

THE MEDIATING EFFECT OF PERCEIVED ORGANIZATIONAL
SUPPORT ON ESPOUSED SAFETY ATTITUDES: A FIELD STUDY

A Thesis

Presented to the

Faculty of the Graduate School of

Angelo State University

In Partial Fulfillment of the

Requirements for the Degree

MASTER OF SCIENCE

by

STEVEN PHILIP APODACA

May 2010


Major: Industrial/Organizational Psychology

THE MEDIATING EFFECT OF PERCEIVED ORGANIZATIONAL
SUPPORT ON ESPOUSED SAFETY ATTITUDES: A FIELD STUDY

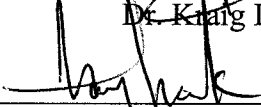
by

STEVEN PHILIP APODACA

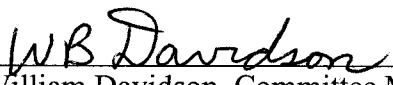
APPROVED:




Dr. Craig L. Schell, Chairperson



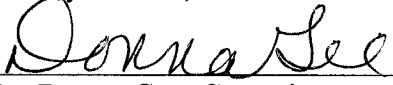
Dr. Jay Hack, Committee Member



Dr. William Davidson, Committee Member



Dr. Molly Walker, Committee Member



Dr. Donna Gee, Committee Member

4/14/10

Date Successfully Defended and
Approved by Advisory Committee

APPROVED:



Dr. Brian J. May
Interim Dean of Graduate School

4/30/2010

Date

ACKNOWLEDGEMENTS

I would like to express my thanks to Dr. Kraig Schell for guiding me along the thesis process and offering his knowledge and experience whenever it was needed. As my mentor and friend for the past two years, you have provided unwavering support and guidance throughout my time at ASU. I would also like to thank the rest of my Advisory Committee: Dr. Tay Hack, Dr. William Davidson, Dr. Molly Walker, and Dr. Donna Gee. Additionally, without the support of Dr. Wilma Stuart and the supervisors at the participating hospital, this thesis would never have been possible.

ABSTRACT

This research examined a proposed mediated model of safety attitudes and perceived organizational support in affecting safety outcomes in a population of nurses within a West Texas community hospital. Participants completed questionnaires pertaining to the aforementioned measures, and supervisors were solicited to complete a questionnaire pertaining to safety behaviors of subordinates within their respective departments. Data analysis revealed significant correlations among safety attitudes and perceived organizational support but failed to show support for a mediated model. Explanations as to why hypotheses were not supported are discussed, as well as avenues for future research.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	iii
ABSTRACT.....	iv
TABLE OF CONTENTS.....	v
LIST OF TABLES	vii
INTRODUCTION	1
Safety Climate and Culture.....	4
The Importance of Attitudes	7
Safety Climate Survey	8
Perceived Organizational Support as a Mediator of the Attitude-Behavior Link.....	10
Description of the Proposed Mediation Model.....	15
Hypotheses.....	16
METHOD	18
Participants.....	18
Procedure	20
Issues of Confidentiality	20
RESULTS	22
DISCUSSION.....	28
Limitations	31
Future Avenues for Research.....	31

REFERENCES	33
APPENDIX A.....	39
APPENDIX B.....	45
APPENDIX C.....	47
APPENDIX D.....	49
VITA.....	52

LIST OF TABLES

TABLE 1. Descriptive Data among Safety Climate Questionnaire, Survey of Perceived Organizational Support Measure (SPOS), and Supervisor Ratings of Safety Outcomes.....23

TABLE 2. Correlations among Safety Climate Questionnaire, Perceived Organizational Support Measure, and Supervisor Ratings of Safety Outcomes.....23

TABLE 3. Low End Outcome Group (≤ 42) Correlations among Safety Climate Questionnaire, Perceived Organizational Support Measure, and Supervisor Ratings of Safety Outcomes.....24

TABLE 4. High End Outcome Group (> 42) Pearson r Correlations among Safety Climate Questionnaire, Perceived Organizational Support Measure, and Supervisor Ratings of Safety Outcomes.....25

TABLE 5. Baron & Kenny (1986) Path to Mediation Model Among High End Outcome Group.....27

INTRODUCTION

The field of Health Services Research can be characterized as incorporating a diverse number of ideas from fields, including Industrial-Organizational Psychology and Public Health. Because of the wide range of situational factors affecting safety within the healthcare field, both quality and safety must be investigated by observing specific contextual factors which allow errors and other adverse events to occur (Sexton, et al., 2006). Such organizational factors that contribute to errors include: safety climate and morale, work environment factors (including staffing levels and managerial support), team factors (including levels of teamwork and supervision), and individual staff factors (including employee overconfidence, and over-self-assurance) (Sexton et al., 2006). With the realization that these contextual factors have a substantial influence on employees, researchers have made attempts to devote greater efforts to gathering psychometric data in the form of surveys and measures in an attempt to effectively measure influences, such as caregiver safety attitudes toward patients within healthcare organizations.

The common term used to describe errors in healthcare is known as an *adverse event*. Vincent, Taylor-Adams, and Stanhope (1998) describe adverse events as incidents in which a patient who undergoes treatment is unintentionally harmed by a medical caregiver. Researchers have reported that 45% of U.S. patients experienced some type of medical mismanagement, and 17% of these patients were directly affected by these failures. These outcomes have led to a longer hospital stay or other more serious problems (Andrews, Stocking, Krizek, Gottlieb, Krizek, Vargish & Siegler, 1997). The end results in many cases

are complaints or litigation by patients who have suffered harm by health care organizations. Because of longstanding beliefs towards faulting health care personnel, investigators have until recently only focused their investigations on individuals within the organization (Firth-Cozens, 2001). As a result of these organizational norms, the background and context of these events have lacked an examination in their entirety.

The field of health care is classified as a “high reliability” industry (Singer, Gaba, Geppert, Sinaiko, Howard, & Park, 2003), meaning that because significant hazards are present, operating companies, as well as regulators, must pay close attention to safety assessment practices. In recent decades, health care and other high reliability industries have moved away from safety measures based purely on retrospective data or “lagging indicators” including fatalities, accident rates, etc. toward more “leading indicators”, such as safety audits and measurements of safety climate. Consequently, these systems do not require organizations to wait for the given system to fail in order to identify weaknesses, thereby switching safety systems from a “feedback” to “feed forward” control system (Flin, Mearns, O’Connor, & Bryden, 2000).

Most overt and dangerous errors tend to occur at the “sharp end” of care; that is, the time during which health professionals and patients interact (Firth-Cozens, 2001). Since incidents on the sharp end of care tend to be more visible, patient safety and safety failures tend to be assessed and analyzed at this level. As a result, analyzing safety from this perspective contributes to a tendency to attribute errors to the smallest sense of ownership within the organization (e.g. nurses, primary care providers, etc.) as opposed to larger parts of the organization because measures tend to examine individual staff members or other

small organizational units (Firth-Cozens, 2001). Researchers, however, have attempted to make distinctions between errors in care that do not necessarily occur at the sharp end of the spectrum (Cook, Render, & Woods, 2000). Furthermore, some investigators contend that the organizational factors which contribute to adverse events within healthcare organizations amount to “gaps” or discontinuities in care and can be considered a “blunt end.” Cook, Render and Woods (2002) argue these gaps tend to appear as losses of information regarding patient care and can be classified as interruptions in the delivery of care. Most gaps that occur in healthcare rarely lead to overt failures simply because they tend to be nullified by actions taken by healthcare professionals on the sharp end. For example, suppose a nurse ordered a heparin drip (an anticoagulant) and the hospital pharmacy provided the incorrect dosage, before administering the injectable the nurse noticing the error and making the appropriate correction would exemplify a nullified action at the sharp end of care.

These undesirable actions taken by health care professionals have been shown to place ownership on individual staff with the effect of further harming preventative measures (Pronovost, et al., 2003). Furthermore, research has revealed comparatively few examples of widespread structured efforts attempting to eliminate these preventative issues. Leape, and colleagues (1998) argue that because of the failure of healthcare organizations to remedy these gaps and the manner in which health care errors are depicted in the media, many healthcare providers have become characterized by frustration, fear, and blame which are further exemplified by the constant levels of errors within the health care industry. Unfortunately, organizations in many cases have only responded to these issues by engaging in suppression, stonewalling, and cover-ups (Leape et al., 1998).

Safety Climate and Culture

Safety climate (sometimes used interchangeably with safety culture) refers to a host of underlying concepts, such as individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine commitment, style and proficiency within a health care organization's safety management initiatives. These underlying concepts subsequently influence the outcomes of an organization's general health and safety management practices (Sexton, et al., 2006). Safety climate level gauges the "...extent to which the personnel feel like they would be safe being treated there as a patient, receive adequate feedback about their performance, learn from the mistakes of others, feel that mistakes are handled appropriately, feel that personnel frequently break the rules, and feel encouraged as well as know how to report safety concerns" (Shteynberg, Sexton, & Thomas, 2005, p. 2). Safety climate has been put forth by other researchers (Cox & Flin, 1998; Hale & Hovden, 1998; Schneider & Gunnarson, 1991) as a practical construct for assessment tools because workforce attitudes and perceptions can be measured at a given point in time; thereby, giving a "snapshot" of the attitudes of a given work group or organization. Furthermore, safety climate scales have been largely utilized to measure a set of consistent themes that are constant in numerous reviews of safety research literature (e.g., Cox & Flin, 1998).

Past research has indicated that the healthcare industry has a number of similarities to other high hazard industries such as aviation, nuclear energy, and shipping (Colla, Braken, Kinney, & Weeks, 2005). Specifically, the healthcare industry has been categorized as high-hazard because of the potential risk for both morbidity and mortality as a result of errors

occurring within the host organization. In recent decades, the growing awareness of organizational, managerial, and human factors as opposed to technical factors have been shown to have a large effect on all of these industries. However, the healthcare industry does differ from most other high hazard industries in one major context: *direct harm from unsafe practices is mostly experienced by the customer as opposed to the employee*. Therefore, the prominent focus in recent research has been on the engagement of preventative measures in order to keep errors from occurring, most notably the improvements in safety culture. It is argued that there are three components of safety culture which are directly measurable: management behaviors, safety systems, and employee perceptions of safety (Colla, et al. 2005). Measurement of these components gives researchers a better idea of the extent to which organizations employ preventative measures in an ongoing effort to avoid errors. Furthermore, according to the National Quality Forum the importance of safety culture is evidenced by its identification as a key safety factor for health care based on the clear effect that safety culture has on safety outcomes (Thomas, Sexton, Neilands, Frankel & Helmreich, 2005).

In order to improve safety climate, organizations must move toward a tradition of transparency. For this change to be achieved, organizations must create a culture in which it is routine to report mistakes and even “near misses” (situations in which mistakes nearly occurred). Additionally, healthcare organizations must demonstrate learning from mistakes and create a culture in which these behaviors are clearly valued and rewarded (Firth-Cozens, 2001). This change has been best illustrated by the air transportation industry, which a number of researchers (Helmreich & Merritt, 1998; Helmreich, Merritt, Sherman, Gregorich,

& Wiener, 1993) have argued has been expanded through the creation of a climate of both openness and accountability (Leape, et al. 1998). This “human factors approach” attempts to institute resolutions by focusing on the broader understanding of accident causations while focusing less on the specific individual who makes the error. Additionally, pre-existing organizational factors, which may provide conditions for similar errors to occur, are examined to a greater extent by researchers as well (Vincent, Taylor-Adams & Stanhope, 1998).

In order to create an effective transition for problematic healthcare cultures, several recommendations are paramount. The first is the formation of teams, which should be utilized to implement safety protocols or examine potential gaps in care (Waterson, 2008). Effective safety teams should have specific overarching qualities, such as being able to actively listen to staff that have the most experience regarding what can go or has gone wrong with patient care. In addition, active listening should be in effect even if the staff with experience is of “lower rank” compared to their colleagues (Firth-Cozens, 2001). Aside from these strategies there have been a number of ways in which researchers have attempted to improve safety culture. Executive walk rounds (EWR’s) have been one such strategy by which hospitals can identify opportunities to improve specific caregiver processes; this approach demonstrates both the organization’s and executive’s commitment to safety (Thomas, Sexton, Neilands, Frankel & Helmreich, 2005). Attitudes of employees (especially those favorable toward improving safety) have the subsequent effect of playing an important role in a hospital’s safety culture and have been identified in research as a fundamentally important “driver of safety” within the healthcare setting (Nieva & Sorra, 2003). Aside from

safety culture, additional drivers of safety include an explicit commitment to safety by organizational leaders, a focus on system improvement, recording and learning from past errors, and attempting to limit unsafe acts regardless of frequency (Thomas, et al., 2005).

The Importance of Attitudes

Characteristics of a strong and proactive safety culture include commitments from both leadership and from subordinates within the given organization. A strong safety culture can be characterized by employees discussing and learning from errors, documenting and improving patient safety, encouraging and practicing teamwork, spotting potential hazards in the workplace, using systems for reporting and analyzing adverse events, and finally celebrating employees as heroes improving safety as opposed to seen as villains committing errors. A strong safety culture is exemplified effectively by the aviation industry (Helmreich, & Merritt, 1998). This industry encourages individuals to share their stories of near misses. In comparing the health care and aviation industries it has been suggested that in respect to effective safety culture the two have many similarities, however, the medical field has been shown to lag behind aviation's standards (Pronovost et al., 2003).

Past studies (Colla, et al., 2005; Firth-Cozens, 2001; Hrebiniack, 1974; Leape, et al., 1998; Shtynberg, Sexton, & Thomas, 2005; Singer, et al., 2003; Thomas, Sexton & Helmreich, 2003; Vincent, Taylor-Adams, & Stanhope, 1998) have attempted to evaluate the extent to which safety culture in the health care industry supports patients' safety as well as the extent to which safety attitudes are a strategic priority for the given organization. Unfortunately, safety efforts have been mainly focused on reacting to crises rather than proactively identifying potential hazards and improving health care systems (Pronovost et al.,

2003). The results of increased safety interventions within the health care industry have widespread effects on safety attitudes. For example, researchers have noted safety attitudes among employees have the effect of improving safety outcomes even among individuals who are not directly influenced by the given safety intervention. This is likely due to “spillover” effects originating from providers who were influenced by these factors (Thomas et al., 2005).

Because of the greater emphasis on safety culture in recent decades, hospitals have begun to regularly measure the safety attitudes of various teams within hospitals including: intensive care units (ICU), operating rooms (OR), medical wards, and surgical wards. In recent years one of the most widely acknowledged measures of safety attitudes exhibited by hospital employees has been examined by the *Safety Climate Survey* (Sexton & Thomas, 2003). By measuring employee climate at fixed intervals in respect to the various dimensions of safety, it is likely that the “gaps” in care will be rooted out and significantly minimized through examination and subsequent incorporation of new preventative policies.

Safety Climate Survey

Sexton and colleagues derived the Safety Climate Survey (Sexton & Thomas, 2003) from the Intensive Care Unit Management Attitudes Questionnaire (Thomas, Sexton, & Helmreich, 2003), which was derived from the Flight Management Attitudes Questionnaire (FMAQ; Helmreich, et al., 1993; Helmreich & Merritt, 1998). Originally, the FMAQ was created after researchers studied breakdowns in teamwork, whistle-blowing, leadership, communication, and collaborative decision making within the aviation industry. As such, the Safety Climate Survey (Sexton & Thomas, 2003) attempts to measure factors closely related

to these topics. Additionally, a similar measure: the Safety Attitude Questionnaire (Sexton et al., 2006) has been adapted to be applied to specific care units such ICU's, OR's, general patient settings (medical ward, surgical ward), and ambulatory clinics with minor modifications to reflect the clinical areas in each unit.

A review of nine similar patient safety climate surveys was conducted by Colla et al. (2005), all of which used similar scaling techniques and designed to measure the safety attitudes of individuals. Of the nine surveys reviewed, the Safety Climate Survey (Sexton & Thomas, 2003) was used to explore the relationship between safety climate scores and patient outcomes, thereby further adding to the validity of the measure. The review concluded that favorable scores on the Safety Climate Survey (Sexton & Thomas, 2003) tend to be associated with lower nursing turnover as well as increased quality of care; specifically, “shorter lengths of stay, fewer medication errors, lower ventilator associated pneumonia rates, and lower bloodstream infection rates” (Colla, et al., 2005, p.365). Several conclusions can be drawn from this study. First, the Safety Climate Survey (Sexton & Thomas, 2003) has been shown to be statistically reliable and comprehensive through sound psychometric testing. Finally, organizations which voice concerns about patient safety have shown limited evidence in safety outcomes in regard to quality of care, whereas surveys that have been linked to employee's safety attitudes have yielded higher levels of safety outcomes (Colla et al., 2005).

Researchers have also made ambitious attempts to correlate the results of the Safety Climate Survey to cultural dimensions in regard to safety, as well as to practices and outcomes (Singer, et al. 2003). Like similar surveys, the Safety Climate Survey (Sexton &

Thomas, 2003) examines individual work units as opposed to entire hospitals. However, there are no known studies which have surveyed all hospital personnel including managers, physicians, and other employees. Consistency with other similar safety climate surveys is further exemplified by the Safety Climate Survey (Sexton & Thomas, 2003) since most surveys of this type when administered to multiple hospitals are related to one another in some manner. Furthermore, published studies have not included diverse sets of institutions when reporting results.

Based upon previous literature safety climate which is further encompassed by safety attitudes has been shown to be linked to safety behaviors (Colla, et al., 2005; Firth-Cozens, 2001; Hrebiniack, 1974; Leape, et al., 1998; Shtynberg, Sexton, & Thomas, 2005; Singer, et al., 2003; Thomas, Sexton & Helmreich, 2003; Vincent, Taylor-Adams, & Stanhope, 1998). Because research has indicated this linkage as apparent, it can be surmised that the degree to which safety attitudes are exhibited by individuals within an organization likely predicts subsequent safety behaviors as well.

Perceived Organizational Support as a Mediator of the Attitude-Behavior Link

Because of the number of factors that potentially mediate safety attitudes, it is important to take these variables into account. It is argued that perceived organizational support (POS) is a factor that should relate to employee safety attitudes, performance, and work productivity (Kath, Marks, & Ranney, 2010). For this reason, POS will be examined as a potential mediator of the relationship between safety climate and work behaviors.

POS is closely aligned with research concerning affective commitment toward one's organization. Further affecting employees' views are a number of factors which encompass

POS and include perceived actions by the organization (Levinson, 1965). These perceptions are significant because employees tend to view actions by *agents* of the organization as actions of the organization itself. This phenomenon occurs because of the tendency to assign the organization humanlike characteristics (Eisenberger, Huntingon, Hutchison, & Sowa, 1986). Other factors affecting POS are the various aspects of an employee's treatment from the organization. This relationship also influences employee's interpretation of organizational motives underlying the treatment from the organization. Specifically, employee perceptions of support from the organization are likely to be formed in reaction to instances such as illness, mistakes, superior performance, fair salary, and the extent to which employees hold meaning and interest toward their current job (Eisenberger, et al. 1986).

Employees experiencing high POS may differ from employees experiencing low POS to the extent that he or she incorporates organizational membership as well as role status into his or her self-identity. Because of this phenomenon, high levels of POS have been shown to promote an affective bond to the given organization. Moreover, research (Chadwick-Jones, Brown, & Nicholson, 1982; Mowday, Porter, & Steers, 1982) has highlighted other factors including employee exchange ideology (the degree to which one values the trade of work for material and symbolic benefits) as having the effect of mediating this relationship as well.

A positive influence of POS has been marked in previous research by increasing employee's expectancy that the organization will reward greater employee effort toward meeting organizational goals (Hrebiniak, 1974). Additionally, positive POS influences have resulted in employees being more likely to incorporate organizational membership into their self-identity; thereby, developing a positive emotional bond (affective commitment) to the

organization. The end result of these positive levels of POS influence is strengthening of employee's effort-outcome expectancy as well as increased levels of affective attachment to the organization (Hrebiniak, 1974). These characteristics result in greater efforts to fulfill the organization's goals because employees are more likely to expect that greater efforts toward meeting the organization's goals will be rewarded (Eisenberger, et al, 1986).

Employees who become emotionally connected to the organization have been shown to exhibit increased performance, reduced absenteeism, and have a lessened likelihood of quitting their given job (Rhoades & Eisenberger, 2002). This phenomenon comes about as a result of the reciprocity norm, which is characterized as taking place when one person treats another well; this person is subsequently obliged to return the favorable treatment (Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001). Furthermore, the reciprocity norm asserts that employees form general beliefs concerning the extent to which a given organization contributes and cares about the well-being of its employees. This behavior is exemplified when employees seek equity with their benefactors by engaging in reciprocation behaviors (Reilly & Aronson, 2009). Specifically, satisfied employees will engage in helping behaviors that are seen to be valued by their superiors. These employee behaviors are maximized by employers providing satisfying work conditions, and by giving more to the employee-employer relationship than can be reciprocated through task performance (Reilly & Aronson, 2009).

Through the reciprocation theory, employees are, in general, concerned with an organization's commitment to them. This relationship stems from employees being valued by a given organization which can yield a host of benefits such as approval, respect, pay,

promotion, access to information, and other forms of aid contributing to the ability to do one's job (Rhoades & Eisenberger, 2002). In addition, researchers (Rhoades & Eisenberger, 2002; George, Reed, Ballard, Colin, & Fielding, 1993) have asserted POS results in employees expecting that aid will be available from the organization when it is needed to carry out their job - particularly in stressful situations. In such a relationship, supervisors are seen as organizational agents, and employee's receipt of favorable/unfavorable treatment has the effect of subsequently contributing to levels of POS (Eisenberger, Stinglhamber, Vandenberghe, Sucharski & Rhoades, 2002).

Given the outcomes that result from POS, researchers assume *organizational support theory* is apparent in this relationship, organizational support theory can be described as the extent to which employees believe the organization values their contributions and takes their well-being into account (Eisenberger, Cummings, Armeli & Lynch, 1997; Eisenberger et al., 1986; Shore & Shore, 1995). Organizational support theory also assists in addressing the psychological consequences of POS since Rhodes and Eisenberger (2002) subsume that in following organizational support theory, POS has the effect of producing a felt obligation about a given organization's welfare, which in turn, is beneficial to the organization in that it assists the employee in reaching given objectives put forth by the organization. Secondly, it is noted that the feelings of caring, approval, and respect resulting from POS fulfill employee socioemotional needs, which, in turn, leads employees to incorporate increased levels of organizational membership and defining role status as fundamental aspects into their social identity. Finally, increased levels of POS felt by employees have been shown to strengthen employee beliefs that the organization recognizes and rewards increased performance

(Rhodes & Eisenberger, 2002). Assuming employees display these performance characteristics it is only through the belief that the given organization has a generally positive orientation (as opposed to negative), which individual employees see as originating from the organization itself. As a result of these positive feelings toward the organization, POS researchers have found this construct to be related to a host of other positive employee feelings such as affective commitment (Eisenberger, Fasolo, & Davies-LaMastro, 1990), supervisor support (Kottke & Sharafinski, 1988; Malatesta, 1995), continuance commitment (Shore & Tetrick, 1991), and effort-reward expectancies (Eisenberger et al., 1990).

The main concern of the topic of POS is the particular dynamic that is shown to influence both the stability and intensity of employee's dedication to a given organization (Eisenberger, et al., 1986). A valid measure with regard to the perception of organizational support within individual employees is known as Survey of Perceived Organizational Support (SPOS; Eisenberger, et al., 1986). The SPOS measure serves to illustrate the extent to which employees within an organization incorporate a social exchange interpretation to organizational commitment.

The 17-item SPOS (Eisenberger, et al., 1986) incorporates the 17 highest loading items of what was originally a 36-item questionnaire reported to have a Cronbach's α of .97 with item-total correlations ranging from .42 to .83. Meta-analysis (Rhoades & Eisenberger, 2002) of the construct has also supported the high internal reliability and unidimensionality of SPOS (Eisenberger et al., 1986). Additionally, antecedents of POS have been documented as well, these include: perceptions of fairness, supervisor support, organizational rewards, and job conditions (Rhoades & Eisenberger, 2002).

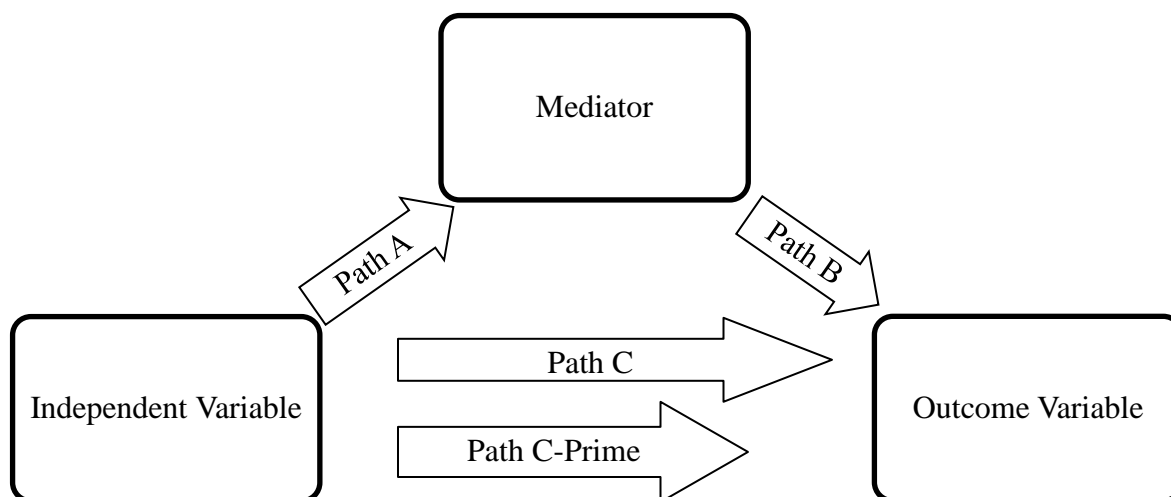
Description of the Proposed Mediation Model

Mediation is described as a statistical relationship which occurs when a third variable “carries” the effect of a causative variable onto another variable. Kenny (2009) describes the causative variable as the *initial variable* and the variable that is being affected as the *outcome variable*. However, instead of having a direct effect relationship, mediation refers to a third variable as being an intervening or process variable that completes the relationship. One reason for statistically estimating a mediation relationship is to understand the mechanism through which initial variables are affected by an additional variable subsequently affecting the outcome variable (Kenny, 2009). If this additional variable is thought to affect the outcome variable, it is described as functioning as a *mediator*, assuming it accounts for a statistically significant relationship between the predictor and criterion (Baron & Kenny, 1986). Successful mediation models can be tested utilizing a multiple regression strategy; however, prerequisites for a mediation model are necessary and will be described further.

A mediation model is a causal chain supplied by two causal paths feeding into the given outcome variable (Figure 1). The first causal path is illustrated in Figure 1 as “Path A” in which the independent variable significantly impacting the mediator. Second, it is necessary for the mediating factor to explain significant variance in the outcome variable as illustrated in “Path B” in Figure 1. Third, the direct impact from the independent variable must impact the outcome variable illustrated in “Path C” in Figure 1 as well. This effect occurs only when Paths A and B have been statistically controlled for and the relation between the independent and dependent variables are no longer shown to be significant, which shows further support for a mediation effect (Baron & Kenny, 1986). Finally, in order

to establish that the mediator partially mediating the initial variable along with the outcome variable (or “Path C-Prime“), the path from the criterion to the outcome variable should be reduced in absolute size but still different from zero.

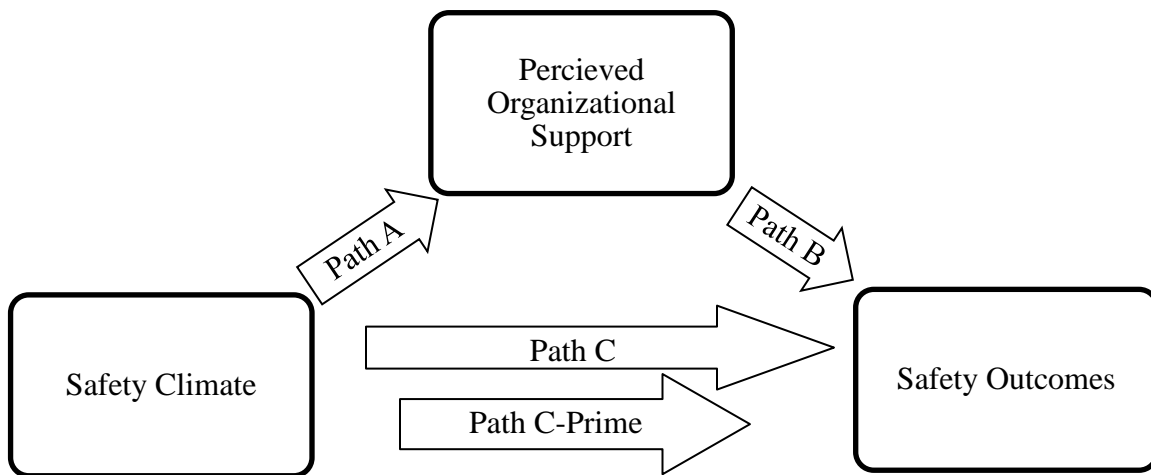
Figure 1



Hypotheses

It is expected that nurses' scores on the Safety Climate Questionnaire (Sexton & Thomas, 2003) will be significantly correlated with safety outcomes reported from supervisors (H-1). Secondly, it is expected that nurses' scores on the Safety Climate Questionnaire (Sexton & Thomas, 2003) and the SPOS (Eisenberger, et al., 1986) will be significantly correlated (H-2). Thirdly, it is expected that the SPOS (Eisenberger, et al., 1986) will be significantly related to supervisor-reported safety behavior after controlling for safety attitudes (H-3). Finally, a mediation model should be fitted to the data such that POS partially mediates the effect of safety attitudes on safety behaviors (Figure 2; H-4).

Figure 2



METHOD

Participants

A total of 98 nurses were recruited from a Texas hospital between October 2009 and February 2010. Due to incomplete survey responses, five individuals were eliminated from the final data-set leaving a final employee sample of 93. Aside from the individuals initially surveyed, a second survey was administered to supervisors for each clinical area in order to measure safety outcomes; 14 supervisors completed this questionnaire for each subordinate. Demographic items asked participants to indicate “Job Position,” “Experience in Position,” “Experience in Organization,” and “Age,” as well as an item regarding history of completing the questionnaire before.

Measures

For the purposes of this study, three measures were utilized in order to test for a mediated model predicting safety outcomes from safety attitudes and levels of perceived organizational support (POS). Safety outcomes were measured utilizing a seven item questionnaire given only to supervisors. The Safety Climate Survey (Appendix A; Sexton & Thomas, 2003) contains a total of 21 items pertinent to safety climate. The first of 14 questions asks participants to indicate on a five-point Likert-type scale to what degree they agree with statements concerning teamwork climate (employees also had the option of reporting “not applicable”). The final 13 of the total of 21 questions asks participants to indicate to what degree they agree with statements concerning the dimension of safety climate. Example items include: “The culture of this clinical area makes it easy to learn from the mistakes of others,” and “The senior leaders in my hospital listen to me and care about

my concerns.” One item “Personnel frequently disregard rules or guidelines that are established for this clinical area” was reverse scored. The scale score for the measure was computed by summing the items where: “1 = Disagree strongly” to “5 = Agree strongly.” As mentioned above the questionnaire also contains a number of demographic items included in the measure.

The second questionnaire, a Survey of Perceived Organizational Support (SPOS; Appendix B; Eisenberger et al., 1986) was given to participants immediately following the Safety Climate Survey (Sexton & Thomas, 2003). Eight of the 17 items ask questions concerning employee’s perceptions of the degree to which the organization values their contributions, while the remaining nine items ask employees questions concerning actions the organization may take which could potentially affect the well-being of the employee. Responses were indicated on a seven-point Likert-type scale ranging from “1 = Strongly Disagree” to “7 = Strongly Agree.” Example items include: “The organization values my contribution to its well-being,” and “Even if I did the best job possible, the organization would fail to notice.”

Additionally, supervisors in the host organization provided performance data specific to their department’s safety outcomes via a 7-item questionnaire (Appendix C). In an effort to maximize validity for this questionnaire, items were derived by utilizing the dimensions of the Safety Climate Survey (Sexton & Thomas, 2003) which were converted to a behavioral context. Example items include: “The nurses in my clinical area make an obvious effort to learn from errors that occur,” and “My nurses are wholly engaged and invested in the patient safety initiatives our facility implements.” Supervisors were asked to indicate to what degree

they perceived each statement as being true ranging from “1 = Mostly False” to “7 = Mostly True” the subsequent responses for each supervisor rating were summed in this manner.

Procedure

IRB approval was given by both Angelo State University and a Texas hospital for participants to be recruited and assessed via online surveys. Data collection/questionnaires were hosted on the website www.survs.com. Participants were administered the Safety Climate Survey (Sexton & Thomas, 2003), and the SPOS (Eisenberger et al., 1986). These questionnaires were converted to an electronic format from the traditional “paper-and-pencil” distribution method to facilitate electronic data collection. Individual questions were duplicated verbatim, minimizing significant changes from the original questionnaire. Hard copies of invitations for nurses to participate in the study were given to supervisors overseeing desired participants who were then asked to distribute handouts to their subordinates beginning in November, 2009. However, because of low response rates, arrangements were made with the organization for a two week “data collection event” during February of 2010. During this time, arrangements were made with a number of the nursing supervisors to be physically present in order to facilitate participation. As a result, participation was significantly increased.

Issues of Confidentiality

Prior to beginning the questionnaire, participants were electronically presented with an “informed consent.” Participants were notified that proceeding with the questionnaire indicated their agreement to participate in the study. Original participant numbers were used for data entry purposes. Debriefing was conducted at the conclusion of each survey, which

included a brief overview of the purpose of the study. Participants were also supplied with the investigator's e-mail and other contact information to allow for an opportunity to express observations or concerns and for the opportunity for any questions to be answered via e-mail or telephone.

RESULTS

Items were summed for each respective questionnaire in order to facilitate reporting of means (M), standard deviations (SD), Cronbach's α , and sample size (n). The mean sample-weighted internal consistency estimate (Cronbach's α) for the Safety Climate Questionnaire (Sexton & Thomas, 2003) indicated high internal consistency. The mean sample-weighted internal consistency for SPOS (Eisenberger et al., 1986) indicated exceptionally high internal consistency. The internal consistency estimate for the Safety Outcome questionnaire indicated marginal internal consistency. Values for mean sample-weighted internal consistency estimates (Cronbach's α) for each measure are presented in Table 1. Additionally, frequencies and percentage values for each demographic question are indicated in Appendix D.

In order to test the hypotheses of interest, correlations were calculated in order to determine support for the establishment of statistical mediation (Table 2). Scores on the Safety Climate Questionnaire (Sexton & Thomas, 2003) and reported safety behaviors along the "direct path" were not significantly correlated; thus, H-1 was not supported. Regarding the relationship between scores on the Safety Climate Questionnaire and perceived organizational support, results showed a significant correlation ($r(93, 32) = .51, p < .01$), lending support to H-2. Because H-3 was dependent on both H-1 and H-2 showing significant correlations, testing was not necessary to conclude that it was not supported in the given data.

Table 1

Descriptive Data among Safety Climate Questionnaire, Survey of Perceived Organizational Support Measure (SPOS), and Supervisor Ratings of Safety Outcomes

Measure	<i>M</i>	<i>SD</i>	<i>n</i>	<i>α</i>	N of items
SCQ	89.38	12.26	93	.89	21
SPOS	83.20	22.30	92	.96	17
SO	42.58	1.90	78	.57	7

Note: SCQ = Safety Climate Questionnaire. SPOS = Survey of Perceived Organizational Support. SO = Safety Outcomes.

Table 2

Correlations among Safety Climate Questionnaire, Perceived Organizational Support Measure, and Supervisor Ratings of Safety Outcomes

Measure	SCQ	SPOS	SO
SCQ	---	---	---
SPOS	.51**	---	---
SO	.10	.17	---

Note: SCQ = Safety Climate Questionnaire. SPOS = Survey of Perceived Organizational Support. SO = Safety Outcomes. ** = $p < .01$ (2-tailed).

To explore the data even further, a *post hoc* analysis plan was constructed, which separated the sample into two groups based on the safety behavior measure answered by supervisors. This analysis was designed to counteract the relatively low variance in the safety behavior measure, which may have contributed to the non-significant correlations described previously. The sample was separated at the median into *low* (those supervisors reporting a sum of ≤ 42 on the Safety Outcome Questionnaire, $n = 45$), and *high* (those supervisors reporting a sum of > 42 on the Safety Outcome Questionnaire, $n = 33$). Following this restructuring of the data, correlations were calculated to test for mediation on each subsample separately. These results are shown in Table 3 and Table 4.

Table 3

Low End Outcome Group (≤ 42) Correlations among Safety Climate Questionnaire, Perceived Organizational Support Measure, and Supervisor Ratings of Safety Outcomes

Measure	SCQ	POS	SO
SCQ	---	---	---
POS	.47**	---	---
SO	.23	.21	---

Note: SCQ = Safety Climate Questionnaire. POS = Perceived Organizational Support. SO = Safety Outcomes. ** = $p < .01$ (2-tailed).

Table 4

High End Outcome Group (> 42) Pearson r Correlations among Safety Climate Questionnaire, Perceived Organizational Support Measure, and Supervisor Ratings of Safety Outcomes

Measure	SCQ	POS	SO
SCQ	---	---	---
POS	.53**	---	---
SO	.42*	.22	---

Note: SCQ = Safety Climate Questionnaire. POS = Perceived Organizational Support. SO = behavioral safety measure. * = $p < .05$ (2-tailed), ** = $p < .01$ (2-tailed).

Within the high end outcome group (supervisors indicating > 42 on outcome reports), there were significant correlations between the Safety Climate Questionnaire (Sexton & Thomas, 2003) and the SPOS (Eisenberger, et al., 1986). Furthermore, there was a significant correlation between the Safety Climate Questionnaire (Sexton & Thomas, 2003) and the Safety Outcome Questionnaire, suggesting the possibility of a mediated relationship as hypothesized. For the “Low End” Safety Outcome group, correlations were not significant, therefore no further analyses were conducted.

The Baron and Kenny (1986) method for mediation was utilized among the “high-end outcome group.” Step one of a mediated model requires that support for a predictive relationship between the initial variable and the outcome be successfully fulfilled via linear

regression. Because the relationship between the initial variable (Safety Climate) and the outcome variable (Safety Outcomes) were shown to be statistically related, the appropriate prerequisites for a mediated model along “Path C” (e.g. Figure 2) were found thus fulfilling H-1.

Step two of the Baron and Kenny method requires examining the predictive relationship between the initial variable and the mediator via linear regression: thus, the relationship between Safety Climate and POS. This analysis revealed a significant correlation (depicted in Figure 2) via “Path A”, thus showing support for H-2.

Step three utilizing the Baron and Kenny (1986) model was unmet, since the proposed mediator must be shown to be statically related to the outcome variable when controlling for the initial variable via a multiple regression analysis. In this case, the proposed mediator (POS) was not shown to be statistically related to Safety Outcomes when the initial variable (Safety Climate) was controlled for via “Path B” (depicted in Figure 2). Because of this finding, H-3 was unsupported.

Step four in the mediated model found a significant relationship along “C-Prime.” C-Prime, according to Baron and Kenney (1986) poses that the initial variable (Safety Attitudes) and the outcome variable (Safety Outcomes) should show a statistically related relationship when the mediator (POS) is controlled for. Although Safety Attitudes were shown to be statistically related to Safety Outcomes when the mediator (POS) was controlled for, the failure of “step 3” negated the proposed mediated relationship, thus resulting in a lack of support for a fully mediated model (Table 5).

Table 5

Baron & Kenny (1986) Path to Mediation Model Among High End Outcome Group

Step	Path	β	B	SEB	t
1	IV to DV	.42*	.03	.01	2.59
2	IV to mediator	.53**	1.11	.32	3.46
3	Mediator to DV	-.01	.00	.01	-.03
4	IV to DV with mediator in model	C-Prime .42*	.03	.01	2.18

Note: C' = C Prime (e.g. Baron & Kenny, 1986), * = $p < .05$, ** = $p < .01$.

DISCUSSION

The purpose of this study was to find support for a model of safety climate for nurses in the workplace, mediated by POS affecting safety outcomes. It was proposed that this was a likely relationship since attitudes about safety alone are unlikely to fully predict outcomes; instead, the support of the organization is seen as further contributing to this mediated relationship. By first conducting a Pearson's Correlation among the respective measures, the investigator was able to determine whether the possibility of a mediated relationship existed between the initial variable, proposed mediator, and outcome variable. Because significant correlations were found only between Safety Climate and POS (Table 2) the steps required for mediation (Baron & Kenny, 1986) were not met.

In an effort to further examine the possibility of a mediation effect within a portion of the sample, nurses and supervisors were separated into either "high" or "low" safety outcome groups. By conducting a Pearson's Correlation on these individual groups (Table 3 & Table 4) it was found (1) Safety Climate (Sexton & Thomas, 2003) responses and the SPOS (Eisenberger, et al., 1986) responses were significantly correlated within the "high outcome group", and (2) Safety Climate (Sexton & Thomas, 2003) responses and Safety Outcomes were significantly correlated as well within the "high outcome group." The SPOS (Eisenberger, 1986) responses and Safety Outcome responses did not show a significant correlation, however a Pearson's Correlation between the mediator and the outcome variable (Path B) is not sufficient to test for a precursor to mediation (Baron & Kenny, 1986); therefore, a multiple regression analysis was performed on each precursor to further test for the mediated relationship.

By conducting a multiple regression analysis on each of the appropriate paths, e.g. Path C: initial variable Safety Climate Questionnaire (Sexton, et al., 2006) regressed on the outcome variable (the Safety Outcome Questionnaire), Path B: the proposed mediator POS (Eisenberger, et al., 1986) regressed on the outcome variable (Safety Outcome Questionnaire) while controlling for the initial variable, and Path A: the initial variable regressed on the proposed mediator, the investigator was not able to find statistically significant support for a mediated model. Although Paths: A, C, and C-Prime met appropriate significant levels, Path B failed to show any meaningful effects resulting in a lack of statistical support for the proposed mediated model.

The first significant effect found is that of responses to the Safety Climate Questionnaire (Sexton & Thomas, 2003) were significantly correlated with safety outcome responses utilizing both a Pearson Correlation and a regression equation. This effect suggests that Safety Climate within the workplace likely significantly impacts subsequent observable safety behaviors. This result further supports the utilization of the Safety Climate Questionnaire (Sexton & Thomas, 2003) to assess safety climate within the health care setting. Past research (Andrews, et al., 1997; Colla, et al., Firth-Cozens, 2001, Leape et al., 1998, Sexton et al., 2006; Shteynberg, et al., 2005; Thomas et al., 2005) has indicated levels of safety climate have been inherently linked to outcomes since improvements in safety climate scores have been linked to reductions in medication errors as well as shorter lengths of stay. Additionally, high outcomes on the Safety Climate Questionnaire (Sexton & Thomas, 2003) have been linked to low blood-stream infection rates for patients.

The second significant effect found was that responses to the Safety Climate Questionnaire (Sexton & Thomas, 2003) significantly correlated with the SPOS (Eisenberger, et al., 1986) as shown through both Pearson Correlation and a linear regression equation. This result was expected since hospitals as well as clinical areas have the same components (e.g. safety climate, leadership norms, etc.) as other large scale organizations. Because of the similarities to other organizations, the given scales have the effect of measuring the given sample for the presence of these underlying themes.

The partial mediation effect failed to meet all of the steps required for establishing mediation, specifically failing to meet a significant effect along “Path B.” Because of lack of support for this aspect of the mediated model, the data is then seen to be inconsistent with the hypothesis that the variable of POS mediates the Safety Climate – Safety Outcome relationship. A possible explanation for why POS did not affect the outcome variable when Safety Climate was controlled for is that POS had a weak effect on the Safety Climate – Safety Outcome relationship.

Although a mediated model was not supported in this circumstance it is likely this model may be supported in other contexts. Eisenberger, et al. (1990) suggest employee perceptions of how the organization values its employees is deemed as vital for determining the subsequent attitudes or behaviors that emerge from the social exchange relationship. Following this reasoning, the extent to which the facets of safety climate are exhibited by employees’ likely affects the perceptions that they are valued by the organization and this impression may encourage employees to reciprocate by engaging in a greater number of safety behaviors. For example, Wayne, Shore, and Liden (1997) showed that POS was

related to the positive perception of developmental experiences in both formal and informal training. In this context, developmental experiences may illicit higher feelings of safety climate in nurses since these efforts may be viewed as attempting to enhance safety practices.

Limitations

The current study contained some limitations. First, rating bias on the part of the supervisors was a major problem; this effect had the outcome of limiting variance with respect to the outcome measure. The result was a lack of variance with responses clustered on the higher end of the measure which contributed to subsequent low reliability for the Safety Outcome Measure. However, reliability for this measure was expected to be relatively lower since the instrument was created for this study with no opportunity to validate the integrity of the items beforehand. Finally, because a single hospital setting was used that included only a sample of nurses the specific nature of the study may limit the external validity of the findings.

Future Avenues for Research

Future avenues for research include expanding the scope of the current study to incorporate a greater number of nurses as well as their supervisors. By using the various versions of the Safety Attitude Questionnaire (Sexton, et al., 2006) the scope of a future study could also be adapted to serve for additional health care departments as well, such as: Ambulatory, ICU, Labor and Delivery, Operating Room, and Pharmacy. By utilizing these measures as respective initial variables in a mediated model each given clinical area could be administered similar methodological processes to test for the proposed model.

A future study would likely benefit from the use of a previously standardized safety behavior scale, upon examining this avenue several scales show promising relatedness to the scope of the study (e.g. Strickoff, 2000; Reber & Wallin, 1983) and could likely be adapted to serve as the dependent measure in the given mediated relationship.

Because significant correlations were found along “Path C” (Safety Climate and Safety Outcomes) within the “high-outcome group” this relationship suggests support for the notion that subordinate perceptions of safety, at least at the clinical level, are subsequently related to supervisor perceptions of subordinate safety performance. Future avenues may attempt to examine the extent to which this phenomenon occurs at the individual level as well as the team/area level through hierarchical linear regression strategies. Additionally, significant relations were found along “Path A” in both “low” and “high” outcome groups as well, indicating Safety Climate and POS are related at the team/area level. This relationship suggests the degree to which organizations elicit feelings of perceived support from nurses is likely to be related to the safety attitudes felt by nurses as well. Because this relationship is shown to exist, health care organizations may attempt to employ strategies in an effort to increase POS which may have the effect of increasing safety attitudes as well. Furthermore, previous literature has shown safety climate is an important predictor of safety outcomes, therefore any increase in these feelings across employees is likely to minimize negative outcomes, (e.g. medication errors, reporting of errors, efforts to learn from errors, investment of safety initiatives, etc.) thus providing a safer treatment for the patient.

REFERENCES

- Andrews, L. B., Stocking, C., Krizek, T., Gottlieb, L., Krizek, C., Vargish, T., & Siegler, M. (1997). An alternative strategy for studying adverse events in medical care. *The Lancet*, *349*(9048), 309-313.
- Baron, R., & Kenny, D. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182.
- Chadwick-Jones, J. K., Brown, C. A., & Nicholson, N. (1982). *The social psychology of absenteeism*. New York: Praeger.
- Colla, J. B., Bracken, A. C., Kinney, L. M., & Weeks, W. B. (2005). Measuring patient safety climate: a review of surveys. *Quality Safety in Health Care*, *14*, 364-366.
- Cook, R. I., Render, M., & Woods, D. D. (2000). Gaps in the continuity of care and progress on patient safety. *British Medical Journal*, *320*, 791-794.
- Cox, S., Flin, R. (1998). Safety culture: philosopher's stone or man of straw? *Work & Stress*, *12*(3), 189-201.
- Eisenberger, R., Armeli, S., Rexwinkel, B., Lynch, P.D., Rhoades, L. (2001). Reciprocation of perceived organizational support. *Journal of Applied Psychology*, *86*(1), 42-51.
- Eisenberger, R., Cummings, J., Armeli, S., & Lynch, P. (1997). Perceived organizational support, discretionary treatment, and job satisfaction. *Journal of Applied Psychology*, *82*(5), 812-820.

- Eisenberger, R., Fasolo, P. M., & Davis-LaMastro, V. (1990). Effects of perceived organizational support on employee diligence, innovation, and commitment. *Journal of Applied Psychology, 53*, 51-59.
- Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology, 82*(5), 500-507.
- Eisenberger, R., Stinglhamber, F., Vandenberghe, C., Sucharski, I., & Rhoades, L. (2002). Perceived supervisor support: Contributions to perceived organizational support and employee retention. *Journal of Applied Psychology, 87*(3), 565-573.
- Firth-Cozens, J. (2001). Cultures for improving patient safety through learning: the role of teamwork. *Quality in Health Care, 10*, ii26-ii31.
- Flin, R., Mearns, K., O'Connor, P., & Bryden, R. (2000). Measuring safety climate: identifying the common features. *Safety Science, 34*, 177-192.
- George, J. M., Reed, T. F., Ballard, K. A., Colin, J. & Fielding, J. (1993). Contact with AIDS patients as source of work-related distress: effects of organizational and social support. *Academy of Management Journal, 36*, 157-171.
- Hale, A., Hovden, J., 1998. Management and culture: the third age of safety. A review of approaches to organisational aspects of safety, health and environment. In: Feyer, A., Williamson, A. (Eds.), *Occupational Injury: Risk Prevention and Intervention*. Taylor & Francis, London, pp. 129-165.
- Helmreich, R. L., & Merritt, A. C. (1998). *Culture at work in aviation and medicine: national, organizational, and professional influences*. Aldershot, UK: Ashgate.

- Helmreich, R. L., Merritt, A. C., Sherman, P. J., Gregorich, S. E., & Wiener, E. L. (1993). *The flight management attitudes questionnaire (fmaq)*. University of Texas. Austin: NASA/UT/FAA.
- Hrebiniack, L. G. (1974). Effects of job level and participation on employee attitudes and perceptions of influence. *Academy of Management Journal*, 17(4), 649-662.
- Kath, L. M., Marks, K. M., & Ranney, J. (2010). Safety climate dimensions, leader-member exchange, and organizational support as predictors of upward safety communication in a sample of rail industry workers. *Safety Science*, 45(5), 643-650.
- Kenny, D. A. (2009). Mediation: Issues and questions [WWW page].URL <http://www.davidakenny.net/cm/mediate.htm>.
- Kottke, J. L., Sharafinski, C. E. (1988). Measuring perceived supervisory and organizational support. *Educational and Psychological Measurement*, 48, 1075-1079.
- Leape, L. L., Woods, D. D., Hatlie, M. J., Kizer, K. W., Schroeder, S. A., & Lundberg, G. D. (1998). Promoting patient safety by preventing medical error. *Journal of the American Medical Association*, 280, 1444-1447.
- Levinson, H. (1965). Reciprocation: the relationship between man and organization. *Administrative Science Quarterly*, 9(4), 370-390.
- Malatesta, R. M. (1995). *Understanding the dynamics of organizational and supervisory commitment using a social exchange framework*. Unpublished doctoral dissertation, Wayne State University.
- Mowday, R. T., Porter, L. W., & Steers, R. M. (1982). *Employee-organization linkages*. New York: Academic Press.

- Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior, 14*(2), 223-247.
- Nieva, V. F., Sorra, J. Safety culture assessment: a tool for improving patient safety in healthcare organizations. *Quality Safety in Health Care 2003, 12* (II), ii17–23.
- Porter, L. W., Steers, R. M., Mowday, R. T., & Boulian, P. (1974). Organizational commitment, job satisfaction, and turnover among psychiatric technicians. *Journal of Applied Psychology, 59*(5), 603-609.
- Pronovost, P. J., Weast, B., Holzmueller, C. G., Rosenstein, B. J., Kidwell, R. P., Haller, K. B., Feroli, E. R., Sexton, J. B., & Rubin, H. R. (2003). Evaluation of the culture of safety: survey of clinicians and managers in an academic medical center. *Quality Safety in Health Care, 12*, 405-410.
- Reber, R. A. & Wallin, J. A. (1983). Validation of a behavioral measure of occupational safety. *Journal of Organizational Behavior Management, 5*(2), 69-78.
- Reilly, R. R., & Aronson, Z. H. (2009). Managing contextual performance. In J.W. Smither & M. London (Ed.), *Performance Management* (pp. 297-328). San Francisco, CA: John Wiley & Sons.
- Rhoades, L., & Eisenberger, R. (2002). Perceived organizational support: a review of the literature. *Journal of Applied Psychology, 87*(4), 698-714.
- Schneider, B., Gunnarson, S., 1991. Organizational climate and culture: the psychology of the workplace. In: Steffy, J., Bray, D. (Eds.), *Applying Psychology in Business*. Lexington, MA, pp. 542-551.

- Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J., Roberts P.R., & Thomas E.J. (2006). The safety attitudes questionnaire: psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research*.
- Sexton J. B., & Thomas E. J. (2003). *The Safety Climate Survey: psychometric and benchmarking properties*. (Technical Report 03-03). Austin, TX: The University of Texas Center of Excellence for Patient Safety Research and Practice.
- Sexton, J. B., Thomas, E. J., & Grillo, S. P. (2003). *The safety attitudes questionnaire (SAQ) guidelines for administration*. Austin, TX: The University of Texas Center of Excellence for Patient Safety Research and Practice.
- Sexton, J. B., Thomas, E. J., & Helmreich, R. L. (2000). Error, stress, and teamwork in medicine and aviation: cross sectional surveys. *British Medical Journal*, 320, 745-749.
- Shore, L. M., & Tetrick, L. E. (1991). A construct validity study of the Survey of Perceived Organizational Support. *Journal of Applied Psychology*, 76, 637–643.
- Shteynberg, G., Sexton, J. B., & Thomas, E. J. (2005) *Test Retest Reliability of the Safety Climate Scale*. (Technical Report 01-05). The University of Texas Center of Excellence for Patient Safety Research and Practice.
- Singer, S. J., Gaba, D. M., Geppert, J. J., Sinaiko, A. D., Howard, S. K., & Park, K. C. (2003). The culture of safety: results of an organization-wide survey in 15 california hospitals. *Quality Safety in Health Care*, 12, 112-118.

- Stricoff, R. (2000). Safety performance measurement: identifying prospective indicators with high validity. *Professional Safety*, 45(1), 36.
- Thomas, E. J., Sexton, J. B., & Helmreich, R. L. (2003). Discrepant attitudes about teamwork among critical care nurses and physicians. *Critical Care Medicine*, 31(3), 956-959.
- Thomas, E. J., Sexton, J. B., Neilands, T. B., Frankel, A., & Helmreich, R. L. (2005). The effect of executive walk rounds on nurse safety climate attitudes: a randomized trial of clinical units. *BMC Health Services Research*, 5(28).
- Vincent, C., Taylor-Adams, S., & Stanhope, N. (1998). Framework for analyzing risk and safety in clinical medicine. *British Medical Journal*, 316, 1154-1157.
- Waterson, P. (2008, June). *The Systems Approach to Patient Safety: Progress and Gaps in Our Understanding*. Poster session presented at the Health Ergonomics and Patient Safety International Conference, Strasbourg (France).
- Wayne, S. J., Shore, L. M., & Liden, R. C. 1997. Perceived organizational support and leader-member exchange: A social exchange perspective. *Academy of Management Journal*, 40, 82-111.

APPENDIX A

SAFETY CLIMATE QUESTIONNAIRE

Items were scored utilizing a 5-point Likert-type scale ranging from “Disagree Strongly” to “Agree Strongly”, “Not Applicable” was allowed as an option as well. Items 1-21 included items pertaining to safety climate while items 22-28 included items regarding demographics and open ended unit title/location.

**Please answer the following items with respect to your specific unit or clinical area.
Choose your responses using the scale below:**

1. The culture of this clinical area makes it easy to learn from the mistakes of others.
 - Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable

2. Medical Errors are handled appropriately in this clinical area.
 - Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable

3. The senior leaders in my hospital listen to me and care about my concerns.
 - Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable

4. The physician and nurse leaders in my area listen to me and care about my concerns.
 - Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable

5. Leadership is driving us to be a safety-centered institution.
- Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable
6. My suggestions about safety would be acted upon if I expressed them to management.
- Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable
7. Management/Leadership does not knowingly compromise safety concerns for productivity.
- Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable
8. I am encouraged by my colleagues to report any patient safety concerns I may have.
- Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable
9. I know the proper channels to direct questions regarding patient safety.
- Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable

10. I receive appropriate feedback about my performance.

- Disagree Strongly
- Disagree Slightly
- Neutral
- Agree Slightly
- Agree Strongly
- Not Applicable

11. I would feel safe being treated here as a patient

- Disagree Strongly
- Disagree Slightly
- Neutral
- Agree Slightly
- Agree Strongly
- Not Applicable

12. Briefing personnel before the start of a shift (i.e., to plan for possible contingencies) is an important part of patient safety.

- Disagree Strongly
- Disagree Slightly
- Neutral
- Agree Slightly
- Agree Strongly
- Not Applicable

13. Briefings are common here.

- Disagree Strongly
- Disagree Slightly
- Neutral
- Agree Slightly
- Agree Strongly
- Not Applicable

14. I am satisfied with the availability of clinical PHYSICIAN leadership.

- Disagree Strongly
- Disagree Slightly
- Neutral
- Agree Slightly
- Agree Strongly
- Not Applicable

15. I am satisfied with the availability of clinical NURSING leadership.
- Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable
16. I am satisfied with the availability of clinical PHARMACY leadership.
- Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable
17. This institution is doing more for patient safety now, than it did one year ago.
- Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable
18. I believe that most adverse events occur as a result of multiple system failures, and are not attributable to one individual's actions.
- Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable
19. The personnel in this clinical area take responsibility for patient safety.
- Disagree Strongly
 - Disagree Slightly
 - Neutral
 - Agree Slightly
 - Agree Strongly
 - Not Applicable

20. Personnel frequently disregard rules or guidelines that are established for this clinical area.

- Disagree Strongly
- Disagree Slightly
- Neutral
- Agree Slightly
- Agree Strongly
- Not Applicable

21. Patient safety is constantly reinforced as the priority in this clinical area.

- Disagree Strongly
- Disagree Slightly
- Neutral
- Agree Slightly
- Agree Strongly
- Not Applicable

22. Have you ever completed this survey before?

- Yes
- No
- Don't Know

BACKGROUND INFORMATION

23. Job Position: (mark only one).

- Attending/Staff Physician
- Registered Nurse
- Dietician
- Fellow Physician
- Nurse Manager/Charge Nurse
- Support Associate
- Resident Physician
- Resident Physician
- LVN
- Medical Administrator
- Pharmacists
- Respiratory Therapist
- Technicians (e.g., EKG, Lab, Radiology)
- PT/OT/Speech
- Other

24. Experience in position

- Less than 6months
- 6 to 11months
- 1 to 2yrs
- 3 to 7yrs
- 8 to 12yrs
- 13 to 20yrs
- 21 or over

25. Experience in specialty

- Less than 6 months
- 6 to 11months
- 1 to 2yrs
- 3 to 7yrs
- 8 to 12yrs
- 13 to 20yrs
- 21 or over

26. Experience in organization

- less than 6 months
- 6 to 11months
- 1 to 2yrs
- 3 to 7yrs
- 8 to 12yrs
- 13 to 20yrs
- 21 or over

27. Age

- less than 30
- 30 to 34
- 35 to 39
- 40 to 44
- 45 or over

28. Unit (please write in title and/or location):

APPENDIX B

SURVEY OF PERCEIVED ORGANIZATIONAL SUPPORT (SPOS) (17-ITEM SCALE)

The short version of POS measure were scored utilizing a 7-point Likert-type scale where 1 = strongly disagree and 7= strongly agree. Items: 2, 3, 5, 6, 10, 13, and 14 were reverse scored. All questions were then summed to produce the POS measure.

Listed below is a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. With respect to your own feelings about the particular organization for which you are now working, please indicate the degree of your agreement or disagreement with each statement by checking one of the several alternatives below each statement.

1. The organization values my contribution to its well-being.
(1) (2) (3) (4) (5) (6) (7)
- *2. If the organization could hire someone to replace me at a lower salary it would do so.
(1) (2) (3) (4) (5) (6) (7)
- *3. The organization fails to appreciate any extra effort from me
(1) (2) (3) (4) (5) (6) (7)
4. The organization strongly considers my goals and values.
(1) (2) (3) (4) (5) (6) (7)
- *5. The organization would ignore any complaint from me
(1) (2) (3) (4) (5) (6) (7)
- *6. The organization disregards my best interests when it makes decisions that affect me.
(1) (2) (3) (4) (5) (6) (7)
7. Help is available from the organization when I have a problem.
(1) (2) (3) (4) (5) (6) (7)
8. The organization really cares about my well-being.
(1) (2) (3) (4) (5) (6) (7)
9. The organization is willing to extend itself in order to help me perform my job to the best of my ability.
(1) (2) (3) (4) (5) (6) (7)

- *10. Even if I did the best job possible, the organization would fail to notice.
(1) (2) (3) (4) (5) (6) (7)
11. The organization is willing to help me when I need a special favor
(1) (2) (3) (4) (5) (6) (7)
12. The organization cares about my general satisfaction at work.
(1) (2) (3) (4) (5) (6) (7)
- *13. If given the opportunity, the organization would take advantage of me.
(1) (2) (3) (4) (5) (6) (7)
- *14. The organization shows very little concern for me.
(1) (2) (3) (4) (5) (6) (7)
15. The organization cares about my opinions
(1) (2) (3) (4) (5) (6) (7)
16. The organization takes pride in my accomplishments at work.
(1) (2) (3) (4) (5) (6) (7)
17. The organization tries to make my job as interesting as possible.
(1) (2) (3) (4) (5) (6) (7)

Note: * Indicates item was reverse scored

APPENDIX C

SAFETY OUTCOMES: SUPERVISOR QUESTIONNAIRE

The short version of POS measure were scored utilizing a 7-point Likert-type scale where 1 = Mostly False and 7= Mostly True.

For the following questions think about one of the nursing subordinates working under your supervision. Please rate on the given scale the extent to which you believe the given individual performs the given behavior. Please complete a separate questionnaire for each subordinate within your clinical area.

1. The given nurse in my clinical area makes an obvious effort to learn from errors that occur.
(1) (2) (3) (4) (5) (6) (7)
Mostly False.....Mostly True

2. The given nurse under my supervision handles medical errors according to hospital policy.
(1) (2) (3) (4) (5) (6) (7)
Mostly False.....Mostly True

3. The given nurse often gives me suggestions or observations concerning patient safety.
(1) (2) (3) (4) (5) (6) (7)
Mostly False.....Mostly True

4. The nurses under my supervision rarely sacrifice safety for other pressing factors, such as speed.
(1) (2) (3) (4) (5) (6) (7)
Mostly False.....Mostly True

5. The nurse under my supervision utilizes the proper channels when reporting information about patient safety incidents.
(1) (2) (3) (4) (5) (6) (7)
Mostly False.....Mostly True

6. The given nurse under my supervision is wholly engaged and invested in the patient safety initiatives our facility implements.

(1) (2) (3) (4) (5) (6) (7)
Mostly False.....Mostly True

7. The given nurse under my supervision makes it clear that he/she trusts me to support his or her patient safety efforts.

(1) (2) (3) (4) (5) (6) (7)
Mostly False.....Mostly True

APPENDIX D
DEMOGRAPHICS AMONG NURSES

Item	Frequency	Percent
Job Position		
Registered Nurse	35	35.7%
Nurse Manager/Charge Nurse	15	15.3%
Support Associate	4	4.1%
LVN	10	10.2%
Technicians	3	3.1%
PT/OT/Speech	1	1%
Other	25	25.5%
Missing	5	5.1%
Experience in Position		
< 6 Months	8	8.2%
6 – 11 Months	14	14.3%
1 – 2 Years	10	10.2%
3 – 7 Years	26	26.5%
8 – 12 Years	3	3.1%
13 – 20 Years	12	12.2%
21 + Years	20	20.4%
Missing	5	5.1%

Experience in Specialty

< 6 Months	18	18.4%
6 – 11 Months	4	4.1%
1 – 2 Years	10	10.2%
3 – 7 Years	23	23.5%
8 – 12 Years	8	8.2%
13 – 20 Years	16	16.3%
21 + Years	14	14.3%
Missing	5	5.1%

Experience in Organization

< 6 Months	16	16.3%
6 – 11 Months	6	6.1%
1 – 2 Years	7	7.1%
3 – 7 Years	25	25.5%
8 – 12 Years	8	8.2%
13 – 20 Years	14	14.3%
21 + Years	17	17.3%
Missing	5	5.1%

Age

< 30 Years	18	18.4%
30 – 34 Years	10	10.2%

35 – 39 Years	14	14.3%
40 – 44 years	9	9.2%
45 + Years	42	42.9%
Missing	5	5.1%

Note: PT = Physical Therapy, OT = Occupational Therapy, LVN = Licensed Vocational

Nurse

VITA

Steven Philip Apodaca was born in Houston, Texas in January, 1986. He grew up in La Porte, Texas and graduated from La Porte High School in 2004. He earned a Bachelor of Science from the University of Houston in 2008; double majoring in Psychology and Political Science, and Master of Science in Industrial-Organizational Psychology from Angelo State University in 2010. During Steven's time at San Angelo State University he was President of Graduate Student Psychological Association (GSPA), Treasurer of Psi Chi; the National Honor Society in Psychology, a member of Southern Management Association, and a member of SIOP – the Society for Industrial-Organizational Psychology. Steven has experience working at Angelo State University as a graduate assistant and teaching at the undergraduate level as a teaching assistant.

Permanent address: 10916 E. Idlewood Ct.

La Porte, TX 77571