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# Creating and fostering Singerian inquiring organizations through psychological empowerment in the context of information assurance

Kristen Lee Brewer King

CREATING AND FOSTERING SINGERIAN INQUIRING

ORGANIZATIONS THROUGH PSYCHOLOGICAL

EMPOWERMENT IN THE CONTEXT OF

INFORMATION ASSURANCE

by

Kristen Lee Brewer King, BBA, MBA

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Business Administration

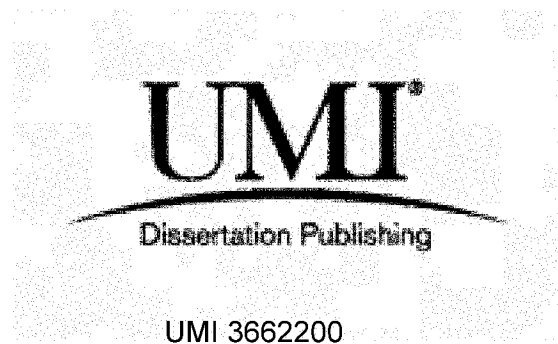COLLEGE OF BUSINESS
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# ABSTRACT

Singerian Inquiring Organizations (SIO) (Courtney, et al., 1998; Courtney, 2001) are knowledge-based enterprises based on Churchman's theory of Singerian inquiring systems (Courtney, 2001). For Singerian organizations to thrive, employees must feel unfettered to quest for knowledge, share what knowledge has been found, and express opinions about the findings of others. In short, employees must feel empowered to act in order to foster the well-being and development of the organization and its stakeholders. Both the psychology and organizational behavior literature have examined psychological empowerment as a way to challenge individuals and/or employees to take control of and interest in organizational situations; however, there has been limited research examining the amalgamation of empowerment and information systems (IS) research constructs.

The purpose of this research is to extend the empowerment stream of research into IS and examine the potential positive influence that empowered employees can have on the information assurance of an organization, and ultimately, the ways in which these principles can foster Singerian Inquiring Organizations, providing a roadmap for organizations to construct their own SIO environment. These ideas were conceptualized in a research model, which was tested by collecting survey data, and proven to be significant and of good fit.

The model conceptualized in this research is offered as a way for organizations to model themselves as a Singerian Inquiring Organization, and in turn foster an organizational environment where employees are empowered to contribute in the decision-making process and tackle real world problems.

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# DEDICATION

This dissertation is dedicated to my family and friends, who have been my cheerleaders, support system, and shoulders to cry on throughout my doctoral program. First, to my husband Jason, thank you for always being there to support me and my dreams—you are my sunshine and I love you to the moon and back. Your love, encouragement, and calming words throughout these past four years has made such a difference, and I am so thankful for you, Jordan, Dylan, and our lives together. Next, a few words to my mother, Peggy, my father, Virgil, and my brother, Oliver—thank you from the bottom of my heart. I am so very grateful for the three of you and words cannot express how much I love you all. When I first embarked on this journey, I knew it would be difficult, but without your love and reassurance, I surely would not have succeeded. Third, I would like to thank my friends at Louisiana Tech University, specifically Julia Graham, Rebecca Martin, Nilakshi Borah, and Shelly Marasi, for their friendship and support. Even during the darkest of days, I knew I could always count on you all for encouragement or a laugh, and I will always treasure our friendship. Finally, I would like to thank my extended family, especially my Little Creek family and the Kings, for their support. I am truly blessed to have so many people in my corner, and I will never forget your kindness!

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# CHAPTER ONE

## INTRODUCTION

C. West Churchman regards design as fascinating because it enables one to create systems which will perform tasks better than a single person does alone (Churchman, 1971). This concept is the foundation for the design of "inquiring systems" whose objective is the creation of scholarly knowledge. Churchman's inquiring systems are based on the epistemologies of the well-known western philosophers, Leibniz, Locke, Kant, Hegel and Singer.

Churchman's concept of inquiring systems has been extended to the idea of "inquiring organizations" that ultimately identify, expand, and create new ethical organizational knowledge (Courtney 2001; Courtney et al. 1998; Linden et al. 2007; Richardson et al. 2006). Churchman's original thoughts applied the inquirers to the creation of scholarly knowledge, not specifically to organizations. However, for the purposes of this dissertation, the concept of inquiring organizations has its origins in Churchman's research.[1]

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[1] Another stream of research, outside the scope of this investigation, describe uses the term "inquiring organizations" in a different sense, specifically as an "organization that survives and thrives because it creates the conditions for creative inquiry by those it employs, and thus is always on the cutting edge." Kikoski, C. K., and Kikoski, J. F. *The inquiring organization: Tacit knowledge, conversation, and knowledge creation: Skills for 21st-century organizations* Greenwood Publishing Group, 2004. Thus while similar, the Kikoski organizations on not founded on Churchman's inquiring systems.

Singerian inquiring organizations consider non-traditional ways to ensure *all* stakeholders and processes are equally considered, with the goal of improving the human condition and environment (Courtney 2001; Courtney et al. 1998). In an ideal Singerian inquiring organization, everyone is a decision maker and a direct stimulus and respondent of organizational inputs and outputs. At the root, they are knowledge-based enterprises based on Churchman's theory of Singerian inquiring systems. Knowledge creation in Singerian Inquiring Organizations is dependent on a common goal and/or viewpoint and must foster an environment of cooperation, coordination, and openness to express opinions to succeed.

While other research has examined the positive potential that the Singerian school of thought can provide to knowledge management and decision making in organizations, it has yet to be studied in several other areas of IS research. Further, it has yet to be conceptualized and empirically tested as to how businesses can put these concepts into motion within functional organizational capacities. In other words, how can one "create" such an organization? This research contends that psychological empowerment may bridge the theory of Singerian inquiring organizations with organizations in practice by providing a roadmap for application based upon strong constructs which have been validated throughout a multitude of studies appearing in the management and psychology literature.

Psychological empowerment has been described in both the psychology and organizational behavior literature as a way to challenge individuals and/or employees to take control of and interest in work situations. The applications are not strictly limited to the management and psychology disciplines; however, there has been limited research

examining the amalgamation of empowerment and IS research constructs. One objective of this dissertation is to extend the empowerment stream of research into IS and examine the potential positive influence that empowered employees can have on the information assurance of an organization. Specifically, this research investigates how psychological empowerment may enable the development of Singerian Inquiring Organizations (SIO). Furthermore, using the principles of empowerment as a basis for creating SIO security policies, procedures, and systems that are designed to protect proprietary organizational information was empirically assessed. The findings will potentially help address how empowerment can help develop Singerian organizations, and most importantly, how this type of organization can foster positive feelings regarding organizational protocol, potentially increasing intentions to follow them.

Chapter Two will lay the foundation for the research by first reviewing the pertinent prior literature of the constructs and relating them to the context of this research application. Next, research methods, including the measures, hypotheses, and models, will be discussed. Later, results, conclusions, and discussion sections will summarize the findings. The scales used in this research can be found later in Appendix A.

# CHAPTER TWO

## LITERATURE REVIEW

### Churchman's Inquiring Systems

As an introduction to Singerian inquirers, it is helpful to briefly review the history of C. West Churchman and Inquiring Systems as a whole. In 1971, Churchman conceptualized the design of inquiring systems based on the epistemologies of Leibniz, Locke, Kant, Hegel, and Singer as a way to understand how computer systems might be able to support knowledge creation activities, or possibly even conduct such activities themselves. While each of the five inquirers is unique in its own sense, the underlying principles build upon one another, creating dynamic processes for critical knowledge creation and also decision making.

The first of the inquirers, the *Leibnizian* system, is comprised of an unlimited number of substances or "monads" that are the building blocks of the system. These monads, thought of as existing in a closed system, and are organized into "fact nets" of similar monads that represent cognitive truths by which the system is governed. These truths are subsequently ranked and are governed by an omniscient guarantor of the system (e.g., God). Leibnizian systems are always examining new information against knowledge in fact nets, appraising the validity based on knowledge of the current system, and reorganizing accepted knowledge in an attempt to create an optimal fact net.

There are several essential features of a Leibnizian inquiring system. First is the recognition of the monads as innate ideas that cannot be changed or influenced by any other created thing; accordingly, there are no inputs. Leibniz defines monads as simple substances, with no parts, that are "immaterial, lacking spatial extension, containing only perception and desire"; otherwise, a soul (Leibniz 1898). Leibnizian inquiring systems break strings of information down into manageable and usable units that are capable of generating sentences internally and classifying them as either tautologies, non-tautologies or contingent truths. The units are then put into fact nets based on their relationships with one another. These fact nets can then be arranged or ranked based on some predefined set of criteria or by importance. The Leibnizian inquiring system will systematically keep re-arranging fact nets based on rankings and will ultimately know when it has reached an optimal net; else, the system will know it has not reach optimality and will continue.

Contradictory to the Leibnizian system, a *Lockean* system is based on Locke's concept of the mind as initially a blank slate, or tabula rasa and does have inputs, not just innate ideas; rather, observations must be received from outside the inquirer, subsequently labeled, and filed into the system. The system starts with simple labels it is given, then as observations are made, labels are assigned to that knowledge in an attempt to create a "storehouse of knowledge" (Churchman 1971; Courtney et al. 1998; Linden et al. 2007; Parrish Jr. 2008). A community of inquirers makes decisions regarding labels and structure and acts as a guarantor for the system. The guarantor ensures that created knowledge is both true and consistent to the best of the system's knowledge (Courtney et

al. 1998). The Lockean inquiring system also adds the element of reflection, i.e. the ability to receive information and to recognize that information has been received.

The third inquirer, *Kantian* systems, is another extension of the Leibnizian inquirer, with the application of a prescribed set of functions for receiving and classifying input. The main additions of the Kantian inquiring system include the executive as the decision-maker who can control the operation of the system, but not the inputs received; the implementation of a clock; the inclusion of multiple models to represent a problem domain; and the dialogue between differing inquirers. The Kantian inquirer allows inputs to be interpreted subjectively and then used to create hypotheses, which makes it unique in nature (Courtney et al. 1998). Kantian inquirers give equal weight to both theory and data, which allows the generation of multiple ways to analyze inputs and problems (Carugati 2008). Further, Kantian inquiring systems attempt to offer many differing viewpoints, with the guarantor being the fit between the underlying theory and the data collected under the presumptions of that theory (Mason et al. 1973).

The fourth inquirer, *Hegelian* systems, can best be described as two Leibnizian inquirers that are based on diametrically opposed worldviews or *Weltanschauung,* one representing a thesis regarding some problem domain, and the other its antithesis. Proponents of the thesis and antithesis have access to the same data set and a debate is conducted in which the two sides interpret the data in such a manner as to provide maximal support for their view. An objective over-observer of the debate combines elements of the two worldviews to form a synthesis comprised of the strongest attributes of each. Ultimately, the conflict and debate of thesis versus antithesis results in a synthesis that in the ideal is superior to either of its predecessors.

Churchman's final inquiring system is the most complex and perhaps the most useful in real world decision making, where many decisions are "wicked problems" in that they do not have a simple, obvious, or even feasible solution (Rittel et al. 1973). *Singerian* inquirers, the basis of this research, are comprised of a Lockean community based in metrology, or the study of measurements. Two decisions must be made regarding measurements as they relate to the design of inquiring systems – the unit and the standard. The key attribute of a measuring system lies in its ability to test and replicate information numerous times. When the system reaches a point of redundancy, the inquirer must shift to a higher level of refinement (more precise measurements) and possibly "sweep in" new exterior concepts that may change the way information is interpreted and used.

According to Churchman, Singerian inquiring systems have several general characteristics. Initially, the purpose of the inquiring system is to create knowledge that helps arrive at a meaningful end and performance must be measurable. Next, it must be considered that the client for the Singerian inquiring system is humankind and, in the ideal, the designers and decision-makers include everyone. The system also needs a cooperative environment to create inquiry and the system must be optimistic with a focus on the ethical well-being of all.

Mason and Mitroff (1973) later employed the inquirers to represent IS models as options with relation to what type of information is to be analyzed and what type of output is needed. Lockean IS are rooted in raw data, best for working on well-structured problems; Leibnizian IS are model-based, best for working on clearly defined problems for which there exists an analytic formulation with a solution; Kantian IS provide

multiple models, best for handling problems of moderately ill- or wicked-structure; Hegelian IS, which present conflicting models, are best for "wicked" ill-structured problems; and Singerian-Churchmanian IS, otherwise known as learning systems, are also suitable for solving wicked problems and studying the other models. Table 1 is a summary of each of the inquirers as adapted from Linden et al. and Parrish and Courtney (Linden et al. 2007; Parrish et al. 2008).

Table 1

*Churchman's Inquiring Systems*

| | Leibnizian | Lockean | Kantian | Hegelian | Singerian |
|---|---|---|---|---|---|
| **Internal Mechanisms** | Monads; arranged, organized, and connected by fact nets; ranked by level of relationship | Inputs gained through experience; labeled and filed by a community of inquirers | Extension of Leibnizian agents with prescribed functions to label and rank inputs | Extension of Leibnizian conflicting agents ranked with respect to the world view | Extension of Lockean agents and community of inquirers |
| **Environment** | Closed system | Seeks optimal environment through ranking of agents reflection | Adds the element of multiple possible models – pluralism | Agents initiate debate of thesis versus antithesis | "Sweeping in" new ideas to find optimal models; cooperative environment |
| **Process** | Formal logic | Assign labels to inputs | Construct models from theories | Construct theses, antithesis & synthesis | Participative decision making, sweeping in new ideas |
| **Guarantor** | Consistency | Group Consensus | Fit between data and model; includes an executive as a decision-maker | Over-observer who enforces system rules | Ability to replicate; Hegelian over-observer |
| **IT Example** | Expert System | Groupware System | IT Problem Processor | Group Support System | Internet & World Wide Web |

Note: Adapted from Linden et al., 2007, Parrish et al., 2008

Overall, Churchman's (1971) inquiring system theories are especially well suited to serve as kernel theories for knowledge management systems (KMS) design as has been shown in prior research (Linden et al. 2007). It stands to reason that Singerian inquirers can also be used as a kernel theory for examining psychological empowerment. Both concepts embrace the inclusion of all users involved in the decision-making process and incorporate feedback. These relationships will be examined in a later section of this research. First, the concept of Singerian inquiring systems is discussed in greater detail. Then, psychological empowerment is defined and discussed. The final section examines the integration of Singerian inquirers with psychological empowerment as examined by Churchman's standards for Singerian systems and the foundational concepts of each construct.

*Singerian Inquiring Systems*

Churchman's (1971) Singerian Model of Inquiry is built upon principles of the preceding inquirers. Specifically, it is comprised of the Lockean consensus as measured by the standard, the Hegelian dialectic process, and Singer's concept of "sweeping-in" new ideas that may lead discussion into a completely new, perhaps contentious, direction when the discussion has reached a standstill. Singerian Inquirers, based on the philosophical work of Edgar A. Singer, are rooted in the fervent pursuance of progress through debate and multiple influences and interpretations (Carugati 2008). Singerian systems become especially useful when groups can come together to collaborate ideas, exchange practices, and work toward a common goal.

The basis of Singerian inquiring systems is rooted in metrology, the science of measurement. Courtney et al. describe two standards that guide Singerian inquiry; the

first establishes a system of measures to resolve conflicts and the second is agreement between the involved parties (Courtney et al. 2005). In the words of Courtney et al (2000), "the goal of the Singerian inquirer is the creation of common knowledge, suitable for resolution of social and public problems" (Courtney et al. 2000).

Churchman also discusses partitioning, or refinement, as an integral part of the Singerian inquiring system; whenever all readings/measurements are identical, a Singerian inquiring system must shift to a higher level of refinement. In other words, if two contrary hypotheses are both consistent with a set of adjusted readings at a specified level of refinement, then there exists some higher (more precise) level where one (or both) will fail to be consistent. When an inquiring system determines that a hypothesis is not consistent with a set of readings, one of the following three approaches may be considered: 1) Revise the hypothesis by adding new variables or changing the functional form of the hypothesis; 2) Revise the procedure of adjusting the readings (or discard one or more due to being incorrectly obtained; or 3) Tolerate the inconsistency until more evidence is available. Ultimately, partitioning forces the inquiring system to a stage where it must decide between the three alternatives.

Initially, the purpose of the Singerian inquiring systems is to create knowledge that is useful where performance can be evaluated (evaluation of the outcome). The system also needs a collaborative environment to create inquiry and the system must be *optimistic*. Singerian inquiring systems must meet nine conditions in the ideal as described by Churchman:

1. Create independent knowledge in an ethical manner

2. Measured by general level of moral alignment with regard to stakeholders

3. Apply to all of humanity

4. Involve all members of society

5. Have society in general as the client

6. Involve everyone as the decision maker

7. Involve everyone as the designer

8. Benefit everyone in society in general

9. Creates optimism that ethical knowledge is being created, by which ethical decisions are being made

*Singerian Inquiring Organizations*

In general, inquiring organizations identify, develop, and expand upon the creation of new ethical scholarly knowledge (Courtney 2001; Linden et al. 2007; Richardson et al. 2006). The principles of the Singerian inquiring system translate into the Singerian inquiring organization, where organizational performance, knowledge, goals and other aspects are reevaluated to consider the nine conditions listed above. Later, these nine conditions will be described in the context of Singerian organizations vis-à-vis empowerment. Prior research has considered that "Singerian organizations model contemporary management trends where employees are empowered to contribute in the decision-making process" (Courtney et al. 1998). Singerian organizations, are best designed to deal with "wicked" problems that have no clear solution, which are ever-present in today's business environment (Courtney 2001). Although goals may be shifted from that of the traditional organization to that which is good for the organization and all stakeholders combined, performance can still be measured by the metrics imposed by the Singerian inquirer. While traditional organizational goals and metrics focus on the

financial viability of the organization and the maximization of shareholder wealth, Singerian organizations also consider other non-traditional ways to ensure *all* stakeholders and processes are equally considered. The question remains as to how organizations can integrate Singerian inquiring principles into the organization. This research contends that psychological empowerment may be that conceptual key (or at least one of them) that helps provide a roadmap for Singerian organization realization.

## Psychological Empowerment

Psychological empowerment has been described in both the psychology and organizational behavior literature as a way to charge individuals and/or employees to take control of and interest in work situations. Empowerment gives employees freedom to determine work roles, accomplish goals, and produce meaningful, influential feedback (Yukl et al. 2006). Empowerment can also be described as the delegation of roles, responsibilities, and authority from management to employees (Sharma et al. 2008). According to Quinn and Spreitzer (1997), it can also be described as employees' mindsets about the importance of their roles at work. Other research suggests that empowerment is multi-dimensional, including constructs of employee *self-determination, impact, meaning, and competence* (Drake et al. 2007; Spreitzer 1995; Spreitzer et al. 1997; Thomas et al. 1990). Empowerment, and the culmination of these four dimensions can also be used to describe employees' individual quests for strengthening levels of self-efficacy (Gómez et al. 2001).

The four dimensions of empowerment represent a way to examine and explain the driving forces behind how and why this construct affects individuals. They additively represent the cognitions of the psychological empowerment construct, and the non-

inclusion of any one of the dimensions when operationalized will reduce overall empowerment (Bhatnagar 2005). These four dimensions, as first discussed by Thomas & Velthouse in 1990, and later developed and validated and by Spreitzer (1995), represent a key component of the measures and theoretical underpinnings for this research (Spreitzer 1995; Thomas et al. 1990). Together, they promote an active work orientation which allows employees to strive for and attain flexibility in how they shape their work roles (Boudrias et al. 2004).

*Meaning*

Meaning implies that employees truly care about their work. In other words, their tasks are important to them and stem from a purpose (Spreitzer 1995). Brief and Nord suggest that meaning must involve a fit between the needs of employee work roles and their own personal beliefs, values, and norms (Brief et al. 1990). That is, employee perceptions regarding the value of their work and the intrinsic consideration of those tasks affect how empowered an individual feels (Ergeneli et al. 2007).

*Impact*

Impact describes the level to which employees feel their voices are heard and what sort of control they have over their work (Spreitzer 1995). It is different from self-determination in that employees sense they have some sort of control over results other than just their work (Spreitzer et al. 1997). In other words, individuals have noteworthy influence over specific and visible outcomes at work with regard to attaining organizational goals on both small (e.g., administrative) and large (e.g., strategic and operational) levels (Ashforth 1989; Boudrias et al. 2004).

*Self-Determination*

Self-determination, also called choice in the infancy of empowerment research, implies that employees are not "micro-managed," but rather, have the flexibility and autonomy to ascertain how and when to do their work. This flexibility should extend into actual work choices, such as those individuals make about the methods, speed, and effort put into their work (Drake et al. 2007). It can also represent a sense of control in initiating constructive action and change (Liao et al. 2009) and governing individual behaviors at work (Koberg et al. 1999).

*Competency*

Also described as self-efficacy, competency describes employees that are confident about their ability to perform their work roles (Spreitzer 1995). This dimension reflects an individual's "mastery of behavior" (Spreitzer 1995). In other words, competency is "the degree to which a person can perform task activities skillfully when he or she tries" (Thomas et al. 1990). Competence may also be influenced by the job type, prior experience, and environment in which employees work (e.g., fast-paced, multitask jobs) (Hancer et al. 2005).

Outside of empowerment, self-efficacy has been widely studied in the IS literature, specifically in the area of computer self-efficacy (CSE). CSE is defined as the level to which an individual believes that he/she can successfully use a computer, and has been found to be an important influence in the use and adoption of computer technologies (Compeau et al. 1995). Marakas and colleagues developed scales and a research framework to study CSE, and later compared those scales to better measure and assess the construct (Marakas et al. 2007; Marakas et al. 1998). Self-efficacy has also been

examined in the IS literature as an influence in response to fear appeals in a multitude of studies of protection motivation theory (Rogers 1975), including similar topics with regard to this research, such as information security behaviors (Johnston et al. 2010).

There is a plethora of research surrounding psychological empowerment in the management literature. One particular study found that empowered employees increased unit production and reported higher levels of control and impact, but only for individuals who felt their managers were supportive (Logan et al. 2007). Another study found positive correlations between top management and its leadership, employees' empowerment, job satisfaction, and overall reported customer satisfaction (Ugboro et al. 2000). Additionally, psychological empowerment has also been identified as a way to increase workplace and organizational learning (Zahrani 2012). Prior empirical research also suggests that employees' needs for individual achievement and power directly affect organizational commitment, job satisfaction, and levels of perceived empowerment (Hon et al. 2006). Empowering employees can be encouraged through strategic teams, top-down sharing of knowledge, and structure; however, empowered employees should be duly rewarded for their additional accountability (Quinn et al. 1997). Yukl and Becker offer further suggestions as how to condition an effective empowerment environment; conversely, they highlight reasons for empowerment program failures, such as fear of change, time-consuming implementation, and resistant employees (Yukl et al. 2006).

Finally, for psychological empowerment to be successfully implemented, an organization must adhere to the specific culture and employee needs to create a sense of ownership; otherwise, it is doomed to fail (Honold 1997). One particular study found

that collective organizational cultures, described as doing- or team-oriented, had significantly higher perceptions of empowerment (Sigler et al. 2000).

Empowerment, especially as defined and measured by Spreitzer, has only been sporadically studied in the IS literature thusfar, and to the knowledge of the author, never in the way as is proposed in this research. Studied IS empowerment topics range from using the Internet to empower individuals, also known as e-empowerment (Amichai-Hamburger et al. 2008), to improving communication through empowerment and the use of online information services (Bunning et al. 2009), to empowerment in support of knowledge management (Kolsky 2011; Lamont 2010). Futher, empowerment has been studied extensively with applications in geographical information systems (Bauer 2009; Corbett et al. 2005; Kwaku Kyem 2001) and in the medical field with regard to computerized information retrieval systems (Hudon et al. 2010; Peoples et al. 2011).

Relationships between empowerment and computer-based information systems have also been examined in attempt to identify ways to improve organization of work (Psoinos et al. 2000). Psoinos and collegues' research in one British organization found that information systems themselves do not lead to employees feeling empowered; however, a failing or obsolete information system can place contraints on empowerment. Finally, empowerment has also been conceptually examined as an influencing role in participatory design (PD), where users are encouraged to take part in the development of new information systems, which is a crucial element of SIOs (Clement et al. 1993).

Psychological empowerment might also be applied in a more comprehensive sense, perhaps with the notion of an empowered organization. In other words, within this research context, it might be more appropriate to consider psychological empowerment

within a culture or climate rather than focus on individual motivation. This notion is further discussed below.

## Empowerment Within Singerian Inquiring Organizations

The beauty of Singerian systems and/or organizations is that the decision-making process, whether it be strategic decision making or day-to-day operations, is dispersed among many individuals or groups rather than with a sole authoritarian. The Singerian inquirer has been argued as perhaps the most powerful of the inquirers, namely because it encompasses elements of all of the other inquirers, introducing ethical concerns with an emphasis on functionality and collaboration (Courtney et al. 2000). This ties directly into principles of psychological empowerment, which encourages the involvement and integration of feedback from the users who are directy involved in the decision-making process. Furthermore, the driving principles of Singerian systems can be readily integrated with psychological empowerment to further enhance the way organizations deal with decision making, especially regarding "wicked problems" that have no obvious or simple solution. Ultimately, psycological empowerment enables the development of Singerian organizations, and provides a possible tangibile roadmap for such advancement.

It also seems that Churchman's nine standards for Singerian systems and/or organizations can be further modified to ecompass the fundamentals of an empowering organization:

1. Creates independent knowledge from empowered, collaborative sources of those involved in the decision-making process (Self-Determination)

2. Measured by the general level of moral alignment with that of the empowered or involved group and all relevant stakeholders (Meaning)

3. Applies to all those involved in the empowered collaboration (Impact, Self-Determination, Competency)

4. Involves all organizational members within the process (empowered employees), including all relevant stakeholders (Impact, Self-Determination, Competency)

5. Has the organization, the affected employees, and all relevant stakeholders as the client (Impact, Self-Determination, Competency)

6. Empowers all employees and all relevant stakeholders as decision makers (Impact, Self-Determination, Competency)

7. Empowers all employees and all relevant stakeholders as designers (Impact, Self-Determination, Competency)

8. Benefits all employees in the organization and all relevant stakeholders in general (Meaning, Impact, Self-Determination, Competency)

9. Creates optimism that ethical decisions are being made that are best for the empowered employees and all relevant stakeholders and that the feedback of employee users are being integrated into organizational decisions (Impact; Meaning)

Furthermore, the four building blocks that foster psychological empowerment—meaning, impact, self-determination, and competency—directly tie into the fundamental properties of decision making underlying Singerian organizations. By empowering all employees as designers and decision makers, *meaning* is achieved because their work

will be viewed as purposeful and reflects a fit between their beliefs and organizational outcomes. *Impact* is reflected within almost all steps of the decision-making process; ensuring not only that employees' voices are heard, but that their opinions are valued and can result in tangible organizational actions. *Competency* comes from the collaborative process whereby all employees are encouraged and expected to participate. This fosters an organizational environment that encourages individuals to improve themselves and reinforces the belief that they can effectively do their jobs in an impactful way. *Self-determination* is also achieved by the overall decision-making process as guided by Singerian principles; by empowering employees and integrating their perspectives and ideas into organizational assessments, they can voice their opinions as to how and when they most effectively can complete tasks.

This particular study aims to expand and contribute to IS research by examining how empowerment can enable the development of Singerian inquiring organizations. While prior IS research has applied the concept of Singerian inquiring organizations to other organizational issues such as knowledge management and decision making in organizations (Courtney 2001; Courtney et al. 1998), little research has been aimed at actually developing a foundation for creating such organizations. It is proposed that psychological empowerment can be the kernel theory which allows us to make the connection between the two, ultimately describing a feasible, useful application for organizations. Using well-documented research constructs such as those in multi-dimensional psychological empowerment and others, as will be discussed later, concepts of Singerian inquiring organizations can be operationalized and empirically assessed with regard to organizational processes. Specifically, this research aims to examine how

organizational IT security policies and procedures can be improved via employee involvement (psychological empowerment), and in turn, how that participation in the decision-making process might improve organizational outcomes, specifically, perceived organizational support for IT security. Perceived organizational support for IT security should also influence felt obligation to use IT security procedures, which will also be evaluated. Furthermore, an employee's felt obligation to use the security policies and procedures could increase intentions to follow them, which is a very important, desirable, and measurable organizational outcome. Furthermore, specific behavioral measures can also be assessed, including voice, knowledge sharing, and knowledge creation behaviors.

Building upon the theoretical and literature foundation as discussed in this section, the following sections describe the research methods used to evaluate the research questions. Specifically, the measures, hypotheses, model, and scales used to evaluate constructs will be presented and described.

# CHAPTER THREE

## RESEARCH MODEL AND METHODS

### Hypotheses Development

Considering the prior literature in IS, inquiring systems, psychological empowerment, and other related managerial concepts, a model was constructed as a way to express the relationships between and among the various constructs. As mentioned earlier, this research examines psychological empowerment as a way to foster the development of Singerian organizations; however, it can be very difficult to measure the intrinsic task motivations of employees who are not directly or only partially involved in organizational decision making. Therefore, so that both employees who are directly involved in organizational decisions regarding the development of IT security policies and procedures as well as the majority of employees who are perhaps not directly involved can be surveyed, participation in decision making about those items will be examined as an antecedent to Psychological Empowerment.

While Perceived Organizational Support for IT Security (POSITS), which examines the level to which employees feel that the organization supports and cares about the IT security policies and procedures, is a new construct stemming from the ideas of this research project, perceived organizational support (POS) as it is studied in the managerial literature, describes individuals' beliefs that the organization values their contributions, truly cares about them and their personal goals, will listen to their

grievances and help solve employee problems, and will treat them in a fair and consistent manner (Eisenberger et al. 1986; George et al. 1993). In prior literature, POS has been found to be positively related to employees' felt obligation to care about the organization and the attainment of its goals (Eisenberger et al. 2001). In the same study, which provides the theoretical underpinnings of the construct, POS was also positively related to affective commitment, in-role performance, and organizational spontaneity, as mediated by felt obligation. A review of the POS research indicates that affirmative employee and organizational outcomes, comprised of three major categories of advantageous behavior as perceived by employees—fairness, supervisor support, and organizational rewards/favorable job outcomes—are positively related to perceived organizational support (Rhoades et al. 2002).

Further, as the antecedent of POSITS, empowerment will be examined in two ways. Currently, empowerment is conceptualized two ways—structural empowerment and psychological empowerment. *Structural empowerment* is a socio-structural approach to empowerment that involves initiatives made by management that are meant to reduce feelings of powerlessness. Structural empowerment focuses upon pushing decision making authority down through the organizational hierarchy and providing resources to employees at lower levels of the organization, for example, information and training opportunities (Heller 2003). Accordingly, one IT related question would be does the organization encourage participation in decision making in IT security procedures, allowing employees to voice their opinions? Another IT-related question would be to what extent does the organization provide opportunities for IS security training, Both participation in decision making and training are two key aspects of what are called "high

commitment" or "high performance" work systems (Huselid 1995). High performance human resource practices, like participation in decision making and investment in training, are thought to increase not only employee performance, but also employer performance. Delaney and Huselid state that high performance HR practices show that the organization is committed to the employee, resulting in the employee reciprocating that commitment back to the organization in the form of positive attitudes and behaviors, as well as higher performance (Delaney et al. 1996). Lawler suggests that high performance management practices such as participation in decision making and opportunities for training/growth create environments that foster strategic thinking among employees and lead to employees assuming personal responsibility for their work product (Lawler 1986). Structural empowerment is conceptualized as an antecedent of psychological empowerment. That is, these types of human resource practices promote employees to take a proactive orientation towards their jobs (i.e., psychological empowerment).

Firstly, participation in decision making in IT security procedures can be considered as an outlet for employees to voice their opinions with regard to the development and implementation of IT security policies. The "voice effect" has been widely researched in the procedural justice literature and indicates that those who have the opportunity to provide input and opinions when making decisions ultimately feel that those decisions are more fair (Barry et al. 2000; Folger 1977). A plethora of research has focused on the voice effect, and it has been found to be comprised of two psychological mechanisms that jointly generate the effect—instrumental and non-instrumental (Lind et al. 1990; Shapiro et al. 1993). The difference between the two is that instrumental

explanations support procedural justice in that if individuals are involved in the process, it generates a higher chance that a favorable outcome will be reached; whereas, non-instrumental explanations focus on the information and abstract consequences of the process, such as feelings that employees have been treated with respect and that the organization values and supports their contributions (Lind et al. 1990; Lind et al. 1988). Voice has been found to enhance justice perceptions (Barry et al. 2000; Folger 1977; Korsgaard et al. 1995; Roberts et al. 2006; Shapiro 1993; Shapiro et al. 1993; Tyler et al. 1992), and similarly, we might expect that it would also influence the empowerment cognitions regarding actively participating in the decision-making process. In other words, we expect that certain job related cognitions (e.g., psychological empowerment) will arise from the involvement of employees via participation in decision making (one part of organizationally-provided structural empowerment), as has been found in prior literature concerning PDM and psychological empowerment cognitions (Carless 2004). Hypotheses 1 evaluates this potential relationship:

> *H1: Employees who actively participate in the decision-making process regarding IT security policies will have higher perceptions of Empowerment.*

Secondly, as an additional way to measure the structural empowerment of the organization via high performance work systems, it might be interesting to assess the impact that physical opportunities provided by the organization for training have on the psychological empowerment felt by the employees. For example, if the organization not only provides training sessions, but also allows employees to actively participate in those sessions, do employees feel stronger

cognitive attachment and obligation to the policies and the process of creating/implementing them? In other words, as we similarly predicted with PDM, we expect psychological empowerment (job related cognitions) will be a result of organization-provided opportunities for growth (other half of hypothesized structural empowerment). This is congruent with prior literature, which suggests that psychological empowerment is a logical product of structural conditions of empowerment (e.g., access to information, support, having resources at-hand, opportunities to learn and grow) (Kanter 1977; Laschinger et al. 2001). Hypothesis 2 examines this relationship:

*H2: Employees who actively participate in opportunities for training in the organization will have higher perceptions of Empowerment.*

The final building block comprising the measurement of a High Performance Work System is Incentive Pay, which is measured by Hypothesis 3. The goal of pay-for-performance plans is to inspire employees to capitalize upon their own high performance or performance in a group (Deckop et al. 1999). However, it is important that organizations clearly state what will and what will not be rewarded, so that employees are clear on what rewards their actions will bring (Morrison 1994). More than 90% of US organizations use some type of individual incentive program, and several theoretical perspectives support the argument that workplace performance can be enhanced by formal incentive systems (Shaw et al. 2002). Prior studies have found a connection between high performance work system practices, specifically empower employees to leverage their knowledge, skills, and abilities for organizational value, which relates directly to this research (Becker et al. 1998; Delery et al. 2001). An increase in job

flexibility and efficiency are also supported and increased by this relationship, both of which encompass ideas of psychological empowerment (Evans et al. 2005). As an important building block of high performing work systems initiatives, incentive pay should also foster a sense of psychological empowerment within employees. Building upon this, Hypothesis 3 posits:

> *H3: Employees who understand the incentive pay system and are rewarded accordingly in an organization will have higher perceptions of Empowerment.*

The thoughts, motivations, and feelings of employees regarding Empowerment can be measured using the four dimensions of psychological empowerment, where those employees who have participated in these types of tasks and those who have yet to participate can be differentiated, and the cognitions of participation and the actual participation can be parsed. These dimensions represent the constructs as to how organizations can become more like Singerian inquiring organizations. Further, these four dimensions will be operationalized as a unidimensional measure of psychological empowerment (Spreitzer 1995; Spreitzer et al. 1997). Participant responses will be compared with self-reported levels of POSITS regarding the organization's IT security policies and procedures. Specifically, POSITS will examine the level to which employees feel that the organization supports and cares about the IT security policies and procedures.

Prior research has examined psychological empowerment as a mediating factor between high performance/involvement work systems (as described earlier), job performance, job satisfaction, and organizational commitment via perceived

organizational support, which would stimulate a felt obligation to follow organizational protocol (Butts et al. 2009). Further, some studies suggest that both structural and psychological empowerment are both related to respect, and latently, organizational trust and perceived organizational support (Faulkner et al. 2008; Laschinger et al. 2005). POS is also an infrequently studied construct in information systems, and may provide new ways to explore traditional IS research topics (Lo et al. 2011).

Organizations that empower employees are signaling that they respect the employee and value the contributions they can make to the organization. Consequently, employees who feel empowered are likely to attribute these positive cognitions, at least in part, to a supportive environment created by the organization, thereby increasing perceptions of organizational support. Specifically, employees who feel empowered will feel a closer sense of connection between their involvement at work and subsequent perceptions of organizational support regarding IT security. This is important because a close match between employees' felt involvement, influence, and sense of empowerment and the way they perceive the organization to value their inputs into IT security (and to IT security as a whole) signals a strong connection and congruence between employee values/norms with regard to IT and the organization's IT vision, values, and norms. This connection, driven by the empowered employee's cognitions, should foster a higher sense of perceived organizational support for IT security, and thus, yields the next hypothesis:

*H4:*    *There is a positive relationship between psychological empowerment and perceptions of support for IT security.*

Once we better understand how employees form their opinions regarding the perceived organizational support for those IT security policies and procedures in place in an organization (based on their level of participation in the creation of those policies and procedures), we can begin to analyze the effect this may have on other organizational outcomes. One of the important objectives of a Singerian inquiring organization is to promote the good of all stakeholders while including all in the decision-making process. This is represented in the first set of hypotheses, which examines psychological empowerment with regard to how involved employees are in the development of organizational IT security policies (as an application of Singerian inquiring organizational philosophy) as an antecedent to perceived organizational support for IT security (POSITS) of those policies in a Singerian inquiring organization. In an ideal Singerian organization, it may also be advantageous to include the ideas other organizational outsiders such as stockholders, customers, and governmental agencies in decision making. In other words, if employees feel that an organization values their participation in the decision-making process of developing IT security policies and procedures (and use of those procedures and policies), they may also better understand the employers' values regarding the organizational support for those protocols. Consequently, if one better understands how important IT security is to the organization and its stakeholders and it is clear that the organization values one's efforts to maintain IT security, then one would be likely feel obligated to use those procedures and policies for the good of the organization and all of its stakeholders. Fuller and colleagues expand upon the work of Tyler and Blader, describing perceptions of organizational support as "a reflection of an individual's global evaluation of the extent to which they feel that they

are a member 'in good standing' (Tyler et al. 2002; p. 830) or that they believe they are a valued member of the organization (i.e., "I am valued by my organization," (Tyler 1999; p. 219)" (Fuller et al. 2006a; p. 819). Because people tend to value respect, social exchange theory and the norm of reciprocity would suggest that this would create a feeling of obligation to provide the organization with something of equal value. Therefore, in the context of IT security, perceptions of organizational support for IT should result in feelings of obligation to support the organization by adhering to IT security protocols. Thus, through providing support for IT security, the organization facilitates the alignment of organizational values (i.e., IT security is important to the organization and its stakeholders) and those of its employees. Employees' self-reported perceptions of the organization's support for IT security policies is examined in Hypothesis 5:

> *H5:    Perceived organizational support for IT security increases employees' felt*
>
> *obligation to use IT security procedures.*

Finally, the last five hypotheses help measure the outcome of our initial intent—assessing how a Singerian inquiring organization can be fostered via empowerment to create measureable, sustainable organizational outcomes. In other words, an employee's felt obligation to follow the IT security policies in place in an organization is particularly useful when that felt obligation translates into actual adherence to those policies and behaviors and cognitions associated with the change.

The first of these hypotheses aims to measure the first of the five behavioral outcomes, voice behavior. The organizational behavior literature describes voice

behavior as one of the important constructs consistent with the conceptualization of constructive change in an organization (Fuller et al. 2006b; Van Dyne et al. 2003). Specifically, "voice is making innovative suggestions for change and recommending modifications to standard procedures even when others disagree" (Van Dyne et al. 1998). In other words, if employees have an increased felt obligation to use and adhere to IT security policies, then those intentions should reflect in their behaviors; specifically, with how they voice their opinions and suggestions regarding the continued improvement, implementation, and enforcement of those procedures. Hypothesis 6 will be assessed as follows:

*H6:   Felt obligation to adhere to organizational IT security policies and procedures increases IT security voice behaviors.*

Although unintentional, increased responsibility, participation, and/or job obligations may actually have a negative organizational outcome. When an employee feels an obligation to do something, in this case follow the IT security policies, he or she may feel that they should adhere to them; however, to do so is a burden. This relationship should be identified as a potential downfall of the increased obligation and job responsibilities surrounding new organizational policies. Further, if this relationship is found to be significant, organizations have to find a way to tweak their processes so that employees are not torn between what they should do and with what they feel burdened, perhaps with providing a sense of autonomy for employees regarding their work (Payne 1979). Hypothesis 7 examines this potential phenomenon:

*H7:    Felt obligation to adhere to organizational IT security policies and*

*procedures increases job strain.*

Next, it may be very difficult to measure actual compliance with IT security policies, as many survey participants might be hesitant to report that they have violated rules, and perhaps, there are many violators who are never caught. In light of this, intentions to adhere to the IT policies can be used as a substitute measure, and may very well better measure the actual relationship. Therefore, to assess employees' intentions to follow the IT security protocol in place in their organizations based on their felt obligation to do so, Hypothesis 8 is conceived:

*H8:    Felt obligation to adhere to organizational IT security policies and*

*procedures increases intentions to use to those guidelines.*

In addition to participants' *intentions* to use and follow the IT security policies and procedures, the tangible actions and use of them will also be collected because felt obligation to adhere to organizational IT security policies and procedures should also be related to the actual use of those policies and procedures (albeit indirectly through its influence upon intentions).

*H9:    Felt obligation to adhere to organizational IT security policies and*

*procedures increases use of IT security procedures.*

The final two hypotheses are a measure of a second and third behavioral outcome of the felt obligation to use IT security procedures. First, while self-reported survey information is very useful, especially when collected anonymously, it might also be interesting to see how superiors of employees assess their behaviors. Specifically, this can be measured by an employee's willingness to share knowledge regarding the IT

security procedures as seen by others in a managerial role. Prior research has found a positive relationship between POS and employee knowledge sharing, which should also translate over to POSITS through individuals' felt obligation to adhere to organizational IT security policies (Bartol et al. 2009). Hypothesis 10 is stated as follows:

*H10: Felt obligation to adhere to organizational IT security policies and*

*procedures increases IT security knowledge sharing behaviors.*

Further, knowledge creation is also an integral part of Singerian Organizations, which are dependent on a common goal and/or viewpoint and must foster an environment of cooperation, coordination, and openness to express opinions to succeed. If there is congruence between employees' involvement in the IT security policies decision-making process and their felt support and integration from the organization regarding their participation and inputs, the outputs of the involvement could include knowledge. Knowledge creation has been positively linked to decision comprehensiveness and debate, both of which could be viewed as an outward sign or organizational support for employee involvement in decision making; thus, demonstrating an organization's support for the decision (Mitchell et al. 2009). In this case, the development of IT security policies will be the decision at hand. Hypothesis 11 will be assessed as follows:

*H11: Felt obligation to adhere to organizational IT security policies and*

*procedures increases IT security knowledge creation behaviors.*

These hypotheses and are visually conceptualized within the model (see, Figure 1) which this research conceptualizes as a Singerian Inquiring Organization, in theory.

High Performance
Work Systems

Participation in
Decision Making

+

Incentive Pay

+

Opportunities
For Training

+

+

Psychological
Empowerment

+

Perceived
Organizational
Support for
IT Security

+

Felt Obligation
To Use IT Security
Procedures

Voice Behavior

+

Job Strain

+

Intent to Use
IT Security
Procedures

+

Use of IT Security
Procedures

+

IT Security
Knowledge
Creation

+

IT Security
Knowledge
Sharing

+

+

+

Figure 1 Research Model

## Methodology

To operationalize this research, a survey instrument was developed and distributed in order to measure the constructs in the research model (see Figure 1). Individuals' sense of involvement in both the organization in general and also the development and implementation of organizational information technology security policies and, in turn, the impact on the perceived levels of organizational support for IT security (POSITS) were be measured. Further, employees' obligation and intention to adhere to those policies were also measured. In other words, this research asks how does an organization promote psychological empowerment and how do those perceptions affect the determination of outcomes of organizational information technology security

policies and how employees perceive the organization to support said protocol? Furthermore, do the perceptions of perceived organizational support for IT security influence felt obligation to use and intentions to adhere to organizational security regulations? Additional demographic information was also collected, including, gender, age, type of employment, and highest completed level of education.

It is of critical importance to address all possible threats to data validity through consideration *a priori* and rigorous statistical testing. Internal validity, construct validity, and external validity (and the threats associated with each) will be addressed individually to help guarantee the authenticity of hypothesized causal relationships, the appropriateness of constructs, and the overall generalizability of the results, and are discussed later in the analysis section. Statistical conclusion validity will be addressed by ensuring appropriate statistical power, testing the assumptions necessary for statistical inference, and avoidance of "fishing" for significant relationships (Shadish et al. 2002).

*Sample*

To ensure statistical power and the ability to identify meaningful effects, an appropriate sample size of subjects is needed to complete the survey (Cashen et al. 2004). According to Baroudi & Orlikowski, statistical power is the probability that a statistical test will correctly reject a null hypothesis based on the chosen significance criterion alpha ($\alpha$), the sample size (n), and the effect size (strength of relationships) (Baroudi et al. 1989; Cashen et al. 2004). An *a priori* determination of statistical power is a helpful tool to help ensure that the study has the proper ability to detect significant findings. A large enough sample size is the goal to ensure enough suitable data points are obtained (e.g., valid representation of employees), and this is feasible through the use of information

technology in the form of online survey systems. To obtain the conventionally accepted power level of 0.80, α should be set at 0.05 and β (the probability of failing to reject the null hypothesis when it is actually false) at 0.20, which is four times as much, where power = 1-β (Cohen 1977; Cohen 1992). This is demonstrated in Table 2.

Table 2

*Power Tables for Effect Size D*

| | | D | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 1.0 | 1.20 | 1.40 |
| Power | .25 | 332 | 84 | 38 | 22 | 14 | 10 | 8 | 6 | 5 | 4 | 3 |
| | .50 | 769 | 193 | 86 | 49 | 32 | 22 | 17 | 13 | 9 | 7 | 5 |
| | .60 | 981 | 246 | 110 | 62 | 40 | 28 | 21 | 16 | 11 | 8 | 6 |
| | 2/3 | 1144 | 287 | 128 | 73 | 47 | 33 | 24 | 19 | 12 | 9 | 7 |
| | .70 | 1235 | 310 | 138 | 78 | 50 | 35 | 26 | 20 | 13 | 10 | 7 |
| | .75 | 1389 | 348 | 155 | 88 | 57 | 40 | 29 | 23 | 15 | 11 | 8 |
| | .80 | 1571 | 393 | 175 | 99 | 64 | 45 | 33 | 26 | 17 | 12 | 9 |
| | .85 | 1797 | 450 | 201 | 113 | 73 | 51 | 38 | 29 | 19 | 14 | 10 |
| | .90 | 2102 | 526 | 234 | 132 | 85 | 59 | 44 | 34 | 22 | 16 | 12 |
| | .95 | 2600 | 651 | 290 | 163 | 105 | 72 | 54 | 42 | 37 | 19 | 14 |
| | .99 | 3675 | 920 | 409 | 231 | 148 | 103 | 76 | 58 | 38 | 27 | 20 |

Adapted from Cohen 1988, pg. 55

Further, prior research has found that MIS research studies are unlikely to display large effects and that, typically, small to medium effect sizes should be anticipated (Baroudi et al. 1989). A small effect is defined as a 0.20 standard deviation between population means and a medium effect as a 0.50 standard deviation between population

means (Cohen 1977). Table 2 uses the described values for the desired levels for power, significant criterion alpha ($\alpha$), and an effect size, an analytic study examining the hypotheses would require a sample size of at least 396 to detect a small effect. This threshold will be used as a guideline for collecting an acceptable sample size.

Additionally, the survey audience will need to be appropriate and representative. This was accomplished by working with the distributor of the online survey to ensure the survey was disseminated to working professionals who were willing and able to complete the survey.

## Measures & Development of Instrument

When considering measures of constructs, the compilation of survey instruments and the ordering/grouping of questions, threats regarding common methods biases should be minimized (Podsakoff et al. 2003). To further control for common method biases, the inclusion of control or "dummy" questions in the questionnaire should be strongly considered, as was addressed by the inclusion of question items regarding Attitudes Towards the Color Blue (described later in this section) (Richardson et al. 2009). Missing data was handled appropriately based upon the sample size collected, and those methods are documented at a later time in the manuscript (Roth 1994). Further, listwise deletion of missing data was be implemented, as it is often the default option for researchers dealing with missing data, namely because it is straightforward to implement, and in large enough sample sizes, produces minimal levels of average error (Christie 1985; Roth 1994). Prior research has suggested that the use of online/computer-based distribution of the survey instrument should be considered to save both time and money and assures the anonymity of respondents as there is no direct contact between them and

the researchers (Keisler et al. 1986; Webster et al. 1996). Therefore, participants completed the survey via the use of an online survey distributor (Qualtrics). Potential biases of doing so should also be considered; however, this data collection method lends itself to being the most convenient and comprehensive way to collect a mass of data from organizational insiders (Meade et al. 2007). Furthermore, before dissemination, the survey instrument was pre-tested and evaluated by ten IS professionals to ensure the final distributed survey accurately measures the construct in which this study is interested (Straub 1989; Straub 1990). Their feedback, which consisted mostly of appropriate wording corrections, was incorporated into the final survey instrument.

The vast majority of measures implemented were adapted from previously validated measures to help ensure reliability and validity (Boudreau et al. 2001; Straub 1989). Question items modified from prior studies were chosen based upon their high alpha coefficients calculated from use in former published research, and each of the original papers are cited within Appendix A. The following sections briefly describe the measures for the constructs and how they have been adapted for this research in the survey instrument. Table 3 gives an overview of the scales used in this study as they were adapted.

Table 3

*Summary of Scales*

| | Construct | Scale Used |
|---|---|---|
| High Performance Work Systems | Participation in Decision Making | Adapted from Steele & Mento 1987 |
| | Incentive Pay | Adapted from Fuller |
| | Opportunities for Training | Adapted from Price & Mueller 1986 |
| Empower- ment | Competence | Adapted from Spreitzer 1995 |
| | Self-Determination | |
| | Impact | |
| | Meaning | |
| | POSITS | Adapted from Eisenberger et al. 2001 |
| | Felt Obligation | Developed for this study |
| | IT Security Voice Behavior | Adapted from Tucker et al. 2008 |
| | Job Strain | Adapted from Karasek et al., 1998 |
| | Intentions to Use | Adapted from Ajzen 1991; Bulgurcu et al. 2010 |
| | Use of IT Security Procedures | Developed for this study |
| | IT Security Knowledge Sharing | Adapted from Bartol et al. 2009 |
| | IT Security Knowledge Creation | Adapted from Mitchell et al. 2009 |

**Measuring Structural Empowerment
as High Performance Work Systems:
Participation in Decision Making,
Incentive Pay, and Opportunities
for Training**

Three constructs were used to assess ideals of a high performance work system, which this research considers as opportunities provided by the organization for employees to engage in training, incentive pay in an organization, and the expression of employees' voice through participation in decision making or organizational procedures. In other words, these are opportunities and tangible actions as provided by the organization. Opportunities for Training was assessed with five Likert-anchored

questions adapted from Steele and Mento's (1987) measure, as included in Appendix A (Steele et al. 1987). Participation in Decision Making was measured using an adapted version of Price and Mueller's work in assessing opportunities for training and growth (Price et al. 1986). Finally, Incentive Pay was assessed by a four-item scale, adapted from Fuller and colleagues' work (Fuller). These three constructs become antecedent influences to the psychological empowerment construct—Empowerment—which assesses the overall cognitions, motivations, and feeling of employees. All scale items used in the questionnaire can be found in Appendix A.

**Measuring Psychological Empowerment**

Although each of the four subdimensions of empowerment was assessed, empowerment was examined primarily as a unidimensional construct, incorporating employee perceptions of impact, meaning, self-determination, and competency. Spreitzer's widely-cited, 12-item measure was used. The response format was a 7-point Likert scale ranging from Strongly Disagree to Strongly Agree, with appropriate milestones in between (Spreitzer 1995). Through Spreitzer's initial works in empowerment, levels of coefficient alpha reliability for these measures have consistently been shown to exceed Cronbach's recommendation of .80 (Cronbach 1951).

**Perceptions of Organizational Support**
**for IT Security**

Five questions, as adapted from Eisenberger and colleagues' work in 2001, were included on the survey instrument, as anchored by a 7-point Likert scale. Respondents were asked to rate their perceptions with regard to how much their organization values, promotes, fosters, aims to improve, and supports IT security. Although traditionally considered as perceived organizational support (POS), this research will examine a more

specific type of support and aim to identify an innovative construct for IS research, perceived organizational support for IT security (POSITS). Borrowing kernel theories from other disciplines has long been an accepted practice for building good theory in IS.

**Measures of Felt Obligation to and
Intention to Adhere to Policies
and Procedures**

A four-item, 7-point Likert scale was implemented to quantify Felt Obligation to Use IT Security Procedures and a three-item scale used to quantify Intentions to Adhere to IT Security Procedures, with the former being items developed specifically for this research and the latter adapted from prior works (Ajzen 1991; Bulgurcu et al. 2010). These measures are unique in that the research is concerned with felt obligation and intentions rather than actual behaviors (e.g., if employees actually comply with security policies and procedures). Therefore, participants will only be asked if they *anticipate* adhering to the organizational conventions, and if they *feel obligated* to follow those rules. Similar to the measures of perceptions of policies and procedures, tests were run to confirm construct validity, internal validity, internal-consistency reliability, and other pertinent statistics. The scale items for the survey instrument are included later in the manuscript in Appendix A.

**Measures of Behavioral Outcomes**

IT Security Voice Behavior was assessed using five questions adapted from a scale that has been used and validated in prior management literature (e.g., Tucker et al., 2008), anchored by a 7-point Likert scale. Specifically, the respondents were asked to assess how they make suggestions to improve IT security and express any concerns in a vocal manner. To help control for common method variance, dummy variable questions

regarding Attitudes Towards the Color Blue were used to ensure that collected data was not affected by the one source/time period collection.

Job strain can also trigger changes in employee behavior. This construct, which can be a negative influence on employees' attitudes and efficiency at work, was assessed using six questions adapted from the Job Content Questionnaire (JCQ), which has been used frequently and is widely accepted in the literature, with regard to Psychological Job Demands (Karasek et al. 1998). Specifically, respondents were asked to report how the changes in the IT security policies affect how they are able to do their work with regard to excessiveness of workload, time constraints, conflict of work roles, interruptions to daily work flow, how hectic work roles become under the new rules, and the need to wait on others to do work effectively. Again, these questions were anchored using a 7-point Likert scale and the full questions can be reviewed in Appendix A.

Use of IT Security Procedures was assessed with three questions which charge the employee to report whether or not he or she has adopted these policies into work actions. The responses were anchored on a 7-point Likert scale. These questions can be viewed in Appendix A.

Knowledge Sharing and Creation are other behaviors (rather than intentions) that can be assessed with regard to IT security policies. In this application, eight questions were asked of the respondent, anchored on a 7-point Likert scale. A full list of the questions for both Voice and Knowledge Sharing is included in Appendix A.

**Attitudes Towards the Color Blue**

Prior research indicates that common method variance is a common thorn in the side of researchers, and although sometimes ignored, the measurement error associated

can either inflate or deflate the observed correlations between measures, depending on the correlation between methods (Podsakoff et al. 2003; Spector 2006). Although there are several techniques for controlling common method biases, Richardson and colleagues (2009) suggest that the inclusion of a marker variable on the instrument can help parse true variance from that not solely connected to method effects (Richardson et al. 2009). This is especially important in this particular data collection process, as one of the major causes of common method variance is derived from obtaining measures from one common source at one data collection time period (Podsakoff et al. 2003). Although it would be advantageous to collect data from not only employees, but their peers and/or supervisors, across a span of time, research accepts that this is not always feasible. In this case, four marker questions taken from the eight-item scale regarding Attitudes Toward the Color Blue were included on the survey instrument (Miller et al. 2008). These items were formatted similarly to the other variables (9-point Likert scale) and have no known relationship or theoretical connection to them. These particular four questions (which can be found in Appendix A) were chosen due to their positively worded arrangement, rather than the negative verbiage.

# CHAPTER FOUR

## ANALYSIS AND RESULTS

The purpose of this chapter is to describe the analysis techniques used to examine the data collected, the tests conducted to investigate the research model, and the results determined from these assessments. An overview of the respondent profile based on the data collected can be viewed in Table 4. To begin, an overview of the statistical methodologies conducted will be discussed.

Table 4

*Profile of Respondents*

| 389 Total Respondents | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| Male | 194 | 49.9% |
| Female | 195 | 50.1% |
| **Age** | | |
| 18-24 | 37 | 9.5% |
| 25-34 | 131 | 33.7% |
| 35-44 | 101 | 26.0% |
| 45-54 | 82 | 21.1% |
| 55+ | 38 | 9.8% |
| **Highest Completed Level of Education** | | |
| Some High School | 3 | 0.8% |
| High School Diploma (or equivalent) | 60 | 15.4% |
| Some College | 71 | 18.3% |
| Associate's Degree (or equivalent) | 48 | 12.3% |
| Bachelor's Degree (or equivalent) | 143 | 36.8% |
| Master's Degree (or equivalent) | 55 | 14.1% |
| PhD/Doctorate (or equivalent) | 9 | 2.3% |

## Statistical Methodology

A mix of analyses were implemented to appropriately analyze the data collected from the survey panel, which returned 389 usable responses, closely approaching the level determined earlier in the power analysis. However, before any statistical testing of the research model was conducted, the conditions under which inference testing is valid were assessed—identification of outliers, examination of fit/linearity, homoscedasticity, normality, autocorrelation, multicollinearity, and due to the type of data collection, common method variance/bias. First, because the data collected was based on a 7-point Likert scale using an online survey panel where respondents could only choose values 1 through 7, the potential issue of outliers in the data was not identified as a problem. Next, using SPSS, plots were generated to examine fit/linearity, homoscedasticity, and normality, which can be viewed in Appendix B. Visual examination of all of the graphs suggests no major issues or delineation from these required assumptions. Further, autocorrelation (independence of error terms) is generally only a problem that occurs with time-series data, and because there is no reason to believe these data are seasonal or cyclical in nature, this was assumed not to be an issue (Draper et al. 1998). Finally, the issue of potential multicollinearity was examined by calculating tolerances and variance inflation factors (VIF) for the independent variables. There were no tolerance levels less than the suggested 0.20 cutoff and no VIF levels above the 4.00 cutoff for any of the constructs across the independent variables tested in this study (Hair et al. 2006).

Upon the completion of these checks, statistical testing of the model was completed. To begin, correlations were calculated between all constructs and collected control variables from the survey instruments, as can be reviewed in Appendix C. Although some strong correlations exist between constructs, that is to be expected from their relationships in the model. Appropriately, Direct Oblimin rotation was used in the factor analysis (EFA), as is appropriate to use when the factors are expected to be

correlated (Hair et al. 2006). Factor analysis, structural equations modeling, multiple regression, and other statistical tests were conducted to examine the relationships between the independent and dependent variables throughout the model where appropriate, as will be discussed later in this section.

## Factor Analyses

Factor analyses, specifically exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), were conducted to assess the discriminant validity for all scales in the model as prior literature suggests is appropriate for such types of scales (Petter et al. 2007; Posey 2010). Discriminant validity is the extent to which a construct is different from other constructs in that each uniquely measures a different phenomenon (Hair et al. 2006).

Scale items for the Attitudes Towards the Color Blue were not included in factor analyses (Questions 25-29), as those items were only used in methodology to identify common method variance. Direct Oblimin rotation and factor extraction based on Eigenvalues > 1 was implemented as the cutoffs in all factor analyses. As described earlier, Direct Oblimin was selected as the rotation method to be used, as we expect that some of the model constructs will most likely be related to one another. Further, two question items (Q12 and Q54) were re-coded due to their reverse scored nature because when variables need to be combined into an overall composite scale, they must first be coded in the same direction so that the results will be relative and comparative toward the other item responses (Robert et al. 2005). An exploratory factor analysis was conducted separately for each of the individual constructs.

First exploratory factor analyses were conducted, which models variation of individual indicators as explained by one overall construct. Upon running the factor analyses, all question items well-exceeded the recommended cutoff of 0.50 to be interpreted as significant, nor were there any cross-loadings between items or across measures; rather all items loaded on one unidimensional factor for all constructs (Hair et al. 2006). However, after review of the first iteration of factor loadings for Job Strain measure, two question items (Q44 and Q45) were flagged onto their own second factor. This phenomenon was examined in greater detail in the confirmatory factory analysis (CFA), which is discussed later. The loadings generated from the exploratory factor analyses for both all measures can be viewed below in Tables 5a through Table 5l.

Table 5a

*EFA Factor Loadings for Participation in Decision Making*

| Item | Factor Loading |
|------|----------------|
| Q1 | 0.822 |
| Q2 | 0.863 |
| Q3 | 0.864 |
| Q4 | 0.877 |
| Q5 | 0.877 |

Table 5b

*EFA Factor Loadings for Incentive Pay*

| Item | Factor Loading |
|------|----------------|
| Q6 | 0.733 |
| Q7 | 0.904 |
| Q8 | 0.958 |
| Q9 | 0.923 |

Table 5c

*EFA Factor Loadings for Opportunities for Training*

| Item | Factor Loading |
|------|----------------|
| Q10  | 0.860          |
| Q11  | 0.917          |
| Q12  | 0.921          |

Table 5d

*EFA Factor Loadings for Psychological Empowerment*

| Item | Factor Loading |
|------|----------------|
| Q13  | 0.870          |
| Q14  | 0.883          |
| Q15  | 0.847          |
| Q16  | 0.704          |
| Q17  | 0.759          |
| Q18  | 0.723          |
| Q19  | 0.837          |
| Q20  | 0.923          |
| Q21  | 0.848          |
| Q22  | 0.892          |
| Q23  | 0.956          |
| Q24  | 0.934          |

Table 5e

*EFA Factor Loadings for Perceived Organizational Support for IT Security*

| Item | Factor Loading |
|------|----------------|
| Q29  | 0.839          |
| Q30  | 0.833          |
| Q31  | 0.828          |
| Q32  | 0.878          |
| Q33  | 0.819          |
| Q34  | 0.781          |

Table 5f

*EFA Factor Loadings for Felt Obligation to Use IT Security Procedures*

| Item | Factor Loading |
|------|----------------|
| Q35  | 0.859          |
| Q36  | 0.921          |
| Q37  | 0.842          |
| Q38  | 0.808          |

Table 5g

*EFA Factor Loadings for Voice Behavior*

| Item | Factor Loading |
|------|----------------|
| Q39  | 0.872          |
| Q40  | 0.730          |
| Q41  | 0.917          |
| Q42  | 0.910          |
| Q43  | 0.675          |

Table 5h

*EFA Factor Loadings for Job Strain*

| Item | Factor | |
|------|--------|--------|
|      | 1      | 2      |
| Q44  | 0.993  | 0.166  |
| Q45  | 0.466  | -0.023 |
| Q46  | 0.088  | 0.864  |
| Q47  | 0.003  | 0.943  |
| Q48  | 0.003  | 0.929  |
| Q49  | 0.065  | 0.778  |

Table 5i

*EFA Factor Loadings for Intent to Use IT Security Procedures*

| Item | Factor Loading |
|------|----------------|
| Q50 | 0.791 |
| Q51 | 0.736 |
| Q52 | 0.815 |

Table 5j

*EFA Factor Loadings for Use of IT Security Procedures*

| Item | Factor Loading |
|------|----------------|
| Q53 | 0.824 |
| Q54 | 0.827 |
| Q55 | 0.705 |

Table 5k

*EFA Factor Loadings for IT Security Knowledge Creation*

| Item | Factor Loading |
|------|----------------|
| Q61 | 0.912 |
| Q62 | 0.943 |
| Q63 | 0.950 |

Table 5l

*EFA Factor Loadings for IT Security Knowledge Sharing*

| Item | Factor Loading |
|------|----------------|
| Q56 | 0.819 |
| Q57 | 0.848 |
| Q58 | 0.796 |
| Q59 | 0.710 |
| Q60 | 0.836 |

Next, a confirmatory factor analysis (CFA) was conducted to assess discriminant validity of the constructs. In other words, the constructs may be correlated, but they should each be different in that they measure separate phenomenon. SPSS Amos was used to facilitate the CFA, which generate results to measure both Model Fit and Reliability/Validity. Two items from the Job Strain construct (Q44 and Q45) were initially flagged non-significant, lending explanation as to why those two items loaded on a separate factor in the EFA above. These items were removed from the CFA and from all further analysis. After removal, both model fit and reliability/validity measures improved. The model fit criterion all approach or exceed acceptable cutoffs, which suggested adequate model fit; further, all reliability/validity criteria well exceed the suggested cutoffs (Hair et al. 2006). The results of this analytical process can be viewed below in Tables 6a and 6b, respectively.

Table 6a

*CFA Model Fit*

| Measure | Calculated Estimate |
|---|---|
| Chi-square/df (cmin/df) | 3.511 |
| CFI | 0.866 |
| RMR | 0.102 |
| RMSEA | 0.080 |

Table 6b

*CFA Reliability/Validity*

|  | Composite Reliability | Average Variance Extracted | Maximum Shared Variance | Average Shared Variance |
|---|---|---|---|---|
| KC | 0.955 | 0.875 | 0.726 | 0.251 |
| PDM | 0.928 | 0.722 | 0.578 | 0.207 |
| IP | 0.950 | 0.863 | 0.358 | 0.192 |
| OFT | 0.927 | 0.809 | 0.599 | 0.334 |
| PE | 0.920 | 0.592 | 0.578 | 0.269 |
| POSITS | 0.929 | 0.686 | 0.570 | 0.298 |
| FeltOb | 0.914 | 0.727 | 0.701 | 0.337 |
| VB | 0.918 | 0.739 | 0.726 | 0.293 |
| JS | 0.933 | 0.778 | 0.243 | 0.073 |
| Intent | 0.915 | 0.783 | 0.660 | 0.338 |
| Use | 0.829 | 0.619 | 0.559 | 0.342 |
| KS | 0.895 | 0.632 | 0.577 | 0.342 |

After completing the factor analyses, overall scales were computed based on the remaining instrument items so that further analyses could be conducted (only two items removed—Q44 and Q45 from Job Strain). The overall scale was calculated by taking the sum of all individual items which make up the scale (Bagozzi 1994; Diamantopoulos et al. 2001).

## Construct Validity and Reliability Assessment

Prior research describes construct validity as an ability of measures to withstand the test of time and show stability across methodologies, without which results obtained from research could be misleading (Shadish et al. 2002; Straub 1989). In an effort to preserve construct validity, when possible, scales were adapted from prior studies with very little change to the verbiage or format (Straub 1989). Straub (1989) further suggests

ways that construct validity can be achieved via appropriate instrument validation where new scales are used. Although a full-scale instrument validation was not deemed necessary in this research, as the majority of scales had been validated in prior studies, a few key points from Straub's research and four-phase scale implementation were implemented into the planning for this research project. Specifically, when planning and designing the survey instrument, ten outside IT professionals were contacted and questioned regarding the items. Furthermore, before dissemination, the survey instrument was pre-tested and evaluated by those same professionals to ensure the final survey accurately measured the appropriate constructs (Straub 1989; Straub 1990). Their feedback, which consisted mostly of appropriate wording corrections, was incorporated into the final survey instrument. Finally, a confirmatory factor analysis (CFA) has been the method suggested as an appropriate way to assess construct validity, as was completed and described above (Straub 1989). The results of the CFA suggest both strong discriminant and construct validity, lending support to the strength of any findings uncovered by hypothesis testing.

Based on concepts developed by Cronbach (1951), coefficient alpha reliability has been described as the assessment of internal consistency reliability of instruments that have different scoring and scales (Cronbach 1951). Internal consistency reliability estimates ($\alpha$) results are directly influenced by the number of items on an instrument and how correlated they are with one another. Typically, when a measure is comprised of a large number of items, it still has high internal-consistency even if the items don't have much to do with one another; however, a measure can have very few items and still have high internal-consistency provided that the correlation among the items is high (Kerlinger

et al. 2000; Pedhazur et al. 1991). When assessing reliability, prior research recommends that an internal consistence reliability of greater than 0.70 is acceptable in early stages of research, greater than 0.80-0.90 is acceptable in advanced stages of research, and any score below 0.60 would indicate a potential problem with the reliability of the measures (Nunnally et al. 1994; Nunnally et al. 1967). Using the overall scales computed for the constructs measured on the survey, Cronbach alphas were calculated for each construct and as a global measure to assess reliability, and those results can be viewed in Table 7.

Table 7

*Cronbach Alphas Calculated to Assess Reliability*

| Scale | Cronbach Alpha |
|---|---|
| **Overall** | **0.968** |
| High Performance Work Systems (Global) | 0.912 |
| Participation in Decision Making | 0.933 |
| Incentive Pay | 0.932 |
| Opportunities for Training | 0.926 |
| Psychological Empowerment (Global)** | 0.930 |
| Competence | 0.912 |
| Self-Determination | 0.893 |
| Impact | 0.906 |
| Meaning | 0.949 |
| Perceived Organizational Support for IT Security (POSITS) | 0.929 |
| Felt Obligation to Comply | 0.917 |
| IT Security Voice Behavior | 0.914 |
| Job Strain | 0.931 |
| Intentions to Use IT Security Policies | 0.915 |
| Use of IT Security Policies | 0.855 |
| IT Security Knowledge Sharing | 0.898 |
| IT Security Knowledge Creation | 0.954 |
| **Global, unidimensional model of PE used for analysis* | |

All calculated values exceeded the lower bound of the recommended cutoff for advanced stages of research, which would be expected of scales used in prior studies. Even the two constructs for which measures were created for this research project (Felt Obligation to Use IT Security Procedures, Intent to Use IT Security Procedures) exceeded the minimum cutoff with calculated Cronbach alphas of 0.912 and 0.809, respectively.

## Testing for Common Method Variance

Following tests as suggested appropriate by prior literature, a test using the survey instrument variables regarding Attitudes Towards the Color Blue were used as marker variables to complete a CFA marker variable test (Richardson et al. 2009; Williams et al. 2010). A CFA marker test was selected as the appropriate method, as opposed to Harman's single factor test or a Common Latent factor test, as it is the recommended method to help alleviate concerns of common method variance in data (Richardson et al. 2009). SPSS's Amos package was used to diagram the research model, including all measured constructs, their measureable survey items, and an error term for each. An additional, generic latent variable was drawn into the model (named Common Factor), and it was regressed against each of the individual, observed survey item components in each of the constructs, with the regression weight set equal for each item. Further, each of the constructs was drawn to covary with one another. Then, the marker variable (Attitudes Towards the Color Blue), which is believed to be theoretically unrelated to any other items in the model, was added to the model. Each of the four items from the Blue scale were also regressed against the Common latent factor, with regression weights all being set as equal. As measured by this test, we estimate the common method variance in

the model (indicative of measurement error), to be about 2.56% ($\alpha = 0.16^2$), indicating that the data can be reasonably assumed to be unbiased by common method variance. A figure is included in Appendix B which depicts the Amos model with calculated relationships.

## Testing of Hypotheses

All fourteen hypotheses generated from the research model which postulate relationships between the constructs were tested implementing structural equations model (SEM) and multiple regression techniques to test for significance throughout the model. Individual pathways are discussed below, as generated from the structural model, which can be viewed in Figure 2.
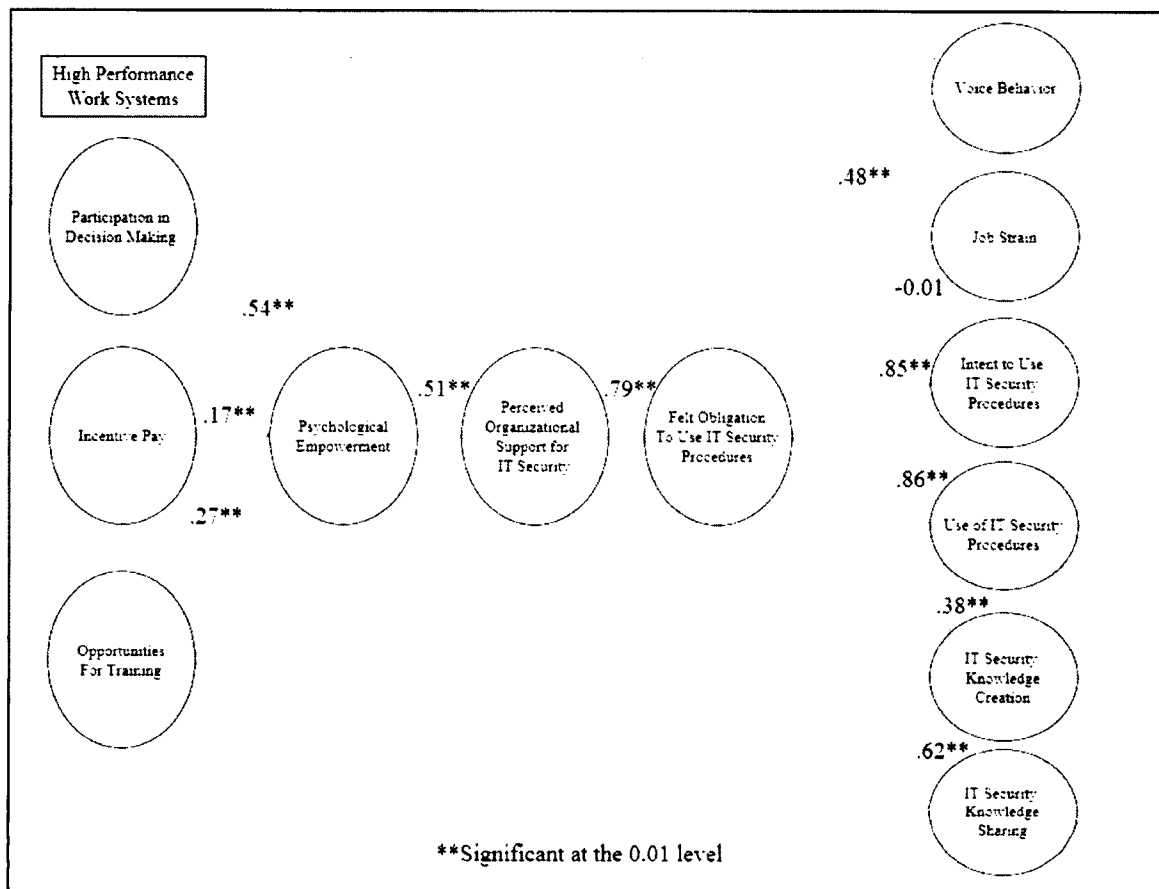
Figure 2 *Structural Model Results*

Hypotheses 1 through 3 questioned whether the elements of High Performance

Work Systems—participation in decision making, incentive pay, and opportunities for

training—would predict higher levels of Empowerment within employees when present

in an organization. First, in the structural model, Participation in Decision Making was

found to be a significant predictor of Empowerment, with significance on both the

regression weight and the generated Beta, which lends support for Hypothesis 1. Next,

Opportunities for Training was also found to be statistically significant in the model,

lending support to Hypothesis 2. Finally, Incentive Pay was also statistically significant

when entered into the model, supporting Hypothesis 3. Further, a multiple regression

entered each of the independent variables in a stepwise manner with Empowerment as the

dependent variable, while also the controlling for collected demographics (e.g., gender, age, education). All three components generated very small p-values (<0.001), which suggests a very strong relationship to the dependent variable, Empowerment.

Table 8

*Regression Results for Predicting Psychological Empowerment*

| Variable | Standardized Beta Coefficient | $DR^2$ | VIF | Adjusted $R^2$ |
|---|---|---|---|---|
| Gender | 0.0590 | -- | 1.048 | |
| Age | 0.091* | 0.457 | 1.077 | |
| Education | 0.0090 | -- | 1.041 | |
| Participation in Decision Making | 0.489** | 0.044 | 1.658 | 0.526 |
| Incentive Pay | 0.204** | 0.023 | 1.581 | |
| Opportunities for Training | 0.205** | 0.006 | 1.129 | |
| **Significant at the 0.01 level; Significant at the 0.05 level | | | | |

The next Hypothesis (H4) proposed that the four dimensions of Psychological Empowerment—Meaning, Impact, Self-Determination, and Competence—as measured unidimensionally, would each be positive predictors of higher levels of Perceived Organizational Support for IT Security. Similar to the prior procedure, a multiple regression was also calculated by entering the unidimensional, global psychological empowerment as independent variables with POSITS as the dependent variable. Further, the structural model found significance on both the regression weight and the generated Beta. Support emerged for the Psychological Empowerment construct (p < 0.001) as a predictor of POSITS, supporting Hypotheses H4. Below, Table 9 summarizes these findings.

Table 9

*Regression Results for Predicting Perceived Organizational Support for IT Security*

| Variable | Standardized Beta Coefficient | $\Delta R^2$ | VIF | Adjusted $R^2$ |
|---|---|---|---|---|
| Gender | 0.062 | -- | 1.049 | |
| Age | -0.054 | -- | 1.047 | 0.293 |
| Education | -0.005 | -- | 1.040 | |
| Psychological Empowerment | 0.54** | 0.293 | 1.017 | |
| **Significant at the 0.01 level | | | | |

Hypothesis 5 suggested that perceptions of Perceived Organizational Support for IT Security Procedures would in turn increase employees' Felt Obligation to Use IT Security Procedures. The Beta coefficient of 0.78 (p-value < 0.001) indicates that the predictor variable (POSITS) is a strong, positive predictor for Felt Obligation, finding strong support for Hypothesis 5. Further, a simple regression was used to determine this hypothesized relationship, which also identified a very strong relationship between the two constructs. Table 10 summarizes these findings.

Table 10

*Regression Results for Predicting Felt Obligation to Use IT Security Procedures*

| Variable | Standardized Beta Coefficient | $\Delta R^2$ | VIF | Adjusted $R^2$ |
|---|---|---|---|---|
| Gender | 0.037 | -- | 1.053 | |
| Age | 0.138** | 0.483 | 1.038 | |
| Education | -0.017 | -- | 1.039 | 0.499 |
| Perceived Organizational Support for IT Security | 0.693** | 0.018 | 1.014 | |
| **Significant at the 0.01 level | | | | |

The final six hypotheses measured Felt Obligation to Use IT Security Procedures against six potential outcome variables—Voice Behavior, Job Strain, Intent to Use IT Security Procedures, Use of IT Security Procedures, IT Security Knowledge Creation, and IT Security Knowledge Sharing—all of which predicted a positive relationship. All six hypotheses were examined both in the structural model and through regression analysis. First, support was found for Hypothesis 6, as a strong positive relationship emerged from the regression between Felt Obligation and Voice Behavior ($p < 0.001$). Table 11 summarizes these findings.

Table 11

*Regression Results for Predicting Voice Behavior*

| Variable | Standardized Beta Coefficient | $\Delta R^2$ | VIF | Adjusted $R^2$ |
|---|---|---|---|---|
| Gender | -0.103* | 0.197 | 1.053 | |
| Age | -0.179** | 0.03 | 1.057 | |
| Education | 0.080 | -- | 1.039 | 0.239 |
| Felt Obligation to Use IT Security Procedures | 0.479** | 0.013 | 1.030 | |
| **Significant at the 0.01 level; Significant at the 0.05 level | | | | |

However, Hypothesis 7, which proposed a potential "negative" effect of an obligation to follow rules which might produce additional strain on the employee did not produce similar results. The very, very small Beta of 0.00 from the structural model and very large p-value associated with the standardized Beta coefficient from the regression both indicate that the relationship is non-statistically significant ($p = 0.884$), which does not support Hypothesis 7. Though, this finding can actually be viewed as a favorable outcome for organizations. In other words, even with additional responsibilities and IT

procedures to follow, employees are still able to complete with work with hindrances due to those changes. Table 12 summarizes these findings.

Table 12

*Regression Results for Predicting Job Strain*

| Variable | Standardized Beta Coefficient | $\Delta R^2$ | VIF | Adjusted $R^2$ |
|---|---|---|---|---|
| Gender | -0.115* | 0.068 | 1.053 | |
| Age | -0.264** | 0.016 | 1.057 | |
| Education | 0.101* | 0.01 | 1.039 | 0.085 |
| Felt Obligation to Use IT Security Procedures | 0.007 | -- | 1.030 | |
| **Significant at the 0.01 level; Significant at the 0.05 level | | | | |

Hypotheses 8 and 9 examined the relationship between Felt Obligation to Use and whether those internal mechanisms produced an increased feeling to follow the rules, either through intentions to do so, or physical actions. Both were determined to have positive, statistically significant relationships when regressed with Felt Obligation as the independent variable and Intent to Use IT Security Procedures and actual Use of IT Security Procedures as the dependent variables, respectively. Further, the structural model found them both to be significant. Overall, support was found for both Hypothesis 8 ($p < 0.001$) and Hypothesis 9 ($p < 0.001$). Tables 13 and 14 summarize these findings.

Table 13

*Regression Results for Predicting Intent to Use IT Security Procedures*

| Variable | Standardized Beta Coefficient | $\Delta R^2$ | VIF | Adjusted $R^2$ |
|---|---|---|---|---|
| Gender | -0.008 | -- | 1.053 | |
| Age | 0.029 | -- | 1.057 | |
| Education | 0.040 | -- | 1.039 | 0.587 |
| Felt Obligation to Use IT Security Procedures | 0.767** | 0.587 | 1.030 | |
| **Significant at the 0.01 level | | | | |

Table 14

*Regression Results for Predicting Use of IT Security Procedures*

| Variable | Standardized Beta Coefficient | $\Delta R^2$ | VIF | Adjusted $R^2$ |
|---|---|---|---|---|
| Gender | 0.002 | -- | 1.053 | |
| Age | 0.029 | -- | 1.057 | |
| Education | 0.024 | -- | 1.039 | 0.495 |
| Felt Obligation to Use IT Security Procedures | 0.710** | 0.495 | 1.030 | |
| **Significant at the 0.01 level | | | | |

Hypotheses 10 and 11 aimed to examine the potential for the formation, distribution, dissemination, and use of knowledge in an organization, which is a central component of a functioning Singerian Inquiring Organization, as an outcome of Felt Obligation to Use IT Security Procedures. A positive, statistically significant relationship between the independent variable Felt Obligation to Use IT Security Procedures and dependent variables IT Security Knowledge Sharing Behaviors ($p < 0.001$) and IT Security Knowledge Creation Behaviors ($p < 0.001$) emerged both in the regression

analysis and the structural model, which gives support for both Hypothesis 10 and

Hypothesis 11. Below, Tables 15 and 16 summarize these findings.

Table 15

*Regression Results for Predicting IT Security Knowledge Creation*

| Variable | Standardized Beta Coefficient | $\Delta R^2$ | VIF | Adjusted $R^2$ |
|---|---|---|---|---|
| Gender | -0.059 | -- | 1.053 | |
| Age | -0.215** | 0.079 | 1.057 | |
| Education | 0.071 | -- | 1.039 | 0.125 |
| Felt Obligation to Use IT Security Procedures | 0.317** | 0.046 | 1.030 | |
| **Significant at the 0.01 level | | | | |

Table 16

*Regression Results for Predicting IT Security Knowledge Sharing*

| Variable | Standardized Beta Coefficient | $\Delta R^2$ | VIF | Adjusted $R^2$ |
|---|---|---|---|---|
| Gender | -0.052 | -- | 1.053 | |
| Age | -0.122** | 0.24 | 1.057 | |
| Education | 0.049 | -- | 1.039 | 0.252 |
| Felt Obligation to Use IT Security Procedures | 0.512** | 0.014 | 1.030 | |
| **Significant at the 0.01 level | | | | |

Overall, support was found for all but one of the 11 hypothesized relationships,

lending support for the overall research model. In addition to the structural model in

Figure 2, model fit indices were generated for the structural model, similar to the

procedure used in the CFA. While the model fit indices were not as strong as those found

in the CFA, it is expected that the CFA will have better fit than the structural model,

namely because of its complexity and number of included constructs. The model fit

indices for the structural model can be viewed in Table 17.

Table 17

*Structural Model Fit*

| Measure | Calculated Estimate |
|---|---|
| Chi-square/df (cmin/df) | 6.744 |
| CFI | 0.676 |
| RMR | 0.198 |
| RMSEA | 0.122 |

Some of the hypothesized relationships did prove significant in this particular

experiment while others did not; however, it can be determined that the general research

model, which assumes to be a conceptual model of a Singerian Inquiring Organization,

held together quite well, especially considering this is the first set of data collection

utilizing the model. A summary of the findings from the analyses is shown in Table 18.

Table 18

*Summary of Findings*

| Hypothesis | Findings |
|---|---|
| H1: Employees who actively participate in the decision-making process regarding IT security policies will have higher perceptions of Empowerment. | Supported |
| H2: Employees who actively participate in opportunities for training in the organization will have higher perceptions of Empowerment. | Supported |
| H3: Employees who understand the incentive pay system and are awarded accordingly in an organization will have higher perceptions of Empowerment. | Supported |
| H4: There is a positive relationship between psychological empowerment and perceptions of support for IT security. | Supported |
| H5: Perceived organizational support for IT security increases employees' felt obligation to use IT security procedures. | Supported |

Table 18 (Continued)

| | |
|---|---|
| H6: Felt obligation to adhere to organizational IT security policies and procedures increases IT security voice behaviors. | Supported |
| H7: Felt obligation to adhere to organizational IT security policies and procedures increases job strain. | Not Supported |
| H8: Felt obligation to adhere to organizational IT security policies and procedures increases intentions to use to those guidelines. | Supported |
| H9: Felt obligation to adhere to organizational IT security policies and procedures increases use of IT security procedures. | Supported |
| H10: Felt obligation to adhere to organizational IT security policies and procedures increases IT security knowledge sharing behaviors. | Supported |
| H11: Felt obligation to adhere to organizational IT security policies and procedures increases IT security knowledge creation behaviors. | Supported |

Next, Chapter Five will discuss findings and conclusions in a general sense, with an in-depth examination of the contributions to IS theory and practice as they have been described in the literature review and research hypotheses development.

# CHAPTER FIVE

## DISCUSSION AND CONCLUSIONS

This chapter presents a brief summary of the dissertation as a whole, with a focus on a summary of findings and potential contributions to IS theory and practice. Finally, potential limitations of this study and directions for future research will be discussed.

### Summary of Findings

The purpose of this research was to extend the empowerment stream of research into IS and examine the potential positive influence that empowered employees can have on the information assurance of an organization, and ultimately, the ways in which these principles can foster Singerian Inquiring Organizations. The research model was tested and overall support was found, providing a roadmap for organizations to construct their own SIO environment.

Specifically, as this research hypothesized that psychological empowerment would be an integral part in empowering employees and fostering relationships between the employee and organization that further promote a Singerian Inquiring Organization, it was important to understand how an organization could encourage these empowerment cognitions within employees. The research model proposed that elements of a High Performance Work System (i.e., Opportunities for Training, Incentive Pay, and Participation in Decision Making), provide structural empowerment (i.e., arising from organizational practices), which would encourage higher levels of employee cognitions

with regard to psychological empowerment. Statistical testing confirmed that relationship to be true, as a strong and positive connection between those constructs and Empowerment.

Further, the research model proposed that the perceptive feelings of Empowerment would then lead to higher levels of Perceived Organizational Support for IT Security. In other words, if employees felt their work and cognitions surrounding their jobs were understood and reinforced by the organization, they would feel a stronger sense of connection to the organization in that those ideals are supported and understood. The findings from this study revealed strong, positive relationships between Psychological Empowerment as a unidimensional construct and POSITS.

Next, the research model hypothesized that when employees felt a sense of Perceived Organizational Support for IT Security, they would feel a higher sense of Obligation to Use IT Security Procedures. In other words, when an employee feels they are supported by the organization, those sentiments should result in feelings of obligation to support the organization by adhering to IT security protocols. Strong support was also found for this positive relationship, which completes the set of constructs that generate and foster an empowerment and recursive relationship between employee and organization. After which, several outcome variables were assessed.

Building upon the research model, it was hypothesized that when employees had a Felt Obligation to Use IT Security Procedures, that organizations could perhaps expect some certain outcome variables. Specifically, Voice Behavior, Job Strain, Intent to Use IT Security Procedures, Use of Security Procedures, IT Security Knowledge Creation, and IT Security Knowledge Sharing. Each of the outcome variables were hypothesized

to have a positive relationship with Felt Obligation, meaning that if employees feel more indebted to follow IT Security Procedures, then higher levels of the outcome variable should be seen as well. This was true for all of the aforementioned outcome variables, save Job Strain. Although a positive relationship between Felt Obligation and Job Strain was hypothesized as a potential "negative" of implementing IT Security Protocols, the direction of the Beta coefficient indicates that the true nature of the relationship may actually be negative, indicating that clear-cut rules with what is/is not appropriate may actually help employees do their jobs better. The relationship was not found to be significant; however, it does bring up an interesting finding perhaps that should be addressed or again assessed in future studies. Not only do the findings support the idea that IT Security Procedures do not cause any additional stress on employees completing their jobs, it also suggests that they may be more vocal in sharing their ideas, have higher intentions to use and actual use of IT Security Procedures, and be more likely to share and create knowledge, important ideals of Singerian Inquiring Organizations.

While more research is necessary to fully understand and further validate the model, this research is a significant start in conceptualizing and realizing Singerian Inquiring Organizations. Future research and limitations of this study are discussed below.

## Implications for IS Theory and Practice

As prior literature suggests, IS research should be both rooted in theory and applicable for practitioners, and researchers should look to use new research paradigms that even extend from other areas of study (Adams et al. 2004). In general, the contribution to both IS theory and practice is to help structure the development of

Singerian organizations via the exploration and implementation of the research constructs. Prior research has proposed guidelines for developing cultures to sustain/promote Singerian organizations through building a community of minds, fostering effective dialogue/dialectic process, avoiding bureaucratic rigidity, and "rocking the boat" with new ideas (Courtney et al. 2000; Richardson et al. 1999; Richardson et al. 2001). However, this research helps expand upon the applicability of Singerian Organizations into real-world organizational problems by examining the concept against a specific issue (the development/implementation of IT security policies) and how other managerial and psychological constructs such as structural and psychological empowerment (kernel theories from other areas) can help achieve organizational goals and foster Singerian Organization characteristics from within.

Also important to IS practitioners is how the organization can foster a sense of fairness, organizational openness, and increase intentions to follow organizational protocol with regard to employee cognitions. Further, based upon the findings of this study which support the research model, organizations can use the modeled constructs as a way to implement Singerian Inquiring Organization ideals into their own organization.

This research has a high correlation between the contribution to IT theory and practice, as its intention is to not only further the stream of research, but to also provide a useful set of protocols that organizations can implement in order to increase effectiveness and efficiency. The model conceptualized in this research is offered as a way for organizations to model themselves as a Singerian Inquiring Organization, and in turn foster an organizational environment where employees are empowered to contribute in the decision-making process and tackle real world "wicked" problems. Further,

employees feel more allied and structurally aligned with the organization, and in turn, can be more productive members of the organization while following organizational protocol. This is also significant to IS research, as a conceptualization of Singerian Inquiring Organizations has yet to be described or statistically verified. Direction for future research on how this topic can be expanded upon is discussed below.

## Future Research and Limitations

While this dissertation is a pronounced start in transfer of a conceptualization of Singerian Inquiring Organizations into an actual organizational model, "sweeping in" ideas of psychological empowerment to help foster employee cognitions, there is still much to be done. While all measures were taken to ensure that this study was completed without any unwanted biases, the nature of the survey panel, and the wide variety of jobs and organizations in which respondents are employed cause for a potential limitation. Future research may want to look at different types of jobs in differing industries to see if any of the identified relationships are stronger, or perhaps less strong, in certain situations. Another limitation was that all data was collected from one individual employee rather than paneling others involved (coworkers, supervisors). Future research may want to survey a less-broad panel so that individual employees and those connected to them can be surveyed in tandem. This would allow targeted questions to be directed to the appropriate parties and potentially reduce any bias (e.g., asking performance questions of peers or supervisors rather than the employee directly).

With regard to future research, forthcoming studies will want to retest the model to confirm that the relationships discovered through this round of statistical settings hold up in other environments, ensuring external validity and generalizability. Further,

additional organizational constructs such as support (e.g., coworker or supervisor) or value congruence might be measured to assess their potential role in the research model with regard to employee cognitions and how a SIO works in the "real world."

Another direction for future research would be to consider a case study as a type of consulting job within an organization in an attempt to implement ideas from the research model as to help foster a Singerian Inquiring Organization. By doing so, the research would be more flexible, in that ideals perhaps not currently observed by organizations (e.g., autonomy of work/self-determination) could be safeguarded to be included in the organization. Some employees may not have much flexibility within their job tasks or work environment, and as such, might affect the relationships between measured constructs in future studies. This is likely typical in most organization, but within a case study/consulting environment, could be controlled. However, when confined to one particular organization, this type of research could be limited in external validity and generalizability.

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# APPENDIX A

## SCALES USED IN DATA COLLECTION

QUESTIONS BASED ON 7-POINT LIKERT SCALE FROM
STRONGLY DISAGREE TO STRONGLY AGREE

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Strongly Disagree | Disagree | Slightly Disagree | Neutral/ No Opinion | Slightly Agree | Agree | Strongly Agree |

## Measuring HPWS Practices in the Organization

*Participation in Decision Making; adapted from Steele & Mento 1987*

1. I am allowed to participate in making decision regarding my job

2. My supervisor asks my opinion on important issues

3. I am allowed to have significant influence on decisions that affect my work

4. My supervisor usually asks for my opinions and thoughts about decisions that affect my work

5. I am frequently allowed to be involved in resolving problems that affect my work group

*Incentive Pay; adapted from Fuller*

6. Where I work, I normally expect a pay increase if my performance evaluation shows I have done a really good job

7. Where I work, I am rewarded based upon my contributions

8. Where I work, I know that better performance is rewarded with better compensation

9. Where I work, there are incentives for better performance

*Opportunities for Training; adapted from Price & Mueller 1986*

10. My company provides me the opportunity to improve my skills and knowledge

11. My company provides the means for me to keep up with the new developments related to my job

12. My company does not provide the means for me to attend courses which increase my job skills (R)

# Psychological Empowerment; Spreitzer 1995

## *Competence*

13. I am confident about my ability to do my job

14. I am self-assured about my capabilities to perform my work activities

15. I have mastered the skills necessary for my job

## *Self-Determination*

16. I have significant autonomy in determining how I do my job

17. I can decide on my own how to go about doing my work

18. I have considerable opportunity for independence and freedom in how I do my

job

## *Impact*

19. My impact on what happens in my department is large

20. I have a great deal of control over what happens in my department

21. I have significant influence over what happens in my department

## *Meaning*

22. The work I do is very important to me

23. My job activities are personally meaningful to me

24. The work I do is meaningful to me

## *Attitudes Towards the Color Blue; Miller & Chiodo, 2008*

25. I prefer blue to other colors

26. I like the color blue

27. I like blue clothes

28. I hope my next car is blue

*For the next several questions, please consider these as IT Security Policies (as suggested by Siponen & Vance 2010 as the most common and significant information security policy violations):*

- *Locking or Logging Out of Workstations when away from the computer*
- *Keeping personal passwords safe (e.g., out of sight of others)*
- *Not sharing passwords with family or friends*
- *Not copying sensitive data to insecure USB drives*
- *Keeping organizational information confidential to outsiders*
- *Not disabling security configurations*
- *Using laptops (or other work technologies) responsibly outside of work*
- *Sending confidential information encrypted*
- *Creating complex passwords that would be difficult to guess*

## Perceived Organizational Support for IT Security; all six items adapted from Eisenberger et al. 2001

29. My organization takes pride in my actions surrounding information technology (IT) security policies

30. My organization really cares about IT security policies

31. My organization encourages employees to voice their concerns about IT security policies

32. My organization values my efforts to maintain its IT security policies

33. My organization takes IT security policy concerns seriously

34. My organization makes sure help is available if I have a problem with IT security policies

*Felt Obligation to Comply with Organizational Security Policies and Procedures*

35. As an employee, I feel obligated to abide by all information technology (IT) security policies in place

36. I feel like 'it is my job' to follow all of the IT security policies set forth by my organization

37. I would feel guilty if I did not follow the IT security policies set by my company

38. I owe it to my company to make sure that I follow the company's IT security policies

*IT Security Voice Behavior; adapted from Tucker et al. 2008*

39. I make suggestions about how IT security policies can be improved

40. I tell my coworkers who do something that violates company IT security policies to stop

41. I discuss new ways to improve IT security policies with my coworkers

42. I discuss new ways to improve IT security policies with my boss

43. I inform the boss when I notice a potential threat to IT security policies

*Job Strain; adapted from Job Content Questionnaire –*
*Psychological Job Demands, Karasek et al., 1998*

44. The information technology (IT) security rules and regulations set forth by my

    organization require no excessive work

45. I have enough time to complete my work, even while following the organization's IT

    security policies

46. The IT security policies set forth by my organization cause conflicting demands between

    my job requirements and how I can complete them

47. My work tasks are interrupted by the steps needed to appropriately follow IT security

    policies

48. My job is made more hectic by the IT security policies

49. The IT security policies require me to wait on others to complete my work

*Intentions to Adhere to IT Security Procedures, Adapted from Ajzen 1991; Bulgurcu et al.*
*2010*

50. I intend to comply with the requirements of the IT Security Policy of my organization in

    the future

51. I intend to protect information and technology resources according to the requirements of

    the IT Security Policy of my organization in the future

52. I intend to carry out my responsibilities prescribed in the IT Security Policy of my

    organization when I use information and technology in the future

*Use of IT Security Procedures*

53. I always adhere to the company's IT security policies

54. I rarely use the procedures developed by the organization to maintain IT security policies (R)

55. My actions reflect those advocated by the IT security policies

*IT Security Knowledge Sharing; adapted from Bartol et al. 2009*

56. I readily pass along information to others that might be helpful for IT security policies

57. I keep others in the work group informed of emerging developments that may increase IT security policies

58. I actively seek helpful IT security policy information to share with the group

59. I share IT security policy information when it can be beneficial to others in the work group

60. I readily share my expertise to help resolve IT security policy issues

*IT Security Knowledge Creation; adapted from Mitchell et al. 2009*

61. I develop new ideas that are incorporated into the final IT security policy decisions

62. I suggest new ideas during the IT security policy decision process, even if they are not incorporated into the final decision

63. I give creative input toward the development of IT security policies

**Screening Question**

- Which of the following best describe you?
    - ○ Employed full time
    - ○ Employed part time
    - ○ Self employed
    - ○ Retired
    - ○ Home maker
    - ○ Student
    - ○ Other

- My job requires me to use a computer.

  - o Yes
  - o No

## Demographics

64. Gender

65. Age

66. Highest Completed Level of Education

**APPENDIX B**

**SPSS CONSTRUCT PLOTS**

# SPSS CONSTRUCT PLOTS

Normal P-P Plot of Regression Standardized Residual
Participation in Decision Making



Normal P-P Plot of Regression Standardized Residual
Incentive Pay



Normal P-P Plot of Regression Standardized Residual
Opportunities for Training



Normal P-P Plot of Regression Standardized Residual
Psychological Empowerment



Normal P-P Plot of Regression Standardized Residual
Perceived Organizational Support for IT Security



Normal P-P Plot of Regression Standardized Residual
Felt Obligation to Use IT Security Procedures

Normal P-P Plot of Regression Standardized Residual — Voice Behavior

Normal P-P Plot of Regression Standardized Residual — Job Strain

Normal P-P Plot of Regression Standardized Residual — Intent to Use IT Security Procedures

Normal P-P Plot of Regression Standardized Residual — Use of IT Security Procedures

Normal P-P Plot of Regression Standardized Residual — IT Security Knowledge Creation

Normal P-P Plot of Regression Standardized Residual — IT Security Knowledge Sharing

**APPENDIX C**

**CORRELATIONS BETWEEN OBSERVED CONSTRUCTS**

**AND CONTROL VARIABLES**

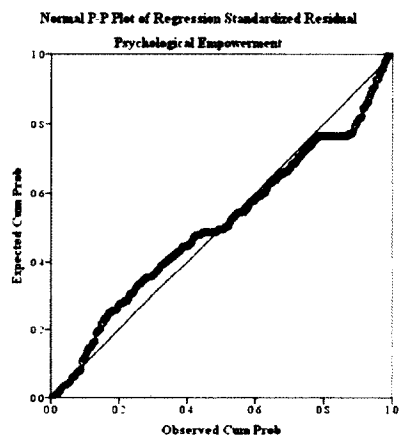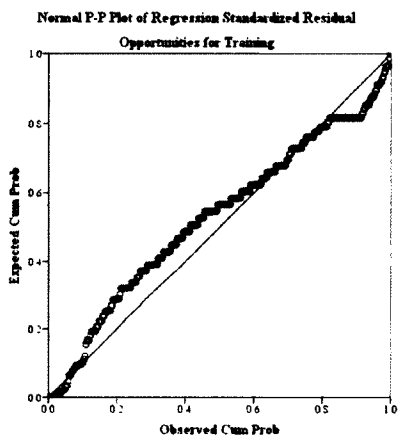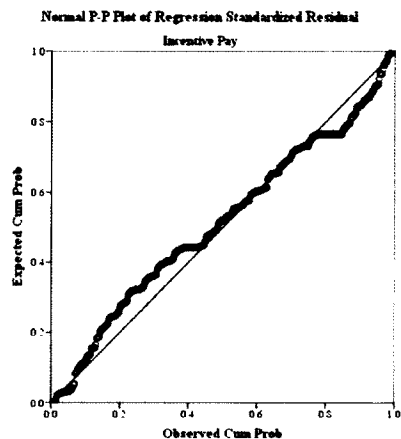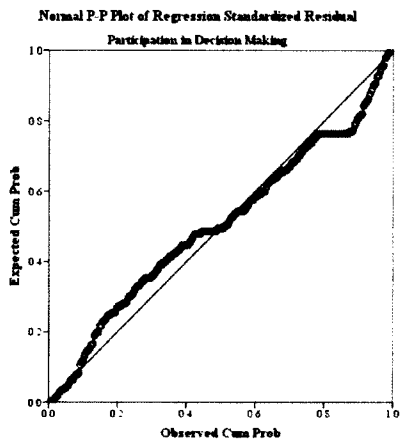| | Gender | Age | Highest Completed Level of Education | Participation in Decision Making | Incentive Pay | Opportunities for Training | Psychological Empowerment | POSITS | Felt Obligation to Use IT Security Procedures | Voice Behavior | Job Strain | Use of IT Security Procedures | Intent to Use IT Security Procedures | IT Security Knowledge Sharing | IT Security Knowledge Creation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gender | 1.000 | | | | | | | | | | | | -0.031 | 0.010 | -0.009 |
| Age | -.125* | 1.000 | | | | | | | | | | | -.111* | -0.059 | -.177** |
| Highest Completed Level of Education | -.131** | -.126* | 1.000 | | | | | | | | | | .139** | 0.050 | 0.093 |
| Participation in Decision Making | 0.046 | -0.008 | 0.029 | 1.000 | | | | | | | | | .403** | .444** | .390** |
| Incentive Pay | 0.014 | -.112* | 0.027 | .595** | 1.000 | | | | | | | | .490** | .491** | .533** |
| Opportunities for Training | 0.063 | .116* | 0.000 | .308** | .188** | 1.000 | | | | | | | .515** | .557** | .192** |
| Psychological Empowerment | 0.084 | 0.079 | 0.010 | .676** | .525** | .408** | 1.000 | | | | | | .494** | .495** | .436** |
| POSITS | .115* | -0.018 | -0.001 | .382** | .421** | .533** | .541** | 1.000 | | | | | .556** | .558** | .406** |
| Felt Obligation to Use IT Security Procedures | .102* | .123* | -0.040 | .334** | .276** | .766** | .526** | .695** | 1.000 | | | | .483** | .490** | .282** |
| Voice Behavior | -0.042 | -.117* | 0.096 | .447** | .550** | .351** | .497** | .551** | .444** | 1.000 | | | .617** | .763** | .769** |
| Job Strain | -0.095 | -.261** | .149** | .179** | .365** | -.126* | .171** | .133** | -0.041 | .412** | 1.000 | | .658** | .325** | .502** |
| Use of IT Security Procedures | 0.073 | 0.050 | 0.020 | .355** | .257** | .763** | .469** | .608** | .705** | .445** | -0.049 | 1.000 | .478** | .532** | .317** |

Correlations (Continued)

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intent to Use IT Security Procedures | -0.031 | -.111* | .139** | .403** | .490** | .515** | .494** | .556** | .483** | .617** | .658** | .478** | 1.000 | .631** | .577** |
| IT Security Knowledge Sharing | 0.010 | -0.059 | 0.050 | .444** | .491** | .557** | .495** | .558** | .490** | .763** | .325** | .532** | .631** | 1.000 | .740** |
| IT Security Knowledge Creation | -0.009 | -.177** | 0.093 | .390** | .533** | .192** | .436** | .406** | .282** | .769** | .502** | .317** | .577** | .740** | 1.000 |

# APPENDIX D

# SPSS AMOS MODEL

**SPSS AMOS Model**

# APPENDIX E

# HUMAN USE APPROVAL LETTER

# LOUISIANA TECH
## U N I V E R S I T Y

OFFICE OF UNIVERSITY RESEARCH

### MEMORANDUM

TO:            Ms. Kristen Brewer King, Dr. James Courtney, Dr. Bryan Fuller
               and Dr. Selwyn Ellis

FROM:          Barbara Talbot, University Research

SUBJECT:       HUMAN USE COMMITTEE REVIEW

DATE:          March 20, 2013

In order to facilitate your project, an EXPEDITED REVIEW has been done for your proposed study entitled:

**"Creating and Fostering Singerian Inquiring Organizations through
Psychological Empowerment"**

**HUC 1067**

The proposed study's revised procedures were found to provide reasonable and adequate safeguards against possible risks involving human subjects. The information to be collected may be personal in nature or implication. Therefore, diligent care needs to be taken to protect the privacy of the participants and to assure that the data are kept confidential. Informed consent is a critical part of the research process. The subjects must be informed that their participation is voluntary. It is important that consent materials be presented in a language understandable to every participant. If you have participants in your study whose first language is not English, be sure that informed consent materials are adequately explained or translated. Since your reviewed project appears to do no damage to the participants, the Human Use Committee grants approval of the involvement of human subjects as outlined.

Projects should be renewed annually. *This approval was finalized on March 20, 2013 and this project will need to receive a continuation review by the IRB if the project, including data analysis, continues beyond March 20, 2014.* Any discrepancies in procedure or changes that have been made including approved changes should be noted in the review application. Projects involving NIH funds require annual education training to be documented. For more information regarding this, contact the Office of University Research.

You are requested to maintain written records of your procedures, data collected, and subjects involved. These records will need to be available upon request during the conduct of the study and retained by the university for three years after the conclusion of the study. If changes occur in recruiting of subjects, informed consent process or in your research protocol, or if unanticipated problems should arise it is the Researchers responsibility to notify the Office of Research or IRB in writing. The project should be discontinued until modifications can be reviewed and approved.

If you have any questions, please contact Dr. Mary Livingston at 257-2292 or 257-5066.