ORGANIZATIONAL JUSTICE, COMFORT WITH SAFETY REPORTING, AND PERCEPTIONS OF HOSPITAL SAFETY: AN ANALYSIS USING A STRUCTURAL EQUATION APPROACH

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Abstract

Patient safety in healthcare has become a national objective. Hospital safety concerns are not isolated to patient safety, occupational safety is also important. One initiative adopted by healthcare is improving patient safety climate – shifting from one of a "no harm, no foul" approach to a culture of learning that encourages the reporting of errors, even those in which patient harm does not occur. Lacking from the literature, however, is an understanding of how to encourage reporting and how safety perceptions are formed among hospital employees. In addition, although safety-related reporting and safety perceptions are deemed important, the majority of research has been conducted in nursing populations. In order to create a safer hospital, it is crucial to investigate safety-related reporting and safety perceptions among all hospital employees.

The purpose of this cross-sectional study is to test and refine a model that explains the influence of perceived procedural justice, interpersonal justice, informational justice, and distributive justice on comfort with safety-related reporting and, ultimately, hospital safety perceptions among hospital employees.

The proposed model was tested on a sample of 652 hospital employees from a regional children's hospital with a 76% return rate. Consistent with the hypothesized model, perceptions of higher interpersonal justice predicted higher comfort with safety reporting, which in turn predicted perceptions of hospital safety. In addition, comfort with safety reporting, interpersonal justice, and informational justice contributed directly to the prediction of hospital safety perceptions.

This study illustrates why different dimensions of organizational justice, specifically interpersonal justice and informational justice, should be considered above and beyond safety-specific climate when individuals are intent on improving hospital safety. Thus, hospital managers and administrators should enhance interpersonal justice along with comfort with safety-related reporting and informational justice to create a safer hospital. Study limitations and recommendations for new research methods and areas are discussed.

Dedication

I lovingly dedicate this thesis to my parents, who supported me each step of the way.

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Chapter 1: Introduction and Study Purposes

In this thesis, the influence of perceived organizational justice on level of comfort to engage in safety-related reporting, and ultimately on hospital safety perceptions among hospital employees is explored.

In an effort to protect both patients and staff, laws, regulations, and governing agencies have been developed. However, despite various safety laws and regulations for health service organizations, a significant number of incidents continue to occur each year. The widely recognized Institute of Medicine report entitled "To Err is Human" estimates that between 44,000 to 98,000 Americans are thought to be harmed as a result of medical errors each year (Kohn, Corrigan, & Donaldson, 2000). Furthermore, studies suggest that preventable adverse events are a leading cause of death in Canada (The Canadian Adverse Events Study, 2004) and the United States (Kohn, Corrigan, & Donaldson, 1999).

A health professional's behavioral involvement in patient safety is critical in ensuring safety and quality in delivering healthcare. Behavioral involvement in patient safety is defined as "specific actions or working behaviors which are practically enacted by frontline health care professionals to ensure patient safety" (Chiang, Lin, Hsiao, & Chang, 2012, p1). A hospital employee's involvement is defined as a safety buffer to lack of enthusiasm to report, ineffectual quality improvement from reported data, and inefficiency of feedback regarding errors. Lacking employee's involvement threatens incident reporting mechanisms and patient safety improvement in both Canada and the United States (Iedema, Flabouris, Grant, & Jorm, 2006).

To avoid harmful events happening in hospital, it is essential that hospital leaders create a culture of safety among their staff (Nieva & Sorra, 2003). In addition, to further create a non-punitive environment, Weiner, Hobgood, and Lewis (2008) proposed a conceptual framework that explores the extent to which having a "just culture" influences safety incident reporting. Weiner et al. (2008) hypothesized that perceptions of "justice" could influence a healthcare employee's willingness to engage in unrewarded safety behavior, such as providing safety-related suggestions.

Organizational justice is defined as a multidimensional social construct that refers to perceptions of fairness in the workplace (Colquitt et al., 2005). Organizational justice has been classified into four types: distributive justice (based on outcome), procedural justice (based on process), interpersonal justice (based on personal treatment), and informational justice (derived from data-based explanations of decisions) (Greenberg & Colquitt, 2005). Each dimension of organizational justice has been found to correlate with attendance, mental health, physical health, performance, intention to quit, loyalty, and corporate citizenship (Colquitt et al., 2005). The relationship between different dimensions of organizational justice and level of comfort to perform safety reporting, however, remains unclear.

Scholars have found that safety behavior, such as incident reporting, is one of the best indicators of hospital safety (Hutchinson, Young, Cooper, McIntosh, Karnon, Scobie, & Thomson, 2009). Given the effect that safety reporting has on improving hospital safety, it is crucial to study the relative importance of different factors, for example, each dimension of organizational justice, on safety-related reporting behaviors among hospital

employees. The literature regarding the concepts of procedural justice, interpersonal justice, informational justice, distributive justice, safety reporting, and safety climate perceptions is reviewed and the importance of this topic is highlighted in the next chapter.

Study Purpose

The primary purpose of this study is to test and refine a model that describes the influence of perceived procedural justice, interpersonal justice, informational justice, and distributive justice on comfort with safety-related reporting and, ultimately, hospital safety perceptions.

Chapter 2: Literature Review

This literature review examines theoretical and empirical studies of the influence of procedural justice, interpersonal justice, informational justice, and distributive justice on safety behaviors and safety perceptions. The objective of this review is to describe the current state of knowledge on how organizational justice, in its various dimensions, influences safety behaviors (e.g., reporting behaviors) and safety perceptions among employees. Gaps in the research are identified, and an explanation of how this study will address the link between organizational justice and safety perception will be discussed.

Safety in Hospitals

The risk of adverse outcomes to hospital employees and patients has been featured in both research and the media. Hospitals are acknowledged as potentially high risk environments that should be of concern both to its employees as well as the general public (Hutchinson et al., 2006; Hutchinson, Young, Cooper, McIntosh, Karnon, Scobie, & Thomson, 2009a; Kho, Carbone, Lucas, & Cook, 2005). The focus of research and media on patient safety has intensified since the Institute of Medicine of the National Academies (IOM) released its report, "To Err is Human" (Kohn, Corrigan, & Donaldson, 2000), reporting that between 44,000 and 98,000 patients in the United States die from medical errors each year. The Canadian Adverse Events Study (2004) estimates that approximately 23,750 (7.5%) of deaths from adverse events in a year could have been prevented (Baker et al., 2004). In both studies, adverse events were defined as unintended injuries or complications resulting in death, disability or prolonged hospital stays that

arise from health care management, such as medication errors, and falls (Baker et al., 2004).

Hospital safety concerns include not only patient safety, but also the safety requirements of staff. Safe patients, safe workers, and safe systems are inter-related and interconnected (Goodman, 2003). Occupational injuries, for example, have a significant impact on a staff's ability to provide safe patient care. Nurses have the highest rate of back and other musculoskeletal injuries of all occupations, resulting in a median loss of five days of sick time per episode (Trinkoff, Lipscomb, Geiger‐Brown, & Brady, 2002). Furthermore, the quality of work environments has been associated with absenteeism, emotional exhaustion and intention to quit (Riolli & Savicki, 2006; Shannon et al., 2001; Shannon, Robson, & Sale, 2001; Stone, Du, & Gershon, 2007) which further compounds the health professional shortage and the ability of health service organizations to provide quality patient care.

Safety Culture & Safety Climate

To avoid harm to staff and patients, it is essential that hospital leaders create a culture of safety among their staff (Nieva & Sorra, 2003). Based primarily on the research revolving around organizational culture, the term "safety culture" did not receive much attention until the late 1980's when it was raised into awareness by the Chernobyl disaster (Glendon & Stanton, 2000). It was cited, for the first time, that a poor safety culture contributed to this catastrophe (Zhang, Wiegmann, von Thaden, Sharma, & Mitchell, 2002). The Institute of Occupational Safety and Health (1994), after extensive reviews,

defines "safety culture" as (1) aspects of organizational culture that relate to safety (e.g., policies), (2) common values, beliefs, attitudes, and behaviors regarding safety, and (3) the joint values, attitudes, competencies, and behaviors of individuals and groups that establishes an organization's commitment to its safety program (Glendon & Stanton, 2000). Based on this definition, it is clear that safety culture relates to the *practices* and *attitudes* of both individual hospital staff and the organizations that deliver health services. In short, safety culture is recognized as a higher-level construct, which ultimately influences safety climate.

An organization's commitment to safety is manifested through its values, and these values translate to the organization's safety culture. The safety culture is then observable through the actions and attitudes of management and employees. Safety climate, in comparison to safety culture, is defined as an individual's shared *perceptions* of policies, procedures, and practices relating to safety in the workplace (Zohar, 1980). Specifically, safety climate reflects the employee's perceptions of the safety of policies, procedures, and practices in use within an organization, acting as a frame of reference for their behaviors and attitudes (Clarke, 2006; Mearns, Flin, Gordon, & Fleming, 2001; Zohar, Livne, Tenne-Gazit, Admi, & Donchin, 2007). Appendix 1 summarizes the key differences between safety culture and safety climate. Unlike safety culture, which was derived from the literature regarding organizational culture, safety climate is rooted more in empirical research (Glendon & Stanton, 2000; Brown & Holmes, 1986) and is most often assessed by questionnaires attempting to get at certain safety dimensions.

Lundstrom and colleagues (2002) identified six organizational dimensions of a hospital safety climate: (1) senior management support for safety programs; (2) absence of workplace barriers to safe work practices; (3) cleanliness and orderliness of the worksite; (4) minimal conflict and good communication among staff members; (5) frequent safety-related feedback/training by supervisors; and (6) the availability of personal protective equipment and engineering controls (Lundstrom, Pugliese, Bartley, Cox, & Guither, 2002).

Considering the evidence, researchers argued that the most important dimensions of hospital safety climate are management commitment and safety performance feedback from managers and coworkers (Lundstrom et al., 2002). Employees need to feel that administration is concerned about their safety, supports their safety efforts, and learns from errors to improve the system (Lundstrom et al., 2002). Considerable safety climate research has been done in other industries with the focus solely on occupational safety (Geldart, Smith, Shannon, & Lohfeld, 2010). Health care, however, is faced with a dual responsibility: the safety of patients and the safety of employees. Therefore, research on safety-climate outcomes in both patients and employees will be addressed below.

Safety Climate Outcomes

Despite a handful of studies examining scales to measure safety climate in health care (Flin, 2007), an emerging body of literature has begun to empirically link safety climate to patient outcomes (Vogus & Sutcliffe, 2007). Findings from industry research suggested that a positive safety climate decreases occupational injuries (Geldart, Smith,

Shannon, & Lohfeld, 2010). Therefore, it is reasonable to assume similar effects in health care settings. Studies in health care investigating patient safety outcomes have predominantly studied medication errors (Hofmann & Mark, 2006; Vogus & Sutcliffe, 2007) or barriers to error reporting (Chiang & Pepper, 2006).

Hofmann and Mark (2006) utilized a broad view of safety climate which included openness and constructive responses to errors in their study of 1127 nurses from 81 medical-surgical units in 42 randomly selected acute care hospitals throughout the United States. Both nurse and patient outcomes were examined. Specifically, patient outcomes included medical errors that resulted in deaths as well as urinary tract infections, patient satisfaction, and perceptions of nurse responsiveness. Findings from this study suggested that the overall positive safety climate of the unit significantly predicted fewer medication errors, fewer urinary tract infections, and higher patient perceptions of nurse responsiveness (Hofmann & Mark, 2006). The relationship between medication errors and safety climate was strongest when coupled with complex patient conditions, strongly suggesting that a positive safety climate is key as patient needs become more complex (Hofmann & Mark, 2006).

Using a newly developed self-report measure designed to capture behaviors and perceptions that underlie a culture of safety (e.g., safety climate), Vogus and Sutcliffe (2007) examined the association of safety climate with reported medication errors and patient falls. Participants were drawn from a convenience sample of 13 private, non-profit Catholic hospitals of various sizes across the United States. A total of 1685 registered nurses from 125 nursing units completed the survey. This study also included variables on

trust in managers and organizational commitment. Medication errors and falls for each unit over a 6-month period were collected through incident reports. Findings revealed that safety climate was positively correlated with theorized antecedents of trust and commitment and negatively related to medication errors and falls (Vogus & Sutcliffe, 2007).

A number of outcome measures have been used to determine the effects of occupational safety climate including minor injuries not resulting in lost days (Zohar, 2000), injuries (Michael et al., 2005), safety compliance (Neal, Griffin, & Hart, 2000), and safety participation among nurses (Hofmann et al., 2003). In health care, positive safety climate has been associated with decreased nurse back injuries (Hofmann & Mark, 2006), reduced needle stick injuries (Clarke, Rockett, Sloane, & Aitken, 2002), and less emotional exhaustion among 600 acute care registered nurses (Squires, Tourangeau, Laschinger, & Doran, 2010).

In short, despite the fact that studies utilized different safety climate measures, the general findings support a reverse relationship between safety climate and both adverse patient and healthcare employee events.

Safety Behaviors

In addition to safety climate, researchers also argue the importance of understanding safety behaviors among leaders and employees. Safety behaviors, based on Borman and Motowidlo's (1993) classification, could be differentiated into two types: compliance and participation (Borman & Motowidlo, 1993). Safety compliance refers to the core

activities that individuals need to carry out to maintain workplace safety (Neal & Griffin, 2006). These behaviors include adhering to standard procedures and using necessary protective equipment. Safety participation describes behaviors that do not directly contribute to an individual's personal safety, but do help in developing an environment that supports safety (Neal & Griffin, 2006). These behaviors include participating in voluntary safety training, helping coworkers with safety-related issues, and attending safety-related meetings.

There is limited research on the specific nature of the relationship between perceived supervisor practices and safety performance (Squires et al., 2010). Available results, however, support the idea that supervisors are one of the most influential factors on employee behaviors (Squires et al., 2010). An entire domain of research exists on how leadership influences employee behavior (Squires et al., 2010). However, a small amount of this research discusses the relationship in a safety context, and specifically looks at the relationship in terms of safety performance (Squires et al., 2010). Other researchers suggest that the relationship between supervisors and employees, and the influence of supervisors over employee behavior can be explained by Social Exchange Theory (Cropanzano & Mitchell, 2005), which stipulates that employees feel obligated to reciprocal high quality interactions on behalf of a leader. Hofmann and Morgeson (1999) based their study on the hypothesis that employees will feel obligated to engage in reciprocal safety behaviors when they encounter high quality leader-member exchanges and perceived organizational support (Hofmann & Morgeson, 1999). High quality of interaction is defined as the perception that benefits (e.g., financial gains, social status, or

emotion comfort) outweigh costs (e.g., sacrifices of time, money or emotion discomfort) (Hofmann & Morgeson, 1999). Past research has shown positive correlations between high quality leader-member exchanges and an employee's communication and commitment (Cho & Ringquist, 2011; Cogliser, Schriesheim, Scandura, & Gardner, 2009). In other words, employees who reported a higher quality of leader-member exchanges and perceived organizational support were more likely to engage in safety-related communication (e.g., raising safety concerns) (Hofmann & Morgeson, 1999).

Organizational processes, such as error reporting, have been found to be one of the critical factors that influence safety perceptions among nurses and physicians (Mwachofi, Walston, & Al-Omar, 2011; Throckmorton & Etchegaray, 2007; Schectman & Plews-Ogan, 2006). Badir and Herdman (2008) examined critical care nurses' patient safety perceptions in Turkish public, private, and teaching hospitals. The study found that private hospitals had more quality management and patient safety programs, and were more likely to encourage adverse event reporting than did public and teaching hospitals (Badir & Herdman, 2008). In addition, these private hospitals were also more likely to have punitive responses to reported errors compared to public and teaching hospitals (Badir & Herdman, 2008). A Korean research group studying eight teaching hospitals noted that most nurses were not comfortable reporting errors or communicating safety concerns (Kim, An, Kim, & Yoon, 2007). In a study that involved 26 nursing homes in the United States, Hughes and Lapane (2006) found that 40 percent of nurses felt reporting errors was seen as a personal attack, and found it difficult to effect safety improvement (Hughes & Lapane, 2006). Schectman and Plews-Ogan (2006) found that

while 60% of a sample of 120 physicians had witnessed at least three adverse events or near misses, 65% did not make any adverse event or near miss reports. Uncertainty about reporting needs and mechanisms, concern about time required, and lack of physician involvement in the system were all important reasons for failure to report.

In addition, these reporting barriers were shown to negatively associate with respondent's perception of safety (Schectman & Plews-Ogan, 2006). Concern about being blamed or judged less competent (or similar consequences) by others were also considered barriers to reporting. In short, previous studies have illustrated a number of issues that prevented health care providers from engaging in safety-related behaviors, specifically in reporting adverse events.

To achieve a safe environment for patients and hospital employees, psychological safety is essential; meaning that the environment must be conducive for one to voice concerns and ask for help knowing that the response will always be respectful and prompt (Flemons & McRae, 2012; Frankel, Leonard, & Denham, 2006). Unless respect is the basic tenet of the culture, employees will hesitate to voice a concern and avoidable harm will occur (Frankel et al., 2006). An organization with a fair and just culture openly examines its weaknesses and learns from its mistakes. An essential element of this climate is for employees to feel that they are supported and safe when voicing concerns (Max, 2001). To date, no studies have directly examined how perceived fairness influences the level of comfort for employees to engage in certain safety-related behaviors (e.g. reporting unsafe practices or errors) in a hospital.

Organizational Justice

Organizational justice is defined as a multidimensional social construct that refers to perceptions of fairness in the workplace (Colquitt et al., 2005). A number of research studies have explored the connection between employee's perceptions of workplace justice, which may or may not impact their job satisfaction and commitment behaviors (Colquitt, Greenberg, & Zapata-Phelan, 2005; Colquitt, Conlon, Wesson, Porter, & Ng, 2001). Differences in individual perceptions of organizational justice likely play a role in employee-employer relationships within organizations. For example, if an individual perceives a situation to be fair, then one could expect a positive outcome. Similarly, when hospital leaders support and promote organizational justice within their hospitals, their actions are thought to influence an employee's level of commitment to the organization, which may further lead to increased patient safety.

Distributive justice refers to the overall reward and recognition system in an organization (Colquitt et al., 2005). According to Equity Theory, there should be a balance between the inputs and outputs (Adam, 1965), such as the wages an employee receives for the work accomplished. Monetary reward, however, is only one aspect of the balance. A balance between what one puts in and what one receives as the output will impact an individual's motivation and performance. In other words, an individual's perception of an unbalanced relationship may negatively influence their behaviors toward the organization (Zafirovski, 2003). Unfortunately, Adam's Equity Theory received significant criticism, as it was unable to explain other aspects of an individual's justice

perceptions (Cohen-Charash & Spector, 2001). Researchers have begun exploring other factors influencing an individual's perception of fairness within the workplace.

Procedural justice refers to the fairness of the process used in determining outcomes and decisions (Colquitt et al., 2005). Procedural justice serves as a signal that the employer is trustworthy. High procedural justice will reduce employees' tendencies to respond negatively to unfavorable outcomes, including employee discipline (Cohen-Charash & Spector, 2001). Thibault and Walker (1975) first investigated the idea of this process within the context of dispute resolution in legal situations. They examined a control model of organizational justice and their research applying this model initiated the concept of procedural justice (Blader & Tyler, 2005). The premise behind the control model of justice is that people will view a procedure as fair to the extent that they have some control over how it was implemented. When an individual has less control over the actual outcome, the best option is to rely on a fair process. This is known as the "fair process effect" and it was this idea that prompted research exploring the notion of procedural justice and how it affects employee performance (Blader & Tyler, 2005).

Van Den Bos, Lind, Wermunt, and Wilke (1997) proposed that people use their fairness judgments as a decisional heuristic. Fairness heuristic theory is grounded in the idea that people are often in situations where they must cede control to an authority figure which opens up the opportunity for that authority figure to exploit the subordinate individual (Van den Bos, Lind, Vermunt, & Wilke, 1997). Consequently, people are often unsure about the relationship they have with that authority figure. In order to compensate for this uncertainly, people use fairness judgments as a decisional heuristic of whether

that authority figure can be trusted to treat them fairly. The subordinate individual then uses fairness judgments to guide his or her behaviors (Blader & Tyler, 2005). Van den Bos and colleagues (2001) argued that people often use available information from their environment (e.g., how decisions are made within a company or how fairly the processes are implemented) to make a decision about whether they can trust the authority figure with whom they are interacting. Specifically, this process is used to form judgments about authority figures with whom an employee may have little interaction, such as its hospital CEOs. Thus, when an individual receives an outcome and cannot judge the relative fairness of it (for example, unable to know other people's outcomes), he or she will use his or her procedural justice perceptions to determine whether it was allocated fairly and whether the authority figure is trustworthy. If the subordinate deems the supervisor "trustworthy", the employee is more inclined to behave in a positive manner either accepting or rejecting his or her supervisor's requests or demands (Blader & Tyler, 2005). Although a number of researchers have demonstrated that procedural justice perceptions play a key role in understanding distributive justice perceptions (Colquitt et al., 2005), procedural justice perceptions do not completely explain people's fairness perceptions (Greenberg, 1993; Colquitt et al., 2005). This encouraged later research to investigate the quality of interactions between those implementing policies and procedures and those on the receiving end of those policies and procedures. This research created a new dimension of organizational justice known as interactional justice (Colquitt et al., 2005).

Interactional justice is defined as the degree to which the people affected by decisions are treated with dignity and respect (Cohen-Charash & Spector, 2001). A

significant debate within the field is whether interactional justice is an extension of procedural justice and not a standalone dimension of organizational justice (Colquitt et al., 2005). A number of studies have found that, although procedural and interactional justice perceptions are closely related, they are distinct constructs (Colquitt et al., 2001). Greenberg (1993) further argued that interactional justice is not only different from procedural justice but also a bidimensional perception. The two distinct dimensions are informational justice and interpersonal justice (Colquitt et al., 2005).

Informational justice refers to perceptions of whether one has been provided with adequate, timely, honest, and complete information about a procedure or process (Colquitt et al., 2005). Providing information to individuals about the procedure that has a direct influence on their work environment will likely lessen anxiety that occurs during transition periods such as organizational restructuring or policy changes (Woodward et al., 2000; Woodward et al., 1999). Woodward and colleagues (1999) conducted a longitudinal study among 900 hospital employees to explore the relationship between hospital restructuring and employee mental health. Their results indicated that employees reported significant increases in depression, anxiety, emotional exhaustion, and job insecurity in the first year of restructuring. Increased unclarity of role and deterioration in team work were observed by the end of the second year. These investigators concluded that the work environment was negatively affected by restructuring (Woodward et al., 2000).

Interpersonal justice refers to the perception that one is treated with respect and dignity during interactions and enactment of procedures (Colquitt et al., 2005). This

perception has been shown to impact an individual's workplace commitment (Laschinger, 2004). Past research has demonstrated how informational justice and interpersonal justice influence different outcomes. Several studies further highlight the importance of separating informational and interpersonal justice (Colquitt et al., 2001; Cropanzano, Goldman, & Benson III, 2005; Sanchez & Byrne, 2004) to achieve a better understanding of target outcomes.

There is a substantial amount of research that supports the relationship between organizational justice and various organizational behaviors (Colquitt et al., 2005; Colquitt et al., 2001). A number of studies have demonstrated that all four types of justice are related to important organizational behaviors and attitudes. For example, Ince and colleagues (2011) conducted a cross-sectional study of 83 employees in a Turkish public hospital, and found a positive relationship between procedural justice and contributions to both organizational development and job performance. Distributive justice, on the other hand, related to development, self improvement, and commitment to job behaviors (Ince & Gül, 2011). Greenberg and Colquitt's (2005) review of relationships between organizational justice and job-related attitudes and behaviors showed that procedural justice is related to task performance and compliance, while interactional (i.e., informational and interpersonal) justice is related to management trust, job performance, and workplace incivility. Colquitt and colleagues (2001) conducted a meta-analysis summarizing studies looking at the relationship between fairness and organizational outcomes. Results indicated that organizational justice is related to management trust, job satisfaction, outcome satisfaction, and organizational commitment (Colquitt et al., 2001).

Given the previous findings, it is reasonable to assume a relationship between organizational justice and safety-related behaviors (e.g., reporting). The relationship between organizational justice and safety will be discussed below.

Laschinger and colleagues (2004) suggested that, in a correlational study involving 285 nurses from a hospital in Ontario, the stronger predictor of perceptions of respect was interactional justice. The consequences of respect were lower emotional exhaustion and higher ratings of quality of care in the hospital (Laschinger, 2004). In another study that involved 244 Dutch nurses, researchers found that the more injustice nurses perceived, the more likely they were to respond to problematic situations in a destructive manner (VanYperen, Hagedoorn, Zweers, & Postma, 2000). This was particularly the case with interactional injustice, when nurses perceived that they were being treated unfairly by their direct supervisor. VanYperen and colleagues' study also indicated that nurses are more likely to have the intention to leave when they perceived unfair outcomes related to both procedural and distributive justice (VanYperen, Hagedoorn, Zweers, & Postma, 2000).

Several studies correlated decision-making opportunities, a measure of procedural justice, to employees' positive feelings of justice within the workplace. Furthermore, these perceptions were found to associated with an employee's well-being and their commitment toward the organization. Elovainio et al. (2004) used a sample of 2969 employees from 162 wards working in Finnish hospitals to examine the association between organizational justice and employee health status. Results showed that job decision latitude and justice varied significantly between work units and individuals

within the hospital setting (Elovainio et al., 2004). A low perception of procedural justice was found to predict negative emotional reactions, including stress. Perceived procedural injustice negatively predicted an employee's health, which could impact patient safety (Elovainio et al., 2004). In addition, Viswesvaran and Ones' (2002) meta-analysis concluded that both procedural and distributive justice had a positive influence on work behaviors.

Organizational Justice and Safety

Some researchers have alluded to a theoretical relationship between organizational justice and safety. Weiner, Hobgood, and Lewis (2008) proposed a model suggesting that a "just culture" would influence safety incident reporting. A just culture is defined as one that has a clear and transparent process for evaluating errors and separating blameworthy from blameless acts (Weiner, Hobgood, & Lewis, 2008; Blouin & McDonagh, 2011). A just culture recognizes the human impact of making unintentional errors which result in serious harm to patients or staff including oneself. Weiner, Hobgood, and Lewis (2008) proposed the idea that the health professional's perception of the fairness of incident reporting process results in both affective and behavioral reactions. Specifically, Weiner and colleagues theorized that health professionals' perception of justice may influence their level of obligation to follow reporting procedures, which could influence future reporting behaviors (Weiner, Hobgood, & Lewis, 2008). The authors hypothesized that justice perceptions could also influence a health professional's willingness to engage in unrewarded safety behaviors, including safety improvement activities (Weiner et al., 2008). The basic principle that fair exchanges result in reciprocation is the framework

they used to explain how justice perceptions can influence employee's safety reporting behaviors. However, Weiner and colleagues did not test their hypothesis with actual data. Research investigating the relationship between general organizational justice and safety is needed.

Current study

Given the fact that the majority of the hospital safety research rarely examines the connections between organizational factors and safety perceptions, the relationship between organizational justice perception and hospital safety is unclear. The main purpose of this research is to address the gap in the safety literature and examine how organizational justice perceptions might predict hospital employees' level of comfort for safety-related reporting, and ultimately their perception of hospital safety. To date, hospital safety studies have primarily focused on leadership characteristics, such as leader-follower relationships (Squires et al., 2010), safety specific transformational leadership (Barling, Loughlin, & Kelloway, 2002), and passive safety leadership (Kelloway, Mullen, & Francis, 2006), without consideration of other antecedents such as organizational justice (Zohar, 2012). Griffin and Hart (2000), however, proposed that there are possible specific organizational climate factors that can influence employee safety behaviors and perception. Therefore, it is reasonable to assume that the level of comfort to engage in safety-related reporting has the potential to mediate the relationship between different dimensions of organizational justice and perceptions of hospital safety.

The present study will first evaluate the psychometric properties of the organizational justice scale created by Cunningham and colleagues (Cunningham et al., 2013) from a larger program of research to improve organizational justice in a regional children's hospital in Ontario. Past research suggests that, although the four dimensions of organizational justice are related, they are linked to different outcomes (Colquitt et al., 2001), I propose that procedural, interpersonal, informational, and distributive justice should be perceived as a four-factor model. Specifically, this four-factor model differs from a three-factor model where interpersonal and informational justice were combined as one construct, interactional justice (Colquitt et al., 2001).

Hypothesis 1: Procedural, interpersonal, informational, and distributive justice are empirically distinct constructs. In other words, organizational justice should be defined as a four-factor model instead of a three-factor model.

Next, I propose to investigate the extent to which organizational justice predicts level of comfort with safety-related reporting by drawing upon the Social Exchange Theory of organizational justice. The Social Exchange Theory is based on the idea that an individual engages in a give-and-take exchange with another individual (or the organization), and the fairness of this exchange is perceived as warranting reciprocation. In other words, when administrators or managers treat employees fairly (e.g., fair teatment or giving an equal chance to participate during the decision making process),

employees will value that fair exchange and be more likely to reciprocate the behavior (in compliance and extra role behaviors) (Blader & Tyler, 2005). Neal and Griffin (2006) suggested that the Social Exchange Theory is one possible theoretical framework that helps to explain why employees engage in safety-related behaviors. As the original program of research did not collect data on actual safety behaviors, the present study will use the level of comfort with safety-related reporting as a proxy measure for the actual safety-related reporting behaviors. Past studies have illustrated that level of comfort was a good indicator for the actual behaviors among 906 pharmacists (Blake & Madhavan, 2010) and 397 dental students (Vainio, Krause, & Inglehart, 2011) in mutilple cross-sectional studies in the United States

Thus, building upon the Social Exchange Theory as well as the "just culture" framework proposed by Weiner et al. (2008), I expect it is possible for a fair implementation of rules and procedures, in addition to respectful communication and interpersonal treatment, to have an impact on an employee's level of comfort to engage in safety-related reporting.

Hypothesis 2.1. Procedural justice will predict employees' comfort with safety-related reporting.

Hypothesis 2.2. Interpersonal justice will predict employees' comfort with safety-related reporting.

Hypothesis 2.3. Informational justice will predict employees' comfort with safety-related reporting.

Hypothesis 2.4. Distributive justice will predict employees' comfort with safety-related reporting.

More specifically, if a hospital employee is able to take part in decisions, be treated with respect, and is given sufficient information and communication about safety, then the employee will value that fair treatment, and it will influence his or her comfort to perform safety-related reporting. In addition, scholars have found that safety behaviors, such as incident reporting, are one of the best indicators of hospital safety (Hutchinson, Young, Cooper, McIntosh, Karnon, Scobie, & Thomson, 2009b). Thus, it seems reasonable to assume that a higher level of comfort to engage in safety reporting could positively influence hospital safety perceptions. Individual employees have limited information about the overall safety of a hospital. They do, however, know whether they are willing to engage in specific safety related behaviors, such as safety reporting. In the absence of more information, a heuristic model (Shah & Oppenheimer, 2008) would predict employees will base overall safety judgments on the information which is available to them. A heuristic is a strategy that ignores part of the information or missing information, with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods (Shah & Oppenheimer, 2008). Therefore, it is reasonable to propose that comfort with safety-related reporting will have a positive influence on

hospital safety perceptions. In short, organizational justice perceptions first influence employee level of comfort in performing safety reporting, and then goes on to influence employees' hospital safety perception. Thus, the present study proposes that the level of comfort with safety-related reporting mediates the relationship between each dimension of organizational justice and hospital safety perceptions.

H*ypothesis 3. Each dimension of organizational justice will have a positive relationship with comfort with safety-related reporting, which ultimately predicts higher hospital safety perceptions.*

Chapter 3 Methods

The purpose of this study was to explore the extent to which organizational justice predicted comfort with safety reporting and ultimately perceptions of hospital safety among hospital employees. Most of the current organizational justice literature supports the use of a four-factor justice framework containing distributive justice, procedural justice, informational justice, and interpersonal justice. Although Greenberg and Colquitt (2005) recommended measuring interactional justice as two separate constructs, there is some research to support the use of a three-factor structure (Ince & Gul, 2011; Ambrose, Seabright, Schminke, 2002 ; Cohen-Charash & Spector, 2001). It is important to understand whether organizational justice should be treated as a four-factor or three-factor concept as it could potentially change how future organizational improvements should be planned. In addition, as the present study employed a newly constructed organizational justice scale, the measurement properties of the scale need to be validated before proceeding to model testing to ensure a quality result. Thus, I will conduct a confirmatory factor analysis to determine if the data best supports a four-factor or a three-factor solution.

It should be noted that the present study was derived from a larger program of research lead by Cunningham and colleagues (Cunningham et al., 2013) to model organizational justice improvement strategies via discrete choice conjoint methods.

Setting and Sample

Employees who worked at all units in a regional children's hospital were surveyed. The research team surveyed beyond nurses (RNs), who were the usual survey targets in past research, because we believed that all employees can play an important role in increasing hospital safety. Multidisciplinary teams in hospitals have been shown to be critical to providing a more complete treatment for different disorders/diseases (Jongen et al., 2011; Wonderlich et al., 2012). The health-care management literature advocates for more frequent use of multidisciplinary teams to improve treatment effectiveness (Fleissig, Jenkins, Catt, & Fallowfield, 2006; Heather, Marja, & O'Hara Dennis, 2004). As such, all employees in a hospital system are all likely to be involved in safety concerns. The present study planned to recruit managers, physicians, nurses, psychologists, social workers, pharmacists, child and youth workers, dietitians, therapists (e.g., OT, PT, and STP), researchers, lab technicians, health care assistants, and clerical workers. In addition, both full time and part time children's hospital employees were included in the subject pool.

Sample Size

To test the fit of the hypothesized model with the data obtained from the sample, structural equation modeling (SEM) was performed. To test proposed relationships using SEM, a medium to large sample size is required (Kline, 2010). While there is no defined formula for sample size estimations in SEM (Schumacker & Lomax, 2004), a large sample (exceeding 200 subjects) is preferred to maintain the accuracy of estimates and to ensure representativeness (Kline, 2010). Alternatively, to consider the complexity or size

of the model, a sample size of 10 to 20 cases per parameter is also appropriate (Schumacker & Lomax, 2004). The proposed model in this study had 25 parameters that included four dimensions (20 items) of organizational justice, three levels of comfort to perform different safety behaviours, and two hospital safety perception questions. Therefore, a minimum sample of 250 subjects was required. Based on Hayduk's (1987) suggestions, a sample size ranging from 50 to 500 may be appropriate depending on the complexity of the model being estimated (Hayduk, 1987). Others indicate that a sample of less than 100 is considered small and small samples increase the likelihood of error and limit the statistical power of tests (Kline, 2010). Therefore, to ensure adequate power, a sample size greater than 250 subjects is preferred. The present study successfully recruited 652 participants and thus met the minimal sample size requirement.

Measures

The present study employed newly constructed scales created by Cunningham and colleagues (Cunningham et al., 2013), which were not previously tested for validity elsewhere. Cunningham et al. (2013) conducted preliminary reliability tests based on the original scale clusters which yielded moderate to good internal consistency. All scale items were rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). To better map the survey items onto the existing organizational justice literature, the present study conducted the confirmatory factor analysis employed below.

Procedural Justice. This scale consisted of five items related to how decisions were made in the hospital such as "decisions are made in a fair way". This scale's internal consistency (Cronbach's α) was .86 based on the current study sample.

Interpersonal Justice. This measure included five items examining relational justice (α=.74, based on the current study sample). Example items of relational justice include "management treats me with dignity and respect" and "staff treat each other with dignity and respect".

Informational Justice. This measure included five items evaluating informational justice perceptions (α=.84, based on the current study sample). For example, "there are adequate opportunities to communicate with my immediate manager".

Distributive Justice. This scale consisted of five items (α=.64, based on the current study sample) addressing participants' perception of both monetary and non-monetary resources allocation. For example, "salaries at the hospital are fair".

Comfort with Safety-Related Reporting. This measure included three questions examining the level of comfort in performing safety-related reporting behaviors. Questions like "I feel comfortable reporting concerns regarding unsafe practices" are included in this scale. The internal consistency of all three items was .84 based on the current study sample.

Hospital Safety Perceptions. This measure included two questions examining hospital safety perceptions. Questions included in this scale are "Care is always delivered in a safe manner" and "The atmosphere here helps me work in a safe way". These two items showed moderate bivariate correlation (r = 0.60) based on the current study sample (Field, 2009; Norman & Streiner, 2007).

Survey Procedure

Study procedures were Research Ethics Board (REB) approved. This study recruited

all hospital employees from a regional Children's Hospital in Ontario. Surveys were administered via hospital internal emails to all children's hospital employees (Appendix 2). All employees' email addresses were obtained from the management team with approval. Those who agreed to complete the anonymous survey endorsed a consent statement confirming the voluntary nature of the project, the confidentiality of their responses, and the option to refuse or withdraw without consequence (Appendix 3). Each participant received up to five email reminders (Appendix 4, 5, & 6). Of the 861 staff emailed, 718 opened the survey, 33 declined to participate, 33 answered fewer than 10 questions, and 652 (76%) completed the survey. Participants who completed the survey had the opportunity to enter a draw to win 1 of 10 $50.00 Chapters Indigo bookstore gift certificates.

Data Management

Once surveys were returned, data from each survey was exported into SPSS v19.0 software for data checking and analysis. Data was also exported to AMOS v19.0 software for structural equation modeling. The current study only used fully completed surveys as all incomplete surveys (n = 33) missed more than 85% of questions. Therefore, all incomplete surveys were removed in order to carry a less biased estimation (Muthén, Kaplan, & Hollis, 1987). Prior to analyses, all variables were examined through various programs for accuracy of data transferring (e.g. from online server to SPSS), missing values, and existence of univariate and multivariate outliers. Univariate distributions were first examined for normality and outliers. By examining histograms of each variable and their skewness and kurtosis statistics using a cut-off of three (Field, 2009), it was evident

that multiple items were negatively skewed (Table 1). All three comfort with safety reporting items demonstrated varying degrees of severe positive kurtosis and negative skewness (Table 1). One recommended method to remedy univariate non-normality of positive skew is by mathematically transforming variables into square roots or logarithmic functions prior to further analysis (Tabachnick & Fidell, 2013; Kline, 2010). In this study, all three comfort with safety reporting items were converted to square root values. With transformation, kurtosis and skewness were within normal limits and square Mahalanobis distances showed minimal evidence of serous multivariate outliers. Table 1 lists the results of the transformation.

Each endogenous variable in the proposed structural model was also examined for multicollinearity. Multicollinearity may occur when correlations among variables are greater than .85 or when the squared multiple correlation between each variable and all the rest is greater than .90 (Field, 2009). Table 2 lists the correlation coefficients among three safety behaviours and two hospital safety questions. Because correlations did not exceed .85, multicollinearity was not a concern.

Relationships between each predictor and the dependent variable were then examined for homoscedasticity and linearity through the use of residual plots (Field, 2009). Including the transformed variables, none of the variables showed evidence for heteroscedasticity and non-linearity. The values also revealed linear and homoscedastic residual plots and the residuals were normally distributed for each of the analyses. Collinearity among the predictors was assessed for each of the analyses (Field, 2009). All of the variance inflation factors were below the cut-off of three and, therefore, there was

no excessive collinearity among study predictors that would impact the results (Field, 2009).

Data Analysis

Sample demographic characteristics were analyzed using descriptive statistics. Descriptive analysis of each study construct measure included mean, standard deviation, and internal consistency reliability using Cronbach's alpha coefficient (Field, 2009). All demographic characteristics and survey measures were also analyzed by job categories to examine group differences. Structural equation modeling (SEM) with maximum likelihood estimation (Byrne, 2010) was used to test the hypotheses, examine the relationship between concepts of interest as proposed in the hypothesized theoretical model (Figure 1) and to refine the hypothesized model.

The structural equation modeling program AMOS v19.0 was used to analyze the data. SEM is useful to test a theoretical model (Munro, 2005; Byrne, 2010). SEM techniques examine the covariance structure and relationships between and among latent variables (Kline, 2010). SEM allows researchers to use multiple measures of theoretical constructs and removes measurement error from the relationship between theoretical constructs. Estimates of measurement error are included in SEM models (Byrne, 2010). SEM does not assume variables are accurately measured (Kline, 2010). SEM examines the effects of direct, indirect, reciprocal, and possible causal relationships (Byrne, 2010; Kline, 2010). Therefore, SEM is a more robust and precise test of theories than traditional regression analyses (Byrne, 2010).

SEM can examine two models simultaneously: the structural model (model of

hypothesized relationships between the set of endogenous latent variables and the set of exogenous latent or observed variables) and the measurement model (the model expressing observed variables as functions of latent variables and measurement errors). Valid tests of the theoretical model depend on the fit of the measurement model to the data (Munro, 2005; Byrne, 2010).

Fit indices were used to evaluate goodness of fit between the hypothesized model and observed data. Diagnostics were considered to revise the model accordingly. Kline (2010) recommends that a minimal set of fit indices should be presented and interpreted when reporting results of SEM analyses. This minimal set of indices includes: model chi-square, chi-square over degrees of freedom, the Goodness-of-Fit Index (GFI), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA) with its 90% confidence interval, PCLOSE, and Standardized Root Mean Square Residual (SRMR). To date, there is no consensus by researchers on just what indices should be reported (Byrne, 2010; Kline, 2010).

Model chi-square tests whether the observed model and the hypothesized model differ. A significant χ^2 relative to the degrees of freedom indicates the two models differ. As χ^2 increases in size, the model fit worsens (Kline, 2010); therefore a small non-significant χ^2 is desired. Chi-square statistics are very sensitive to sample size; as the sample size increases (N > 200) it has a tendency to indicate a significant probability level (Schumacker & Lomax, 2004). Therefore, chi-square statistics should not be considered in isolation when looking at goodness of fit. As a result, researchers have developed additional fit indices that take a pragmatic approach (e.g., model comparisons)

to the model-fitting process and are used as adjuncts to χ^2 statistics (Kline, 2010).

The Goodness-of-Fit Index (GFI) evaluates model fit based on the amount of variance predicted. This index is similar to an R^2 statistic, but is based on the amount of variance and covariance explained by the variance-covariance matrix accompanying the model (Kline, 2010). The closer the GFI is to one, the better the fit. A GFI value in the range of .95 indicates a good fit (Kline, 2010).

The Comparative Fit Index (CFI) indicates the relative improvement in fit between the proposed model and the baseline model. A good fit is demonstrated by values greater than 0.95 (Kline, 2010).

RMSEA approximates a non-central chi-square distribution and takes into account the error of approximation, which means it does not assume the model fit with the population to be perfect (Kline, 2010). RMSEA is less impacted by sample size (Kline, 2010). A close approximate fit is less than or equal to .05 (Schumacker & Lomax, 2004). Values between .05 and .08 indicate a reasonable fit and those close to 1.0 or more indicate a poor fit (Schumacker & Lomax, 2004). A confidence interval can be calculated and ideally it should range between 0.05 and 1.0 (Kline, 2010). In addition to reporting the confidence interval around RMSEA, Byrne (2010) recommends testing for the closeness of fit (PCLOSE). The PCLOSE value is like a p-value for testing the null hypothesis that the population RMSEA is no greater than .05 (Byrne, 2010). According to Byrne (2010), the ideal PCLOSE value should be greater than .05.

Finally, SMSR is the standardized difference between the observed model and the hypothesized model as well as the overall difference between observed and predicted

correlations (Kline, 2010). A value of zero indicates a perfect fit and values less than 0.10 are considered a good fit (Kline, 2010).

Confirmatory Factor Analysis – Organizational Justice Scale

Prior to testing the mediation model, the measurement model for the latent variables of organizational justice scale created by Cunningham and colleagues (Cunningham et al., 2013) was analyzed separately through confirmatory factor analysis (CFA) after remapping the items based on the literature. Hypothesis one proposed that procedural, interpersonal, informational, and distributive justice should be perceived as a four-factor model instead of a three-factor model where interpersonal and informational justice was combined as one construct, interactional justice. Some previous studies found high intercorrelations between interpersonal and informational justice constructs (Colquitt & Shaw, 2005) and, as such, the fit of both models was tested. A three-factor model, combining informational and interpersonal justice into one factor, was compared to a four-factor model using a confirmatory factor analysis approach (CFA) with maximum likelihood estimation.

Because the initial measurement model for both 4-factor (Figure 2) and 3-factor (Figure 3) solutions yielded ill–fitting models, some modifications were deemed necessary to identify a model that better represented the sample data and still reflected the theoretical constructs.

To derive a better fit, post hoc modifications were performed as suggested by AMOS's modification indices. Modification indices must be considered along with parameter change statistics and should be theoretically sound prior to making changes to

the model (Byrne, 2010). Based on the results of the modification indices, the best improvement in the model was through the addition of three residual covariances (between the residuals of "fairly treated by colleagues" and "fairly treated by staff"; "fair salaries" and "fair benefits"; as well as "immediate manager is accessible" and "adequate opportunities to communicate"). Therefore, the recommended three additional pathways were reviewed from both theoretical and empirical perspectives to ensure they made substantive sense prior to proceeding.

First, a modification index value of 424 advised that adding a pathway from "My immediate manager is accessible and visible" to "There are adequate opportunities to communicate with my immediate manager" would lead to significant improvement in overall model fit. Guided by team management theory (Schreiber, 1996; Young, Charns, & Shortell, 2001), a workplace with visible and accessible managers increases the chance for employees to communicate with them (Person, 1908; Sutcliffe, Lewton, & Rosenthal, 2004; Tardif et al., 2008; Tiessen, 2008). Second, based on a high parameter statistic (modification indices = 205), a pathway from "my colleagues treat me with dignity and respect" to "staff treat each other with dignity and respect" was also recommended. Based on the assumption that the words "colleague" and "staff" are interchangeable, participants may respond similarly to these two items. According to heuristics theory, individuals tend to judge unfamiliar events based on known facts (Lind, 2001). In this case, once an individual felt he or she was being treated with dignity and respect, he or she would also assume others are being treated in a similar fashion (Colquitt, 2004). Similarly, if one is treated fairly, this model suggests we would assume others are as well. Thus, the

recommended addition of a pathway between these two items made theoretical sense. Third, a pathway between fair salary and fair benefits was recommended with a smaller modification index (MI = 34). This pathway was added based on the empirical understanding that most of the salaries and benefits were negotiated by the representative unions as one package (Lilly, 2008; Csiernik, 2009).

The fit of the model significantly improved upon the inclusion of these paths. As modifications to the initial model were performed, a bivariate correlation was calculated between the parameter estimates from the hypothesized model and estimates from the final model (Tabachnick& Fidell, 2013; Ullman, 2006). A high correlation (greater than 0.90) indicates that the hypothesized model did not change substantially upon modification (Ullman, 2006).

Finally, in order to compare between the three-factor and four-factor model, it is recommended to subtract the chi-square value and degrees of freedom from the smaller model (Tabachnick & Fidell, 2013). The better fitted model will be retained for subsequent analysis.

Mediated Model – Testing the relationship among organizational justice, comfort with safety-related reporting, and hospital safety perception

The purpose of this model was to determine whether different dimensions of organizational justice influence the extent to which participants are comfortable performing safety reporting, and the extent to which comfort with safety reporting predicted an overall perception of hospital safety.

Byrne (2010) encourages researchers to use a two-step approach which tests the pure

measurement model underlying a full structural equation model first, and when the fit of the measurement model is found acceptable, then to proceed to the second step of testing the structural model by comparing its fit with the collected data.

Given the good fit of the measurement model, the initial structural model delineating the hypothesized direct and indirect relationships was developed. The proposed structural model hypothesized that the relationship between four dimensions of organizational justice (e.g., procedural justice, interpersonal justice, informational justice, and distributive justice) and hospital safety is mediated by comfort with safety reporting. Error terms were assigned to each endogenous variable. Error terms represent measurement errors and estimate the adequacy of indicator variables (Kline, 2010). Error terms represent all unmeasured causes not included in the model (Byrne, 2010; Kline, 2010). All latent variables (including error terms) must have their scale determined. This can be accomplished by initially assigning an arbitrary value (typically 1 in AMOS v19) to each error term. With the measurement scale set, the model can be identified and coefficients of the error terms can be determined (Byrne, 2010).

The present study proposed to test two competing mediated models: a fully mediated and a partially mediated model. The full mediation model includes five paths, four from the antecedent variables (i.e., procedural, interpersonal, informational, and distributive justice) to the mediator (i.e., comfort with safety-related reporting) and one from the mediator to the outcome variable (i.e. perception of hospital safety). As such, it assumes that all effects of the antecedent variables on the outcome variable are exerted indirectly, through the mediator.

Based on the fully mediated model, the partial mediation model adds four direct paths that connect each of the four antecedent variables to the outcome variable. Thus, it assumes that the antecedent variables may exert either direct or indirect effects on the outcome variable. In other words, a partial mediation model allows direct effects of procedural, interpersonal, informational, and distributive justice on perception of hospital safety, as well as their hypothesized indirect effects via comfort with safety-related reporting.

Indirect effects involve a mediator variable and are calculated by multiplying the path coefficients of the independent variable to mediator and mediator variable to dependent variable (Byrne, 2010). The total effect is the sum of the indirect and direct effects (Meyers et al., 2006).

Based on Cohen's effect size interpretation, standardized path coefficients with absolute values of less than .30 are considered small, .30 to .50 are medium, and greater than .50 are large (Cohen, 1988; Kline, 2010).

Finally, Byrne (2010) suggests that a final model should be estimated with non-significant pathways deleted from the model. A chi-square difference test was performed to determine if the trimmed partially–mediated or the fully-mediated model should be retained.

Equivalent Models

It is suggested that, after a final structural equation model has been determined, mathematically equivalent models should be considered (Kline, 2010). Since mathematically equivalent models have identical goodness of fit indices to the final

model, the choice among them must be based on theoretical not statistical grounds (Kline, 2010). In the discussion chapter, theoretical reasons for preferring the final model are discussed.

Ethical Considerations

All survey participants were notified that the purpose of the research was to develop actionable strategies for creating a fair work environment in the hospital in all email invitations and communication. No deception strategies were used during recruitment. To maintain confidentiality, participants were assigned a study research number. No name or other identifiable information was collected. Anonymity and confidentiality was assured in all communication with potential participants. All survey data was kept in a secured hospital network with passwords. Only the researcher and research assistants were able to access the data files.

There are no known risks associated with the study. Given the voluntary nature of the survey, staff did not participate unless they wished to, and were able to withdraw from the study at any time. The original study was designed to examine the relative importance of different dimensions of organizational justice as well as the most preferred way to improve organizational justice in the hospital. Results benefited researchers as well as the general public for understanding hospital employees' preferences for organizational justice improvement strategies. Past research demonstrated that an increased perception of organizational justice in the work environment can enhance the work performance and health of employees. Benefits of the present study include the validation of a new organizational justice scale and the increased knowledge of how organizational justice

influences staff safety behaviours in hospitals. This understanding will help administrators and managers address issues of organizational justice that can increase the safety of both staff and patients. Results from the original program of research were disseminated via multiple internal reports and emails as well as oral presentations to maximize public awareness.

Chapter 4 Results

In this chapter, the study findings are presented in sequence. First, the demographic characteristics of the sample and setting are described. Descriptive findings of the exogenous and endogenous variables of the proposed model are provided followed by results of the structural equation modeling analysis that was used to test the hypotheses and refine the hypothesized model.

Sample Characteristics

Respondents were 90% female (N=587) and 70.6% of the survey respondents were over the age of 36. Participants were asked to indicate their primary professional background. Therefore, employees with multiple qualifications were forced to select only one job profession (e.g., the current job category). Out of 652 employees recruited, there were 21 managers, 36 physicians, 241 nurses, 166 allied health professionals (e.g., therapists, psychologists, social workers, dietitians, pharmacists, and lab analysts), 105 clinical support staff (e.g., child and youth workers and health care assistants), and 83 non-clinical support staff (e.g., clerical workers and research assistants). A majority of the sample (57.6%) reported less than 10 years of job experience. All socio-demographic characteristics of the sample are presented in Table 3.

Group Comparisons of Sample Demographics

For descriptive purposes, the sample was analyzed using a one-way ANOVA and chi square statistics to determine if there were differences in sample characteristics by job category (i.e., managers, physicians, nurses, allied health professionals, clinical support

staff, and non-clinical support staff). Regarding the length of time worked at the children's hospital, nurses worked significantly longer than allied health professionals and clinical support staff ($F(5, 646) = 4.5$, $p < 0.001$). Managers were significantly older than all other job categories ($F(5, 646) = 5.9$, $p < 0.001$). Chi-square also revealed a significant gender difference among job categories. The present study had more male respondents from physician compared to all other job categories ($\chi^2(5) = 133.6$, $p < 0.001$).

Study Measures

All four organizational justice scales, comfort with safety-related reporting, and hospital safety perceptions yield moderate correlations with each other, except procedural and interpersonal justice, which indicated a strong correlation (Table 4). All measures yield moderate to good internal consistencies (α ranged from .63 -.86).

Group Comparisons of Study Measures

Organizational Justice Scale

Procedural Justice. In general, managers had a significantly higher rating for procedural justice items compared to all other job categories except "decisions are made in a fair way" (Table 5).

Interpersonal Justice. Managers rated higher than allied health professionals on "management treats me with dignity"; while allied health professionals scored higher on colleagues and staff treat each other with respect and dignity compared to nurses, clinical and non-clinical support staff (Table 5).

Informational Justice. Compared to nurses, clinical and non-clinical support staff

felt that senior administrators are more accessible and visible. In addition, nurses rated lower than the clinical and non-clinical support staff on "opportunities to communicate with senior administrators" and "number of communication forums held by the senior administrators" (Table 5). Alternatively, managers consistently felt that immediate managers are more accessible as well as visible, and more like to provide adequate opportunities for communication when compared to physicians, nurses, and allied health professionals (Table 5).

Distributive Justice. Compared to the ratings of all other professionals, managers and physicians rated equal access to education higher (Table 5). Nurses and non-clinical support staff rated on fair salaries higher compared to physicians (Table 5). Regarding fair benefits, managers and clinical support staff had higher ratings than physicians and nurses, respectively (Table 5). Managers and physicians felt the parking privileges fairer than did nurses and allied health professionals (Table 5). Finally, managers rated scheduling and shifting fairer than did nurses (Table 5).

Comfort with Safety-Related Reporting. Managers were more comfortable to report concerns regarding unsafe practices than were nurses and allied health professionals (Table 5). Managers were also more comfortable to report their own mistakes than were allied health professionals (Table 5). Nurses, allied health professionals, clinical and non-clinical support staff were significantly less comfortable to suggest ways to improve safety in the hospital compared to managers (Table 5).

Hospital Safety Perceptions. Managers and clinical support staff scored higher on "care is always delivered in a safe manner" compared to physicians, nurses, and allied

health professionals (Table 5). Managers also rated that the hospital atmosphere is safer compared to all other professions (Table 5).

Hypothesis Regarding the Organizational Justice Scale

Confirmatory Factor Analysis for the Organizational Justice Scale

The initial measurement model for both 4-factor (Figure 2) and 3-factor (Figure 3) solutions indicated ill–fitting fit indices (Table 6). The fit of the model significantly improved upon the inclusion of three additional paths. The correlation between two models yielded an r exceeding 0.90 (4-factor model: r (26) = 0.96, $p < .001$; 3-factor model: r (23) = 0.92, $p < .001$), which indicated that estimates were minimally changed despite specification of the additional residual covariance paths.

To compare the revised three-factor and revised four-factor model, it is recommended that the larger the chi-square value and degrees of freedom be subtracted from the smaller model (Tabachnick & Fidell, 2013). Results (Table 6) indicated that the revised four-factor structure (Figure 4) is a better fitting model than the alternative three-factor model (Figure 5). A significant chi-square difference test indicated that a revised four-factor model should be retained in subsequent analyses (i.e., mediated model) (Table 8). In other words, the results supported hypothesis one that procedural, interpersonal, informational, and distributive justice are four distinct constructs. All standardized parameter estimates of the revised four-factor model for the organizational justice scale are presented in Table 7.

Structural Model – Test of the Meditational Model

Results of the measurement model (Figure 6) indicated a good fit to the data (Table 8). All parameter estimates were significant and each item loaded on its respective factors (Table 9).

Results of the fully mediated model show a moderate model fit (Table 8). Contrary to what was expected, only interpersonal justice significantly predicted comfort with safety reporting ($\beta = .43$, $p < .001$). As hypothesized, comfort with safety-related reporting was shown to be a significant predictor of hospital safety perceptions ($\beta = .73$, $p < .001$).

Results of the partially mediated model (Figure 8) showed a good fit to the data (Table 8). Results indicated that interpersonal justice was a significant predictor for both safety behaviours ($\beta = .40$, $p = .002$) and hospital safety perceptions ($\beta = .27$, $p = .021$). Both informational justice ($\beta = .14$, $p = .009$) and safety behaviours ($\beta = .52$, $p < .001$) were shown to be significant predictors of hospital safety perceptions.

Because several hypothesized pathways were found to be non-statistically significant, Byrne (2010) suggests that a final model should be estimated with non-significant pathways deleted from the model. Once trimmed of all non significant pathways, the fit of the fully mediated model (Figure 9) was slightly improved (Table 8). A trimmed partially mediated model (Figure 10) also yielded a slightly improved model fit (Table 8). When the two trimmed models' fit indices were compared, the trimmed fully-mediated model should be rejected based on the GFI, CFI, and PCLOSE values.

A chi-square difference test was performed to determine if the trimmed partially–mediated or the fully-mediated model should be retained. Results indicated that the trimmed partially mediated model was the best fitting model based the chi-square difference tests (Table 8). The chi-square difference test yielded similar conclusions to the comparisons based on GFI, CFI, and PCLOSE between the two trimmed models. Thus, the more parsimonious trimmed model was retained. All parameter estimates of the trimmed model were significant. The squared multiple correlations indicate that interpersonal justice explains 21.8% of the variance in comfort with safety reporting. In addition, the combination of interpersonal justice, information justice, and safety reporting accounted for 57% of perception of hospital safety. Table 10 lists all direct and indirect effects in the retained model.

Of the variables in the final model, one had a large effect size: the relationship between comfort with safety reporting and hospital safety (effect size = .52). Two relationships had medium effect sizes: between interpersonal justice and comfort with safety reporting (effect size = .47) and interpersonal justice and hospital safety (effect size = .50). The relationship between informational justice and hospital safety also yielded a small but significant effect size (effect size = .14).

In summary, contrary to hypothesis 2.1, 2.3, and 2.4, neither procedural justice, informational justice, nor distributive justice was a significant predictor of comfort with safety-related reporting. Interpersonal justice, however, significantly accounted for 21.8% variance in the comfort with safety-related reporting as hypothesis 2.2 proposed. The final model provided partial support for hypothesis 3's prediction that the comfort with safety-

related reporting will mediate the relationship between four dimensions of organizational justice and the perception of hospital safety. Comfort with safety-related reporting was the single greatest predictor for perception of hospital safety ($\beta = .52$, $p < .001$). Comfort with safety-related reporting partially mediated the relationship between interpersonal justice and perception of hospital safety. Although the relationship between informational justice and perception of hospital safety was not mediated by comfort with safety-related reporting, informational justice yielded a small but significant direct effect on perceptions of hospital safety ($\beta = .14$, $p = .009$).

Chapter 5 Discussion

This study strove to test and refine a theoretical model that explains the impact of perceived organizational justice on comfort with safety-related reporting and, ultimately, on hospital safety perceptions in a regional children's hospital. I started by examining the factor structure of the Organizational Justice Scale and tested the relationship among the four dimensions of organizational justice and comfort with safety-related reporting. Results partially supported the hypothesis that comfort with safety-related reporting would mediate the relationship between organizational justice and hospital safety perceptions. In the final model, higher perceived interpersonal justice predicted a greater comfort to perform safety-related reporting, and ultimately, to perceive higher hospital safety. In addition, the results suggested that interpersonal justice, informational justice, and comfort with safety-related reporting directly predicted hospital safety perceptions.

One of the strengths of this study was applying structural equation modeling (SEM) to delineate the relationship among dimensions of organizational justice, comfort with safety-related reporting, and perceptions of hospital safety. A majority of research to date has focused solely on incident reporting behaviors. Extensive research has explored the barriers and attitudes to reporting incidents among nurses and physicians (Evans et al., 2006; Vogus & Sutcliffe, 2007b). It is, however, critical to investigate how to encourage other safety behaviors or reporting among hospital employees in order to maximize hospital safety (Jackson, Sarac, & Flin, 2010). The present study is the first to explore the

relative importance of each dimension of organizational justice on comfort with safety-related reporting. Moreover, this is the first study to report that comfort with safety reporting mediates the relationship between quality of interpersonal justice and perceptions of hospital safety. Overall, these findings demonstrate the importance of interpersonal justice in fostering safety-related reporting. The comfort with safety-related reporting and informational justice, in turn, predicted greater perceptions of hospital safety directly.

In the following section, I will provide an interpretation of study results within the context of previous study findings through detailed discussions of each pathway in the hypothesized model. Study limitations and practical implications for hospital administrators and managers will also be discussed.

Hypothesis related to the Organization Justice Scale

Results from the present study were consistent with hypothesis 1: that organizational justice is best depicted by a four-factor solution instead of a three-factor solution. Cronbach's alphas for all four subscales were within reasonable range (.63 to .86) (Streiner & Norman, 2008). Results are consistent with the factor structure and theoretical expectations of other organizational justice measures proposed by Colquitt and Shibaoka et al. (Colquitt, 2001; Shibaoka et al., 2010). Values for several goodness-of-fit indicators were moderate. Taken together, these findings indicated that the Organizational Justice Scale created by Cunningham and colleagues (Cunningham et al., 2013) had acceptable construct validity (Streiner & Norman, 2008).

Organizational Justice and Comfort with Safety-Related Reporting

Study results were consistent with the hypothesis that employees' perceptions of interpersonal justice would predict higher comfort with safety-related reporting (Hypothesis 2.2). This supports the underlying Theory of Social Exchange. Findings suggested that a history of perceived fair interactions with one's managers and colleagues forms the basis of trust and drives employees' attitudes and behaviors of reciprocation, including safety-related reporting (Squires et al., 2010). As illustrated by previous meta-analytic evidence, a significant positive correlation exists between the quality of interpersonal relationships and employees' task performance (Gerstner & Day, 1997), as well as citizenship behaviors (Ilies, Nahrgang, & Morgeson, 2007). A recent meta-analysis also concluded that, across industries, a supportive environment was the most consistent job resource in terms of explaining variance in burnout, engagement, and safety outcomes (Nahrgang, Morgeson, & Hofmann, 2011). Thus, study results along with past evidence indicated that high interpersonal justice, embodying support and respect, contributed toward creating a positive experience for employees. This positive experience, in turn, added to the desire of employees to comply with organizational expectations.

Speaking out and actively participating in open communication is essential to foster safety (Frankel, Leonard, & Denham, 2006). Speaking out about safety concerns requires a decision to trust that managers and colleagues will be supportive and respectful of an individual's opinion. The result that interpersonal justice affected and predicted safety reporting was also consistent with findings of several non-health setting studies (Christian,

Bradley, Wallace, & Burke, 2009; Hofmann & Morgeson, 1999; Hofmann, Morgeson, & Gerras, 2003; Michael, Guo, Wiedenbeck, & Ray, 2006). In these studies, interpersonal justice was linked to safety communication and commitment, which in turn mediated the influence of interpersonal justice on outcomes. In a healthcare setting, speaking out against observed unsafe practices or errors potentiates risky outcomes such as fear of blame (Chiang & Pepper, 2006; Heard, Sanderson, & Thomas, 2012), retaliations (Heard et al., 2012), and litigation (Vincent, Stanhope, & Crowley‐Murphy, 1999). Therefore, the decision to speak out about safety suggestions, unsafe practices and errors requires employees to perceive a high quality of interpersonal justice.

In contrast to hypotheses 2.1, 2.3, and 2.4, procedural, informational, and distributive justices were not significant predictors of comfort with safety-related reporting when all four dimensions of justice were adjusted for each other. A possible explanation is that employees primarily use their interpersonal justice perceptions to help develop, and support, their level of comfort to engage in safety-related reporting. According to the fairness heuristic theory (Lind, 2001), individuals develop broader fairness perceptions called "heuristics" regarding an organization. Once a heuristic is established, it influences the assessment of subsequent actions of the organization. In other words, individuals use shortcuts in their interactions with entities such as their organization. The perceived fairness of individual events, such as the fairness of decision making procedures or fairness of rewards, shapes perceptions regarding the overall fairness of the organization (Lind, 2001).

Thus, study results demonstrated a possibility that health care workers may simplify their perception of fairness entirely based on interpersonal justice. When employees are unable to predict or understand how processes or decisions are made regarding safety-related reporting, they can only rely on personal relationships with managers and colleagues as an indicator. Similarly, hospital employees may utilize interpersonal justice to validate the information received as to whether the reporting process is adequate or reliable. Despite how other scholars have reinforced the importance of carrying out fair processes and decisions in incident reporting (Heslin & VandeWalle, 2011; Yang, Mossholder, & Peng, 2009), this study highlighted the importance of improving interpersonal justice in order to enhance comfort with reporting unsafe practices, errors and suggestions to improve hospital safety.

Moreover, study results should also be interpreted with statistical caution. As stated previously, multicollinearity was not an issue for the present study. Correlation matrices (Table 2), however, revealed moderate to high correlations between interpersonal justice and procedural justice (r = .85, p <.001), informational justice (r = .49, p <.001), as well as distributive justice (r = .54, p <.001). When high correlation coefficients exist, it is reasonable to assume that all four dimensions of organizational justice are correlated in various degrees (Colquitt et al., 2005). The fact that procedural justice was not a significant predictor of safety-related reporting may be due to its high correlation with interpersonal justice. In other words, the extra explanatory power of the three non-significant dimensions of justice is small because they are correlated with interpersonal justice. It is, therefore, important to recognize that procedural justice, informational

justice, and distributive justice may all contribute to the comfort with safety-related reporting in addition to interpersonal justice. This explanation returns to the argument about whether organizational justice is a multi-dimensionality concept or not. Several studies, including a meta-analysis, demonstrated strong correlations between various dimensions of organizational justice and safety (Hauenstein et al., 2001; Masterson et al, 2000; Piccolo et al., 2008). In light of these results, the researchers suggest that it is necessary to study organizational justice as a concept if the research design is predictive, but to study separate dimensions if the research design is exploratory (Hauenstein et al., 2001). Because of the need to understand the relative importance of each dimension of organizational justice on safety-related reporting, the present study design is deemed to be appropriated.

The organizational justice scale could also be one possible explanation for informational justice not being a significant predictor for comfort with safety-related reporting. When comparing items included in the informational justice scale with other informational justice measures (Colquitt, 2001; Shibaoka et al., 2010), it is clear that the current scale only included management visibility and number of communications forums. Important contents such as information availability, information exchange process, and information accuracy were not measured. It is reasonable to assume that the informational justice scale defined this construct too narrowly and, therefore, yielded a non-significant predictor for comfort with safety-related reporting.

Konovsky (1989) demonstrated that perceived distributive justice does not affect commitment because of the quid pro quo matters concerning fairness in the exchange of

labour for compensation. The employees, in lieu of receiving compensation, provide labour, and hence do not feel any further obligation towards the organization beyond this quid pro quo. Thus, distributive justice may not have any impact on the tendency to perform safety reporting because fair pay for work is what most health service organizations are expected to provide. In addition, in the context of Canadian hospitals, distributive justice (i.e., pay and benefits) is sometimes influenced by collective agreements specifying obligations between the employees and the organizations (van Knippenberg et al., 2006). In a study that explored organizational justice improvement preferences among hospital employees, Cunningham et al. (Cunningham et al., 2013) found that improvements in procedural and interactional justice exerted more influence on organizational improvement choices than did distributive justice. Their results reflected the fact that hospital employees felt a relative lower need to improve distributive justice than procedural and interactional justice. Distributive justice proved to be a relatively unimportant dimension in influencing employees' behaviors. Therefore, it may be reasonable to assume that distributive justice is not a great indicator to predict safety-related reporting among employees.

In summary, although healthcare organizations have expended substantial effort to promote incident reporting, studies suggest that underreporting is pervasive (Kopp, Erstad, Allen, Theodorou, & Priestley, 2006; Noble & Pronovost, 2010; Wald & Shojania, 2010). Researchers believed that a punitive culture in many healthcare organizations contributes to underreporting of errors (Weiner, Hobgood, & Lewis, 2008). Weiner, Hobgood, and Lewis (2008), for example, suggested that, by inculcating a sense of fear, the punitive

approach discourages reporting and, in doing so, prevents organizational learning and improvement. Although Weiner et al. (2008) postulated the possible connection between organizational justice and incident reporting, the present study further clarified the relative importance of each dimension of organizational justice. Specifically, study results suggest that encouraging reporting behaviors should primarily focus on improving employee perceptions of interpersonal justice. In other words, interpersonal justice should be considered as an essential component in creating a no-blame culture in hospitals.

Safety Outcome – Perceptions of Hospital Safety

Consistent with past literature (Neal & Griffin, 2006) , comfort with safety-related reporting, including reporting unsafe practices and errors as well as making suggestions for safety improvements, predicted hospital safety perceptions. As the greatest indicator of hospital safety perceptions, this may illustrate a critical underlying mechanism to improve perception of hospital safety through specific actionable behaviors. Researchers argue that, in line with the theory of reasoned action, the "willingness" to report is regarded as an indicator for the intention to report incidents, which further leads to hospital safety (Pfeiffer, Manser, & Wehner, 2010). In addition, Hutching and colleagues (2007) conducted a correlational study with 148 acute hospitals in England to explore the relationship between reporting rates and other indicators of hospital-level safety. Similar to the current study findings, Hutching et al.(2009)'s results showed that higher reporting rates correlated positively with data on safety culture and incident reporting from the National Hospital Safety (NHS) Staff Survey (Hutchinson, Young, Cooper, McIntosh, Karnon, Scobie, & Thomson, 2009). Thus, current study results, along with other past

research demonstrated the important relationship between comfort with safety-related reporting and perceptions of hospital safety.

In addition, the current study demonstrated the association between informational justice and perceptions of hospital safety. In the past decade, many hospitals have implemented executive walk rounds to improve patient safety (Frankel et al., 2003; Morello et al., 2012). Executive walk rounds involve executives and clinical leaders visiting units they are responsible for and communicating with employees directly (Morello et al., 2012). Walk rounds have been shown to have a positive impact on climate. In one randomized trial, nurses who participated in visits from senior managers reported higher perceptions of safety climate after the visit than nurses who worked on control units (Thomas, Sexton, Neilands, Frankel, & Helmreich, 2005). Another study of seven hospitals that implemented the program from 2002 to 2005 found that, in the two hospitals that sustained the program, frontline care providers' perceptions of safety climate improved compared to their pre-intervention scores (Frankel et al., 2008). More recently, consistent with study findings, a study involving 1119 health services providers concluded that more frequent management visibility and accessibility positively predicted greater hospital safety perceptions (Morello et al., 2012). Although the informational justice scale did not capture all relevant content illustrated by other researchers, study findings demonstrated the importance of management visibility and accessibility in enhancing perceptions of hospital safety.

Study results also showed that the relationship between interpersonal justice and perceived hospital safety was partially mediated by comfort with safety-related reporting.

Partial mediation illustrates a situation in which the estimate from interpersonal justice to perceptions of hospital safety is reduced in absolute size, but is still different from zero when the mediator (e.g., comfort with safety-related reporting) is introduced (MacKinnon & Luecken, 2008; Mathieu, DeShon, & Bergh, 2008). Consistent with the past evidences (Connell, Ferres, & Travaglione, 2003; Frankel, Leonard, & Denham, 2006), researchers concluded that a poor working relationship among managers and staff leads to employees hesitating to voice their concerns or suggestions, resulting in the possible occurrence of avoidable harm (Connell, Ferres, & Travaglione, 2003; Frankel, Leonard, & Denham, 2006). A similar finding was found in a recent study surveying 368 participants who worked in a high risk industry. Colley et al. revealed that high human relations (i.e. being treated fairly by supervisors and coworkers) was positively associated with safety perceptions (Colley, Lincolne, & Neal, 2013). In short, study findings and past evidence have supported both a direct and indirect relationship between interpersonal justice and hospital safety perceptions.

To date, safety research has spent minimal effort to understand what factors employees use to develop their safety perceptions. In other words, while researchers immediately understood that safety climate was an important reliable and valid construct as demonstrated in Zohar's (1980) first study, there was little focus on how employees develop those perceptions and which factors predict employee safety compliance and participation (Neal & Griffin, 2006). Most researchers in this area focus more on determining what safety climate predicts and not what predicts safety climate perceptions. Along with a few other studies (e.g., Kelloway, Mullen, & Francis, 2008), the present

study helps to fill this gap by showing that interpersonal and informational justice significantly influence safety perceptions.

Previous studies have spent a significant amount of time on understanding the relationship between organizational justice, various employee behaviors, and organizational outcomes (Colquitt et al., 2005). However, very little time has been devoted to the association between organizational justice and comfort to engage in safety-related behaviors as well as how it could predict organizational safety perceptions. The present study makes a significant contribution to the literature by illustrating that the hypothesized relationship between organizational justice and comfort with safety-related reporting further predicts perceptions of safety. This is consistent with Weiner, Hobgood, & Lewis's (2008) theoretical paper.

Study Implications

This study sheds light on the importance of the interpersonal relationships between hospitals and their employees in fostering a healthy work environment that ultimately improves safety in health care facilities. Given that hospitals are potentially high risk settings (Hutchinson et al., 2006; Hutchinson, Young, Cooper, McIntosh, Karnon, Scobie, & Thomson, 2009a; Kho, Carbone, Lucas, & Cook, 2005), hospital administrators need to take immediate action to protect both patients and employees. Based on the present study, providing a more respectful and supportive working environment would contribute to a higher level of comfort among employees to perform safety-related reporting. With a higher chance in reporting safety-related concerns, more adverse events could be

prevented and further benefits both patients and hospital employees. Thus, administrators and managers should monitor the working atmosphere carefully to ensure that staff treat each other with dignity and respect.

Social Exchange Theory, along with this study's findings, suggests that an investment in relational leadership will be rewarded through reciprocal attitudes. This creates work environments that are conducive to increased comfort with safety-related reporting and safety perceptions. Through respectful relationships between managers and coworkers, studies suggest that a hospital employee's safety perception can improve. Hofmann and Mark (2006) concluded that a positive safety climate of the unit significantly predicted fewer medication errors and higher patient perceptions of nurse responsiveness. In addition, researchers also found that safety perceptions were positively correlated to trust and commitment and negatively to medication errors and falls in hospitals (Vogus & Sutcliffe, 2007).

The current study also revealed the association between informational justice and perceptions of hospital safety. Therefore, the study suggests that hospital managers and supervisors should be more visible and accessible for direct communication in order to enhance safety perceptions among hospital employees. This practical implication is also supported by past research. Various studies, including a randomized controlled trial, have demonstrated the importance of executive walk rounds on safety perceptions and safety outcomes in hospitals (Thomas et al., 2005; Frankel et al., 2008; Morello et al., 2012).

Moreover, psychological safety is essential to achieve a safe environment for hospital employees and patients. Psychological safety is defined as people's perceptions of consequences for taking interpersonal risk at their place of work (Edmondson, 1999). Psychological safety allows employees to provide input without fear of reprisal from others (Hirak, Peng, Carmeli, & Schaubroeck, 2011). When psychological safety exists, employees are rewarded for taking calculated risks, which typically results in more learning (Hirak et al., 2011). When people feel safe psychologically, the likelihood of engaging in behaviors that lead to increased learning and positive change are greater. Therefore, this means the environment must be conducive to an employee's ability to identify unsafe practices, report errors, and suggest safety improvement strategies with the knowledge that the response will always be respectful. Until respect becomes the basic tenet of the working relationship between all managers and staff, employees will hesitate to voice their concerns or suggestions and avoidable harm may occur (Connell et al., 2003; Frankel et al., 2006). Previous research indicates that it is common for employees to report medication errors; however, it is also associated with increased emotional exhaustion (Spence Laschinger & Leiter, 2006; West, Tan, Habermann, Sloan, & Shanafelt, 2009). Since reporting safety-related issues is clearly stressful, it provides a reasonable explanation of why hospital employees are hesitant to engage in safety-related reporting. The relationship between reporting safety-related issues and stress further supports and explains why hospital employees in the study are so sensitive to interactional justice. Hospital administrators and managers should look into programs that lessen staff's emotional exhaustion when safety-related reporting is performed. For

example, in order to reduce the amount of stress associated with safety-related reporting, leaders must create a respectful working environment where all staff treat each other with dignity. In addition, managers should reinforce respectful and prompt responses when safety-related issues are reported.

This research also has several theoretical implications for organizational justice and safety literature. First, study results show that, while interpersonal justice predicted both comfort with safety-related reporting and safety perceptions, informational justice only significantly predicts safety perceptions among hospital employees. Along with the confirmatory factor analysis performed on the Organizational Justice Scale, the present study demonstrates the importance of considering interpersonal justice and informational justice as two separate constructs. In addition, this study will add to the organizational justice literature by further establishing the roles interpersonal and informational justice play in organizations, and the extent to which they can directly affect important attitudes.

Secondly, this study makes a significant contribution to the safety climate and perception literature, providing a framework for how safety perceptions can be developed. Study results highlighted a specific mechanism that employees may use to judge whether the working environment is comfortable enough to engage in safety-related reporting and, ultimately, on their perceptions of safety. It is possible that the level of respect by which an employee is treated by managers and colleagues can act as an antecedent to the development of employee's safety perceptions. Specifically, study results revealed that perceived interpersonal justice provides employees with a basis for whether or not a reciprocal behavior (e.g., safety-related reporting) should be performed. In addition,

corresponding to the heuristic theory, the current study discovered that comfort with safety reporting improves perceptions of safety. Schwab (2008) stated that heuristics are particularly important in cognitively demanding occupations, such as healthcare professionals. Thus, it is possible to assume that, if an individual feels safe reporting issues, others must feel safe to do so as well. Since all employees feel comfortable identifying unsafe practices, reporting errors, and making suggestions to improve safety, this must be a safe hospital.

Finally, study findings validated the Social Exchange Theory, and suggest that employees are more comfortable to engage in safety-related reporting behaviors when working in an environment that promotes positive perceived interpersonal justice. Future studies should be performed to determine whether this positive perception of interpersonal justice will translate into other safety-related behaviors, including monitoring of team members performance, less risk-taking behaviors, or asking for help when overworked.

Limitations

Common method variance (CMV) occurs when variance is attributable to the method of measurement rather than to the constructs being measured, and thus introduces systematic error into the measured constructs (Podsakoff et al., 2003). Additionally, common method variance has been purported to influence relationships between measures, and can inflate or deflate observed true influences between measurements of different constructs (Doty & Glick, 1998; Podsakoff et al., 2003). If such influences exist,

this systematic measurement error threatens internal study validity, and provides an alternative explanation for the observed relationships independent of the hypotheses (Podsakoff et al., 2003). Sources of bias include: (1) common rater effects such as social desirability (Streiner & Norman, 2008); (2) item characteristic effects such as common scale formats, anchors and item priming effects (Streiner & Norman, 2008); and (3) measurement context effects (Podsakoff et al., 2003; Streiner & Norman, 2008). Given the self-report nature of these data, and that both independent and dependent variables were obtained from the same people (hospital employees), the current study does risk CMV or mono-method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Cramptom and Wagner (1994), compared mono-method with multi-method correlations on the same variables using a large meta-analysis of over 40,000 correlations from 581 articles. Of the 143 variable pairs, 62.2% showed no significant difference. Therefore, Cramptom and Wagner concluded that, although common method variance can influence some findings, it does not have the universal effect cited by critics of the self-report method. In addition, previous studies have used structural equation modeling and meta-analysis to assess the level of common method variance in 28 multitrait-multi-method correlation matrices from 25 studies (Doty & Glick, 1998). They (1998) found that the level of common method variance was fairly high, but the problem of method bias was not as great as initially anticipated. Clearly, the results of these studies support the fact that common method variance alone is not sufficient to bias all results.

Spector (2006) acknowledged that biases are real and endemic across research designs. Efforts to avoid this bias, however, are important to increase internal validity of

study results. Addressing potential bias using a variety of approaches will help improve the validity of mono-method studies (Spector, 2006). The approach used to minimize bias should be tailored to match the research setting (Podsakoff et al., 2003).

There are two primary ways to control for method biases. They could be controlled either through the design of study procedures that limit sources of bias or through statistical controls (Podsakoff et al., 2003). To minimize common method variance, the present study design had incorporated a number of strategies. Anonymity as well as highlighting the nature of voluntary participation in the consent form were used to minimize common rater effects of social desirability and the tendency to respond as a result of social acceptability or the demands of leaders (Cohen-Charash & Mueller, 2007; Tourangeau & Yan, 2007). To deal with item characteristics effects, detailed labeled scale anchors (e.g., strongly disagree, neutral, and strongly agree) along with all positively-worded items were used to improve survey readability (Streiner & Norman, 2008). Predictor and outcome questions were also separated in the context of the questionnaires to avoid item priming effects (Streiner & Norman, 2008).

Secondly, because hospital employees are grouped within units, units within programs, and programs within hospitals, researchers must take those "clusters" into consideration. The relationship between patient safety climate (i.e. perceptions) and outcomes has been shown to vary across units (Hofmann & Mark, 2006; Pronovost & Sexton, 2005; Vogus & Sutcliffe, 2007a) as well as professional groups (Listyowardojo, Nap, & Johnson, 2012). In addition, measurement of the effect of safety perceptions evaluated at the different levels of the hospital is limited. Therefore, applying a multilevel

analysis may better link organizational justice with unit outcomes, and provide a more comprehensive test of the model. Given the importance of recognizing unit differences, researchers have suggested to adapt multilevel analysis (Shannon & Norman, 2009). The current study, however, did not collect sufficient data to perform multilevel analysis. Future studies should apply multi–level modeling to further clarify outcome variability associated with units, programs, and hospitals.

It is important to note that when healthcare organizations plan to improve patient safety, they must first determine the most appropriate level at which to direct their interventions. A centralized (hospital level) approach might seem the least time- and money-consuming route, but a decentralized approach (unit level) may be the most efficient way of improving patient safety. Unit-level interventions can be tailored to the specific needs of a unit, while only a portion of the units within a hospital will gain from interventions implemented at hospital level. Clustering of staff responses at unit or at hospital level indicates at which level dimensions of safety behaviors belong and at which organizational level they can be addressed.

Singer and colleagues demonstrated that significant variation in perceived safety climate also exists by work role (Singer et al., 2009; Singer, Gaba et al., 2009), and that hospitals whose frontline staff perceived a better safety climate were less likely to experience adverse patient safety events (Rosen et al., 2010). Cunningham and colleagues' (Cunningham et al., 2013) conjoint experiment, involving 652 hospital employees, revealed different sensitivities between managers and other professions in organizational justice improvement preferences. Managers rated procedural justice higher

than did non-managers, and were more likely to be members of a segment that preferred improvements focusing on interactional justice (Cunningham et al., 2013). In addition, in a cross-sectional study that involved 418 hospital employees in Malaysia, researchers found that reported safety satisfaction and feedback varied significantly with job position. Whereas nurses showed significantly higher mean ratings of safety satisfaction and feedback, staff in other job positions (e.g., physicians or managers) rated safety much lower (Abdullah, Spickett, Rumchev, & Dhaliwalb, 2009). Furthermore, other researchers also found significant differences in how physicians and nurses perceived teamwork climate (Mohr, Burgess Jr, & Young, 2008) and job climate (Lin et al., 2008), which further influenced various safety outcomes in hospitals. Therefore, future studies should replicate the hypothesized model using multilevel analysis that can identify the relative variances associated with job roles. (e.g., physician vs. nurse vs. allied health professional hospital).

Non-response bias is related to the voluntary nature of the study. Non-response bias has the potential to affect survey data by skewing the results of statistical inferences and estimates drawn from the collected data (Groves, Dillman, Eltinge, & Little, 2002; Groves & Peytcheva, 2008). Employees who responded to this survey may perceive organizational justice differently than those who did not respond. Unfortunately, there is no way to compare characteristics of nurses who responded to those of non-responders. Therefore, despite a relatively high return rate (76%) in the current study, it is impossible to determine whether the study participants differ from non-participants.

Finally, it is important to note that the present study is a relatively straightforward design that examines the relationship between organizational justice, comfort with safety reporting, and hospital safety perceptions. Not all potential predictors were included in the hypothesized model tested in this study. There may be other unmeasured variables or unknown variables that may influence safety behaviors, such as job satisfaction, safety-related knowledge, and reporting policies. Moreover, not all potential outcomes of safety behaviors were included. For example, hand-washing practices (Allegranzi & Pittet, 2009) and hand-off communication (Freitag & Carroll, 2011; Merrill, & Brown, 2012) have both been demonstrated to affect safety in hospitals. Therefore, further research is needed to consider the effect of other predictors in a broader range of safety behaviors among hospital employees.

Future Directions

There are several questions stemming from this research that call for further investigation. First, the relationship between different dimensions of organizational justice and the perception of organizational safety appeared to be untested prior to this study. More studies need to be conducted, using the same or similar safety perception measures and organizational justice scales, in order to further validate the proposed structural model. This will lend support to the reliability and validity of the proposed relationship between organizational justice and safety perceptions.

Second, future research should replicate the proposed model with a larger sample from organizations in various job professions, industries, settings, and cultures. This will

increase the level of generalizability. Improvement programs can also be tailored accordingly to maximize safety perceptions.

Third, based on Shannon and Norman's (2009) suggestions, a multi-level analysis should be employed to reveal the correct estimates of the proposed measures. A model with a multilevel analysis could better estimate the relative influences of each independent variable. The estimations could also reveal the relative variances explained at the individual versus unit levels. Results would then provide further information for management to tailor specific organizational justice improvement programs for each level in the hospital to increase safety perceptions (Shannon & Norman, 2009; Hofmann & Mark, 2006; Pronovost & Sexton, 2005; Vogus & Sutcliffe, 2007a).

The present study supports the development of a stronger theoretical framework highlighting possible general predictors (e.g., in contrast to safety-specific predictors) of hospital safety perceptions. Researchers should consider the possibility that other non-safety-specific behaviors and policies could influence comfort with safety-related reporting and perceptions of safety. Thus, researchers investigating the predictors of safety should expand their framework to include general organizational factors that do not focus specifically on safety. Factors as antecedents of interpersonal trust (Bijlsma & Koopman, 2003), such as transformational leadership (Squires, Tourangeau, Spence Laschinger, Doran, 2010), perceived organizational support (Connell et al., 2003), and transactional leadership (Squires, Tourangeau, Spence Laschinger, Doran, 2010) should be included when examining the relationship between interpersonal justice and safety reporting (Zohar, 2010). Incorporating other relationship-related constructs with

interpersonal justice could yield a better understanding of the mechanism that relates to higher comfort with safety-related reporting, and ultimately, organizational safety perceptions. In addition, since the present study suggests that organizational processes that seem unrelated to safety (e.g., interpersonal justice), may have an important impact on comfort in engaging in safety-related reporting, it is reasonable to ask what other dimensions of organizational functioning might influence safety perceptions. Moreover, it is also crucial for future researchers to investigate the link between safety perceptions and more objective measures of safety. For example, the actual number of medical errors and employee injuries. Future studies should examine the proposed model in randomized controlled trials to better understand the underlying causal relationship between different dimensions of organizational functioning and various safety outcomes in hospitals.

Future research should also take into consideration the possibility of moderators between organizational justice and safety reporting. For instance, it is possible that trust could moderate the relationship between organizational justice and comfort with safety-related reporting (Bianchi & Brockner, 2012; Hassan & Semerciöz, 2011). Other possible moderating variables, including job security (Nahrgang, Morgeson, & Hofmann, 2011; Sverke, Hellgren, & Näswall, 2002), group cohesion (Nielsen, Bachrach, Sundstrom, & Halfhill, 2012; Sanders & Shipton, 2012), organizational support (Mearns & Reader, 2008), leadership (Wu, Chen, & Li, 2008), and cultural differences (Cropanzano, 2011) should be examined to determine their role in the relationship between organizational justice, safety-related reporting, and organizational safety perceptions. These possible

moderators should also be examined in a multilevel analysis to detect a more accurate estimation of variations in safety perceptions at both the individual and unit level.

Finally, study results indicated that comfort with safety-related reporting only mediated the relationship between interpersonal justice and safety perceptions. Future studies should explore other possible mediators that could correctly reflect the influence of each dimension of organizational justice on comfort with safety-related reporting as well as hospital safety perceptions. From a methodological standpoint, most justice research, including the present study, has been based exclusively on regression-based methods to test hypotheses (Cohen-Charash & Spector, 2001). These regression-based studies are prone to bias (e.g., undetected relationships among dimensions of organizational justice) (Cohen-Charash & Spector, 2001, Colquitt et al., 2001, Cropanzano et al., 2002). Therefore, regression-based methods may not be the most appropriate analytic strategies for testing hypotheses aimed at determining the relative importance of organizational justice dimensions on employee outcomes. A critical reanalysis using Relative Weights Analysis may reveal the relative strength of prediction among independent variables more accurately (Bernstein & Nunnally, 1994). Johnson and other researchers have proposed that relative weight analysis is the most appropriate technique for explaining the relative contribution to R^2 among multiple independent variables (Behson, 2011; Johnson, 2000; Johnson & LeBreton, 2004; LeBreton, Hargis, Griepentrog, Oswald, & Ployhart, 2007). Therefore, future research should explore the use of Relative Weight Analysis in parallel with the regression-based analyses to more

accurately estimate the importance of each independent variable on comfort with safety-related reporting and safety perception.

Chapter 6 Conclusion

This study has provided interesting new knowledge that has enriched the body of safety and organizational justice literature, as well as testing a theoretical model proposed by Weiner and colleagues (2008). The purpose of this research was to test and refine a theoretical model that explains the impact of perceived organizational justice on comfort with safety-related reporting, and ultimately on hospital safety perception in a children's hospital. Research into safety climate and safety perception has devoted minimal effort to understanding how and what factors employees use to develop their safety perceptions, with minimal focus on how employees develop safety perception since Zohar's (1980) first study in safety climate (Griffin & Neal, 2000). Most researchers in the field have focused more on determining what safety climate and perception predicted, and not what predicted safety perception (Kelloway, Mullen, & Francis, 2008). To my knowledge, this is the first study to examine how different dimensions of organizational justice influence hospital safety perception through the comfort of reporting unsafe practices, errors, or suggestions regarding safety improvement. Consistent with the hypothesized model, study findings indicate that higher interpersonal justice predicted higher comfort with safety reporting, which in turn predicted higher perceptions of hospital safety. In addition, interpersonal justice and informational justice contributed directly to the prediction of hospital safety perceptions. This study illustrates why general organizational justice, specifically interpersonal justice and informational justice, should be considered above and beyond safety-specific climate when individuals are intent on improving hospital

safety perception. Along with a few other researchers (e.g., Kelloway, Mullen, & Francis, 2008), the current study helps to close this gap in our knowledge by showing that there is a significant association between perceived justice and hospital safety perceptions.

Although several study limitations were present, study results have practical implications for healthcare leadership. Recommendations for more rigorous research methods and areas for further investigation are generated. Further review of the relationship between interpersonal justice, informational justice, comfort with safety-related reporting, and hospital safety perceptions is warranted.

In conclusion, this study begins to provide new insights that are useful to health care managers and hospital administrators about the underlying mechanisms for improving hospital safety perception among employees. Specifically, hospital managers and administrators should enhance interpersonal justice along with comfort with safety-related reporting and informational justice to create a safer hospital.

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Table 1 Transformation of Non-Normal Variables

	Pre-transformation			Post-transformation	
Variables	Skewness	Kurtosis	Remedy	Skewness	Kurtosis
Reporting concerns regarding unsafe practices	-1.10	5.11	Square roots	-0.25	3.19
Reporting errors that I made	-1.14	6.33	Square roots	-0.41	3.56
Suggesting ways of improve safety	-1.15	5.69	Square roots	-.0.31	3.35

Table 2 Correlations among Comfort with Safety-Related Reporting and Perceptions of Hospital Safety Variables

Variable	1	2	3	4	5
1. I feel comfortable reporting concerns regarding unsafe practices	-				
2. I feel comfortable reporting errors that I make	.71	-			
3. I feel comfortable suggesting ways to improve safety	.65	.52	-		
4. Care is always delivered in a safe manner	.45	.37	.36	-	
5. The atmosphere here helps me work in a safe way	.52	.46	.54	.60	-

Note. All correlations are significant at the .01 level (2-tailed)

Table 3 Demographic Characteristics of the Sample

	N	%
Total sample	652	100.0
Sex		
Female	587	90.0
Male	65	10.0
Age		
Less than 25	37	5.7
26 to 35	155	23.8
36 to 45	212	32.5
46 to 55	187	28.7
Greater than 55	61	9.4
Job Category		
Managers	21	3.2
Physicians	36	5.5
Nurses	241	37.0
Allied Health Professionals	166	25.5
Therapists (OT, PT, SLP, etc)	79	
Psychologist	36	
Social workers	34	
Pharmacists	7	
Dieticians	8	

Lab analysts	2	
Clinical support staff	105	16.1
Child & youth workers	66	
Health care assistants	39	
Non-clinical support staff	83	12.7
Clerical (Business clerks, secretaries, etc)	73	
Research assistants/technician	10	
Job length at the current hospital		
Less than 1 year	53	8.1
1 to 5 years	188	28.8
6 to 10 years	135	20.7
11 to 15 years	48	7.4
16 to 20 years	99	15.2
More than 20 years	129	19.8

Table 4 Internal Consistency, Mean, Standardized Deviation, and Bivariate Correlations for Items Included in the Organizational Justice Scale, Comfort with Safety-Related Reporting, and Perceptions of Hospital Safety

				Correlation Coefficients (*r*)					
	α	M	SD	1	2	3	4	5	6
1. Procedural Justice	.86			-	.85***	.49***	.54***	.38***	.48***
I have an opportunity to participate in decisions which affect me		3.3	1.0						
I understand how decisions are made		3.1	1.1						
Management listens to my views before decisions are made		3.0	1.0						
Decisions which affect me are made promptly		2.8	1.0						
Decisions are made in a fair way		3.1	0.9						
2. Interpersonal Justice	.74			.85***	-	.57***	.64***	.46***	.58***
Management treats me with dignity and respect		3.7	0.9						
My colleagues treat me with dignity and respect		4.2	0.7						

				Correlation Coefficients (*r*)					
	α	M	SD	1	2	3	4	5	6
Staff treat each other with dignity and respect		3.8	0.9						
My efforts are recognized and rewarded		3.3	1.0						
The children's hospital treats me fairly		3.4	0.9						
3. Informational Justice	.84			.49***	.57***	-	.53***	.30***	.45***
Senior administrators are accessible and visible		2.9	1.0						
My immediate manager is accessible and visible		3.9	1.0						
There are adequate opportunities to communicate with senior administrators		2.9	1.0						
There are adequate opportunities to communicate with my immediate manager		3.9	0.9						
Senior administrators conduct an adequate number of communication forums		3.0	0.9						
4. Distributive Justice	.63			.54***	.64***	.53***	-	.38***	.45***
I have equal access to educational opportunities		3.6	1.0						
Salaries at hospital are fair		3.4	1.0						

				Correlation Coefficients (*r*)					
	α	M	SD	1	2	3	4	5	6
Benefits at hospital are fair		3.4	1.0						
Access to parking privileges at hospital is fair		2.4	1.2						
Shifts and scheduling policies at hospital are fair		3.4	0.9						
5. Comfort with Safety-Related Reporting	.84			.39***	.46***	.30***	.38***	-	.68***
I feel comfortable reporting concerns regarding unsafe practices		3.9	0.8						
I feel comfortable reporting errors that I make		4.0	0.7						
I feel comfortable suggesting ways to improve safety		4.0	0.7						
6. Hospital Safety Perceptions	-			.48***	.58***	.45***	.45***	.68***	-
Care is always delivered in a safe manner		3.8	.9						
The atmosphere here helps me work in a safe way		3.6	.9						

Note. ***All bivariate correlations are significant at $p < .001$ (2-tailed).

Table 5 All Study Measures by Job Category

	Managers		Physician		Nurse		Allied Health Professionals		Clinical Support Staff		Non-Clinical Support Staff			
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	F	C
1. Procedural Justice														
I have an opportunity to participate in decisions which affect me	4.1	.8	3.5	1.1	3.3	0.9	3.1	1.0	3.2	1.0	3.2	1.3	4.2**	M>N,A, C,S
I understand how decisions are made	3.9	1.1	2.9	1.1	3.2	0.9	2.9	1.1	3.1	1.1	3.2	1.1	5.4***	M>P, A,C & N>HP
Management listens to my views before decisions are made	3.8	0.8	2.8	1.0	3.0	0.9	2.8	1.1	3.0	1.0	3.0	1.1	3.8**	M>P,N, A,C,S
Decisions which affect me are made promptly	3.1	1.0	2.3	1.0	2.9	1.0	2.5	1.0	2.9	1.0	2.8	1.1	5.7***	M>P & N,C>P,

	Managers		Physician		Nurse		Allied Health Professionals		Clinical Support Staff		Non-Clinical Support Staff			
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	F	C
														A
Decisions are made in a fair way	3.5	0.8	3.0	0.8	3.2	0.8	2.9	0.8	3.0	0.9	3.2	1.1	2.7*	
2. Interpersonal Justice														
Management treats me with dignity and respect	4.2	0.9	3.4	1.1	3.8	0.8	3.6	1.0	3.7	1.0	3.9	0.9	3.8**	M>A
My colleagues treat me with dignity and respect	4.4	1.1	4.3	0.7	4.2	0.7	4.5	0.6	4.1	0.9	4.1	0.7	5.8***	A>N,C, S
Staff treat each other with dignity and respect	3.7	1.3	3.9	0.8	3.5	0.9	4.1	0.8	3.8	0.9	3.7	0.9	7.6***	A>N,C, S
My efforts are recognized and rewarded	3.6	0.9	3.6	1.0	3.2	0.9	3.1	1.0	3.2	1.1	3.4	1.1	2.2	
The children's hospital treats me fairly	3.7	0.7	3.3	0.9	3.3	0.9	3.3	0.9	3.4	0.9	3.5	1.0	1.0	

	Managers		Physician		Nurse		Allied Health Professionals		Clinical Support Staff		Non-Clinical Support Staff			
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	F	C
3. Informational Justice														
Senior administrators are accessible and visible	3.3	1.1	3.1	1.3	2.7	1.0	2.9	1.1	3.2	1.0	3.1	1.1	5.9***	C,S>N
My immediate manager is accessible and visible	4.4	0.6	3.5	1.1	3.9	1.0	3.9	1.0	3.9	1.0	3.9	1.0	2.6*	M>P,N, A
There are adequate opportunities to communicate with senior administrators	3.2	1.1	3.1	1.2	2.7	1.0	2.9	1.1	3.1	1.0	3.0	1.1	4.1**	C,S>N
There are adequate opportunities to communicate with my immediate manager	4.5	0.6	3.6	1.1	3.9	1.0	3.9	0.9	4.1	0.9	4.0	1.0	3.0**	M>P,N, A
Senior administrators conduct an adequate number of communication forums	3.5	0.9	3.2	0.9	2.8	0.9	3.0	0.9	3.2	0.9	3.2	0.9	5.1***	C,S>N
4. Distributive Justice														

	Managers		Physician		Nurse		Allied Health Professionals		Clinical Support Staff		Non-Clinical Support Staff			
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	F	C
I have equal access to educational opportunities	4.2	0.6	4.2	0.8	3.7	0.9	3.6	1.0	3.6	1.0	3.2	1.0	8.1***	M,P >N,A,C, S
Salaries at hospital are fair	3.1	1.2	2.8	1.1	3.7	0.8	3.1	1.1	3.4	1.0	3.7	0.9	10.3***	N, S >P
Benefits at hospital are fair	3.9	0.8	3.1	1.1	3.3	1.0	3.6	0.9	3.6	0.8	3.4	1.0	4.4**	M > P & C > N
Access to parking privileges at hospital is fair	3.1	1.2	3.0	1.2	2.2	1.1	2.3	1.1	2.7	1.2	2.3	1.2	7.1***	M,P > N,A
Shifts and scheduling policies at hospital are fair	3.8	0.5	3.4	0.7	3.3	1.0	3.5	0.7	3.5	0.8	3.4	0.9	2.0	M>N
5. Comfort with Safety-Related Reporting														
I feel comfortable reporting concerns regarding unsafe practices	4.3	0.6	4.1	0.8	3.9	0.8	3.9	0.8	3.9	0.8	3.9	0.8	1.7	M>N,A

	Managers		Physician		Nurse		Allied Health Professionals		Clinical Support Staff		Non-Clinical Support Staff			
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	F	C
I feel comfortable reporting errors that I make	4.3	0.5	4.1	0.7	4.0	0.7	3.9	0.7	4.0	0.7	4.0	0.6	1.7	M>A
I feel comfortable suggesting ways to improve safety	4.4	0.5	4.0	0.6	4.0	0.7	4.0	0.8	3.9	0.8	3.9	0.8	1.8	M>N,A, C,S
6. Hospital Safety Perceptions														
Care is always delivered in a safe manner	4.2	0.5	3.5	0.9	3.6	0.9	3.8	0.9	4.1	0.8	3.8	0.9	5.9***	M, CS > P, N, HP
The atmosphere here helps me work in a safe way	4.3	0.5	3.4	1.0	3.5	0.8	3.6	0.9	3.8	0.8	3.7	0.8	5.7***	M>P, N, A, C, S & C>N

Note. * p < .05, ** p < .01, *** p < .001. M = Managers, P = Physicians, N = Nurses, A = Allied health professionals, C = Clinical support staff, S = Non-clinical support Staff.

Table 6 Model Fit Indices and Chi-Square Differences Test for the Confirmatory Factor Analyses

Model	χ^2	*df*	GFI	CFI	RMSEA	PCLOSE	χ^{2diff}	df^{diff}
Four-factor model	1311.6	164	.85	.80	.10	.00		
Three-factor model	1813.6	161	.78	.71	.12	.00		
Revised four-factor model	405.1	161	.94	.96	.05	.68		
Revised three-factor model	963.9	164	.86	.86	.09	.00		
Difference between two revised models							558.8***	3

Note. * p < .05, ** p < .01, *** p < .001.

Table 7 Standardized Parameter Estimates of Final Revised Four-Factor Organizational Justice (Based on CFA)

	Organizational Justice Dimension			
Items	Procedural	Interpersonal	Informational	Distributive
I have an opportunity to participate in decisions which affect me	.76			
I understand how decisions are made	.66			
Management listens to my views before decisions are made	.80			
Decisions which affect me are made promptly	.67			
Decisions are made in a fair way	.82			
Management treats me with dignity and respect		.80		
My colleagues treat me with dignity and respect		.63		
Staff treat each other with dignity and respect		.63		
My efforts are recognized and rewarded		.73		
The children's hospital treats me fairly		.81		
Senior administrators are accessible and visible			.84	

	Organizational Justice Dimension			
Items	Procedural	Interpersonal	Informational	Distributive
My immediate manager is accessible and visible			.48	
There are adequate opportunities to communicate with senior administrators			.91	
There are adequate opportunities to communicate with my immediate manager			.47	
Senior administrators conduct an adequate number of communication forums			.69	
I have equal access to educational opportunities				.61
Salaries at hospital are fair				.48
Benefits at hospital are fair				.52
Access to parking privileges at hospital is fair				.47
Shifts and scheduling policies at hospital are fair				.55

Table 8 Model Fit Indices and Chi-Square Difference Test of the Mediated Models

Model	χ^2	*df*	GFI	CFI	RMSEA	PCLOSE	χ^{2diff}	df^{diff}
Measurement Model	619.1	257	.94	.95	.05	.89		
1. Fully mediated model	689.5	261	.92	.94	.05	.46		
2. Partially mediated model	619.1	257	.94	.95	.05	.89		
Difference between model 1 and 2							70.4***	4
3. Trimmed fully mediated model	694.9	264	.92	.94	.05	.48		
4. Trimmed partially mediated model	624.0	262	.94	.95	.05	.92		
Difference between model 3 and 4							70.9***	2

Note. * p < .05, ** p < .01, *** p < .001.

Table 9 Standardized Parameter Estimates of the Measurement Model with Comfort with Safety-Reporting and Hospital Safety Perceptions

Items	PJ	InterJ	InfoJ	DJ	C	HS
I have an opportunity to participate in decisions which affect me	.76					
I understand how decisions are made	.66					
Management listens to my views before decisions are made	.80					
Decisions which affect me are made promptly	.67					
Decisions are made in a fair way	.82					
Management treats me with dignity and respect		.80				
My colleagues treat me with dignity and respect		.63				
Staff treat each other with dignity and respect		.63				
My efforts are recognized and rewarded		.73				
The children's hospital treats me fairly		.81				
Senior administrators are accessible and visible			.84			
My immediate manager is accessible and visible			.48			

Items	PJ	InterJ	InfoJ	DJ	C	HS
There are adequate opportunities to communicate with senior administrators			.91			
There are adequate opportunities to communicate with my immediate manager			.47			
Senior administrators conduct an adequate number of communication forums			.69			
I have equal access to educational opportunities				.61		
Salaries at hospital are fair				.48		
Benefits at hospital are fair				.52		
Access to parking privileges at hospital is fair				.47		
Shifts and scheduling policies at hospital are fair				.55		
Reporting concerns regarding unsafe practices					.90	
Reporting errors that I made					.77	
Suggesting ways of improve safety					.73	
Care is always delivered in a safe manner						.68
The atmosphere here helps me work in a safe way						.87

Note. PJ = Procedural Justice. InterJ = Interpersonal Justice. InfoJ = Informational Justice. DJ = Distributive Justice. C = Comfort with Safety-Related Reporting. HS = Hospital Safety Perceptions.

Table 10 Standardized Parameter Estimates (β) (Direct, Indirect, and Total Effects) for the Significant Constructs and Safety Outcomes from the Final Trimmed Partially Mediated Model

	Direct Effects		Indirect Effects
	Comfort with Safety Reporting	Hospital Safety Perception	Hospital Safety Perception
Constructs	*β*	*β*	*β*
Interpersonal Justice	.47***	.26***	.24***
Informational Justice	-	.14**	-
Safety Related- Reporting	-	.52***	-

Note. **p≤ 0.01 ***p < 0.001

[1] ML estimation; indirect effect estimates based on AMOS™ bootstrap algorithm.

Figure 1 The Proposed Theoretical Model – Mediated Model

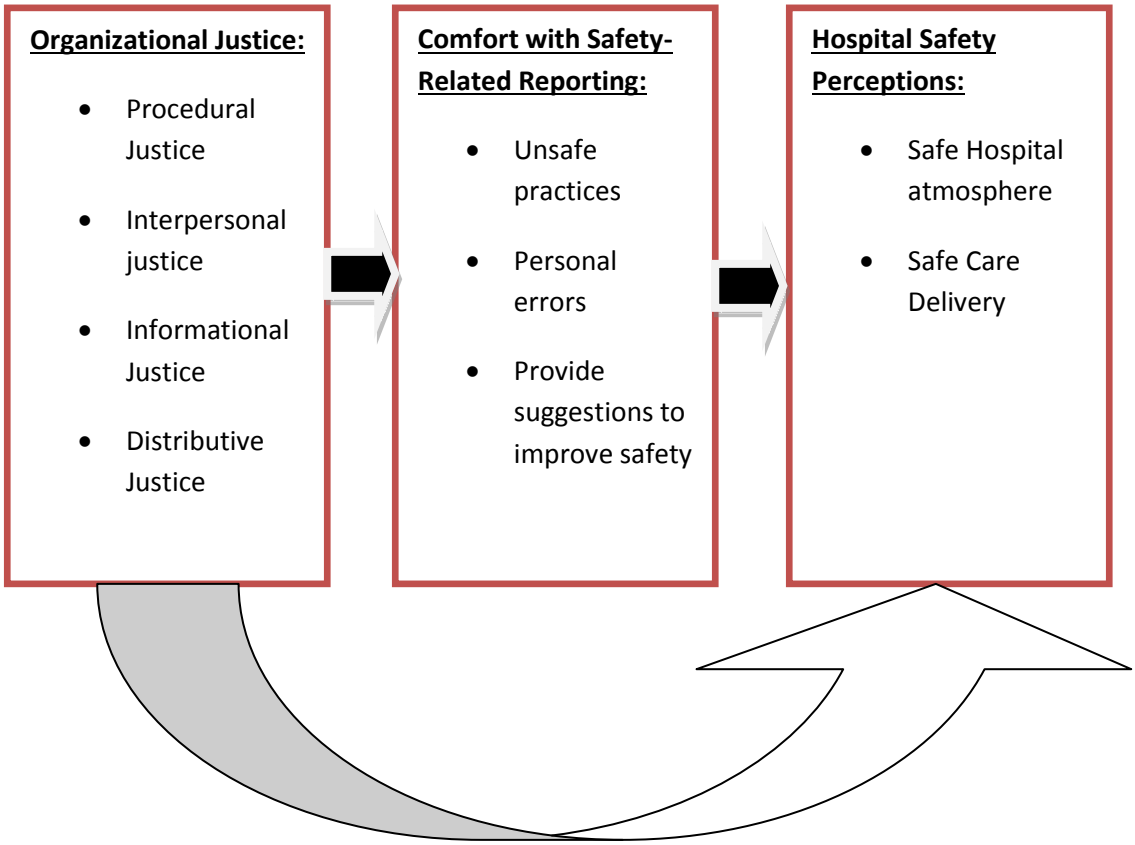


Figure 2 Proposed Four-Factor Organizational Justice Model

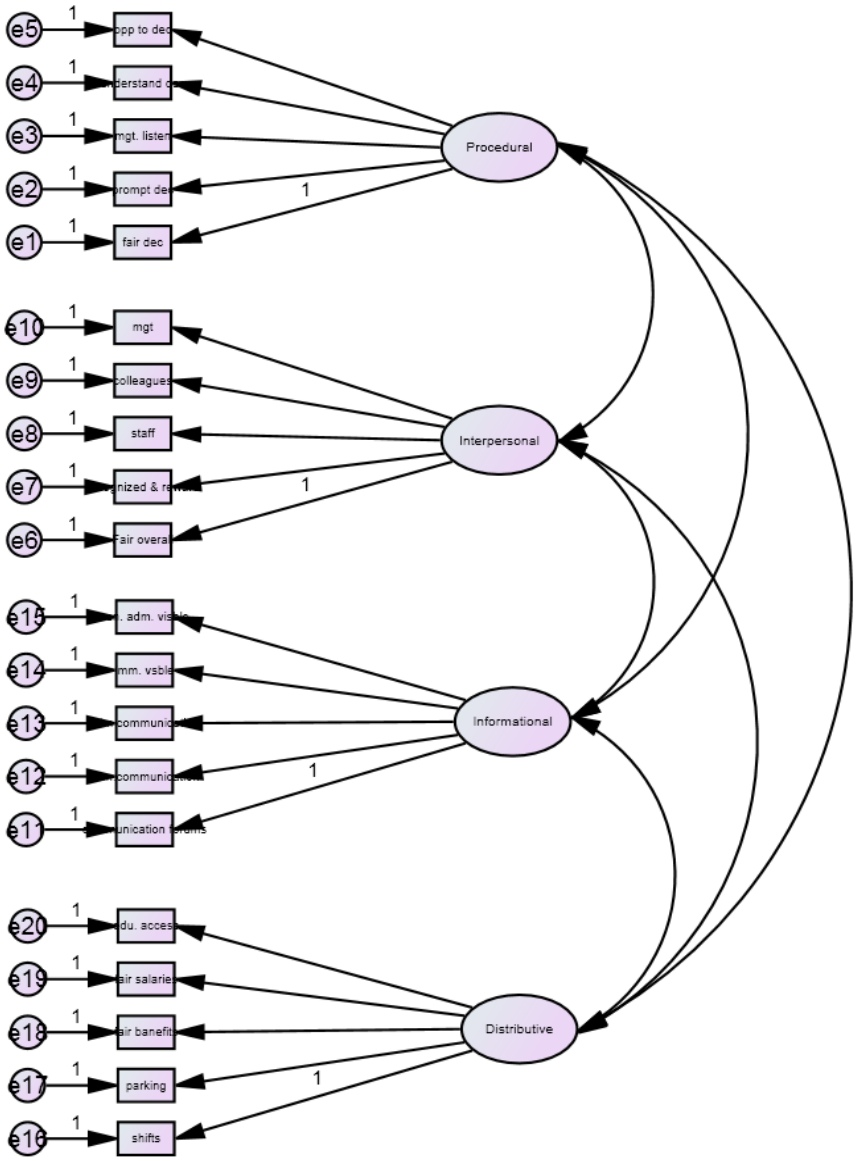


Figure 3 Proposed Three-Factor Organizational Justice Model

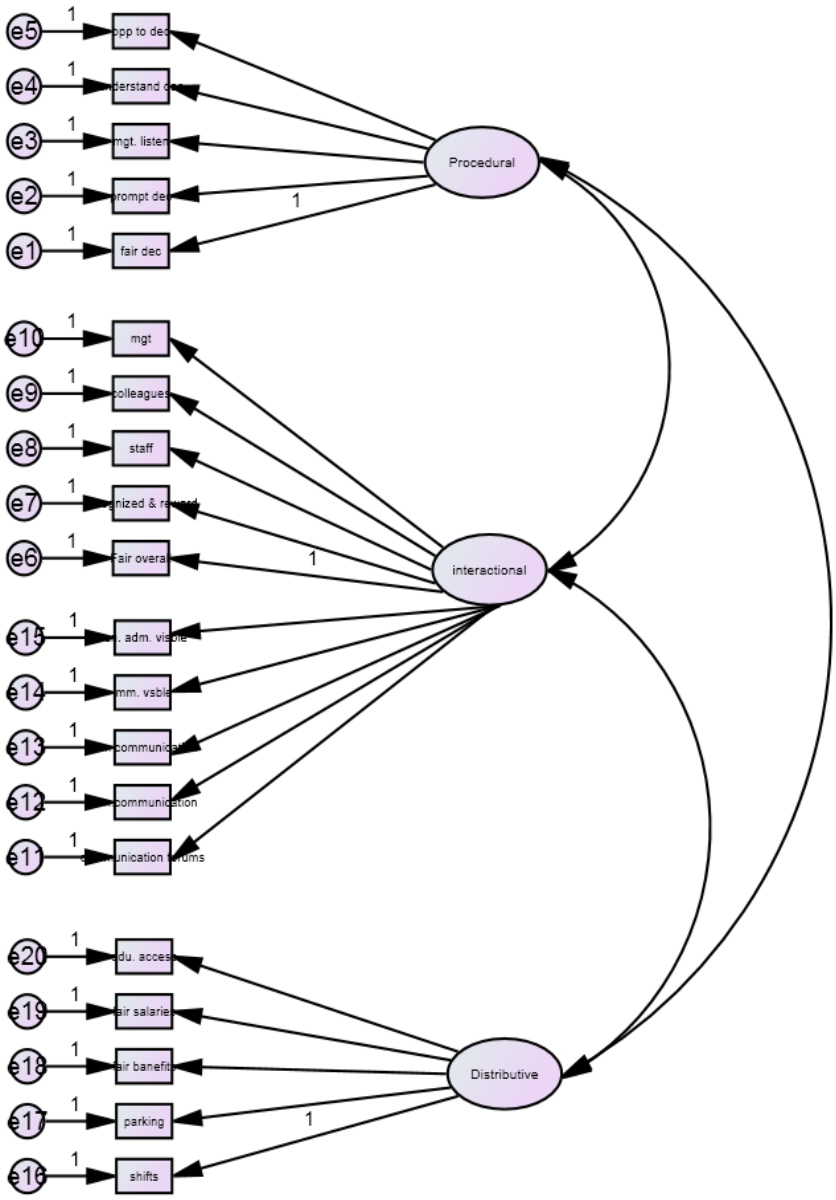


Figure 4 Revised Four-Factor Organizational Justice Model with Error Covariances Added

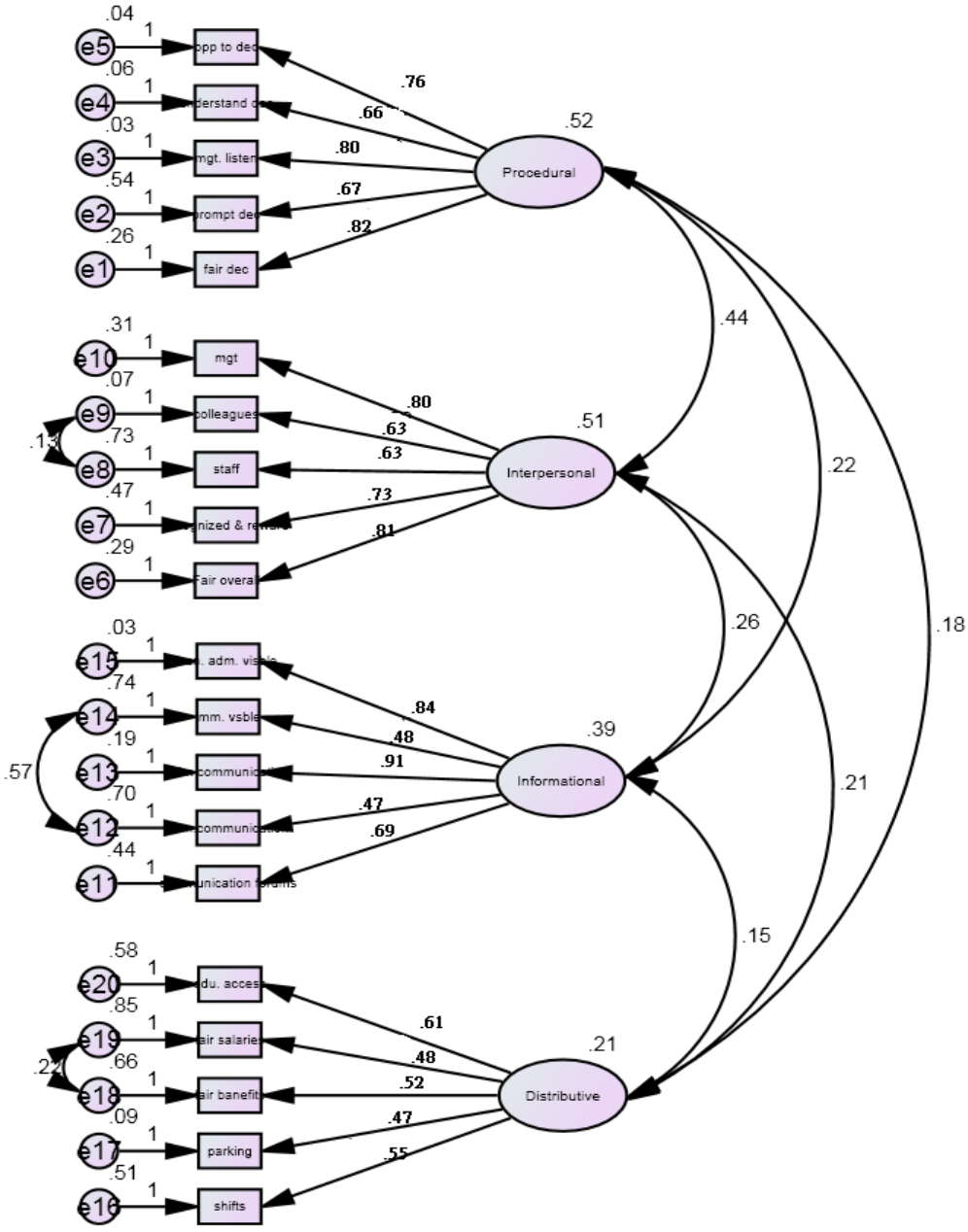


Figure 5 Revised Three-Factor Organizational Justice Model with Error Covariances Added

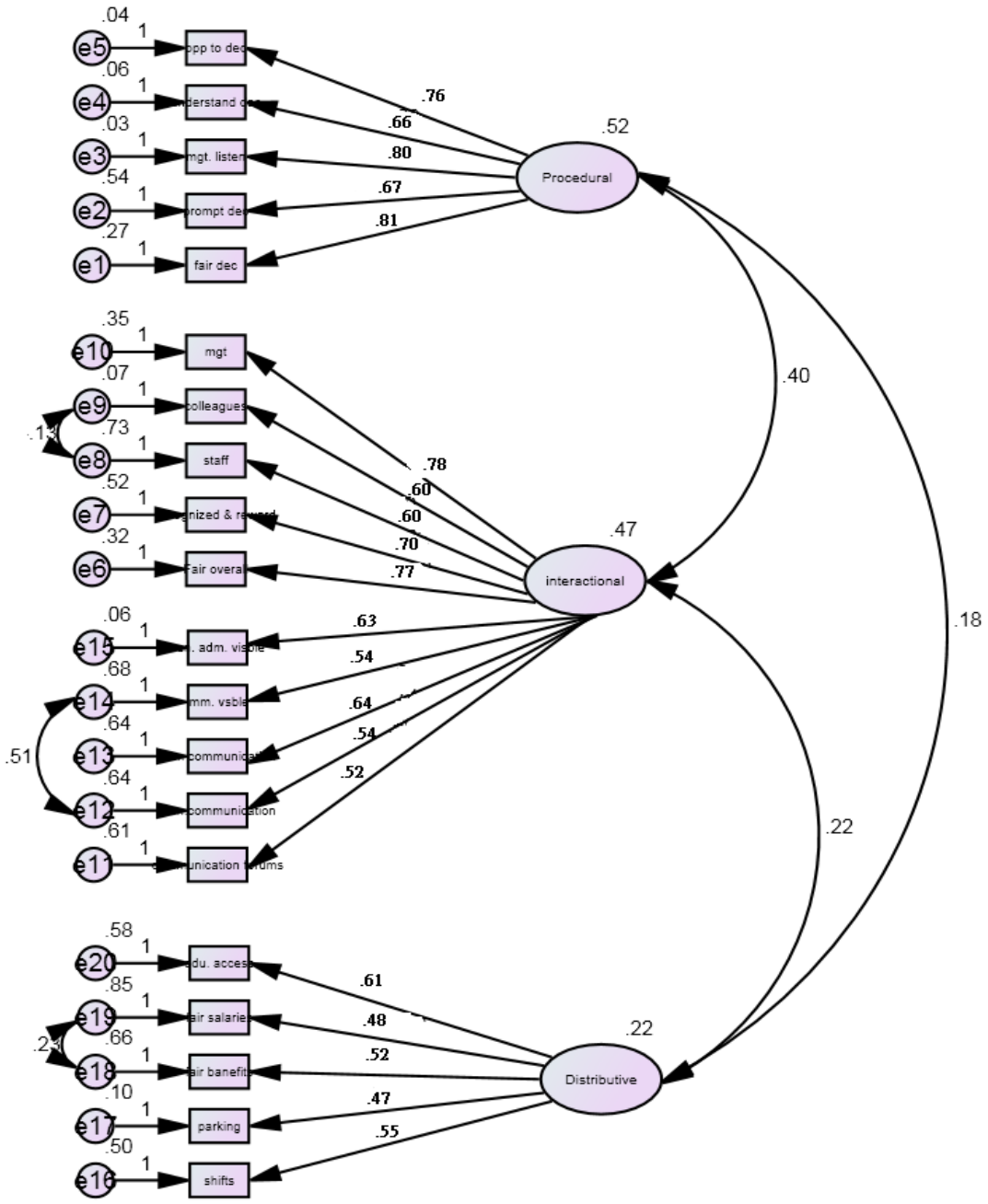


Figure 6 Measurement Model of the Proposed Structural Model

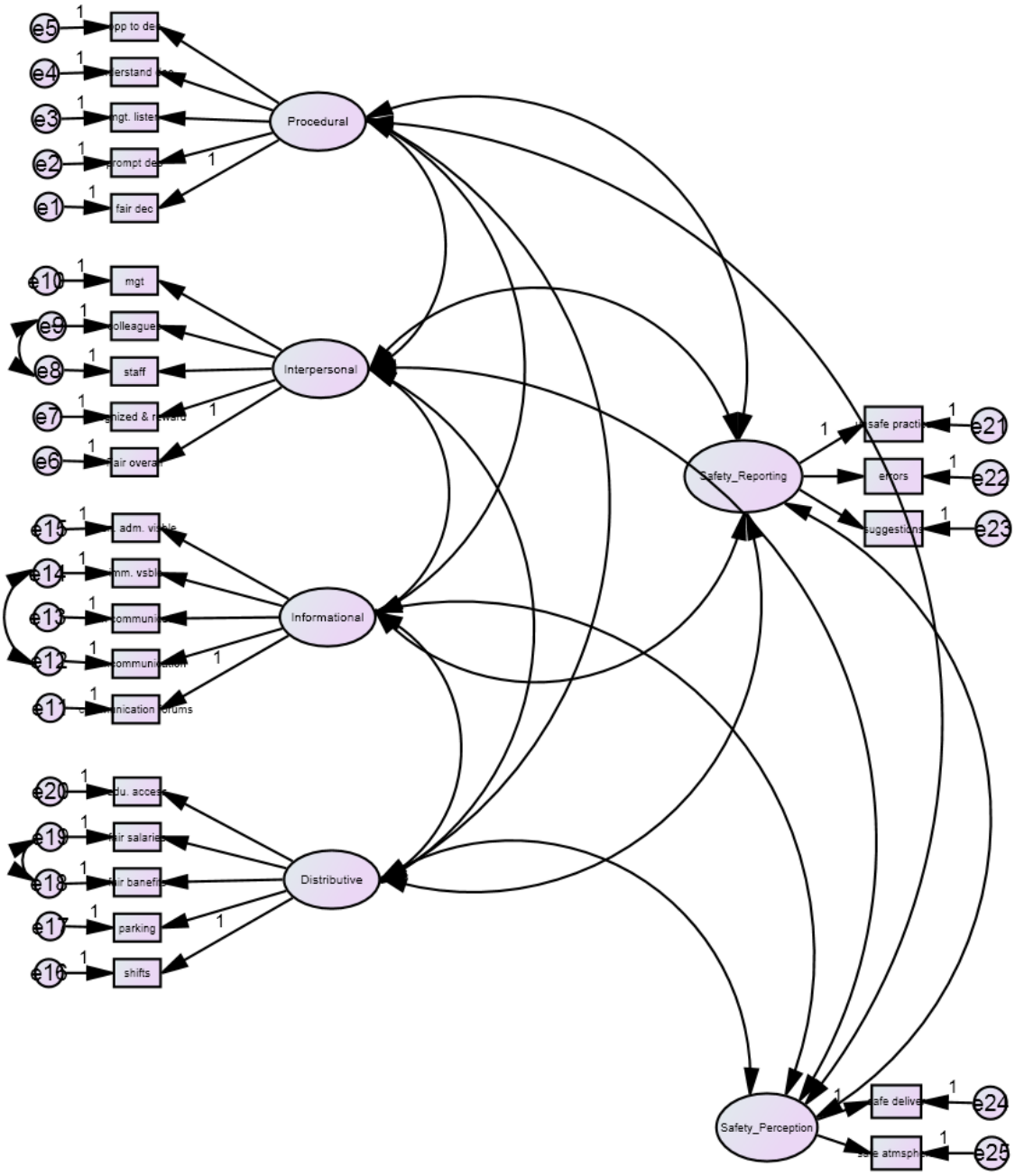


Figure 7 Proposed Fully-Mediated Model

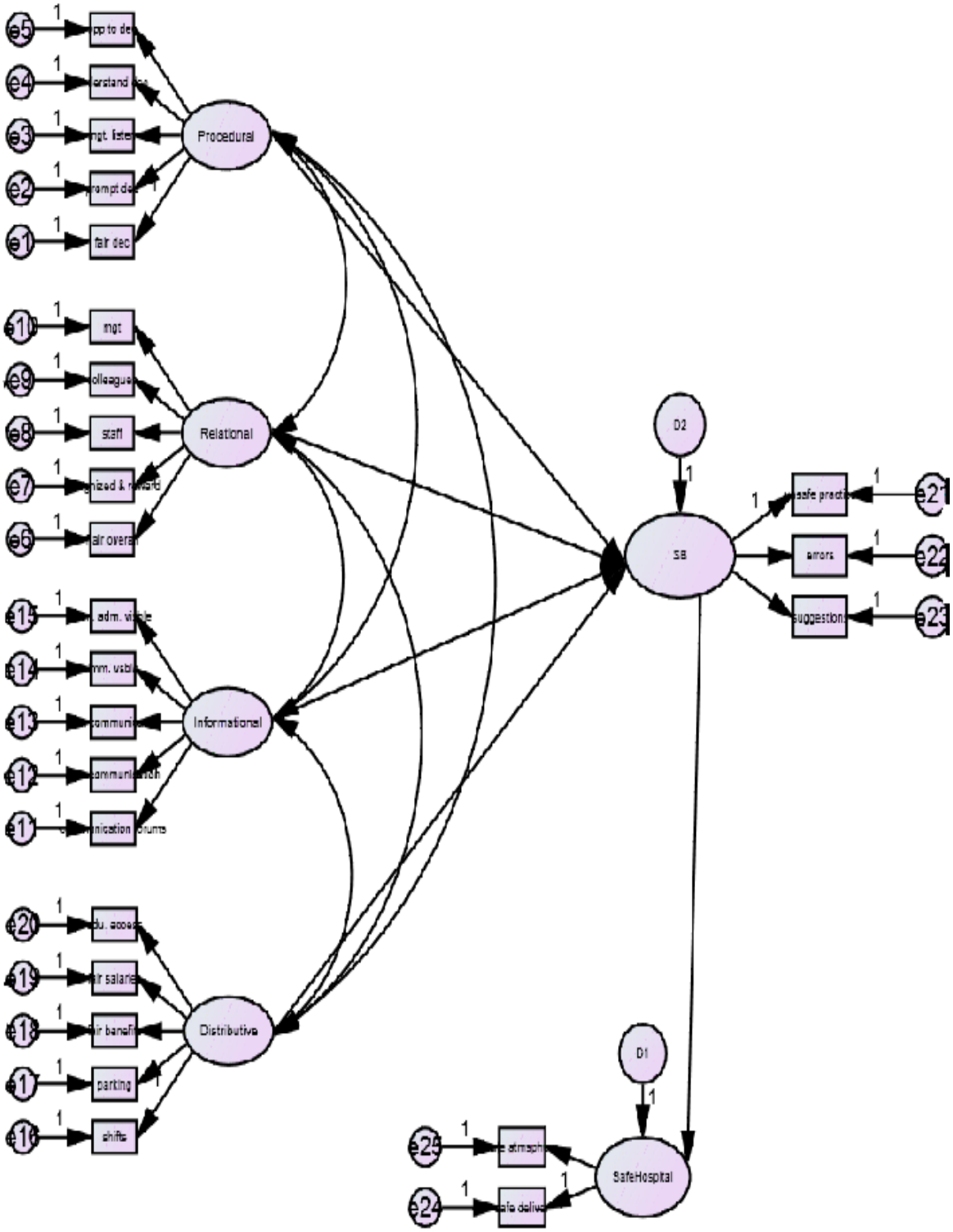


Figure 8 Proposed Partially-Mediated Model

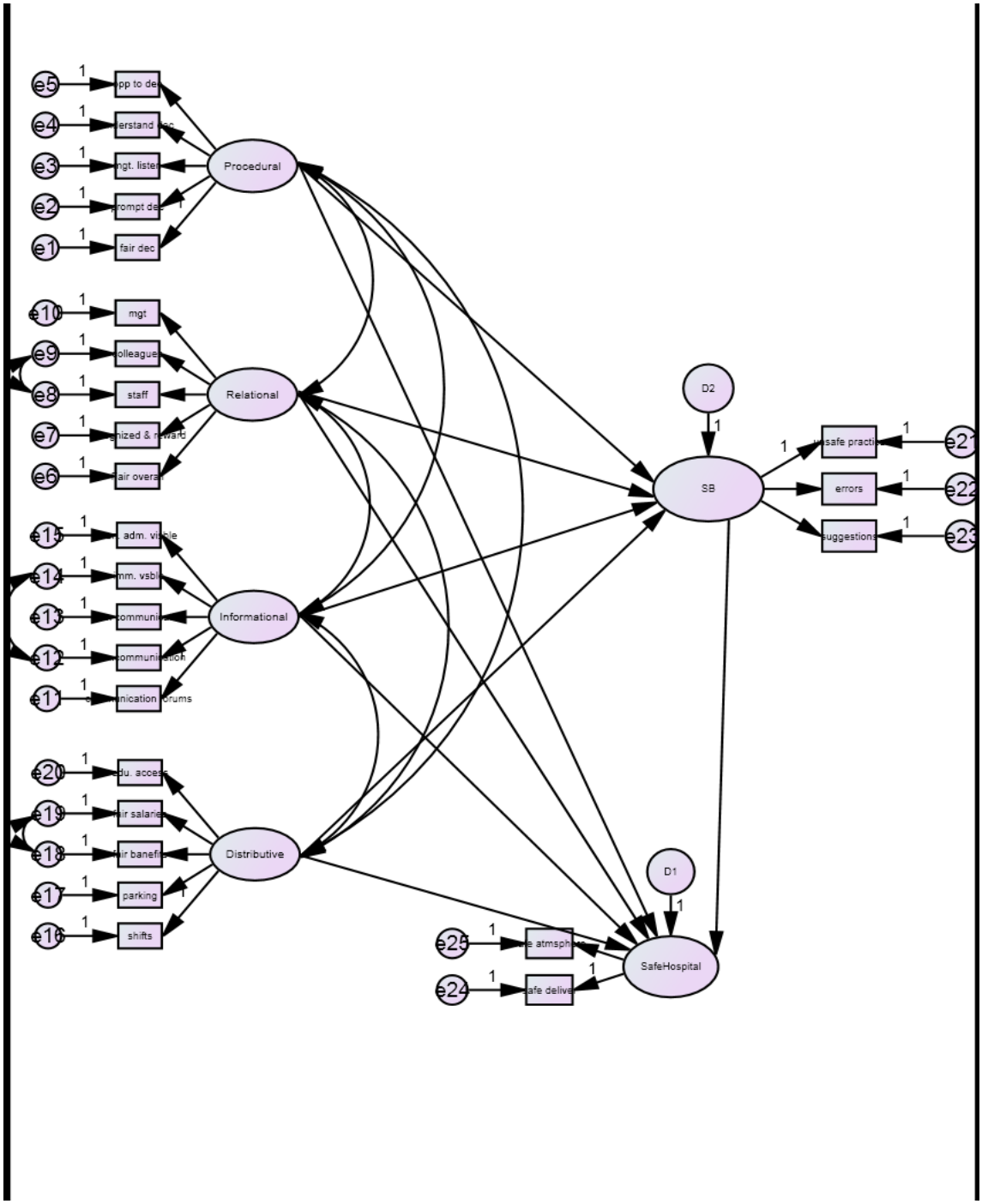


Figure 9 Trimmed Fully-Mediated Model

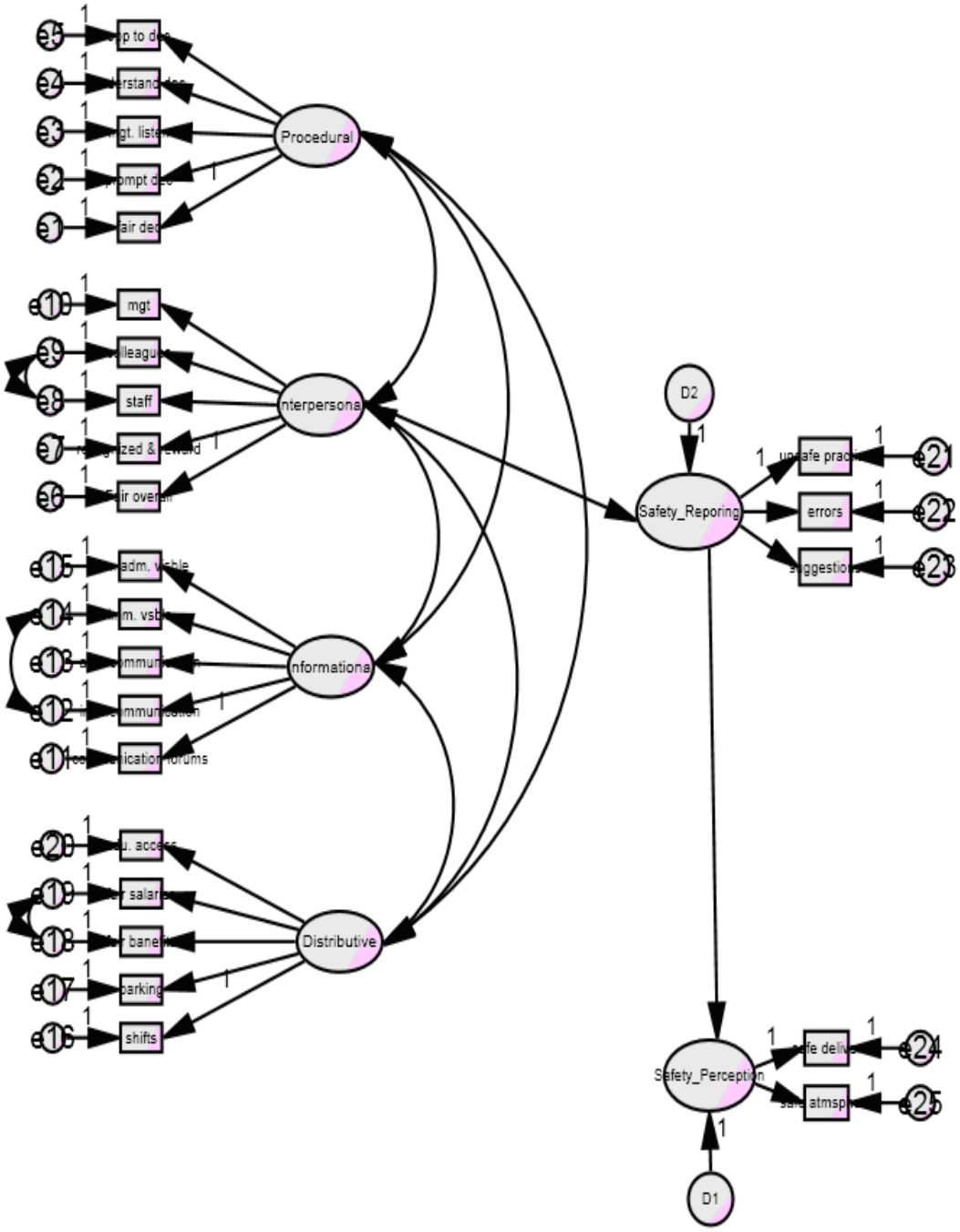
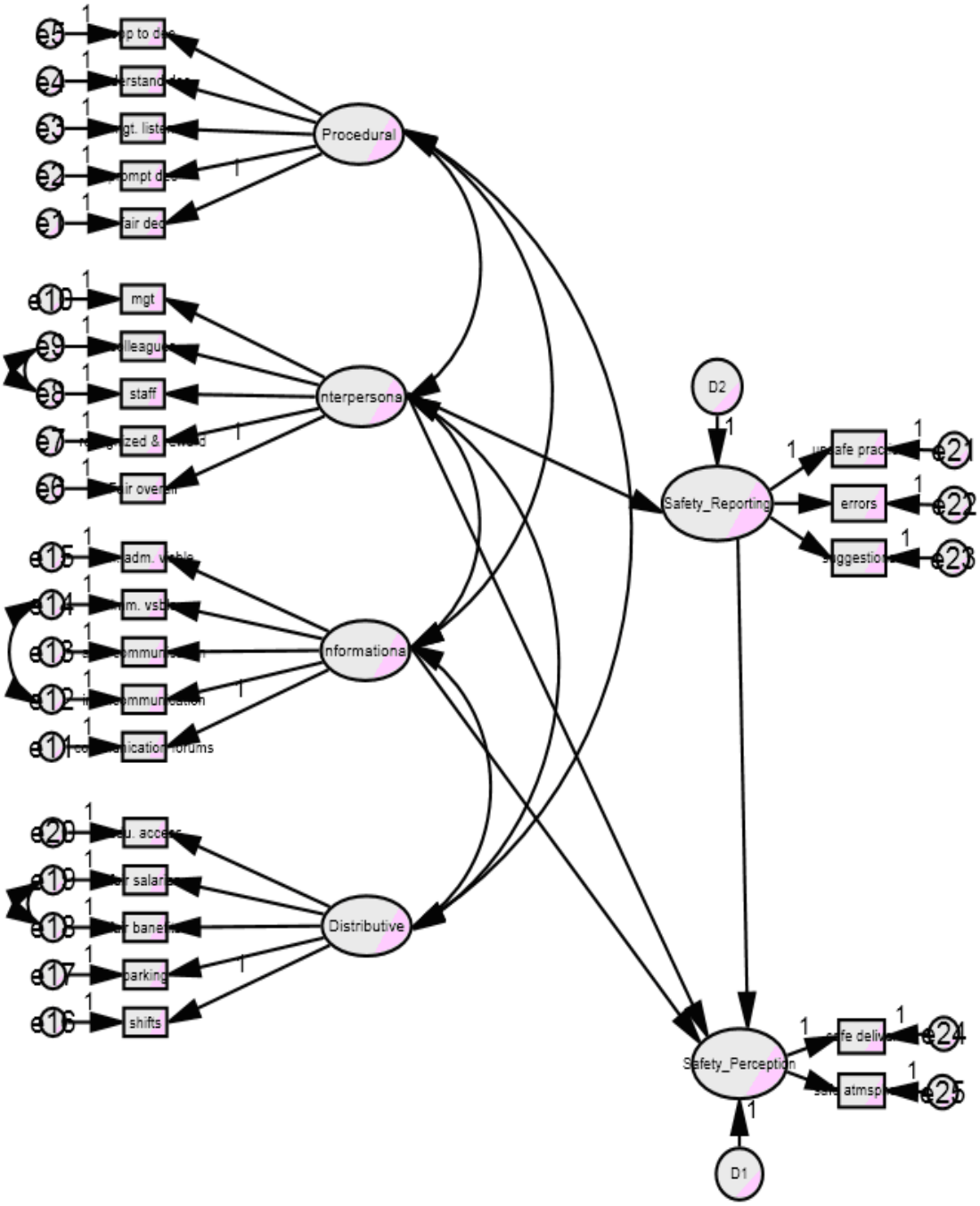


Figure 10 Trimmed Partially-Mediated Model



Appendix 1 Characteristics of Safety Culture and Climate

Safety Culture	Safety Climate
• **Refers to shared values among organization members, defined at the group level.**	• Refers to perceptions, a psychological phenomenon, of safety at a particular time.
• **Concerned with formal safety issues.**	• Concerned with intangible issues (e.g. situational factors)
• **Relatively enduring, resistant to change, and stable.**	• Unstable and subject to change.
• **Emphasizes contribution from people at every level of the organization.**	• Temporal phenomena, described as a "snapshot" of safety culture.
• **Impacts member behavior.**	
• **Reflected in the convergence between reward systems and safety structure.**	
• **Reflected in an organization's willingness to learn from errors, accidents, and incidents.**	

Note: Table adapted from Zhang et al., 2002.

Appendix 2 Consent Form

Consent to Participate

Study: The Organization Justice Project Phase 2

You are being invited to participate in a research project designed to involve staff in the development of actionable ways in which the Children's Hospital can create a fairer working environment.

I understand that participation in the study will involve the following:

1) I will complete a 15 to 20 minute multiple-choice survey.
2) At the end of the survey I will have the opportunity to enter 1 of 10 draws for a $50.00 Chapters Indigo bookstore gift certificate. I will be contacted by email should I win.
3) All information gathered is strictly confidential. Only group findings will be reported. As well, no participants will be identified in any published reports.
4) I understand that my participation in this study is voluntary. I may refuse to participate or withdraw from the study at any time without consequence. I understand that my employment status will not be affected in any way should I decide not to participate or to withdraw from participating in this study. There are no known risks to participating in this study. I will receive a copy of the consent form for my own records.

If I have any further questions, I may contact the principal investigator at XXX-XXX-XXXX ex. XXXXX. If I have any questions about my rights as a research participant I may contact the office of the REB Chair at XXX-XXX-XXXX ex XXXXX.

Click below if you have read, understood and agree to the 5 consent statements above:

- ○ Yes. I have read, understood and agreed to each of the previous statements
- ○ No. I do not wish to participate

Click here to continue

Appendix 3 Recruitment Letter

Dear <Name>!

Thanks for completing this survey for us.

This survey is a type used by marketing researchers - you will find it unusual and perhaps a little frustrating at times. Please don't give up!

At the end of the survey you will have the opportunity to enter 1 of 10 draws for a $50.00 Chapters Indigo bookstore gift certificate.

When you close the survey after completion we will already have it in the database, you don't have to send it back.

Please double click on the link below and that will enter you directly *into* the survey.

If the link doesn't take you directly to the survey, then your email program may have broken the link into more than one line. Please 'copy' the link completely and 'paste' it into your Internet address bar (where it says address: [http//www….]) then click enter.

If you are still having a problem please contact the research assistant whose contact information is listed below.

Thank you in advance for taking the time to complete the survey and providing us with your valuable input.

Sincerely,

Organizational Justice Task Force
Quality Counts Committee
The Children's Hospital

Appendix 4 Reminder Letter 1

Dear _____

We would like to thank the more than 400 of you who completed the The Children's Hospital Organizational Justice Survey. If you completed the survey, please delete this reminder.

If you did not receive a survey or were unable to complete it, please help us make sure that your thoughts and opinions count.

Please click on this link to go to your individual survey. If you started and did not have a chance to finish, the survey will begin where you stopped.

The survey should take about 15 minutes. We would like to assure you that the survey has been reviewed and approved by the Research Ethics Board; all answers are strictly confidential. Your responses will be combined together to reflect everyone's opinions before those results are shared with the Management team. Administration at the Children's Hospital will not have access to your individual responses.

Each and every member of the Organizational Justice Task force thanks you for your contributions to this important component of our efforts to involve staff in the development of a Children's Hospital which is just and fair. We'll be reporting the results to you soon.

The Organizational Justice Task Force

Appendix 5 Reminder Letter 2

Subject line: The Children's Hospital Organizational Justice survey

We would like to invite you to take 10 to 15 minutes to join the more than 560 of your colleagues who have now completed the the Children's Hospital Organizational Justice Project survey. Improving Organizational Justice in an important objective at the Children's Hospital – the views of each and every member of our organization are important to the success of the project.

If you previously started, but did not finish, a survey, clicking the link will return you to the point where you stopped.

This project is being conducted according to a protocol approved by the University Hospital Research Ethics Board. Your participation is voluntary and we want to assure you that your responses are completely confidential – your individual responses cannot be seen by the Children's Hospital administration. Only aggregate data will be reported.

To complete the survey click on the link below. If you chose not to participate, please click on the link and check the appropriate box indicating that you do not wish to participate.

Do not hesitate to contact me if you have any questions or concerns. Thanks for your help!

The Organizational Justice Task Force

Appendix 6 Reminder Letter 3

Subject line: The Children's Hospital Organizational Justice survey

More than 65% of your colleagues at the Children's Hospital have now completed the Organizational Justice Survey. To reach our goal and ensure the success of the survey, we need your help!

We would like to invite you to take 10 to 15 minutes to complete the survey.

The Organization Justice Project Team is conducting this survey according to a protocol approved by the University & Hospital Research Ethics Board. Your participation is voluntary and we want to assure you that your responses are completely confidential – your individual responses cannot be seen by the Children's Hospital administration. Only aggregate data will be reported.

To complete the survey click on the link below. If you chose not to participate, please click on the link and check the appropriate box indicating that you do not wish to participate.

If started but did not finish a survey, clicking the link will return you to the point where you stopped.

Do not hesitate to contact our research coordinator if you have any questions or concerns.

We understand that you are extremely busy and want to thank you in advance for your help!

The Organizational Justice Project Team