. Over 5 years
    e. I don't know
    f. What is a Maturity Level Assessment?

4. Approximately, how large is your organization?
    a. Less than 25 people
    b. 26-50 people
    c. 51-75 people
    d. Over 75 people
    e. Other (Please Specify)

5. Are you male or female?
    a. Male
    b. Female

6. Which best categorizes your age group?
    a. 18-25
    b. 26-35
    c. 36-45
    d. 46-60
    e. 61-70
    f. Other

7. Overall, are you satisfied with your work environment?
    a. Yes
    b. No
    c. Other (please specify)

8. Is the leader you are about to evaluate male or female?
    a. Male
    b. Female

9. Do you feel that the leader you are evaluating is actively engaged in making sure that employee interests are satisfied?
    a. Yes
    b. No
    c. Other (please specify)

10. Approximately, how long has the leader you are evaluating been in the organization?
    a. Less than 6 months
    b. 6 months to 3 years
    c. 3-5 years
    d. Over 5 years
    e. I don't know

11. Do you feel that the leader you are evaluating has time to deal with the everyday business of their employees (i.e. camaraderie, group membership, career interests, conflict resolution)?
    a. Yes
    b. No
    c. Other (please specify)

12. Which of the answers below best describes the main focus of the leader you are evaluating?
    a. Work output /Production
    b. The people in the workplace
    c. Trying to keep up with job demands
    d. Answering email or attending meetings
    e. Other (please specify)

13. Which is the best estimate of position in regard to the leader which you will be evaluating?

    a. Senior Management (Director, Deputy Director, President, Vice President)
    b. Middle Management (Division Chief, Section Manager)
    c. Lower Management (Branch Chief, Team Chief, Team or Work Lead)
    d. I don’t know

APPENDIX 4: LBDQ Form XII

LEADER BEHAVIOR DESCRIPTION QUESTIONNARIE – Form XII
Originated by staff members of
The Ohio State Leadership Studies
And revised by the Bureau of Business Research

Purpose of the Questionnaire

On the following pages is a list of items used to describe the behavior of the leader you have selected. Each item describes a specific kind of behavior, but does not ask you to judge whether the behavior is desirable or undesirable. Although some items may appear similar, they express differences that are important in the description of leadership. Each item should be considered as a separate description. This is not a test of ability or consistency in making answers. Its only purpose is to make it possible for you to describe, as accurately as you can, the behavior of your leader.

Note: The term "group" as employed in the following items, refers to a department, division, or other unit of organization that is supervised by the person being described.

The term "members" refers to all the people in the unit of organization that is supervised by the person being described.

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DIRECTIONS:
a. READ each item carefully.
b. THINK about how frequently the leader engages in the behavior described by the item.
c. DECIDE whether he/she (A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

1. Acts as the spokesperson of the group	A B C D E
2. Waits patiently for the results of a decision	A B C D E
3. Makes pep talks to stimulate the group	A B C D E
4. Lets group members know what is expected of them	A B C D E
5. Allows the members complete freedom in their work	A B C D E
6. Is hesitant about taking initiative in the group	A B C D E
7. Is friendly and approachable	A B C D E
8. Encourages overtime work	A B C D E
9. Makes accurate decisions	A B C D E
10. Gets along well with the people above him/her	A B C D E
11. Publicizes the activities of the group	A B C D E
12. Becomes anxious when he/she cannot find out what is coming next	A B C D E
13. His/her arguments are convincing	A B C D E
14. Encourages the use of uniform procedures	A B C D E
15. Permits the members to use their own judgment in solving problems	A B C D E
16. Fails to take necessary actions	A B C D E
17. Does little things to make it pleasant to be a member of the group	A B C D E
18. Stresses being ahead of competing groups	A B C D E
19. Keeps the group working together as a team	A B C D E
20. Keeps the group in good standing with higher authority	A B C D E
21. Speaks as a representative of the group	A B C D E
22. Accepts defeat in stride	A B C D E
23. Argues persuasively for his/her point of view	A B C D E
24. Tries out his/her ideas in the group	A B C D E
25. Encourages initiative in the group members	A B C D E
26. Lets other persons take away his/her leadership in the group	A B C D E
27. Puts suggestions made by the group into operation	A B C D E
28. Needles members for greater effort	A B C D E
29. Seems able to predict what is coming next	A B C D E
30. Is working hard for a promotion	A B C D E
31. Speaks for the group when visitors are present	A B C D E
32. Accepts delays without becoming upset	A B C D E
33. Is a very persuasive talker	A B C D E
34. Makes his/her attitudes clear to the group	A B C D E
35. Lets the members do their work the way they think best	A B C D E
36. Lets some members take advantage of him/her	A B C D E
37. Treats all group members as his/her equals	A B C D E
38. Keeps the work moving at a rapid pace	A B C D E
39. Settles conflicts when they occur in the group	A B C D E

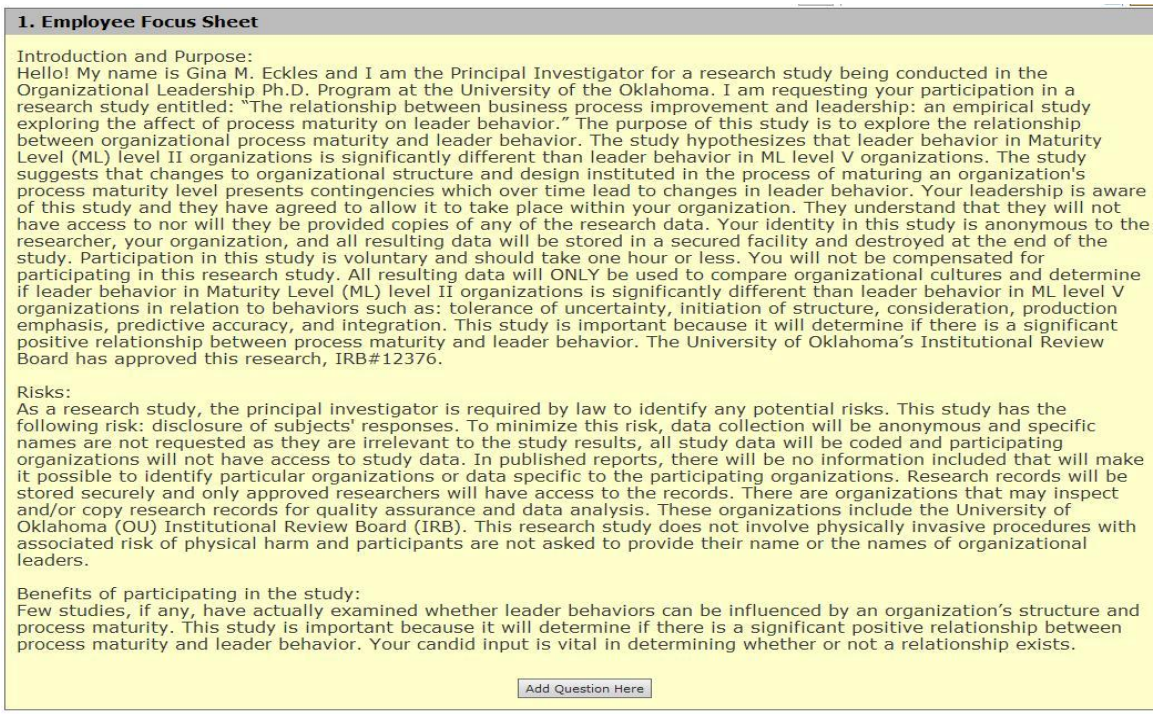
40. His/her superiors act favorably on most of his/her suggestions A B C D E
41. Represents the group at outside meetings A B C D E
42. Become anxious when waiting for new developments A B C D E
43. Is very skillful in an argument A B C D E
44. Decides what shall be done and how it shall be done A B C D E
45. Assigns a task, then lets the members handle it A B C D E
46. Is the leader of the group in name only A B C D E
47. Gives advance notice of changes A B C D E
48. Pushes for increased production A B C D E
49. Things usually turn out as he/she predicts A B C D E
50. Enjoys the privileges of his/her position A B C D E
51. Handles complex problems efficiently A B C D E
52. Is able to tolerate postponement and uncertainty A B C D E
53. Is not a very convincing talker A B C D E
54. Assigns group members to particular tasks A B C D E
55. Turns the members loose on a job, and lets them go to it A B C D E
56. Backs down when he/she ought to stand firm A B C D E
57. Keeps to himself/herself A B C D E
58. Asks the members to work harder A B C D E
59. Is accurate in predicting the trend of events A B C D E
60. Gets his/her superiors to act for the welfare of the group members A B C D E
61. Gets swamped by details A B C D E
62. Can wait just so long, then blows up A B C D E
63. Speaks from a strong inner conviction A B C D E
64. Makes sure that his/her part in the group is understood by the group members A B C D E
65. Is reluctant to allow the members any freedom of action A B C D E
66. Lets some members have authority that he/she should keep A B C D E
67. Looks out for the personal welfare of group members A B C D E
68. Permits the members to take it easy in their work A B C D E
69. Sees to it that the work of the group is coordinated A B C D E
70. His/her word carries weight with superiors A B C D E
71. Gets things all tangled up A B C D E
72. Remains calm when uncertain about coming events A B C D E
73. Is an inspiring talker A B C D E
74. Schedules the work to be done A B C D E
75. Allows the group a high degree of initiative A B C D E
76. Takes full charge when emergencies arise A B C D E
77. Is willing to make changes A B C D E
78. Drives hard when there is a job to be done A B C D E
79. Helps group members settle their differences A B C D E
80. Gets what he/she asks for from his/her superiors A B C D E
81. Can reduce a madhouse to system and order A B C D E
82. Is able to delay action until the proper time occurs A B C D E
83. Persuades others that his/her ideas are to their advantage A B C D E
84. Maintains definite standards of performance A B C D E

85. Trusts members to exercise good judgment	A B C D E
86. Overcomes attempts made to challenge his/her leadership	A B C D E
87. Refuses to explain his/her actions	A B C D E
88. Urges the group to beat its previous record	A B C D E
89. Anticipates problems and plans for them	A B C D E
90. Is working his/her way to the top	A B C D E
91. Gets confused when too many demands are made of him/her	A B C D E
92. Worries about the outcome of any new procedure	A B C D E
93. Can inspire enthusiasm for a project	A B C D E
94. Asks that group members follow standard rules and regulations	A B C D E
95. Permits the group to set its own pace	A B C D E
96. Is easily recognized as the leader of the group	A B C D E
97. Acts without consulting the group	A B C D E
98. Keeps the group working up to capacity	A B C D E
99. Maintains a closely knit group	A B C D E
100. Maintains cordial relations with superiors	A B C D E

APPENDIX 5: SURVEY MONKEY PAGES

This study was administered using the web based administration technique offered by Surveymonkey. Surveymonkey offered the researcher the following benefits: data were automatically secured by Verisign and delivered over a Secure Sockets Layer (SSL) channel; delivery method drastically decreased the time and costs associated to the study; data collection was easy, convenient and accessible in real-time; data were downloadable in spreadsheet format; the delivery method provided quick access to a large sample size; non-intrusive research; and the web tool offered built-in charting capabilities and access to individual responses. Consenting organizations provided participants a web link specific to the type of organization they were in i.e. maturity level 2 or maturity level 5. At the link provided, participants were provided with a complete description of the research study to include: risks, benefits, procedures and consent (See Appendix 5: Survey Monkey Pages). Consenting participants were asked to complete a thirteen (13) question supplemental survey and the LBDQ Form XII. The web links were available for sixteen (16) weeks when the researcher concluded that sufficient quantitative data had been collected.

Survey Monkey Example ML 2 Organizations



1. Employee Focus Sheet

Introduction and Purpose:
Hello! My name is Gina M. Eckles and I am the Principal Investigator for a research study being conducted in the Organizational Leadership Ph.D. Program at the University of the Oklahoma. I am requesting your participation in a research study entitled: "The relationship between business process improvement and leadership: an empirical study exploring the affect of process maturity on leader behavior." The purpose of this study is to explore the relationship between organizational process maturity and leader behavior. The study hypothesizes that leader behavior in Maturity Level (ML) level II organizations is significantly different than leader behavior in ML level V organizations. The study suggests that changes to organizational structure and design instituted in the process of maturing an organization's process maturity level presents contingencies which over time lead to changes in leader behavior. Your leadership is aware of this study and they have agreed to allow it to take place within your organization. They understand that they will not have access to nor will they be provided copies of any of the research data. Your identity in this study is anonymous to the researcher, your organization, and all resulting data will be stored in a secured facility and destroyed at the end of the study. Participation in this study is voluntary and should take one hour or less. You will not be compensated for participating in this research study. All resulting data will ONLY be used to compare organizational cultures and determine if leader behavior in Maturity Level (ML) level II organizations is significantly different than leader behavior in ML level V organizations in relation to behaviors such as: tolerance of uncertainty, initiation of structure, consideration, production emphasis, predictive accuracy, and integration. This study is important because it will determine if there is a significant positive relationship between process maturity and leader behavior. The University of Oklahoma's Institutional Review Board has approved this research, IRB#12376.

Risks:
As a research study, the principal investigator is required by law to identify any potential risks. This study has the following risk: disclosure of subjects' responses. To minimize this risk, data collection will be anonymous and specific names are not requested as they are irrelevant to the study results, all study data will be coded and participating organizations will not have access to study data. In published reports, there will be no information included that will make it possible to identify particular organizations or data specific to the participating organizations. Research records will be stored securely and only approved researchers will have access to the records. There are organizations that may inspect and/or copy research records for quality assurance and data analysis. These organizations include the University of Oklahoma (OU) Institutional Review Board (IRB). This research study does not involve physically invasive procedures with associated risk of physical harm and participants are not asked to provide their name or the names of organizational leaders.

Benefits of participating in the study:
Few studies, if any, have actually examined whether leader behaviors can be influenced by an organization's structure and process maturity. This study is important because it will determine if there is a significant positive relationship between process maturity and leader behavior. Your candid input is vital in determining whether or not a relationship exists.

Add Question Here

Employee Question and LBDQ Form XII_ML II Exit this survey

2. Employee Consent Form and Supplemental Questions-PART ONE

Procedures:
Although the researcher agrees that there are many differences between managers and leaders, for the purpose of this research the term leader will be synonymous with supervisor and manager. For this research study participants are asked to evaluate one of their organizational leaders by answering thirteen (13) supplemental questions, PART ONE, and then completing the LBDQ Form XII questionnaire, PART TWO. Regardless of your personal views, choose an organizational leader who is known in the organization and whose leadership position is not debatable. For example:

Senior Management: The executive heads of the organization or departments, the top-level leadership team. For example, this would include individuals such as: (Directors, Deputy Director, Presidents, Vice Presidents)

Middle Management: Managers in middle-management positions who typically supervise one or more managers. For example, this would include individuals such as: (Division Chiefs, Section Managers)

Lower Management: Management positions who typically supervise employees, but not other managers. For example, this would include individuals such as: (Branch Chief, Team Chief, Team or Work Lead)

This person must be in a position that is empowered to make, change and directly influence organizational decisions in regard to vision, goals, objectives, hiring, budget, profit and mission. You may choose any leader in your organization providing that you know and have had direct experience observing the leader in work settings. Your descriptions should be as fair and accurate as possible.

Informed Consent:
By continuing on to the following questions, you are agreeing to participate in this research study as described above. By continuing you are both: acknowledging your understanding and providing the principal investigator with your participation consent. Remember, you are allowed to stop the questionnaire at any time. However, the thirteen (13) preliminary questions and LBDQ questionnaire must be finished in one, single-phase sitting, which is expected to take about 1 hour.

The survey will not retain your answers, so you will not be able to exit and then re-enter, so please take a few minutes to prepare yourself to participate in the study!

1. How many years have you been in your current organization?

- Less than 1 year
- 1-3 years
- 3-5 years
- Over 5 years

2. What is the Maturity Level (II, III, IV, V) assessment of your current organization?

3. How long has your organization held its current Maturity Level Assessment?

- Less than 1 year
- 1-3 years
- 3-5 years
- Over 5 years
- I don't know
- What is a Maturity Level Assessment?

4. Approximately, how large is your organization?

- Less than 25 people
- 26-50 people
- 51-75 people
- Over 75 people
- Other (please specify)

5. Are you male or female?

- Male
- Female

6. Which best categorizes your age group?

- 18-25
- 26-35
- 36-45
- 46-60
- 61-70
- Other (please specify)

7. Overall, are you satisfied with your work environment?

- Yes
- No
- Other (please specify)

8. Is the leader you are about to evaluate male or female?

- Male
- Female

9. Do you feel that the leader you are evaluating is actively engaged in making sure that employee interests are satisfied?

- Yes
- No
- Other (please specify)

10. Approximately, how long has the leader you are evaluating been in the organization?

- Less than 6 months
- 6 months to 3 years
- 3-5 years
- Over 5 years
- I don't know

11. Do you feel that the leader you are evaluating has time to deal with the everyday business of their employees (i.e. camaraderie, group membership, career interests, conflict resolution)?

- Yes
- No
- Other (please specify)

12. Which of the answers below best describes the main focus of the leader you are evaluating?

- Work output /Production
- The people in the workplace
- Trying to keep up with job demands
- Answering email or attending meetings
- Other (please specify)

13. Which is the best estimate of position in regard to the leader which you will be evaluating?

- Senior Management (Director, Deputy Director, President, Vice President)
- Middle Management (Division Chief, Section Manager)
- Lower Management (Branch Chief, Team Chief, Team or Work Lead)
- I don't know

Previous Page Next Page

Employee Question and LBDQ Form XII_ML II — Exit this survey

3. LEADER BEHAVIOR DESCRIPTION QUESTIONNARIE Form XII- PART TWO

LEADER BEHAVIOR DESCRIPTION QUESTIONNARIE – Form XII
Originated by staff members of
The Ohio State Leadership Studies
And revised by the Bureau of Business Research

Purpose of the Questionnaire

The following pages contain a list of items used to describe the behavior of the leader you have selected. Each item describes a specific kind of behavior, but does not ask you to judge whether the behavior is desirable or undesirable. Although some items may appear similar, they express differences that are important in the description of leadership. Each item should be considered as a separate description. This is not a test of ability or consistency in making answers. Its only purpose is to make it possible for you to describe, as accurately as you can, the behavior of your leader.

Note: The term "group" as employed in the following items, refers to a department, division, or other unit of organization that is supervised by the person being described.

The term "members" refers to all the people in the unit of organization that is supervised by the person being described.

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You are allowed to stop the questionnaire at any time. The LBDQ questionnaire contains 100 questions and should be finished in one, single-phase sitting, which is expected to take forty (40) minutes.

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Employee Question and LBDQ Form XII_ML II — Exit this survey

4. LBDQ Questionnaire Questions (1-25)

(Questions 1-5) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
1. Acts as the spokesperson of the group	○	○	○	○	○
2. Waits patiently for the results of a decision	○	○	○	○	○
3. Makes pep talks to stimulate the group	○	○	○	○	○
4. Lets group members know what is expected of them	○	○	○	○	○
5. Allows the members complete freedom in their work	○	○	○	○	○

(Questions 6-12) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
6. Is hesitant about taking initiative in the group	○	○	○	○	○
7. Is friendly and approachable	○	○	○	○	○
8. Encourages overtime work	○	○	○	○	○
9. Makes accurate decisions	○	○	○	○	○
10. Gets along well with the people above him/her	○	○	○	○	○
11. Publicizes the activities of the group	○	○	○	○	○
12. Becomes anxious when he/she cannot find out what is coming next	○	○	○	○	○

(Questions 13-19) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
13. His/her arguments are convincing	○	○	○	○	○
14. Encourages the use of uniform procedures	○	○	○	○	○
15. Permits the members to use their own judgment in solving problems	○	○	○	○	○
16. Fails to take necessary actions	○	○	○	○	○
17. Does little things to make it pleasant to be a member of the group	○	○	○	○	○
18. Stresses being ahead of competing groups	○	○	○	○	○
19. Keeps the group working together as a team	○	○	○	○	○

(Questions 20-25) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
20. Keeps the group in good standing with higher authority	○	○	○	○	○
21. Speaks as a representative of the group	○	○	○	○	○
22. Accepts defeat in stride	○	○	○	○	○
23. Argues persuasively for his/her point of view	○	○	○	○	○
24. Tries out his/her ideas in the group	○	○	○	○	○
25. Encourages initiative in the group members	○	○	○	○	○

Employee Question and LBDQ Form XII_ML II **Exit this survey**

5. LBDQ Questionnaire Questions (26-50)

(Questions 26-31) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
26. Lets other persons take away his/her leadership in the group	○	○	○	○	○
27. Puts suggestions made by the group into operation	○	○	○	○	○
28. Needles members for greater effort	○	○	○	○	○
29. Seems able to predict what is coming next	○	○	○	○	○
30. Is working hard for a promotion	○	○	○	○	○
31. Speaks for the group when visitors are present	○	○	○	○	○

(Questions 32-37) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
32. Accepts delays without becoming upset	○	○	○	○	○
33. Is a very persuasive talker	○	○	○	○	○
34. Makes his/her attitudes clear to the group	○	○	○	○	○
35. Lets the members do their work the way they think best	○	○	○	○	○
36. Lets some members take advantage of him/her	○	○	○	○	○
37. Treats all group members as his/her equals	○	○	○	○	○

(Questions 38-43) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
38. Keeps the work moving at a rapid pace	○	○	○	○	○
39. Settles conflicts when they occur in the group	○	○	○	○	○
40. His/her superiors act favorably on most of his/her suggestions	○	○	○	○	○
41. Represents the group at outside meetings	○	○	○	○	○
42. Become anxious when waiting for new developments	○	○	○	○	○
43. Is very skillful in an argument	○	○	○	○	○

(Questions 44-50) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
44. Decides what shall be done and how it shall be done	○	○	○	○	○
45. Assigns a task, then lets the members handle it	○	○	○	○	○
46. Is the leader of the group in name only	○	○	○	○	○
47. Gives advance notice of changes	○	○	○	○	○
48. Pushes for increased production	○	○	○	○	○
49. Things usually turn out as he/she predicts	○	○	○	○	○
50. Enjoys the privileges of his/her position	○	○	○	○	○

Employee Question and LBDQ Form XII_ML II **Exit this survey**

6. LBDQ Questionnaire Questions (51-75)

(Questions 51-56) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
51. Handles complex problems efficiently	○	○	○	○	○
52. Is able to tolerate postponement and uncertainty	○	○	○	○	○
53. Is not a very convincing talker	○	○	○	○	○
54. Assigns group members to particular tasks	○	○	○	○	○
55. Turns the members loose on a job, and lets them go to it	○	○	○	○	○
56. Backs down when he/she ought to stand firm	○	○	○	○	○

(Questions 57-62) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
57. Keeps to himself/herself	○	○	○	○	○
58. Asks the members to work harder	○	○	○	○	○
59. Is accurate in predicting the trend of events	○	○	○	○	○
60. Gets his/her superiors to act for the welfare of the group members	○	○	○	○	○
61. Gets swamped by details	○	○	○	○	○
62. Can wait just so long, then blows up	○	○	○	○	○

(Questions 63-68) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
63. Speaks from a strong inner conviction	○	○	○	○	○
64. Makes sure that his/her part in the group is understood by the group members	○	○	○	○	○
65. Is reluctant to allow the members any freedom of action	○	○	○	○	○
66. Lets some members have authority that he/she should keep	○	○	○	○	○
67. Looks out for the personal welfare of group members	○	○	○	○	○
68. Permits the members to take it easy in their work	○	○	○	○	○

(Questions 69-75) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
69. Sees to it that the work of the group is coordinated	○	○	○	○	○
70. His/her word carries weight with superiors	○	○	○	○	○
71. Gets things all tangled up	○	○	○	○	○
72. Remains calm when uncertain about coming events	○	○	○	○	○
73. Is an inspiring talker	○	○	○	○	○
74. Schedules the work to be done	○	○	○	○	○
75. Allows the group a high degree of initiative	○	○	○	○	○

Employee Question and LBDQ Form XII_ML II — Exit this survey

7. LBDQ Questionnaire Questions (76-100)

(Questions 76-81) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
76. Takes full charge when emergencies arise	○	○	○	○	○
77. Is willing to make changes	○	○	○	○	○
78. Drives hard when there is a job to be done	○	○	○	○	○
79. Helps group members settle their differences	○	○	○	○	○
80. Gets what he/she asks for from his/her superiors	○	○	○	○	○
81. Can reduce a madhouse to system and order	○	○	○	○	○

(Questions 82-87) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
82. Is able to delay action until the proper time occurs	○	○	○	○	○
83. Persuades others that his/her ideas are to their advantage	○	○	○	○	○
84. Maintains definite standards of performance	○	○	○	○	○
85. Trusts members to exercise good judgment	○	○	○	○	○
86. Overcomes attempts made to challenge his/her leadership	○	○	○	○	○
87. Refuses to explain his/her actions	○	○	○	○	○

(Questions 88-94) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
88. Urges the group to beat its previous record	○	○	○	○	○
89. Anticipates problems and plans for them	○	○	○	○	○
90. Is working his/her way to the top	○	○	○	○	○
91. Gets confused when too many demands are made of him/her	○	○	○	○	○
92. Worries about the outcome of any new procedure	○	○	○	○	○
93. Can inspire enthusiasm for a project	○	○	○	○	○
94. Asks that group members follow standard rules and regulations	○	○	○	○	○

(Questions 95-100) THINK about how frequently the LEADER you have chosen ENGAGES in the behavior described by the item.

DECIDE whether he/she
(A) Always (B) Often, (C) Occasionally, (D) Seldom or (E) Never acts as described by the item.

	A = Always	B = Often	C = Occasionally	D = Seldom	E = Never
95. Permits the group to set its own pace	○	○	○	○	○
96. Is easily recognized as the leader of the group	○	○	○	○	○
97. Acts without consulting the group	○	○	○	○	○
98. Keeps the group working up to capacity	○	○	○	○	○
99. Maintains a closely knit group	○	○	○	○	○
100. Maintains cordial relations with superiors	○	○	○	○	○

Employee Question and LBDQ Form XII_ML II — Exit this survey

8. Thank you!

Researcher information:

Again, I want to thank you for your candid responses and for participating in this research study! If you have concerns or complaints about the research, the researcher conducting this study can be contacted at:

Gina.M.Eckles-1@ou.edu

Phone: 845-238-0806

If you have any questions about your rights as a research participant, concerns, or complaints about the research and wish to talk to someone other than researcher or if you cannot reach the researcher, you may contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405-325-8110 or irb@ou.edu. IRB #12376

Your Participation in this research study is invaluable and greatly appreciated!

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APPENDIX 6: CODE BOOK

Supplemental Survey

ExtraneousVariables=

P_Years- Participants number of years in organization
Org_ML- Assessed Maturity Level
Org_MLT- Time the organization has held current assessed ML.
Org_Size- Organization size
P_Gender- Participant gender
P_Age- Participant age
P_Satisfaction- Participant satisfaction
L_Gender- Leader gender
Per_L_Engagement- Perceived Leader engagement
L_Time_In_Org- Time leader has been in organization
Per_L_Emp Focus- Perceived Leader Employee Focus
Per_L_Work Focus - Perceived Leader Work Focus
L_Position- Leader position

P_Years	
14. How many years have you been in your current organization?	
a. Less than 1 year	1
b. 1-3 years	2
c. 3-5 years	3
d. Over 5 years	4
Org_ML	
15. What is the Maturity Level (II, III, IV, V) assessment of your current organization?	
Org_MLT	
16. How long has your organization held its current Maturity Level Assessment?	
a. Less than 1 year	1
b. 1-3 years	2
c. 3-5 years	3
d. Over 5 years	4
e. I don't know	0
f. What is a Maturity Level Assessment?	5
Org_Size	
17. Approximately, how large is your organization?	
a. Less than 25 people	1
b. 26-50 people	2
c. 51-75 people	3
d. Over 75 people	4
e. Other (Please Specify)	0
P_Gender	
18. Are you male or female?	
a. Male	1
b. Female	2
P_Age	

19. Which best categorizes your age group?	
a. 18-25	1
b. 26-35	2
c. 36-45	3
d. 46-60	4
e. 61-70	5
f. Other	0
P_Satisfaction	
20. Overall, are you satisfied with your work environment?	
a. Yes	1
b. No	2
c. Other (please specify)	0
L_Gender	
21. Is the leader you are about to evaluate male or female?	
a. Male	1
b. Female	2
Per_L_Engagement	
22. Do you feel that the leader you are evaluating is actively engaged in making sure that employee interests are satisfied?	
a. Yes	1
b. No	2
c. Other (please specify)	0
L_Time_In_Org	
23. Approximately, how long has the leader you are evaluating been in the organization?	
a. Less than 6 months	1
b. 6 months to 3 years	2
c. 3-5 years	3
d. Over 5 years	4
e. I don't know	0
Per_L_Emp Focus	
24. Do you feel that the leader you are evaluating has time to deal with the everyday business of their employees (i.e. camaraderie, group membership, career interests, conflict resolution)?	
a. Yes	1
b. No	2
c. Other (please specify)	0
Per_L_Work Focus	
25. Which of the answers below best describes the main focus of the leader you are evaluating?	
a. Work output /Production	1
b. The people in the workplace	2
c. Trying to keep up with job demands	3
d. Answering email or attending meetings	4
e. Other (please specify)	0
L_Position	
26. Which is the best estimate of position in regard to the leader which you will be evaluating?	
a. Senior Management (Director, Deputy Director, President, Vice President)	1

b. Middle Management (Division Chief, Section Manager)	2
c. Lower Management (Branch Chief, Team Chief, Team or Work Lead)	3
d. I don't know	0

LEADER BEHAVIOR DESCRIPTION QUESTIONNARIE – Form XII

Dependent Variables= the outcome variable the one understudy.

(TU)- Tolerance of Uncertainty behaviors
(IS)- Initiation of Structure behaviors
(C)- Consideration behaviors
(PE)- Production Emphasis behaviors
(PA)- Predictive Accuracy behaviors
(I)- Integration behaviors
(REP)- Representation behaviors
(DR)- Demand Reconciliation behaviors
(PER)- Persuasiveness behaviors
(TOLF)- Tolerance of Freedom behaviors
(RA)- Role Assumption behaviors
(SO)- Superior Orientation behaviors

Eighty (80) items in the LBDQ are scored:
(A) Always= 5
(B) Often= 4
(C) Occasionally= 3
(D) Seldom= 2
(E) Never= 1

Twenty (20) items in the LBDQ are scored in the reverse direction, as follows:
(A) Always= 1
(B) Often= 2
(C) Occasionally= 3
(D) Seldom= 4
(E) Never= 5

The assignment of items to different subscales is indicated in the Record Sheet.
For example, the Representation subscale consists of items 1, 11, 21, 31, and 41. The sum of the scores for these five items constitutes the score for the subscales and affords us the ability to see an accurate score for each subscale.

LBDQ Form XII – RECORD SHEET											
Behavior	**Question Number and Scoring Value**										**Total**
Representation	1)___	11)___	21)___	31)___	41)___						
Demand Reconciliation						51)___	*61)___	*71)___	81)___	*91)___	
Tolerance of Uncertainty	2)___	*12)___	22)___	32)___	*42)___	52)___	*62)___	72)___	82)___	*92)___	
Persuasiveness	3)___	13)___	23)___	33)___	43)___	*53)___	63)___	73)___	83)___	93)___	
Initiation of Structure	4)___	14)___	24)___	34)___	44)___	54)___	64)___	74)___	84)___	94)___	
Tolerance and Freedom	5)___	15)___	25)___	35)___	45)___	55)___	*65)___	75)___	85)___	95)___	
Role Assumption	*6)___	*16)___	*26)___	*36)___	*46)___	*56)___	*66)___	76)___	86)___	96)___	
Consideration	7)___	17)___	27)___	37)___	47)___	*57)___	67)___	77)___	*87)___	*97)___	
Production Emphasis	8)___	18)___	28)___	38)___	48)___	58)___	*68)___	78)___	88)___	98)___	
Predictive Accuracy	9)___		29)___		49)___		59)___		89)___		
Integration		19)___		39)___			69)___	79)___		99)___	
Superior Orientation	10)___	20)___	30)___	40)___	50)___	60)___	70)___	80)___	90)___	100)___	

* Starred items are scored (1 2 3 4 5)
All other items are scored (5 4 3 2 1)

1. Acts as the spokesperson of the group	REP1_5
2. Waits patiently for the results of a decision	TU1_10
3. Makes pep talks to stimulate the group	PER1_10
4. Lets group members know what is expected of them	IS1_10
5. Allows the members complete freedom in their work	TOLF1_10
6. *Is hesitant about taking initiative in the group	RA1_10
7. Is friendly and approachable	C1_10
8. Encourages overtime work	PE1_10
9. Makes accurate decisions	PA1_5
10. Gets along well with the people above him/her	SO1_10
11. Publicizes the activities of the group	REP2_5
12. *Becomes anxious when he/she cannot find out what is coming next	TU2_10
13. His/her arguments are convincing	PER2_10
14. Encourages the use of uniform procedures	IS2_10
15. Permits the members to use their own judgment in solving problems	TOLF2_10
16. *Fails to take necessary actions	RA2_10
17. Does little things to make it pleasant to be a member of the group	C2_10
18. Stresses being ahead of competing groups	PE2_10
19. Keeps the group working together as a team	I1_5
20. Keeps the group in good standing with higher authority	SO2_10
21. Speaks as a representative of the group	REP3_5
22. Accepts defeat in stride	TU3_10
23. Argues persuasively for his/her point of view	PER3_10
24. Tries out his/her ideas in the group	IS3_10
25. Encourages initiative in the group members	TOLF3_10

26. *Lets other persons take away his/her leadership in the group	RA3_10
27. Puts suggestions made by the group into operation	C3_10
28. Needles members for greater effort	PE3_10
29. Seems able to predict what is coming next	PA2_5
30. Is working hard for a promotion	SO3_10
31. Speaks for the group when visitors are present	REP4_5
32. Accepts delays without becoming upset	TU4_10
33. Is a very persuasive talker	PER4_10
34. Makes his/her attitudes clear to the group	IS4_10
35. Lets the members do their work the way they think best	TOLF4_10
36. *Lets some members take advantage of him/her	RA4_10
37. Treats all group members as his/her equals	C4_10
38. Keeps the work moving at a rapid pace	PE4_10
39. Settles conflicts when they occur in the group	I2_5
40. His/her superiors act favorably on most of his/her suggestions	SO4_10
41. Represents the group at outside meetings	REP5_5
42. *Become anxious when waiting for new developments	TU5_10
43. Is very skillful in an argument	PER5_10
44. Decides what shall be done and how it shall be done	IS5_10
45. Assigns a task, then lets the members handle it	TOLF5_10
46. *Is the leader of the group in name only	RA5_10
47. Gives advance notice of changes	C5_10
48. Pushes for increased production	PE5_10
49. Things usually turn out as he/she predicts	PA3_5
50. Enjoys the privileges of his/her position	SO5_10
51. Handles complex problems efficiently	DR1_5
52. Is able to tolerate postponement and uncertainty	TU6_10
53. *Is not a very convincing talker	PER6_10
54. Assigns group members to particular tasks	IS6_10
55. Turns the members loose on a job, and lets them go to it	TOLF6_10
56. *Backs down when he/she ought to stand firm	RA6_10
57. *Keeps to himself/herself	C6_10
58. Asks the members to work harder	PE6_10
59. Is accurate in predicting the trend of events	PA4_5
60. Gets his/her superiors to act for the welfare of the group members	SO6_10
61. *Gets swamped by details	DR2_5
62. *Can wait just so long, then blows up	TU7_10
63. Speaks from a strong inner conviction	PER7_10
64. Makes sure that his/her part in the group is understood by the group members	IS7_10
65. *Is reluctant to allow the members any freedom of action	TOLF7_10
66. *Lets some members have authority that he/she should keep	RA7_10
67. Looks out for the personal welfare of group members	C7_10
68. *Permits the members to take it easy in their work	PE7_10
69. Sees to it that the work of the group is coordinated	I3_5
70. His/her word carries weight with superiors	SO7_10

71. *Gets things all tangled up	DR3_5
72. Remains calm when uncertain about coming events	TU8_10
73. Is an inspiring talker	PER8_10
74. Schedules the work to be done	IS8_10
75. Allows the group a high degree of initiative	TOLF8_10
76. Takes full charge when emergencies arise	RA8_10
77. Is willing to make changes	C8_10
78. Drives hard when there is a job to be done	PE8_10
79. Helps group members settle their differences	I4_5
80. Gets what he/she asks for from his/her superiors	SO8_10
81. Can reduce a madhouse to system and order	DR4_5
82. Is able to delay action until the proper time occurs	TU9_10
83. Persuades others that his/her ideas are to their advantage	PER9_10
84. Maintains definite standards of performance	IS9_10
85. Trusts members to exercise good judgment	TOLF9_10
86. Overcomes attempts made to challenge his/her leadership	RA9_10
87. *Refuses to explain his/her actions	C9_10
88. Urges the group to beat its previous record	PE9_10
89. Anticipates problems and plans for them	PA5_5
90. Is working his/her way to the top	SO9_10
91. *Gets confused when too many demands are made of him/her	DR5_5
92. *Worries about the outcome of any new procedure	TU10_10
93. Can inspire enthusiasm for a project	PER10_10
94. Asks that group members follow standard rules and regulations	IS10_10
95. Permits the group to set its own pace	TOLF10_10
96. Is easily recognized as the leader of the group	RA10_10
97. *Acts without consulting the group	C10_10
98. Keeps the group working up to capacity	PE10_10
99. Maintains a closely knit group	I5_5
100. Maintains cordial relations with superiors	SO10_10

Created Scale Factors

1. Representation=(REP1_5+REP2_5+REP3_5+REP4_5+REP5_5)/5
2. Demand_Reconciliation=(DR1_5+DR2_5+DR3_5+DR4_5+DR5_5)/5
3. Tolerance_of_Uncertainty=(TU1_10+TU2_10+TU3_10TU4_10+TU5_10+TU6_10+TU7_10+TU8_10+TU9_10+TU10_10)/10
4. Persuasion=(PER1_10+PER2_10+PER3_10+PER4_10+PER5_10+PER6_10+PER7_10+PER8_10+PER9_10+PER10_10)/10
5. Initiation_of_Structure=(IS1_10+IS2_10+IS3_10+IS4_10+IS5_10+IS6_10+IS7_10+IS8_10+IS9_10+IS10_10)/10
6. Tolerance_of_Freedom=(TOLF1_10+TOLF2_10+TOLF3_10+TOLF4_10+TOLF5_10+TOLF6_10+TOLF7_10+TOLF8_10+TOLF9_10+TOLF10_10)/10
7. Role_Assumption=(RA1_10+RA2_10+RA3_10+RA4_10+RA5_10)/5
8. Consideration=(C1_10+C2_10+C3_10+C4_10+C5_10+C6_10+C7_10+C8_10+C9_10+C10_10)/10

9. Production_Emphasis=(PE1_10+PE2_10+PE3_10+PE4_10+PE5_10+PE6_10+PE7_10+PE8_10+PE9_10+PE10_10)/10
10. Predictive_Accuracy=(PA1_5+PA2_5+PA3_5+PA4_5+PA5_5)/5
11. Integration= (I1_5+I2_5+I3_5+I4_5+I5_5)/5
12. Superior_Orientation=(SO1_10+SO2_10+SO3_10+SO4_10+SO5_10+SO6_10+SO7_10+SO8_10+SO9_10+SO10_10)/10

APPENDIX 7: Pearson and Spearman Correlation Coefficients

APPENDIX 7: PEARSON AND SPEARMAN CORRELATION COEFFICIENTS

		L_Gender	Per_L_Engagement	Per_L_Emp Focus	Representation	Demand_Reconciliation	Tolerance_of_Uncertainty	Persuasion	Initiation_of_Structure	Tolerance_of_Freedom	Role_Assumption	Consideration	Production_Emphasis	Predictive_Accuracy	Integration	Superior_Orientation
L_Gender	Correlation Coefficient	1.000	.215	.448**	-.247*	-.387**	.068	-.308**	-.436**	-.209	-.150	-.382**	-.492**	-.478**	-.319**	-.195
	Sig. (1-tailed)		.032	.000	.016	.000	.282	.004	.000	.036	.099	.000	.000	.000	.003	.047
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Per_L_Engagement	Correlation Coefficient	.215*	1.000	.378**	-.161	-.309**	-.255*	-.257*	-.374**	-.359**	-.073	-.464**	-.204	-.459**	-.319**	-.226
	Sig. (1-tailed)	.032		.000	.084	.003	.014	.013	.000	.001	.266	.000	.039	.000	.003	.026
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Per_L_Emp Focus	Correlation Coefficient	.448**	.378**	1.000	-.371**	-.375**	-.246*	-.409**	-.644**	-.265*	-.259*	-.531**	-.339**	-.492**	-.476**	-.197*
	Sig. (1-tailed)	.000	.000		.001	.000	.017	.000	.000	.011	.012	.000	.001	.000	.000	.045
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Representation	Correlation Coefficient	-.247*	-.161	-.371**	1.000	.449**	.157	.620**	.650**	.340**	.422**	.393**	.360**	.527**	.488**	.463**
	Sig. (1-tailed)	.016	.084	.001		.000	.089	.000	.000	.001	.000	.000	.001	.000	.000	.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Demand_Reconciliation	Correlation Coefficient	-.387**	-.309**	-.375**	.449**	1.000	.453**	.540**	.652**	.495**	.529**	.645**	.442**	.722**	.667**	.493**
	Sig. (1-tailed)	.000	.003	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Tolerance_of_Uncertainty	Correlation Coefficient	.068	-.255*	-.246*	.157	.453**	1.000	.233*	.294*	.509**	.090	.423**	-.222*	.287*	.306**	.223*
	Sig. (1-tailed)	.282	.014	.017	.089	.000		.022	.005	.000	.220	.000	.028	.006	.004	.027
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Persuasion	Correlation Coefficient	-.308**	-.257*	-.409**	.620**	.540**	.233*	1.000	.683**	.364**	.358**	.646**	.574**	.740**	.625**	.544**
	Sig. (1-tailed)	.004	.013	.000	.000	.000	.022		.000	.001	.001	.000	.000	.000	.000	.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Initiation_of_Structure	Correlation Coefficient	-.436**	-.374**	-.644**	.650**	.652**	.294**	.683**	1.000	.374**	.443**	.666**	.588**	.708**	.799**	.473**
	Sig. (1-tailed)	.000	.000	.000	.000	.000	.005	.000		.000	.000	.000	.000	.000	.000	.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Tolerance_of_Freedom	Correlation Coefficient	-.209	-.359**	-.265*	.340**	.495**	.509**	.364**	.374**	1.000	.114	.569**	.052	.336**	.293*	.315**
	Sig. (1-tailed)	.036	.001	.011	.001	.000	.000	.001	.000		.164	.000	.329	.002	.005	.003
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Role_Assumption	Correlation Coefficient	-.150	-.073	-.259*	.422**	.529**	.090	.358**	.443**	.114	1.000	.330**	.478**	.451**	.439**	.191
	Sig. (1-tailed)	.099	.266	.012	.000	.000	.220	.001	.000	.164		.002	.000	.000	.000	.050
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Consideration	Correlation Coefficient	-.382**	-.464**	-.531**	.393**	.645**	.423**	.646**	.666**	.569**	.330**	1.000	.452**	.630**	.739**	.403**
	Sig. (1-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002		.000	.000	.000	.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Production_Emphasis	Correlation Coefficient	-.492**	-.204*	-.339**	.360**	.442**	-.222*	.574**	.588**	.052	.478**	.452**	1.000	.603**	.520**	.427**
	Sig. (1-tailed)	.000	.039	.001	.001	.000	.028	.000	.000	.329	.000	.000		.000	.000	.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Predictive_Accuracy	Correlation Coefficient	-.478**	-.459**	-.492**	.527**	.722**	.287*	.740**	.708**	.336**	.451**	.630**	.603**	1.000	.667**	.570**
	Sig. (1-tailed)	.000	.000	.000	.000	.000	.006	.000	.000	.002	.000	.000	.000		.000	.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Integration	Correlation Coefficient	-.319**	-.319**	-.476**	.488**	.667**	.306**	.625**	.799**	.293*	.439**	.739**	.520**	.667**	1.000	.477**
	Sig. (1-tailed)	.003	.003	.000	.000	.000	.004	.000	.000	.005	.000	.000	.000	.000		.000
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Superior_Orientation	Correlation Coefficient	-.195*	-.226*	-.197*	.463**	.493**	.223*	.544**	.473**	.315**	.191*	.403**	.427**	.570**	.477**	1.000
	Sig. (1-tailed)	.047	.026	.045	.000	.000	.027	.000	.000	.003	.050	.000	.000	.000	.000	
	N	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75