RELATIONSHIPS BETWEEN LEADERSHIP STYLE, SPAN OF CONTROL AND OUTCOMES

By

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ABSTRACT

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The purpose of this study is to examine the relationships between leadership style, span of control and outcomes using a conceptual model linking concepts from three theories: Transformational Leadership Theory, Span of Control Theory and Contingency Theory.

The sample consisted of 717 nurses, 41 nurse managers and 51 patient care units drawn from four types of units (medical, surgical, obstetrics and day surgery) and seven hospitals. Hierarchical linear modelling and multiple regressions were used to test the study hypotheses.

The study findings provided support for the theoretical relationships between leadership style, span of control and outcomes. Results of the study supported the argument that transformational leadership matters – the higher the nurses rated their manager as having a transformational leadership style, the higher the nurses' job satisfaction and the lower the unit turnover rate. Transactional leadership style had a similar effect on nurses' job satisfaction as that of transformational leadership style although to a lesser extent. Management-by-exception leadership style, on the other hand, decreased nurses' job satisfaction.

As well, the study findings provided support for the argument that span of control matters – the wider the span of control, the higher the unit turnover rate and the lower the unit labour stability rate. A very important and interesting finding is the significant

moderating influence of span of control on the effects of leadership on nurses' job satisfaction. The interaction between span of control and leadership decreased the positive effects of transformational and transactional leadership styles on nurses' job satisfaction, and increased the negative effects of management-by-exception and laissez-faire leadership styles on nurses' job satisfaction. These findings demonstrated that no leadership style can overcome a wide span of control.

Recommendations for practice include designing and implementing management programs that focus on a transformational style of leadership and the development of guidelines regarding the number of staff a nurse manager can effectively supervise and lead.

Recommendations for theory and research include: further testing of the proposed relationships in the study's theoretical model; and continued examination of how various organizational factors affect leaders, staff, work groups and organizations.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1: INTRODUCTION AND STUDY PURPOSE

Introduction

Leadership

There is a large conceptual and empirical literature on leadership, yet little work has been done in leadership in health care (Shortell et al., 1994; Vance & Larson, 2002). Changes to health service management structures have created an urgent need to increase our knowledge of effective leadership in health care. To be able to successfully manage patient care units, nurse managers must increase their understanding of factors, such as leadership, that influence staff outcomes. In several nursing studies, the nurse manager's leadership style has been found to be one of the factors that influence nurses' job satisfaction (Decker, 1997; Loke, 2001; McGillis Hall et al., 2003; McNeese Smith, 1995) and retention of nurses (Irvine & Evans, 1995; Lucas, 1991; Medley & Larochelle, 1995). A high level of support from managers was found to decrease nurses' feelings of emotional exhaustion (Stordeur, D'Hoore & Vandenberghe, 2001) and increase nurses' self-esteem (Bakker, Killmer, Siegriest & Schaufeli, 2000). As well, a participatory and supportive management style was identified as one of the key characteristics of magnet hospitals (Buchan, 1999).

Medley and Larochelle (1995) suggested the need to examine transformational and transactional leadership styles in order to better understand the components of effective leadership. The need for nurse managers to have leadership training, particularly in transformational leadership style, is supported by nursing staff and nursing leaders (May &

Ferguson-Paré, 1997; Stordeur et al., 2001). Empirical evidence identifying particular leadership styles that contribute to optimum performance will assist organizational leaders in designing management development initiatives, which in turn will help nurse leaders acquire the necessary leadership skills to meet the present challenges and contribute to enhanced performance.

Leadership and Organizational Factors

Several conceptual papers (House & Aditya, 1997; Howell, 1997; Pawar & Eastman, 1997) and empirical studies (Bass, Waldman, Avolio & Bebb, 1987; Schriesheim, Castro, & Yammarino, 2000) have identified that organizational factors have a significant influence on the emergence and effectiveness of leadership. For example, in their review of research paradigms and theories on leadership, House and Aditya proposed that organizational variables are likely to impose different demands on leaders. Despite this recognition, studies of the relationship between leadership and organizational variables, such as organizational size and culture, are largely absent from the present body of knowledge (e.g., Conger, 1999; House & Aditya; Shamir & Howell, 1999).

In the nursing literature, only one study (Stordeur, Vandenberghe & D'Hoore, 2000) was found that examined the influence of organizational factors, in this case, hierarchical levels, on leadership style and outcomes.

Leadership Style and Span of Control

Despite the gap in research and a lack of solid evidence regarding the influence of organizational variables on leadership, organizations such as hospitals are increasingly becoming flatter and adopting structures with wider managerial spans of control (Pillai & Meindl, 1998; Spence-Laschinger, Sabiston, Finegan & Shamian, 2001). The hospital restructuring of the 1990's and the resultant changes in organizational structures were precipitated by pressure from the government to be accountable and responsive, that is, to reduce cost while maintaining access and quality of services (Leatt, Lemieux-Charles & Aird, 1994; Ontario Ministry of Health & Long Term Care Nursing Task Force, 1999). Most of these changes included the mergers of several hospitals (as many as eight) into one organization. At the unit level, some of the units combined are not on the same floor, some not in the same building and a few not even in the same community. This newly consolidated organizational structure created dramatic changes to the work environment, such as a reduction in the number of management positions, mostly in nursing. The reduction resulted in nurse managers being responsible for several units, for motivating and evaluating a large number of staff, sometimes more than 100. Thus nurse managers, who are directly responsible for maintaining standards of care and developing staff, were less able to provide nurses with the traditional mentoring and coaching and individual support and encouragement than previously. Spence-Laschinger et al. found that nurses identified relations with management as a concern about their work conditions. The nurses stated that with additional units and staff numbers, managers are not able "to be really in touch with many situations . . . communication to staff was decreased" (p. 10). Similarly, a study by Blythe, Baumann and Giovannetti (2001) found that as a result of the increased

span of control, relations between managers and nurses became distant and their communications became less frequent and more formal. In the United States, California passed the 1999 Assembly Bill 394 law that requires California hospitals to meet fixed nurse-to-patient ratios (Bergmann, 1999). This law mandates the California Department of Health Services to make a fixed nurse-to-patient ratio determination with respect to each institution (e.g., acute care hospitals, acute psychiatric hospitals and special hospitals). However, there are no guidelines specific to manager-nurse ratios. Increasing our knowledge and understanding of how variations in spans of control affect leadership and outcomes has implications for how hospitals structure and budget for the management of nursing units. The results of this study may contribute to the development of guidelines regarding the number of staff a nurse manager may effectively support and supervise.

In summary, when faced with the need to tighten budgets, hospitals have eliminated managerial positions despite: a) limited research on effective leadership in health care; and b) little knowledge of the impact of organizational factors, such as span of control, on leadership and outcomes. An examination is required of the nursing managerial span of control, particularly to determine its effect on leadership, staff satisfaction, turnover and labour stability.

Study Purpose

The purpose of this study is to examine the relationships between leadership style, span of control and outcomes, as measured by nurses' job satisfaction, unit turnover and unit labour stability. The specific objectives of the study are to: 1) examine the extent to which the manager's leadership style influences nurses' job satisfaction, unit turnover and unit labour stability; 2) examine the degree to which the manager's span of control influences nurses' job satisfaction, unit turnover and unit labour stability; and 3) investigate which particular leadership style contributes to optimum outcomes under differing spans of control.

CHAPTER 2: REVIEW OF LITERATURE

The review of literature includes empirical studies that examined the: a) relationship between leadership style and outcomes; b) relationship between span of control and outcomes; and c) relationships between leadership style, span of control and outcomes. The review of leadership studies and of span of control research is specific to their effect on the manager's effectiveness. The most commonly used determination of leader effectiveness is the extent to which the leader's followers and organization achieves its goals (Yukl, 1998). In this study three outcomes were used to determine leadership effectiveness, and will be discussed in the next chapter. The three outcomes are nurses' job satisfaction, unit turnover and unit labour stability.

Leadership

Leadership Defined

Leadership is defined as the ability to influence, motivate and enable others to contribute toward the effectiveness and success of an organization (House & Aditya, 1997). There is considerable agreement in the literature that leadership plays an important role in the success or failure of organizations (Hennessey Jr., 1998; Judge & Bono, 2000). Mintzberg (1994a; 1998) identified leadership as one of the five managerial roles in his "model of managerial work", considering it the key to the manager's job: the development of individual staff and of a smoothly functioning team.

Leadership Style

Leadership style is the manner in which leaders exhibit specific leadership behaviours (House & Aditya, 1997). The Transformational Theory of Leadership by Bass (1985, 1998) identifies four leadership styles: transformational, transactional, management-by-exception and laissez-faire. Several theories have identified other, to some extent similar, leadership styles. One example is the Path Goal Theory of Leadership (Evans, 1970; Evans, 1994; House, 1971), which outlines four styles: directive, supportive or considerate, participative and achievement-oriented. Another example is the Life Cycle Theory of Leadership (Hershey & Blanchard, 1982, 1996), which postulates the following four styles: telling, selling, participating and delegating.

For the purpose of this study, focus shall remain on the Transformational Theory of Leadership for good reasons. First, the Path Goal theory is a complex theory and has not been adequately tested (Evans, 1996; House & Aditya, 1997; Yukl, 1998). Similarly, few empirical tests have been done on the Hershey & Blanchard's Life Cycle Theory (House & Aditya). In contrast, the Transformational Theory of leadership has been the subject of several studies. Lowe, Kroeck, and Sivasubramanian (1996) found 33 published and six unpublished empirical studies. Bass and Avolio (2000) found close to 200 theses and doctoral dissertations on the subject. Finally, the Transformational Theory of Leadership has been associated with the kinds of outcomes of interest in this study, such as staff satisfaction.

Transformational Leadership Theory

The concept of transformational leadership was first developed by James McGregor Burns (1978) and later extended by Bernard Bass (1985). Burns developed the first concepts of transformational and transactional leadership through an analysis of several political leaders' biographies. The Transformational Leadership Theory stresses the importance of the leader's relationship with followers, which in part determines the performance and accomplishments of the group, unit and organization (Bass 1985, 1998). The quality and impact of the relationship between leader and follower vary, depending on leadership style. The four leadership styles, transformational, transactional, management-by-exception and laissez-faire, postulated in the theory are discussed in the next section.

Transformational Leadership Theory and Outcomes

Several studies in management and a few studies in nursing have found that the manager's leadership style affects staff performance. The literature review on leadership style and performance focused on studies exploring the Transformational Leadership Theory.

Transformational leadership style and outcomes. Bass (1998) describes the transformational leader as one who motivates followers to do more than what is expected of them. Transformational leaders inspire subordinates to go beyond their own self-interests for the good of the organization, transforming their subordinates by raising their sense of the value of the task and their sense of importance. Bass outlined four components of transformational leadership: charismatic or idealized influence, inspirational motivation,

intellectual stimulation and individualized consideration. In regards to charismatic or idealized influence, staff who see their leader as being successful and self-confident, may emulate their leader. With inspirational motivation, leaders motivate and inspire followers by articulating and communicating goals and by providing meaning and challenge to subordinates' work. In intellectual stimulation, old ways of doing things and old patterns of thinking are questioned, while new ideas, new ways of handling problems, efforts by staff to be innovative and creative, are supported and encouraged. Lastly, individualized consideration consists of leaders giving personal attention to followers and encouraging their development, making each one feel valued. Transformational leaders act as a coach or mentor.

In several management studies, transformational leadership style has been shown to correlate with leader effectiveness and subordinates' extra effort and satisfaction (Avolio & Bass, 1988; Barling, Weber & Kelloway, 1996; Bass, 1985, 1998; Bass & Avolio, 1990, 1993; Bycio, Hacket & Allen, 1995; Fuller, Patterson, Hester & Stringer, 1996; Hater & Bass, 1988; Howell & Avolio, 1993; Kirkpatrick & Locke, 1996; Koene, Pennings & Schreuder, 1993; Lowe et al., 1996; Podsakoff, MacKenzie, Moorman, & Bommer, 1996; Shamir, House & Arthur, 1993; Sosik, Avolio & Kahai, 1997; Yammarino, 1993; Yammarino & Bass, 1990). For example, two meta-analytic studies (Fuller et al.; Lowe et al.) found that transformational leadership positively correlated with subordinate satisfaction and outcomes. Previous nursing studies also report similar findings (Dunham Taylor, 2000; Medley & Larochelle, 1995; Morrison, Jones & Fuller, 1997; Stordeur et al., 2000). When nurse managers with high transformational leadership scores were compared

with managers with high transactional leadership scores, transformational managers were more likely to have staff nurses with higher job satisfaction scores.

Transactional leadership style and outcomes. Transactional or contingent reward leadership style is characterized by its focus on providing material rewards or discipline depending on the adequacy of the staff's outcomes when compared with the expected standards of practice (Bass, 1998). The leader sets and articulates a goal, states his/her expectations of subordinates and clarifies the link between performance and reward. Then, the leader may either reward for reaching the goal, or penalize for failures. Contingent rewards, such as pay increases, bonuses and promotion, and punishments, such as reprimands, discharge, or other disciplinary procedures, are in most cases already provided by the organization. These provisions are found either in union contracts and/or policy and procedure manuals, and thus, are not fully under the control of the manager.

Transactional leadership style is found to be positively related with subordinate satisfaction and performance, although the results showed weaker correlations than the results for transformational leadership style (Bass, 1985, 1990; Bass & Avolio, 1990, 1993; Bycio et al., 1995; Lowe et al., 1996). Similar findings have been reported in nursing studies (Dunham Taylor, 2000; Medley & Larochelle, 1995; Morrison et al., 1997; Stordeur et al., 2000).

Management-by-exception leadership style and outcomes. Management-by-exception is considered a negative style of leadership. The leader monitors followers' performance and anticipates mistakes and errors. The leader takes action only when required or when problems become serious. Management-by-exception leadership style has

been exhibited in situations in which the leader has a large number of staff (Bass, 1998; Hater & Bass, 1988; Howell & Avolio, 1993). Several studies have found low follower satisfaction with management-by-exception leadership style (Bass, 1985; Bass & Avolio, 1990; Densten & Gray, 1998; Hater & Bass, 1988). Stordeur et al. (2000) found that management-by-exception leadership style was strongly negatively associated with satisfaction, extra effort and perceived unit effectiveness. It is indeed difficult to imagine an effective leader who would take action only after errors are made.

Laissez-faire leadership style and outcomes. Laissez-faire has been defined as the most inactive, as well as the most ineffective leadership style (Bass, 1998). Yammarino and Bass (1990) described the laissez-faire leader as one who avoids leadership duties and responsibilities, such as decision-making and developing staff. In a unit with a laissez-faire leadership style, there is no authority. The leader avoids taking a stand. Responsibilities of leadership are ignored, necessary decisions not made, actions delayed. This passive style of leadership contains no actual leadership.

The findings of several research studies (Bass, 1990; Lowe et al., 1996) demonstrate that laissez-faire leadership is associated with poor individual and unit performance. For example, Bass found a negative association between laissez-faire leadership and a variety of subordinate performance, effort and attitudinal indicators. These findings imply that laissez-faire leadership style is not an appropriate way to lead.

Only four nursing studies (Dunham Taylor, 2000; Medley & Larochelle, 1995; Morrison et al., 1997; Stordeur et al., 2000) were found that examined the effects of leader behaviours on staff performance, using the Transformational Leadership Theory. All four

studies found a significant positive relationship between nurse managers exhibiting transformational leadership style and staff nurses' job satisfaction. Three (Dunham Taylor, Morrison et al. and Stordeur et al.) of these four studies found transactional leadership style to have a similar, although to a lesser extent, positive effect on staff job satisfaction as that of transformational leadership style. Medley and Larochelle, on the other hand, found that transactional leadership style did not influence job satisfaction. This finding may probably be attributed to the fact that Medley and Larochelle defined transactional leadership style as consisting of the management-by-exception items, and considered the transactional contingent reward items as part of transformational leadership style. In contrast, Stordeur et al. considered transactional leadership style as consisting of the transactional contingent reward items only; while Dunham Taylor and Morrison et al. defined transactional leadership style as consisting of both of the transactional contingent reward and management-by-exception items.

The application of the findings of these studies (Dunham Taylor, 2000; Medley & Larochelle, 1995; Morrison et al., 1997; Stordeur et al., 2000) to the present study is limited by two factors. First, Dunham Taylor's study was about the leadership behaviour of nurse executives (vice presidents and directors of nursing) not nurse managers. Second, although Medley and Larochelle used random sampling, the sample size was small (122 nurses).

In terms of other limitations, most of the studies relating transformational leadership behaviors to outcomes have been conducted in educational or military settings. Few have been conducted in health care settings. As well, Transformational Leadership Theory assumes that everyone has the potential to be a high performing individual, and that if the

follower is not able to meet this potential, the leader has not been effective. The theory does not take into account individuals with less potential to be productive, regardless of the amount and quality of support provided them. As well, there may not be a good fit between the staff and the unit or organization, which eventually may result in the termination of the employment relationship. Another limitation of the theory is its failure to take into consideration factors other than followers' needs, which may influence the performance of leaders and followers.

In summary, several studies in management, both in industry and in nursing, demonstrate effects of the manager's leadership style on outcomes. Transformational and transactional leadership styles correlate positively with subordinate satisfaction and outcomes, with transformational leadership style having a stronger correlation than transactional leadership style. In contrast, management-by-exception and laissez-faire leadership styles have been linked with low follower satisfaction and poor performance.

Span of Control

Organizational structure has been defined in various ways. Mintzberg (1996, p. 333) defined structure as "the total of the ways in which its labour is divided into distinct tasks and then its coordination achieved between those tasks." Daft (1998) defined structure as consisting of three key components: a) the formal reporting relationships which include the number of levels in the hierarchy and the span of control of managers; b) the grouping together of individuals into departments and of departments into the total organization; and c) the design of systems to ensure effective communication, coordination and integration across departments. While the two definitions are similar, Daft's definition of structure is

more comprehensive. Of the three structural components suggested by Daft, this study concentrates on span of control. The rationale for this choice is that the hospital restructuring of the 1990's have resulted in a reduction of management positions and increase in the size of the span of control of nurse managers.

Span of Control Defined

Span of control, or span of management, refers to the number of persons who report directly to a single manager, supervisor or leader (Meier & Bohte, 2000), and includes the functions of planning, organizing and leading (Hattrup & Kleiner, 1993). Schriesheim et al. (2000) referred to span of control as span of supervision. An association generally exists between span of control and the number of levels of hierarchy or layers of management within an organization. A narrow span of control, that is, few subordinates per manager, leads to a "tall" organization, which is described as one with many layers. In contrast, a high span of control leads to a flat organization. However, as explained in the following section, this association is not always true, particularly in hospitals.

Span of Control Theory

Span of control is one of the three principles of management proposed by Gulick (1937) and Urwick (1956). Early management scholars such as these two postulated that the structural attributes of organizations affected performance, and proposed that adherence to a core set of management principles would help organizations achieve high performance. These management principles were 1) division of labour, 2) span of control, and 3) unity of command. However, other researchers did not develop Gulick's beliefs because Simon (1946) presented a convincing unsupportive critique of these principles of

management. Simon argued that these principles were vague and full of contradictions, claiming that for each principle, opposite principles may be found that made equal, if not more sense as a framework for the management of organizations.

Based on the work of Draicunas in 1933 (Nickols, 2000), Gulick (1937) and Urwick (1956) postulated that individuals in management positions should oversee a relatively small number of employees to make the mentoring and monitoring of employees a less daunting task for the supervisor. Draicunas recommended a span of control of six, and commented that the supervisor's direct relationships with individuals and the group, and cross relationships with other groups increase in proportion to the addition of subordinates. Gulick added that as the number of employees per supervisor increases, the more difficult it becomes to monitor the behaviour of employees. Simon (1946) argued that if the span of control is limited and the supervisor oversees a relatively small number of employees, the number of levels of hierarchy or layers of management in the organization would increase, resulting in difficulty with vertical communication. The concern with difficulty in vertical communication, however, is not as critical in patient care units or in teams that depend mostly on horizontal communications. Most daily communications of the patient care team, particularly of the nursing staff, are horizontal, not vertical. For example, nurses must communicate with their colleagues and nurse managers more often than with the director of nursing or vice president. Furthermore, most hospitals, regardless of the size of the patient care units, tend to have the same number of management layers (chief executive officer or president, vice president, director and manager). In some cases, and contrary to Simon's argument, a wide span of control creates another management layer in the form of

an assistant nurse manager. Thus, Simon's argument does not seem valid particularly for the health care setting.

Simon's arguments went unchallenged, resulting in the principles of management not being pursued (Meier & Bohte, 2000). Researchers moved away from investigating the structural characteristics of organizations, toward the study of organizational behaviour, and attempts to prove or disprove the principles of management were limited (Hammond, 1990). At the time Simon presented his critique, for example, there was no empirical evidence concerning the effects of variations in spans of control on organizational performance (Meier & Bohte). Using Gulick's (1937) and Urwick's (1956) principle of span of control, Meier and Bohte developed the theory of Span of Control, which explains the relationship between span of control and performance. This theory proposes that there is a certain size at which the span of control reaches its maximum capacity to be effective, and increasing the size beyond this capacity adds no value, and may even be harmful. In general, as span of control increases, performance in terms of cost effectiveness increases, in the form of supervisor per staff. However, performance gains resulting from increases in span of control are subject to diminishing marginal returns. At even higher spans of control, additional subordinates may result in reduced, perhaps even an absence of coordination, management and supervision resulting in a decrease in the overall performance (Williamson, 1990).

Stieglitz (1962) worked with the Lockheed Company in an attempt to identify the factors for determining an optimal span of control. Stieglitz identified the following factors: similarity of the workers' functions, geographic proximity of the workers, complexity of functions, direction and control required by the workers, degree of

coordination required of the workers, planning for future programs and objectives, and organizational assistance. These factors were weighted on a scale and an index was created to determine the necessary manager-to-worker ratio. The suggested spans ranged from 4 to 11 workers per supervisor. However, the factors identified by Stieglitz focused only on the workers and their role. Factors related to the unit and management's role were not identified. In nursing, these factors include staff resources for the unit, number and location of units for which the manager is responsible and the various roles of the manager. Examples of staff resources for units include assistant nurse managers, nurse educators, clinical nurse specialists, business managers and scheduling clerk. Mintzberg (1994a) identified three major management levels and five roles in his "model of managerial work": managing information (communicating and controlling), managing through people (leading and linking) and managing action (doing). In one study Mintzberg (1994b) observed 50 managers, each for one day. He noted that one manager, with a span of control of 41, had worked 11.5 hours that day. This implies that due to the large span of control, the nurse manager may need to work longer hours to do a good job. An unpublished work by Rodger (2002) identified several factors that affect span of control, including the size of the budget and unit unpredictability.

A limitation of the Span of Control theory is its assumption that a narrow span of control means more time for managers to provide support and encouragement to staff. This time may not necessarily be spent with staff, and if it were, the quality of interaction may not necessarily be positive or beneficial to staff, the unit or the organization.

Span of Control Theory and Outcomes

Five empirical studies in the management literature (Burke, 1996; Gittell, 2001; Hechanova-Alampay & Beerh, 2001; Meier & Bohte, 2000; Woodward, 1965) and one in the nursing literature (Altafer, 1998) were found to examine the effects of span of control on performance, and are presented in Table 1. Woodward's study is excluded since specific performance outcomes were not examined.

In an examination of industrial firms, Woodward (1965) found that span of control varied across different organizational settings. She found that within each organizational category (unit, large batch and continuous production) successful firms used similar spans of control to structure relationships between supervisors and employees. Although Woodward found spans of control to vary across organizations, she did not examine how variations in spans of control affect staff performance.

Four studies (Burke, 1996; Gittell, 2001; Hechanova-Alampay & Beerh, 2001; Meier & Bohte, 2000) found span of control to affect performance. In a study of a professional services firm (n = 1,608 staff; 22 units), Burke found that staff in larger units described their work environment more negatively and reported less satisfying work outcomes. Larger units were found to score significantly lower in integration, overall satisfaction, unit morale and rating of firm versus others, and higher in intent to quit and work-family conflict.

Table 1. Studies that examined span of control and outcomes

A. Management studies

Study (author)	Theoretical Frame-work, Hypothesis	Design, Setting, Sample	Measures	Results	**Strengths**	**Limitations**
Unit size, work experiences and satisfactions: An exploratory study (Burke, 1996)	Unit size influences measures of work experience and satisfaction.	Design: Exploratory Setting: One large professional services firm Sample: 1,608 staff 22 units (mean size = 169; range 20-400)	Unit size (span of control) = number of staff working in a unit. Survey questionnaire, reliability and validity not cited. Not clear how outcome variables such as job satisfaction, unit morale and quality of service were measured.	Larger units had a) lower scores in unit integration, overall satisfaction with firm, unit morale, and rating of firm versus others; and higher scores in intent to stay and work-family conflict. Unit size was not related to job satisfaction and quality of service.	Very large sample in terms of number of staff. Multiple outcome variables (8).	Unclear how the outcome variables were measured. Reliability and validity of survey questionnaire not cited.
Supervisory span, relational coordination and flight departure performance: A reassessment of postbureaucracy theory (Gittell, 2001)	Span of control affects performance. Hypothesis 1: Broad span of controls improve performance by strengthening group process. Hypothesis 2: Narrow span of controls improve performance by strengthening group process.	Design: Descriptive correlational Setting: Airline Sample: 9 groups mean span of control = 20 Staff = 352	Span of control = number of staff reporting to one supervisor. Measure of group process: Relational coordination tool by Gittell (2000) with a Cronbach's alpha 0.84 Measure of group performance: 5 items Cronbach's alpha 0.81	H1 not supported, broad span of controls were significantly associated with lower levels of group performance. H2 supported, narrow span of controls were associated with higher levels of group performance. Interactions between supervisors and staff were more frequent and intensive.	Large sample in terms of number of staff. Measures had good internal consistency. Multiple outcome variables (5): customer complaints, baggage handling, late arrivals and gate time per departure.	Examined flight departure process which involves tasks that are considered low skill, for example, cabin cleaning and fueling, thus, may not be applicable to "knowledge work".
Empowerment, span of control and safety in work teams after workforce reduction (Hechanova-Alampay & Beerh, 2001)	Span of control affects performance. Hypothesis related to span of control: Work group size is positively correlated with unsafe behaviours and accidents.	Design: Descriptive correlational Setting: Chemical company Sample: 531 staff 3 sites, 24 teams Group size (mean = 47; range:12 - 110)	Span of control = number of staff reporting to manager. Unsafe behavior Questionnaire, 18 items, 5 point scale; interrater reliability =.78 % of safety accidents	Hypothesis 1 supported: span of control was significantly correlated with both unsafe behaviors (r =.43, p < .05) and safety accidents (r =.44, p < .05).	Large sample in terms of number of staff. Inter-rater reliability of measurement tool reported.	

Table 1. (Continued).

Study (author)	Theoretical Frame-Work, Hypothesis	Design, Setting, Sample	Measures	Results	Strengths	Limitations
Ode to Uther Gulick: Span of control and organizational performance (Meier. and Bohte, 2000)	Span of control has an impact on student performance. There is a certain size at which span of control reaches its maximum capacity to be effective, and increasing the size beyond this capacity does not add value, and may even be harmful.	Design: Descriptive correlational Setting: Schools Sample: 678 school 2,712 students School size mean = 649 Student to teacher (mean 14.5; range 9–19)	Performance measure used: percentage of students in each school district who pass standardized reading and math tests each year.	Span of control had a significant impact on performance. A reduction of 1 student per teacher (from 15.5 to 14.5 student-teacher ratio) improved student performance by .78 % points.	Large sample. Several demographic variables (5): percentage (%) of African American, % Latino; % low income students; teacher experience; teacher salary, and per student spending on education.	Only 1 performance measure used. Did not include other organizational variables, e.g., leadership.
B. Nursing studies						
First line managers: Measuring their span of control (Altaffer, 1998)	Study questions: 1) What are the differences in the span of control between nurse and non-nurse first line managers? 2) What are the differences in the self-reported effectiveness identified by nurse and non-nurse first-line managers? 3) What do nurse and non-nurse first-line managers identify as an optimal span of control?	Design: Descriptive correlational Setting: Health care organizations Sample: 2 organizations; 44 managers (24 nurses, 20 non-nurses)	Survey questionnaire: 19 items including demographic data, scope of responsibilities, number of full time equivalent, number of staff. Reliability and validity not cited. Performance measurement: a self-reported effectiveness tool, 3-point scale, on 4 dimensions: human management, fiscal management, negotiation and facilitation of change. Reliability and validity not reported.	span of control (number of staff): nurse managers mean = 49; non-nurse managers mean = 44 Self-rated optimal span: nurse managers mean = 38; non-nurse managers mean = 26 Effectiveness score of nurse managers, who supervised more staff with fewer assistants, was slightly higher than non-nurse managers. Median effectiveness score was 2.	One of the first and few studies on span of control in health care.	Reliability and validity of tool not reported (can a 4-item questionnaire measure effectiveness in human management, fiscal management, negotiation and facilitation of change?) Not clear if the size of span of control is significantly different between the 2 groups. Minimal statistical tests (mean, SD and t-tests) done. Regression done for salary only. No hypothesis cited specific to salary.

Burke (1996) found that in small units face-to-face communication was more easily facilitated, thus promoting trust and faith in management and the firm. Similarly, Gittell (2001) found that groups with broad span of control (mean span of control of 34) were significantly associated with lower levels of group performance compared to the groups with narrow span of control (mean span of control of 9). Gittell found that groups with broad span of control had significantly less timely communication between group members and lower levels of problem solving. Hechanova-Alampay and Beerh (2001) showed similar findings in their study of a chemical company (n = 531 staff and 24 teams; mean span of control = 47), that is, that wide span of control groups had significantly higher rates of unsafe behaviours and safety accidents. Meier and Bohte (2000) found span of control to have a significant impact on performance. Meier and Bohte noted that a reduction of one student per teacher, specifically from 15.5 to 14.5 student-teacher ratio, improved student performance by almost 1 point in all of the school districts studied.

The studies discussed had several strengths. First, the four studies reviewed had a large sample. The study by Meier and Bohte (2000) involved 2,712 students and 678 school districts. Burke's (1996) sample was 1,608 staff. Gittell's (1996) study involved 352 staff. Hechanova-Alampay and Beehr (2001) had 531 participants. Second, three of the four studies had two or more outcome variables. Burke's (1996) study had eight: integration, job satisfaction, overall satisfaction, unit morale, firm versus others, work-family conflict, intent to quit and quality of service. Gittell's (2001) study had four outcome variables: customer complaints, baggage handling, late arrivals and gate time per departure. Hechanova-Alampay and Beerh had two outcome variables: rates of unsafe behaviour and safety accidents. In contrast, the study by Meier and Bohte used only one

performance measure: the percentage of students in each school district who pass standardized reading and mathematics tests each year. One possible measurement that could have been used is the students' evaluation or satisfaction.

A limitation to the applicability of these studies to the present study is that all four studies (Burke, 1996; Gittell, 2001; Hechanova-Alampay & Beerh, 2001; Meier & Bohte, 2000) had a non-hospital setting. For example, Gittell's study was specific to the flight departure process, which involves tasks (such as cabin cleaning and fuelling) that are considered low skill, and thus may not be applicable to the "knowledge work" required in patient care.

In the nursing research literature, speculations have been made about the possible negative impact of a large span of control on the nurse manager's effectiveness (Altaffer, 1998; Duffield & Franks, 2001). However, only one nursing research study (Altaffer's) was found to measure the impact of the nurse manager's span of control on outcomes. Altaffer's findings were different from the above studies. Altaffer found that the effectiveness score of nurse managers, who supervised more employees and had fewer assistants, was slightly higher than non-nurse managers. On the other hand, Altaffer's study had several limitations. First, the reliability and validity of the study measure was not reported. Second, the term "effectiveness" was measured but not defined. And third, the results showed that the average size of the span of control for the 24 nurse managers was 49; and 44 for non-nurse managers. It was not made clear nor tested if there was a significant difference in these two groups in terms of the size of the span of control.

In summary, while the above studies have limitations, the findings suggest that span of control has an impact on outcomes.

Contingency Theory of Leadership

The contingency theory of leadership proposes that the effectiveness of the leader to influence followers is dependent upon situational factors, which are also referred to as moderating variables. These moderating variables interact with leader behaviour to change the effectiveness of the leader. The more prominent contingency theories of leadership include Fiedler's Contingency Theory (Fiedler, 1967; 1971); Path Goal Theory (Evans 1970, 1994, 1996; House, 1971, 1996; House & Mitchell, 1974); the Life Cycle Theory (Hershey & Blanchard, 1982, 1996); and the Cognitive Resource Theory (Fiedler & Garcia, 1987).

Fiedler's (1967, 1971) Contingency Theory of Leadership proposed that the effectiveness of a leader or the organization is contingent upon leadership style, and on the degree to which the situation provides the leader with control and influence over the outcomes. The Contingency Theory led to the development of the Cognitive Resource Theory of leadership (Fiedler & Garcia, 1987), which postulated the following factors as moderating variables: leader's intelligence and experience, and the stress experienced by leaders and followers. The Life Cycle Theory of Leadership (Hershey & Blanchard, 1982, 1996) hypothesized that the most important factor in the effectiveness of leadership style is the followers' developmental (maturity) level, or the followers' readiness, willingness and ability. The Path Goal Theory of leadership (Evans, 1970, 1994, 1996; House, 1971, 1996; House & Mitchell, 1974; House, Spangler, Woycke, 1991) specified two moderating variables: subordinate characteristics and job/task/work environment characteristics. Of the

four contingency theories of leadership reviewed, only the Path Goal Theory includes organizational factors in its list of moderating variables.

The empirical study of the effect of contingency variables on leadership has been limited, particularly in nursing. This has been identified as one of the deficiencies in the present body of knowledge about leadership (Conger, 1999; House & Aditya, 1997; Pillai & Meindl, 1998; Shamir & Howell, 1999). Similarly, other researchers (Pawar & Eastman, 1997; Tosi, 1991) have acknowledged the important role that broader organizational factors play in moderating leadership processes. Organizational variables that have been postulated to mediate the relationship between leadership style and outcomes include physical distance (Howell & Hall-Merenda, 1999), culture (Hennessey, Jr., 1998), structure (Howell, 1997) and hierarchical levels (Stordeur et al., 2000). Furthermore, in a meta-analytic report of 18 empirical studies, Leithwood, Jantzi and Steinbach (1997) found oganizational factors and leader's personal factors had moderating effects on the relationship between leadership style and outcomes.

Only one nursing study (Stordeur et al., 2000) was found to examine an organizational factor as a moderating variable in the relationship between leadership style and performance. Stordeur et al. examined the effect of hierarchical levels on the relationship between leadership style and work outcomes, which included satisfaction and extra effort. Stordeuer et al. found that the variance among leadership styles was explained primarily by the hospital culture. Hierarchical level was not found to have a moderating effect on the relationship between leadership style and work outcomes. Stordeur et al.'s study was conducted in Belgium, thus its application to the present study is limited.

Span of Control as a Moderator

Span of control is proposed as a contingency variable in this study. The examination of span of control as a moderating variable on the relationship between leadership style and performance was found in a few management studies, but none in the nursing literature, and is summarized in Table 2.

Table 2. Studies that examined span of control, leadership style and outcomes

A. Management studies

Study (author)	Theoretical Framework, Hypothesis	Design, Setting, Sample	Measures	Results	Strengths	Limitations
Exploring work unit context and leader member exchange: A multilevel perspective (Cogliser & Schriesheim, 2000)	Work unit contextual factors (group size, group cohesion, organization climate and leader power) influence leader member exchange. Hypothesis related to span: Work unit size will be negatively related to leader member exchange quality.	Design: Descriptive correlational Setting: Library Sample: 285 staff 65 work groups, (mean size = 10; range 2 - 26).	Unit size (span of control) = number of staff reporting to the supervisor leader member exchange 7-item measure from Scandura and Graen (1984), Cronbach's alpha 0.91	All of the contextual variables tested (e.g., conflict, autonomy, support) except size were significantly related to leader member exchange. Found a negative but nonsignificant relationship ($r = -0.08$, $p > 0.05$) between work unit size and leader member exchange.	Good sample size (65 groups, 285 staff) Measure for leader member exchange had good internal consistency. 29 of respondents deleted from final sample because they were the only person reporting to their immediate supervisor.	Almost one third of the groups (29 of 94) were deleted from the final sample because these groups had only one person reporting to their immediate supervisor.
Demographic and organizational influences on leader member exchange and related work attitudes (Green, Anderson & Shivers, 1996)	Context may affect leader discretion and thus leader member exchange. Hypotheses (H) related to span: H1: Larger unit size will be associated with a lower quality of leader member exchange. H2: unit size will be negatively associated with employee satisfaction after controlling for leader member exchange effects.	Design: Descriptive correlational Setting: Library Sample: 208 staff 42 libraries unit size mean = 6.4; range .57-19.50	Unit size (span of control) = number of staff reporting to the supervisor Leader member exchange 7-item scale by Graen et al. (1982) 5-point Likert scale. Cronbach's alpha 0.89. Satisfaction 6-item from the Job Diagnostic Survey by Hackman and Oldham (1980), Cronbach's alpha 0.86.	Found significant negative relationship ($r = -0.22$, $p < 0.05$) between leader member exchange quality and work unit size. H1 supported: when the work unit increases in size, low quality leader member exchange manager behavior increases. H2 supported: unit size had a significant negative impact on both satisfaction and commitment after controlling for the effects of leader member exchange.	Good sample size (42 libraries, 208 staff). Measures had good internal consistency.	

Table 2. (Continued).

Study (author)	Theoretical Framework, Hypothesis	Design, Setting, Sample	Measures	Results	Strengths	Limitations
Investigating contingencies: An examination of the impact of span of control and upward controllingness on leader member exchange (Schriesheim, Yammarino and Castro 2000).	Span of control and upward controllingness, affect the relationship between leader-member relations and outcomes and commitment. Hypothesis related to span: More positive relationships are found between leader member exchange and performance and commitment under larger span of controls.	Design: Descriptive correlational Setting: Banks Sample: 75 managers Staff: 75 (out of 84) high performers and 75 (out of 75) low performers selected by managers Span of control size mean = 11; range 5 - 21	Span of control = number of full-time staff reporting to the manager. Leader member exchange by Scandura and Graen (1984) with a Cronbach's alpha of 0.86 Measure of performance: 2 items from Mott (1972) with a Cronbach's alpha of 0.77	Span of control did not act as a moderator of the relationship between leader member exchange and performance. Span of control moderated the relationship between leader member exchange and commitment.	Compared demographic data of final sample with those who were omitted because of missing data, and found no differences.	Used only one measure of staff performance, rated by the manager, and consisted of only 2 items.

B. Nursing studies - none

Although the focus of several studies (Cogliser & Schriesheim 2000; Green, Anderson & Shivers, 1996; Schriesheim et al., 2000) was Leader Member Exchange theory, their findings have supported the argument that span of control may be an important leadership contingency variable. In leader member exchange, leaders develop relationships with each member of the group they lead. Leader Member Exchange theory explains how the relationships with various members can develop in very different ways. Cogliser and Schriesheim, and Green et al. found a small but negative relationship between work unit size and leader-member exchange: Cogliser and Schriesheim found no significant relationship ($r = -.08$, $p > .05$), while Green et al. found a significant relationship ($r = -.22$, $p < .05$). The findings by Green et al. suggest that when the work unit increases in size, low quality leader-member exchange manager behaviour increases. Green et al. found that as work unit size increased, relationships between managers and staff became less positive. A possible explanation for this is that managers of large work units tend to have more time constraints and demands than managers of small work units. Unit size may limit the amount of time the manager spends with staff. As a result, opportunities for interaction between managers and individual staff tend to be limited, which in turn may limit the ability of managers to develop close and quality relationships with their staff.

Schriesheim et al. (2000) found that span of control was a moderator of the relationship between leader member exchange and commitment, but not of performance. Schriesheim et al. did not find support for their proposition that more positive relationships are found between leader-member exchange and performance and commitment under larger spans of supervision. They added that large spans of control limit supervisor-subordinate interactions, which creates a situation in which good leader member relations

are more valued by subordinates, as the amount of time spent with individual subordinates is considered a valuable resource or reward. The perception of receiving a valued resource is expected to result in better subordinate performance and job-related attitude. In contrast, in work groups with low span of supervision, time with the supervisor and the relationship that develops may not have as high a value to subordinates.

There are several limitations to the application of the findings of the three studies (Cogliser & Shriesheim, 2000; Green et al., 1996; Schriesheim et al., 2000) to the present study. First, the setting was limited to libraries and banks. Second, the size of the units was small compared to the average patient care unit. Cogliser and Schriesheim's study had an average unit size of 10 (range of 2 - 26), Green et al.'s study had an average unit size of 6.4 (range of .57 - 19.50), and the managers in Schriesheim et al.'s study had a mean span of control of 11 (range of 5 - 21). Cogliser and Schriesheim considered a unit with 10 members moderately large. In contrast, the average size of a patient care unit has been shown to be 40 or more, for example, 49 in Altaffer's (1998) study and 40 in Edwards and Roemer's (1996) study. Nineteen of the 84 nurse managers in the study by Edwards and Roemer had more than 55 staff reporting to them. Third, the study by Schriesheim et al. used one measure of performance, rated by the supervisor that consisted of only two items. Lastly, in Cogliser and Schriesheim's study, almost one third of the groups (29 of 94) were deleted from the final sample because these 29 groups had only one person reporting to their immediate supervisor.

Howell and Hall-Merenda (1999) suggested that transformational leadership produces significantly higher follower performance in close versus distant situations. At a distance, a leader is simply not able to form the type of relationship that is characteristic of close

leadership (Waldman &Yammarino, 1999). Berson, Shamir, Avolio and Popper (2001) suggested that keeping units to a reasonable size may help to increase the chances of leaders presenting a more optimistic and confident vision for their units. Similarly, Shamir (1995) postulated that smaller units facilitate close leadership situations, and that in close leadership situations, some aspects of transactional leadership may contribute to the development of charismatic relationships between leaders and followers. Shamir added that followers are likely to view the leader's ability to follow through on promised transactions as an indication that the leader is honest, consistent with words and actions and trustworthy.

As stated, management-by-exception and laissez-faire leadership styles have been linked with poor performance (Bass, 1985; Lowe et al., 1996). Even at the best of times management-by-exception and laissez-faire leaders do not consistently attend to the needs of their followers, so it is more likely that these managers will turn their attention away from work in situations of wide span of control. Management-by-exception and laissez-faire leaders may use the wide span of control as an excuse to delay or avoid making decisions, which may increase the expected negative relationship between management-by-exception leadership style and outcomes, and between laissez-faire leadership style and outcomes.

In summary, in terms of the effects of span of control on outcomes, Cogliser and Schriesheim (2000) and Green et al. (1996) found a small negative relationship between work unit size and leader-member exchange. The examination of span of control as a moderating variable on the relationship between leadership style and outcomes showed mixed results. Green et al.'s study found unit size to have a significant negative impact on

both satisfaction and commitment after controlling for the effects of leadership style. In contrast, although Schriesheim et al. (2000) found span of control to moderate the relationship between leader member exchange and organizational commitment, it did not act as a moderator of the relationship between leadership style and outcomes.

The present study postulates that as span of control increases, relationships between managers and staff become less positive. The time constraints and demands will likely be more for managers with a large span of control than for managers with a small span of control, resulting in limited opportunities for interaction between managers and individual staff. The limited interaction may decrease the ability of managers and staff to develop close and quality relationships, which in turn may affect staff and patient outcomes. In contrast, increased interaction between managers and staff is more likely for managers with a small span of control.

CHAPTER 3: THEORETICAL FRAMEWORK AND HYPOTHESES

In this chapter the study's theoretical framework is presented. As well, the three outcomes, job satisfaction, turnover and labour stability, are discussed. The key study variables are defined and the empirical rationale for their inclusion in the theoretical model is explored.

Outcomes

Outcome measures are used to assess the degree to which goals are attained, which is the most commonly used determination of leader effectiveness (Yukl, 1998). Outcomes are the results of an action or intervention, for example, by the manager, the nurse, or other people (Jennings, Staggers & Brosch, 1999). Outcome measures evaluate the effectiveness of the action or intervention. Jennings, Staggers and Brosch discussed three types of outcomes: patient, provider and organizational outcomes. Patient outcomes are specific to results manifested by patients. Examples of patient outcomes include functional status, symptom management and patient satisfaction (Doran, 2003; Meterko et al., 1990).

Provider or staff outcomes refer to aspects of provider practice that affect patient outcomes. Examples of provider outcomes are job satisfaction (Blegen, 1993; Decker, 1997; Irvine & Evans, 1995; Loke, 2001; McGillis Hall et al., 2003; McNeese Smith, 1997; McNeese-Smith & van Servellen, 2000), turnover (Leveck & Jones, 1996; McDaniel & Wolf, 1992; Williams & Livingstone, 1994) and labour stability (Evans, 2002).

Organizational outcomes are considered global outcomes and, in health care, provide an indication of the quality of care provided by the organization as a whole. Examples of organizational outcomes are mortality (Jennings et al., 1999), length of stay, readmission rate and nursing bedside hours' cost (McGillis Hall et al., 2003).

The focus of the present study is staff performance, thus, the following outcomes were selected: staff job satisfaction, turnover and labour stability. The rationale for this choice is explained in the following paragraphs.

Job Satisfaction

Job satisfaction is defined as the degree to which employees like their job (Agho, Mueller & Price, 1993; Cavanagh, 1989; Cavanagh & Coffin, 1992), or how they feel about their job (Stamps, 1997). The ideal is to feel good for a job well done and to feel satisfied with aspects of the job. Mueller and McCloskey (1990) and Stamps conceptualized job satisfaction as an overall rating or as the sum of several discrete dimensions of job characteristics. Mueller and McCloskey used the following eight dimensions: extrinsic rewards, scheduling, balance of family and work, praise and recognition, co-workers, interaction opportunities, professional opportunities and control and responsibility. The present study is interested in all of the eight dimensions because they affect the overall job satisfaction.

Job satisfaction is considered an important outcome in this study for two reasons. First, several studies have found a relationship between nurses' job satisfaction and nursing management leadership (Decker, 1997; Irvine & Evans, 1995). A meta analysis of eight studies on supervisory relationships by Irvine and Evans (n = 4,337; r = .51) and the study

by Decker (n = 376; beta = .24; $p < .001$), both found a significant positive correlation between job satisfaction and relations with the nurse manager.

Second, studies of nurses found job satisfaction to be a strong predictor of turnover and intent to stay (Blegen, 1993; Borda & Norman, 1997; Davidson et al., 1997; Irvine & Evans, 1995; Larabee et al., 2003; Lucas, 1991; Lucas, Atwood & Hagaman, 1993; Shader, et al., 2001). In a meta-analysis of 18 studies (16 were nursing samples), Irvine and Evans found a strong negative relationship between job satisfaction and intent to stay (n = 9,279; r = -0.52), suggesting that the more unhappy staff are, the more likely staff are to leave the organization. As hospitals face a nursing shortage, consideration of the factors that influence staff retention is essential.

Turnover

Turnover is defined as the termination of membership in an organization by an individual who received monetary compensation from the organization (Mobley, 1982). The focus of this study was on cessation or separation from an organization, voluntary and involuntary, because all turnovers increase costs. Turnover rate is obtained by determining the percentage of nurses who left their position during a one-year period (Song et al., 1997). The percentage is typically derived by dividing the total number of nurses who left that unit in one year (for example, January 1, 2001 to December 31, 2001) by the total number of nurses employed on that unit on January 1, 2001.

Turnover is an important outcome in this study for two reasons. First, turnover has been associated with leadership style (Leveck & Jones, 1996). Leveck and Jones found leadership style to be a predictor of staff nurse retention. More specifically, leadership

style affects group cohesion and job stress, which in turn affects job satisfaction, and consequently turnover. Shader et al. (2001) found that job stress resulted in lower group cohesion, lower work satisfaction and higher anticipated turnover.

Second, a better understanding of specific factors that influence turnover provide insight on strategies to improve staff retention.

Labour Stability

Labour stability is defined as the proportion of workers who have remained with the organization for one calendar year in the unit (Evans, 2002; Lane & Andrew, 1955), that is, the number of staff who survived the first year in the unit. Low stability means a greater proportion of staff with less than one year of unit experience. No empirical study has been done on the association between labour stability and outcomes. Research has concentrated on turnover (Evans). Similar to turnover, labour stability is an indicator of labour force retention. The present study has chosen to examine labour stability in addition to turnover for two reasons. Labour stability gives an indication of whether it is the nurses with more unit experience who are leaving, or the nurses with less unit experience. In addition, labour stability provides a more accurate indication of the degree of expertise on the unit, with the assumption, that the longer nurses have been on the unit, the greater their knowledge and expertise.

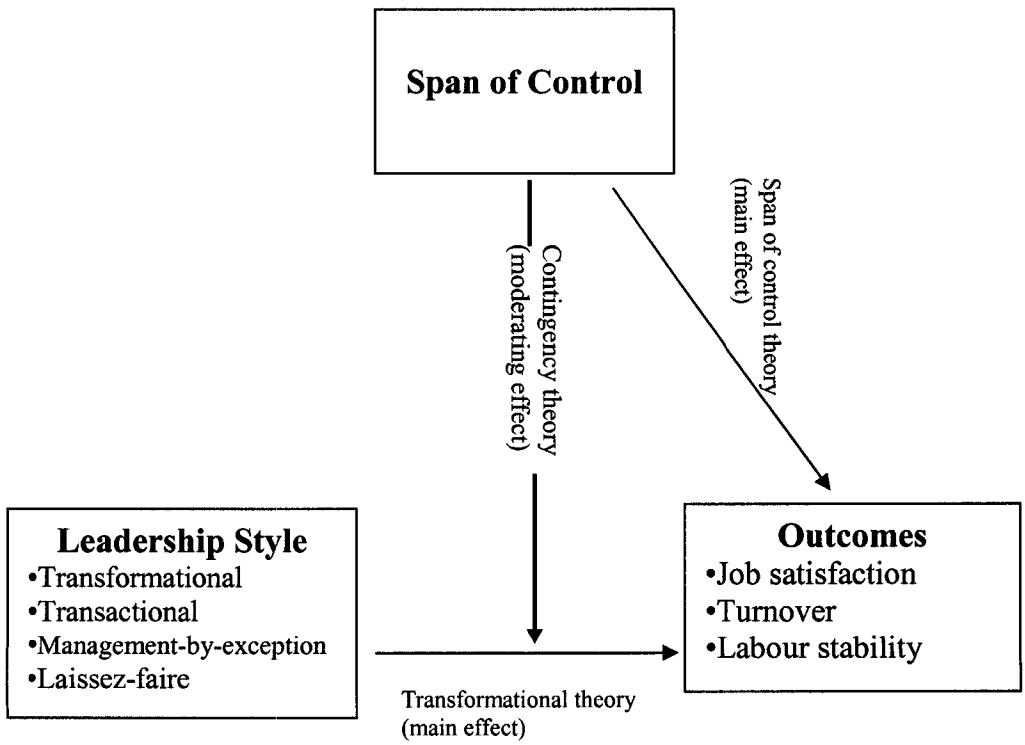
There have been no empirical studies on the association between labour stability and leadership. The examination of labour stability is valuable in understanding a stable workforce to ensure that there is a sufficient number of staff with adequate skills and experience. It also is helpful in addressing issues faced by management when labour

stability is high and turnover is high. These issues include understanding and addressing reasons why staff leave within 1 year of hire, exploring the recruitment practice (e.g., applicant screening), and examining unit orientation and early socialization practices.

Theoretical Framework

For the purpose of this study, a theoretical framework was developed by integrating concepts drawn from three theories: Transformational Leadership theory, Span of Control theory and Contingency theory. This theoretical framework is presented in Figure 1.

Figure 1. Relationships between leadership style, span of control and outcomes model



The study's theoretical framework proposes three specific relationships: a) the manager's leadership style has an effect on outcomes, as measured by job satisfaction, unit turnover and labour stability; b) the manager's span of control has an effect on outcomes, as measured by job satisfaction, unit turnover and labour stability; and c) the manager's span of control has a moderating effect on the relationship between leadership style and outcomes, as measured by job satisfaction, unit turnover and labour stability.

Relationship between Leadership style and Outcomes

Using the Transformational Leadership theory which specifies four leadership styles, several management studies (Avolio & Bass, 1988; Barling, Weber & Kelloway, 1996; Bass, 1985, 1990; Bass & Avolio, 1990, 1993; Bycio et al., 1995; Fuller et al., 1996; Hater & Bass, 1988; Howell & Avolio, 1993; Kirkpatrick & Locke, 1996; Koene et al., 1993; Lowe et al., 1996; Podsakoff et al., 1996; Shamir et al., 1993; Sosik et al., 1997; Yammarino, 1993; Yammarino & Bass, 1990) and nursing research (Dunham Taylor, 2000; Medley & Larochelle, 1995; Morrison et al., 1997; Stordeur et al., 2000) have found that leadership styles had varying degrees of influence on outcomes, such as staff job satisfaction. Therefore in this study, it is proposed that transformational and transactional leadership styles have a positive influence on outcomes; and that management-by-exception and laissez-faire leadership styles have a negative effect on outcomes.

Relationship between Span of Control and Outcomes

Four management studies (Burke, 1996; Gittell, 2001; Hechanova-Alampay & Beerh, 2001; Meier & Bohte, 2000) found span of control influenced outcomes. Groups with

broad spans of control were associated with lower levels of performance compared to the groups with narrow spans of control. Although the outcomes used in these studies were different from the ones in this study, they have a similar effect on organizational functioning. Thus in this study it is proposed that span of control has a negative influence on outcomes.

Relationship between Leadership style, Span of Control and Outcomes

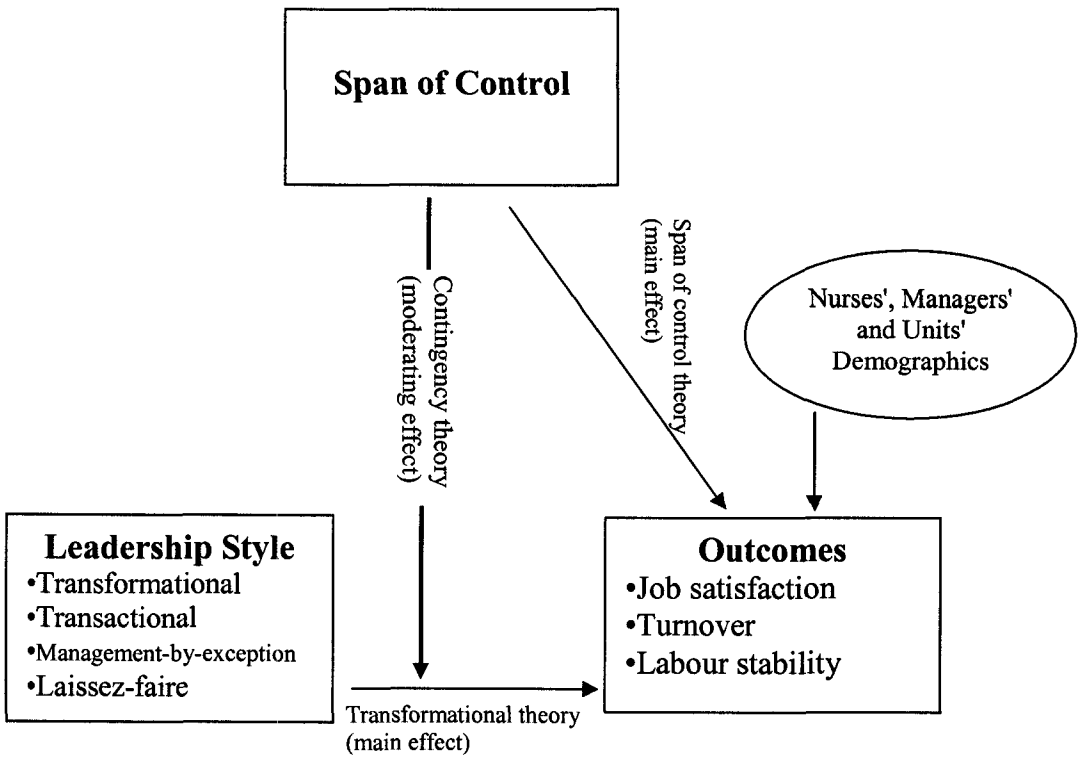
Three studies in the management literature (Cogliser & Schriesheim 2000; Green et al., 1996; Schriesheim et al., 2000) found that when the work unit increases in size, low quality leader-member exchange manager behaviour increases, that is, relationships between managers and staff become less positive, which in turn affect staff performance. Therefore, using the Contingency theory, it is proposed that span of control has a moderating effect on leadership style.

Confounding Variables

Figure 2 shows several confounding variables that may affect the outcome variables and are included, but not theorized, in the study's conceptual framework. Three groups of confounding variables were examined: a) nurses' demographic variables such as age, education and experience; b) managers' demographic variables which include age, education and experience; and c) unit characteristics. Unit characteristics include number of units for which the manager is responsible, role of the manager, the number of staff resources reporting to the manager, number of staff resources not reporting to the manager,

categories of staff, unit type and unit unpredictability. These confounding variables are discussed below including the rationale for their inclusion in the present study.

Figure 2. Relationships between leadership style, span of control, confounding variables and outcomes model



Nurses' Demographics

Age. The results of several studies have suggested an association between nurses' age and their job satisfaction (Ingersoll et al., 2002; McNeese Smith & van Servellen, 2000). These studies found that older nurses were significantly more satisfied with their job. These findings refute the results of Adams and Bond (2000), Busby and Banik (1991) and Ma, Samuels and Alexander (2003). Busby and Banik found that younger nurses were more satisfied with their job, while Adams and Bond, and Ma et al. found no difference in job satisfaction according to age. Certain factors must be considered when comparing the results of these studies. Ingersoll et al.'s study included both urban and rural hospitals, while the study by Busby and Banik involved only rural hospitals. Adams and Bond included nurses (n =834) in acute care settings in England, while Ma et al. included all nurses (n = 3,472; response rate of 20%) in South Carolina.

Education. Nurses' education is measured using four levels of preparation, that is, registered practical nurse diploma, registered nurse diploma, registered nurse baccalaureate and advanced preparation such as a master's degree. Most studies (Decker, 1997; McNeese Smith & van Servellen, 2000) have found no significant relationship between nurses' level of education and their job satisfaction, while a more recent study (Ingersoll et al., 2002) found a significant positive (beta = .09, $p < .003$, n = 4,000) relationship between these two variables. Ingersoll et al. found that Master's prepared nurses were significantly more satisfied with their job than baccalaureate-prepared nurses and nurses prepared at less than the baccalaureate level.

Experience. Nurses' experience, which relates to tenure, has been found to influence nurses' job satisfaction (Decker, 1997; Ma et al., 2003; 1997) and turnover (Davidson et al., 1997). The three types of experience, unit, hospital and total, are discussed in the following sections.

Unit experience. Unit experience is the years in the current position on a unit. Decker (1997) found nurses' unit experience has a significant negative effect (beta = -.16, $p < .01$, n = 376 nurses) on their job satisfaction; that is, the longer nurses had been on the unit, the lower their job satisfaction. One possible explanation is that nurses' unit tenure equates with the period of exposure to the role strains within the hospital system.

Hospital experience. Hospital experience is the years within the hospital. No studies were found measuring the relationship between nurses' hospital experience and the study outcome variables of job satisfaction, turnover and labour stability.

Total experience. Total experience is the years of total professional nursing experience. Various studies have found that nurses' total experience is related to an increase in their job satisfaction (Motowidlo, Packard & Manning, 1986; Ma et al., 2003; Mottaz, 1988; Norbeck, 1985). Nurses with longer total experience have higher job satisfaction scores than nurses with less total experience. One possible explanation is that as experience increases, knowledge and adaptive skills improve, job stress is reduced, and job satisfaction increases.

Managers' Demographics

Age. One study (Schubert, 1988) found that the manager's age had an influence on leadership style. However, the application of the findings of Schubert's study to the present study is limited because the study sample consisted of mayors, not nurse managers.

Education. The managers' education is examined because of its possible association with leadership style. Dunham Taylor (2000) found that nurse executives with higher transformational scores (as rated by themselves, n = 396 and by staff, n = 1,115 or 3 per nurse executive), tended to have higher educational degrees.

Experience

Unit experience. No studies were found measuring the relationship between managers' unit experience and their leadership style.

Hospital experience. No studies were found measuring the relationship between managers' hospital experience and their leadership style.

Total experience. The studies of management by Bantel and Jackson (1989), Singh and Harianto (1989) and Wiersema and Bantel (1993) found total experience and performance to have a negative relationship. Bantel and Jackson, and Singh and Harianto suggested that long tenure involves greater identification with the organization and unwillingness to change the status quo, which could result in lower job performance.

Unit Variables

Using several sources (Mintzberg, 1998; Rodger, 2002; Stieglitz, 1962), the following unit variables that increase or decrease the demands on the manager were identified: number of units, roles of the manager, staff resources reporting to the manager, staff resources not reporting to the manager, number of staff categories, type of unit and unit unpredictability. These factors are discussed below.

Number of units. The number of units for which the manager is responsible was measured to provide an indication of the geographic proximity of the staff. The more units the manager is responsible for, the more time the manager spends going from one unit to another, particularly when the units are in different hospital sites. As well, this variable is measured to give an indication of the complexity of coordination that may not be captured by the number of direct reports. Some managers may have more than one unit but still less direct reports than another manager with fewer units.

Roles of the manager. Roles of the manager was measured because the more roles the manager performs, the more demands on the manager's time. The six managerial roles identified by Mintzberg (1998) were used to measure the roles of the manager variable. The managers were asked how often they performed the managerial roles, using six Likert-type items with 0 to 4 response categories ranging from not at all to frequently or always. These managerial roles include: communicating, controlling, leading, linking, doing and dealing. Communicating involves collecting, processing and disseminating information and keeping staff informed. Controlling consists of developing systems (e.g., planning, budgeting, staffing), designing structures and providing directives (e.g., delegating

responsibilities, authorizing requests). Leading is encouraging, motivating, inspiring, coaching, nurturing and mentoring staff, building and managing teams, creating and maintaining culture. Linking is networking and building contacts and coalitions of supporters beyond one's own units. Doing is carrying out action directly, getting things done (e.g., championing change, fighting fires, juggling projects), analyzing issues and deciding. Lastly, dealing is negotiating and making deals.

Staff resources reporting to the manager. This variable was measured by calculating the number of staff resources for the unit reporting directly to the manager. Staff under this category do not carry a full patient assignment. Examples of staff under this category are charge nurse, clinical nurse specialist and nurse educator. The more staff resources available to the unit, the more support for the staff and the fewer the demands on the manager's time.

Staff resources not reporting to manager. Staff resources available for the unit but not reporting directly to the manager include clinical nurse specialist, clinical or nurse educator and shift supervisor. This factor increases the amount of communication and coordination the manager must do. However, staff resources provide support for the staff that otherwise would be done by the manager or designated staff, thereby decreasing the workload of manager and staff. Examples of this support include orientation of new staff, development of self-teaching educational packages and coordination of clinical inservices.

Categories of staff. Examples of categories of staff are registered nurse, registered practical nurse, respiratory therapist, physiotherapist, occupational therapist and clerical

staff. The different categories represent a variety of function, knowledge and skill. The greater the number of staff categories, the more communicating and coordinating the manager must do. In addition, different categories require knowledge of different professional standards and union contracts. Thus, the more categories of staff reporting to the manager, the more demands on the manager's time.

Type of unit. Several studies found that the type of unit has an impact on job satisfaction (Boumans & Landerweed, 1994; Ingersoll et al., 2002; Kangas, Kee & McKee Waddle, 1999). Two studies demonstrated that nurses in intensive care (Boumans & Landerweed) and critical care (Kangas et al.) areas had higher job satisfaction than nurses in medical and surgical units. On the other hand, Ingersoll et al.'s findings were the opposite, that is, critical care nurses had significantly lower job satisfaction than medical surgical nurses.

Unit unpredictability. Unit unpredictability is the degree to which the staffing needs change due to an increase in the acuity of patients. This variable is measured using the following question: "In terms of my unit unpredictability, I reassign staff on a shift: not at all (highly predictable); once in a while (somewhat predictable); sometimes (somewhat unpredictable); fairly often (moderately unpredictable); and frequently/always (highly unpredictable)" (Rodger, 2002). The more unpredictable the unit is, the greater the complexity of planning for the work needing to be done, and the greater the degree of unit coordination required, and the more demands on the manager.

Research Hypotheses

Hypotheses were advanced to examine the relationships between leadership style, span of control and outcomes as measured by job satisfaction, turnover and labour stability.

Job Satisfaction

The first set of hypotheses addresses the relationships between leadership style, span of control and job satisfaction. Hypotheses 1a to 1d are specific to the relationships between leadership style and job satisfaction.

Hypothesis 1a: Transformational leadership style is positively related to job satisfaction.

Hypothesis 1b: Transactional leadership style is positively related to job satisfaction.

Hypothesis 1c: Management-by-exception leadership style is negatively related to job satisfaction.

Hypothesis 1d: Laissez-faire leadership style is negatively related to job satisfaction.

Hypothesis 2. Span of control is negatively related to job satisfaction.

Hypothesis 3a: Span of control will decrease the positive effect of transformational leadership style on job satisfaction.

Hypothesis 3b: Span of control will decrease the positive effect of transactional leadership style on job satisfaction.

Hypothesis 3c: Span of control will increase the negative effect of management-by-exception leadership style on job satisfaction.

Hypothesis 3d: Span of control will increase the negative effect of laissez-faire leadership style on job satisfaction.

Turnover

The second group of hypotheses was developed to address the relationships between leadership style, span of control and turnover.

Hypothesis 4a: Transformational leadership style is negatively related to turnover.

Hypothesis 4b: Transactional leadership style is negatively related to turnover.

Hypothesis 4c: Management-by-exception leadership style is positively related to turnover.

Hypothesis 4d: Laissez-faire leadership style is positively related to turnover.

Hypothesis 5. Span of control is positively related to turnover.

Hypothesis 6. Span of control moderates the effect of leadership styles on turnover, decreases the positive effect of transformational and transactional leadership styles, and increases the negative effect of management-by-exception and laissez-faire leadership styles.

Labour Stability

The third group of hypotheses was advanced to address the relationships between leadership style, span of control and labour stability. Hypotheses 7a to 7d are specific to the relationship between leadership style and labour stability.

Hypothesis 7a: Transformational leadership style is positively related to labour stability.

Hypothesis 7b: Transactional leadership style is positively related to labour stability.

Hypothesis 7c: Management-by-exception leadership style is negatively related to labour stability.

Hypothesis 7d: Laissez-faire leadership style is negatively related to labour stability.

Hypothesis 8. Span of control is negatively related to labour stability.

Hypothesis 9. Span of control moderates the effect of leadership styles on labour stability, decreasing the positive effect of transformational and transactional leadership styles, and increasing the negative effect of management-by-exception and laissez-faire leadership styles.

CHAPTER 4: METHODS

Design

The research design used for this study was a descriptive correlational design using a survey method to collect data. There were two levels or units of observations, one at the nurse level, and one at the patient care unit level of observation. The study methods, which include determining the required sample size and description of the setting, sample and data collection procedure, are discussed below.

Power Analysis

Power analysis for the nurse level dependent variable job satisfaction was conducted using the Statistical Package for Social Sciences software. The power calculations, shown in Table 3, were for one linear regression with a critical significance level of .01. The unit of analysis was nurses.

An assumption was made that the expected size of the overall effect of leadership, measured via R^2, would be in the order of about .32 using the findings in the literature (Fuller et al., 1996; Leithwood et al., 1997; Lowe et al., 1996). As shown in Table 3, the required sample size to detect an R^2 of .32 at a probability level of .01 was 350. Twice the number of nurses was actually sampled because of the two levels of observation, which will be discussed in the next paragraph.

Table 3. Power calculation

PREDICTOR	# of variables if predictor is *continuous*
Demographic variables	
Nurses' age	Years of age = 1 variable
Nurses' educational level	4 types of nurses (college-trained RPNs, college-trained RNs, baccalaureate-trained RNs, advanced degree RNs), = 4 variables
Nurses' unit experience	Years in unit = 1 variable
Nurses' hospital experience	Years in this hospital = 1 variable
Nurses' total experience	Years in profession = 1 variable
Managers' age	Years of age = 1 variable
Managers' educational level	4 types of nurses (college-trained RPNs, college-trained RNs, baccalaureate-trained RNs, advanced degree RNs) =4 variables
Managers' unit experience	Years in unit as a manager= 1 variable
Managers' hospital experience	Years in this hospital as a manager= 1 variable
Managers' total experience	Years in profession (as a manager) = 1 variable
# Variables in block 1	16
Predictor/Independent variables	# of variables if predictor is *continuous*
Managers' span of control	Number of people supervised by manager = 1 variable
Managers' transformational leadership style	Managers' score on measure of transformational leadership style = 1 variable
Managers' transactional leadership style	Managers' score on measure of transactional leadership style = 1 variable
Managers' management-by-exception leadership style	Managers' score on measure of management-by-exception leadership style = 1 variable
Managers' laissez-faire leadership style	Managers' score on measure of laissez-faire leadership style = 1 variable
# Variables in block 2	5
# VARIABLES IN MODEL	21
# participants required to obtain power of .8 for overall model	190
# participants required to obtain power of 1.00 for overall model	350

The use of the Hierarchical Linear Model is in its infancy so there is no well-established technique for determining the power for the unit level, also referred to as level 2 analysis. Thus the sample size for the hierarchical linear model analysis was determined in consultation with a Statistician from the Institute of Social Science Research, York University. Based on the expert judgment of this statistician, a minimum size of 35 units was determined for the unit level observations. This is consistent with what is in the literature. Bryk and Raudenbush (1992) used the ordinary least squares regression rule of thumb of 10 observations per predictor to develop similar rules for hierarchical lineal models. For example, Bryk and Raudenbush stated that the 10-to-1 rule of thumb applies for predicting a single level 2 outcome. However, with multiple level 2 outcomes, the recommendations from Bryk and Raudenbush are not as clear. Hofmann (1997) provided the following guidelines in determining appropriate sample sizes. More power is gained by increasing the number of groups rather than the number of individuals per group. Specifically, the power of level 1 effects depends more on the total sample size or total number of observations.

With regard to level 2 effects (i.e., cross-level interactions), the power depends on the number of groups. Hofmann, based on the work of Kreft, recommended that to have an adequate power of .90 to detect cross-level interactions, a sample of 30 groups with 30 individuals is necessary. He added that there is a trade off, that is, if a large number of groups is present, then the number of individuals or observations required per group is reduced. For example, a group of 150 requires only five individuals per group to obtain a power estimate of .90. On the other hand, with fewer groups, there is a need for more

individuals within each group for sufficient power. The study achieved a sample size of 51 units, 41 managers and approximately 14 nurses from each unit.

Setting and Sample

Hospitals. Purposive sampling was used to select hospitals. Four organizations, referred to as A, B, C and D, were selected from a convenience sample to represent various types of health care organizations that are located in urban versus rural setting, teaching versus non-teaching and were geographically close to the researcher, enhancing the feasibility of data collection. Organizations A and D were teaching and urban organizations; B was a non-teaching and community organization; and C was a teaching and community organization. Three of the four organizations were multi-sites as a result of mergers of two or more hospitals. One of two hospitals from organization A participated, the second one was in the process of being closed. Organization B, which consisted of one hospital, participated in the study. Three of the four hospitals from organization C participated, the fourth was a rehabilitation hospital thus was not included in the study. Two of three hospitals from organization D were included in the study; the third hospital was a specialty hospital thus was not included in the study. Therefore, there were seven hospital sites involved. All four organizations had similar forms of organizational structure; they had a total of four layers of management (President, Vice-President, Program Director and Manager).

Units. Four types of units were chosen: medical, surgical, obstetrics and day surgery. These patient care units were chosen because most hospitals have these types of units.

The inclusion criterion for nurse managers was: nurse manager on medical, surgical, obstetrics and day surgery unit of a participating hospital. For nurses, the inclusion criteria were: staff Registered Nurses and Registered Practical Nurses, working full-time, part-time, or casual on participating units. The study sample was self-selected (volunteers).

A sample of 41 managers met the study criteria and all 41 managers participated in the study. In terms of number of units, 51 units met the study criteria, and all agreed to participate in the study. The 51 units do not represent all of the units for which the 41 managers are responsible because some of these units, such as intensive care and operating room, did not meet the study inclusion criteria.

Nurses. A purposive sampling method was used to obtain the study sample of nurses. The nurses were recruited through meetings held at the patient care unit. The target sample size was 10 nurses per participating unit. In some units, more than 10 nurses participated. The investigator scheduled four information sessions per unit. Two, one in the morning and one in the afternoon, of the four sessions were on week 1 of the unit schedule and two on week 2 so that as many nurses as possible were accessed for the study. Not all of the nurses scheduled on the information session day were able to attend the sessions due to a variety of reasons such as busy day, sick call, or possibly lack of interest in the study. Of the nurses who attended the study information sessions, seven did not participate in the study. Six of the seven nurses stated that they were too busy to fill out the questionnaires. The seventh nurse stated that it was her policy never to fill out questionnaires. In 47 of 51 units, the target number of staff nurse sample of 10 per unit was obtained from those who attended the open sessions. To obtain the target sample of 10 in the other four units, the Letter Providing Information About the Study and Soliciting Participation of the Nurse

(Appendix A) and the corresponding questionnaires were left in the staff lounge in an envelope. The envelope contained 5 sets of the information letter and questionnaires. Ten days later a reminder letter (Appendix B) was posted in the staff lounge. This attempt to obtain additional participants from the four units was not successful. Since three of the four units had eight or more participants, and one unit (HA7) was closing some beds and moving to another building for the summer, the decision was made to conclude the recruitment of subjects. A total of 744 questionnaires were distributed: 724 were given to nurses who attended the information sessions, and 20 were left in the staff lounge. Of the 744 questionnaires distributed, 717 were returned, giving a response rate of 96%. The actual numbers of nurses scheduled per unit on the days the information sessions were held was not obtained. However, based on the following calculations the estimated total number of potential participants on the days information sessions were held can be obtained: 2 (number of days information sessions were held) multiplied by 8 (average number of nurses on duty per unit) multiplied by 51 (total number of study units) = 816. Thus, if the total number of potential participants (n = 816) was used in the calculation, the response rate would be closer to 88%, which is obtained by dividing 717 (total number of respondents) by 816 (total number of potential participants). The study sample of 717 is 25% of the total number of nurses in the 51 units, which is 2,822 nurses. Data collection was conducted over a period of three months, from April 2002 to June 2002.

Data Collection Procedure

Inclusion of hospitals was based on the willingness of the Vice Presidents of nursing/chief nursing officers and managers to participate in the study. The study proposal

was sent to the University of Toronto Ethics Review Committee and to the respective hospitals' Research/Ethics Committee. Upon approval from the various Ethics Committees, the investigator and research assistants met with the hospitals' nursing management groups to explain the purpose of the study and request their participation as outlined in the Letter Providing Information About the Study and Soliciting Participation of the Nurse Manager (Appendix C). The managers were informed that by responding to the questionnaire and by returning it in the envelope to the researcher, the participants would be giving their agreement/consent to participate in this study. Those who agreed to participate in the study were asked to complete the Nurse Manager Questionnaire (Appendix D).

The investigator and research assistants held four open information sessions for the nursing staff per participating unit to discuss the study and to request their participation as outlined in the Letter Providing Information About the Study and Soliciting Participation of the Nurse (Appendix A). The staff were informed that by responding to the questionnaire and by returning it in the envelope to the researcher, the participants would be giving their agreement/consent to participate in this study.

To minimize possible disruption with patient care, the information sessions were held during the nurses' coffee breaks or lunch breaks. Refreshments were provided during the sessions. Those who agreed to participate were asked to complete three questionnaires: Multifactor Leadership Questionnaire (Bass & Avolio, 2000), McCloskey Mueller Satisfaction Scale (Mueller & McCloskey, 1990) and Nurse Demographic Questionnaire (Appendix E).

Risks and benefits. The participants were informed that there were no known risks to nurses participating in the study, and low to minimal risks to nurse managers. Specifically, questioning nurses about leadership behaviours of their manager may lead nurses to question their manager's leadership in ways they may not otherwise have. Similarly, asking nurses their feelings of satisfaction about certain aspects of their work may make them question the issue more deeply than they ever had. However, the confidentiality of participants was protected. Names were not attached to any of the questionnaires or interviews (number-coding was used). Only the researcher and research assistants had access to the data collected. All the raw data were stored in a locked file cabinet away from the hospital and study participants were not identified by name in any publication or presentation of the study findings. These data will be destroyed five years after the study is concluded.

Participants were informed that they were free to raise questions or concerns with the principal investigator throughout the study, and were free to withdraw from participation at any time. Those who met the subject inclusion criteria were assured that they were under no obligation to agree to participate. Subjects were assured that their decision to participate, or not to participate, or to withdraw participation at a later time, would have no consequences for their employment.

The participants were informed that although the findings of this study may not benefit them directly, by participating in this study they would be contributing to a better understanding of nursing management and nursing job satisfaction. Participants were also informed that they would receive a copy of the summary of findings from the study, if they wished.

Measures

Manager's Leadership Style

Multifactor Leadership Questionnaire. The manager's leadership style was measured using the Multifactor Leadership Questionnaire Form 5X (Bass & Avolio, 2000). This Questionnaire is one of the most widely used measures of leadership styles. It has been used in numerous management studies (Avolio, Bass & Jung, 1999; Bass, 1985, 1998; Den Hartog, Van Muijen, & Koopman, 1997; Tejada, Scandura & Pillai, 2001; Yukl, 1999) and in several nursing studies (Cunningham & Kitson, 2000; Dunham, 1990; Dunham Taylor, 2000; Medley & Larochelle, 1995; Stordeur et al., 2000; Stordeur, et al., 2001). Staff nurse participants were asked to rate how frequently their manager demonstrated each behaviour on a five-point scale ranging from 0 (not at all) to 4 (frequently, if not always).

The leadership style is determined from items for the leadership style subscales. Transformational leadership style consists of items from four subscales: idealized influence or charisma, inspirational motivation, intellectual stimulation and individualized consideration. Transactional leadership style includes the contingent reward items, management-by-exception leadership style consists of management-by-exception active and management-by-exception passive items, and laissez-faire leadership style includes laissez-faire items. A score is calculated for each of the four leadership styles. Leaders may exhibit leadership behaviours characteristic of more than one leadership style.

The Multifactor Leadership Questionnaire has been used in various settings, such as, industry, military, schools and hospitals. Studies conducted in hospitals include: Dunham

Taylor (2000), Medley and Larochelle (1995), Morrison et al. (1997), Stordeur et al. (2000) and Stordeur et al. (2001).

Dunham Taylor (2000) and Medley and Larochelle (1995) demonstrated disparities in the nurses' staff job satisfaction, while Stordeur et al. (2000) found differences in nurses' work attitudes and levels of stress, between the types of leadership styles. Likewise, Stordeur et al. (2001), found disparities in nurses' levels of emotional exhaustion between the various types of leadership styles. These findings support the construct validity of the instrument for a nursing sample.

Bass and Avolio (2000) reported reliabilities, ranging from 0.74 to 0.94, for each leadership factor scale and for the total items.

A limitation of the Multifactor Leadership Questionnaire is related to the disproportionate number of items that measure each leadership style. Twenty items measure transformational leadership style; four items determine transactional leadership style, eight items measure management-by-exception leadership style, and four items determine laissez-faire leadership style. This disproportion implies an increased emphasis on the transformational leadership style. This is compensated for in the calculation of the score for each subscale, which is the average of the items under each leadership style, obtained by dividing the sum of the item scores by the number of items under each leadership style.

The transactional items are purely based on the leader's reward activity. But the transactional models, such as path-goal theory, also focus on the ability of the leader to improve the subordinates' beliefs that effort will result in performance by clarifying the work activities. In order to expand the content of the transactional scale, nine transactional

items were constructed for this study to assess the leader's behaviour in clarifying effort-performance beliefs. Examples of these items are: "Shows me specifically how to complete my tasks"; "Believes that I may accomplish my tasks"; "Explains what is expected of each member of the group"; and "Explains each individual group members' scope of authority". These items were constructed with the assistance of Professor Martin Evans, a subject matter expert with a background in organizational theory. Furthermore, communication and consultation occurred by email between Professor Martin Evans and Professor Bernard Bass, the author of the Multifactor Leadership Questionnaire. Reliability analysis for the new transactional subscale was conducted by measuring the inter-item correlations and Cronbach alpha. The results, which are presented in Appendix F, show an inter-item correlation ranging from 0.31-0.82, with an average of 0.55, and a Cronbach alpha of 0.94. Table 4 demonstrates that the sum of the original transactional 4 items is strongly correlated with the sum of the transactional 9 items added (r = 0.76), and with the sum of the transactional new 13 items (r = .90) subscale. As well, Table 4 shows that the correlations with the three subscales (that is, transformational, management-by-exception and laissez-faire) were similar with or without the additional transactional 9 items.

Table 4. Inter-item correlations of leadership subscales

	Transactional original 4 items	Transactional added 9 items	Transactional new 13 items	Transformational 20 items	Management-by-exception 8 items
Transactional 9 items added	.76				
Transactional new 13 items	.90	.97			
Transformational new 20 items	.87	.80	.87		
Mgmt-by-exception 8 items	-.15	-.09	-.12	-.13	
Laissez-faire 4 items	-.53	-.47	-.53	-.55	.46

Manager's Span of Control

The manager's span of control is the total number of staff reporting directly to the manager on January 1, 2001. This study used the total number of people (full-time, part-time and casual), rather than full time equivalent, which did not accurately reflect the number of people reporting directly to the manager. In some instances one full-time equivalent consisted of two part-time nurses, and in other cases, of one part-time and two casual nurses. Thus, a full time equivalent of 40 may equal 90 staff.

Span of control, which was obtained from the managers through self-report, included all categories of staff, nursing and non-nursing, reporting directly to the manager. The number of staff across all units for which the manager is responsible, including the units that did not meet the study criteria thus were not part of the study, constituted the recorded span of control. For example, manager A is reported in the study as having a total of 130 span of control. She is responsible for three units, unit A with 50 staff which was not part of the study, and units B and C with 40 staff each and were both part of the study.

Nurses' Job Satisfaction

Job satisfaction is defined as the degree to which employees like their job (Cavanagh, 1989, 1992).

McCloskey Mueller Satisfaction Scale. The McCloskey Mueller Satisfaction Scale (Mueller & McCloskey, 1990) was used to measure job satisfaction. The Scale measures eight dimensions of job satisfaction: satisfaction with extrinsic rewards, scheduling, family/work balance, praise/recognition, co-workers, interaction opportunities,

professional opportunities and control/responsibility. The scale contains 31 Likert-like items with 1 to 5 response categories ranging from very dissatisfied to very satisfied.

The choice of the McCloskey Mueller Satisfaction Scale was based on the findings of Huber et al. (2000) who undertook a careful examination of seven instruments. In addition to the McCloskey Mueller instrument being designed for health care settings, it dominated the other instruments in terms of the combination of psychometric properties and ease of use. The instrument developers (Mueller & McCloskey, 1990) reported the following internal consistency for the Scale: Cronbach's alphas for each of the eight subscales ranging from .52-0.84, and Cronbach's alpha of 0.89 for the total scale. Mueller and McCloskey reported that the test-retest correlations between measurements taken at 6 months on the job and at 12 months were consistent. Mueller and McCloskey also evaluated their tool for criterion validity and construct validity against other similar tools with positive results.

In terms of limitations, the McCloskey Mueller Satisfaction Scale was developed in the United States where most nurses are not unionized. In contrast, this study was conducted in Ontario, Canada, where the majority of nurses are unionized. Terms of the union contract dictate some of the items that constitute two of the eight subscales: extrinsic rewards and scheduling. Furthermore, the subscale praise and recognition contains an item (item 25 "recognition of your work from peers") has a stronger correlation with the subscale co-workers. For this study, item 25 was considered a part of the subscale co-workers.

Turnover

Turnover rate is defined as the percentage of nurses who left their position during a one-year period (Song et al., 1997). The percentage was derived by dividing the total number of nurses who left the unit between the periods of January 1, 2001 to December 31, 2001 by the total number of nurses employed on the unit on January 1, 2001. Turnover information was obtained from managers and hospital Human Resources departments.

Labour Stability

Labour stability rate is defined as the percentage of workers who have remained in the unit for one calendar year (Evans, 2002). In other words, labour stability is the percentage of staff who survived the first year on the unit. The percentage was obtained by dividing the total number of nurses who have been on the unit longer than one year, that is, have been on the unit since January 1, 2001, by the average number of nurses on the unit during the year (January 1, 2001 to December 31, 2001). The unit labour stability figures were obtained from the managers and Human Resources department of the participating hospitals.

Demographic Variables

The demographic variables specific to participating nurses and managers were obtained using the Nurse Demographic Questionnaire (Appendix E) and the Nurse Manager Questionnaire (Appendix D). Each questionnaire consisted of questions about the participant's demographic characteristics, including age, level of education, setting of current unit where the participant is working (Medical, Surgical, Obstetrics or Day Surgery) and length of time employed (on the unit, in the hospital and total professional).

In addition, the Nurse Manager Questionnaire contained questions concerning unit level variables, such as roles of the manager, unit unpredictability, number of staff categories and number of staff reporting directly to the manager.

Threats to Validity

To determine whether a correlational relationship across a particular population has been found, Mitchell (1985) stated that the following potential threats must be addressed: statistical conclusion validity, construct validity and external validity. The following section discusses threats and potential study limitations, and how they were addressed in this study.

Statistical Conclusion Validity

Statistical conclusion validity is concerned with the extent that we can draw valid conclusions or inferences about the correlation between the predictors and outcomes on the basis of statistical evidence (Mitchell, 1985). The question is "Are the variables under study related?" "Is it reasonable to presume correlation given a specified alpha level and the obtained variances?" (Cook & Campbell, 1979:41). Two kinds of wrong inferences are possible: type 1 error, which is the probability of rejecting the hypothesis when it should be retained; and type 2 error, the probability of not rejecting a tested hypothesis when it should be rejected. Two major threats to statistical conclusion validity are addressed in this study: statistical power and reliability of measures.

Statistical power. Statistical power is the ability to say with some degree of confidence that the variables under study are related. A more powerful test has a greater

chance of finding a true effect than a less powerful one. The question is "What makes a test more powerful?" Several factors, such as sample size and number of observations per individual in the study, affect power. First, in general the larger the size of the sample, the more powerful the test is in revealing a statistically significant relationship. It is more difficult to find statistically significant relationships with a small number of subjects. In this study, statistical power was demonstrated.

Second, the number of observations per individual in the study also increases the power of a study. In general, longitudinal studies with multiple time points have a statistical power advantage over studies with only one point of measurement. The present study has one point of measurement since a satisfactory level of power was already achieved.

Reliability of measures. A study's conclusions are doubtful if the measurements were inaccurate. When variables are not precisely measured, there is greater variability of scores and more difficulty in detecting the change in the outcome. The measures used in the present study have a good reliability.

Construct Validity

Construct validity asks the question "Am I really measuring the construct that I want to study?" For example, in this study one of the questions is "Does the manager's leadership style affect the nurses' job satisfaction?" The measure used must reflect the most likely effects of leadership style. Numerous studies have shown that leadership style has a significant effect on staff satisfaction. In this study, nurses' job satisfaction was measured using the McCloskey Mueller Satisfaction Scale. The next question is "Does this Scale

truly reflect nurses' job satisfaction?" The construct validity of the McCloskey Mueller Satisfaction Scale has been reported earlier.

Threats to External Validity

External validity is defined as the ability to generalize specific findings across different settings and populations (Mitchell, 1985). The question is "Would the same results be found if the study was conducted in a different setting and with a different sample?" Increased sample heterogeneity, that is, a broad and diverse sample, increases external validity. The issue of heterogeneity is addressed by having a large sample; in this study there were 717 nurse participants and 51 hospital units.

Another issue related to external validity is related to representativeness of the sample. The question is "Is the study sample representative of the target population?" To address this issue in this study, an attempt was made to compare the respondents and non-respondents. The education level of respondents obtained from the demographic questionnaire completed by nurses was compared with the education level of all of the nurses obtained from the questionnaire completed by managers and information obtained from Human Resources. The results showed that 18% of nurses in the study had baccalaureate education, compared to 7% for all of the nurses. This is consistent with the results of other nursing studies, that is, university prepared nurses tend to participate more in research studies than nurses with less education.

Data Analysis Plan

Data Entry and Data Cleaning

The Statistical Consulting Services Staff at the Institute for Social Research at York University entered the data. Data entry consistencies were checked by the Manager of the Consulting Services and by the research assistants. Two strategies were used in handling missing data. The first involved analyzing missing data to determine whether the items were not answered because they were not applicable to the participant. Items deemed to have missing data because they were not applicable to the participant were not replaced. For example, the following items were not answered by nurses working in Day Surgery because they were not applicable due to the nature of the unit: "opportunity to work straight days" and "flexibility in scheduling your weekends off". Items deemed applicable to the participant, thus should have been answered, were replaced using imputation strategy. Imputation involves using other items to predict the value that this individual would have scored on the missing item. This strategy has been shown to reduce bias more than substituting means (Little & Rubin, 1987). Ten items had 5 per cent or more missing data, one of which was nurses' age that had 15% missing. The other nine items were from the McCloskey Mueller Satisfaction Scale. The Multifactor Leadership Questionnaire was not a problem. The most common reason given for not providing a response was "not applicable" particularly for the three items with the highest missing data, which were under the "balance with family and work" subscale: maternity leave had 33% missing data, child care facilities 33% and opportunity for part time work 18%. Three were under "professional opportunities" subscale: opportunities to write and publish 15%,

opportunities to participate in nursing research 6% and opportunities to interact with faculty 5%. The remaining three items where under "scheduling" subscale: compensation for working weekends 9%, flexibility in scheduling weekends off 7% and opportunity to work straight days 6%.

Data Analysis

Data analysis was performed in consultation with the Statistical Consulting Services at the Institute for Social Research at York University. The Statistical Package for Social Sciences (SPSS), the Statistical Analysis System (SAS) and the S Plus softwares were used for data analysis. SPSS was used to perform multiple regression analyses. SAS and the S Plus were used to test the study hypotheses using the hierarchical linear model (Bryk & Raudenbush, 1992).

The hierarchical linear model allows one to simultaneously examine relationships between or across hierarchical levels. Data on nurses nested within nursing units, thus, two levels of data, nurse level and nursing unit level. The hierarchical linear model allowed the examination of the interaction effect of the variables across the two levels. In this study, the hierarchical linear model enabled the investigation of the degree to which the relationships between leadership style, a nurse level variable, and job satisfaction vary between units when span of control, a nursing unit level variable, is taken into consideration. Another advantage of the hierarchical linear model is the pictorial depiction of the interaction or moderating effect.

Job satisfaction. One of the interests in this study is in predicting job satisfaction at the individual level. Leadership styles (an individual level variable) and span of control (a

group level variable) were identified as predictors of job satisfaction. Hypotheses 1 and 2 propose that job satisfaction will be significantly related to both an individual level variable (i.e., leadership style), as well as unit level variable (i.e., span of control). Hypothesis 3 proposes that the relationship between leadership style and job satisfaction will vary as a function of the manager's span of control of the units (i.e., moderating effect of span of control). Four steps were used, following the strategy of Bryk and Raudenbush (1992), to test the three hypotheses: Step 1, one-way analysis of variance; Step 2, random coefficient regression model; Step 3, intercepts-as-outcomes model; and Step 4, slopes-as-outcomes model.

One-way analysis of variance. In step 1, a one-way analysis of variance for job satisfaction was conducted. The results provided useful preliminary information about how much variation in nurses' job satisfaction can be attributed to the nurses (variance within) and to the units (variance between), and the intraclass correlation, which is an index that measures the proportion of the total variance in job satisfaction that can be attributed to variance in job satisfaction between units.

Random coefficient regression model. In step 2, a random-coefficient model was employed to examine whether leadership style is significantly related to job satisfaction (hypothesis 1) that is whether the mean of slopes between the manager's leadership style and job satisfaction across groups differs significantly from zero. The random coefficient regression model also estimates the percentage of the level 1 residual in nurses' job satisfaction explained by the manager's leadership style.

Intercepts-as-outcomes model. In step 3, an intercepts-as-outcomes model was employed to determine whether span of control is significantly related to job satisfaction

(hypothesis 2) that is whether the variance in the intercept term is significantly related to the manager's span of control. This model is similar to the random coefficient regression model except the level 2 predictor span of control is examined instead of the level 1 predictor leadership style.

Slopes-as-outcomes model. Lastly in step 4, a slopes-as-outcomes model was used to investigate whether span of control moderates the relationship between leadership style and job satisfaction (hypothesis 3), that is, to measure whether the variance in the leadership style and job satisfaction slope across units is significantly related to the manager's span of control.

A multiple regression analysis for job satisfaction was also conducted.

Turnover and labour stability. At the unit level of analysis, the effects of the unit level predictors leadership style and span of control on the unit level outcome variables turnover and labour stability were measured. Main effects and multiple linear regressions for turnover and labour stability were conducted. The interaction effect of leadership style and span of control at the unit level was also examined.

CHAPTER 5: STUDY FINDINGS

Study Findings

The study findings are presented in the following order: list of study variables; description of sample (nurses, managers and units); reliability analysis of instruments; descriptive statistics of independent and dependent variables; and hypotheses testing. The study findings and their implications are discussed in Chapter 6.

Study Variables

Table 5 provides the final list of variables in the hypotheses. The initial and alphabetical lists are shown in Appendix G. The variables are categorized by their level (nurse level or unit level) and role (independent, dependent, or confounding variable).

Table 5. Final list of study variables

	Nurse level	Unit level		
Independent variables	Manager's Leadership style: 1) Transformational 2) Transactional 3) Management-by-exception 4) Laissez-faire	Unit average of Manager's Leadership Style 1) Transformational 2) Transactional 3) Management-by-exception 4) Laissez-faire 5) Manager's span of control		
Dependent variables	1) Nurses' job satisfaction	1) Unit turnover rate 2) Unit labour stability rate		
Confounding variables	Nurses' 1) Unit experience	Unit average of Nurses' 1) Unit experience	Managers' 1) Unit experience	Units' 1) Staff resources not direct report 2) Number of categories of staff 3) Type of unit 4) Unit Unpredictability

Description of the Sample

Table 6 shows the number of participants for each unit and span of control of the manager for the unit.

Table 6. Nurse participants per unit and size of managers' span of control

Unit	Nurse Participants	Manager's span of control	Unit	Nurse Paricipants	Manager's span of control
HA1	20	45	HCB11B	13	139
HA10	10	89	HCB14	14	71
HA11	33	258	HCB15	8	96
HA12	17	137	HCB18B	8	85
HA13	15	74	HCB2	14	112
HA2	17	56	HCB9	16	50
HA3	12	43	HCC12A	10	64
HA4	15	39	HCC12B	15	64
HA6	15	84	HCC16A	17	151
HA7	6	60	HCC16B	10	151
HA8	17	96	HCC17	14	40
HA9	13	44	HCC18C	13	85
HB1	20	71	HCC3	15	50
HB2A	13	123	HCC7	16	59
HB2B	16	123	HDA1	14	57
HB3A	16	134	HDA2	16	66
HB3B	17	134	HDA3	14	46
HB4A	22	88	HDA4	11	50
HB4B	15	88	HDA5	10	83
HCA10A	15	129	HDB10	10	39
HCA10B	11	129	HDB6	13	36
HCA18A	13	85	HDB7	10	55
HCA1A	17	102	HDB8	9	49
HCA1B	12	102	HDB9	10	49
HCA5	12	67	Total	717	
HCA6	18	135	Mean	14.16	
HCB11A	10	139	Median	14.00	

The sample consisted of 717 nurses out of 744, a 96% response rate, who attended the study information sessions and received questionnaires. The sample of 717 nurses is 25% of the possible sample of 2,822 nurses. The study involved 51 units and 41 managers, which are all of the units and managers that met the study criteria. Certain units for which some managers in the study are responsible, did not meet study criteria, thus were excluded.

Nurses' Age, Experience and Education. Several demographic variables were identified in the literature as possible predictors of job satisfaction, turnover and labour stability. The variables age, experience and education were examined in this study. Table 7 shows that the nurses in the study had a mean age of 40 years, 7 years of unit experience, 12 years of hospital experience and a total nursing experience of 16 years. The demographic characteristics of the nurses in this study compare well with the study findings of McGillis Hall et al. (2003), n = 1,116 nurses, mean age of 39 years, 8 years of unit experience, 13 years of hospital experience and 16 years of total nursing experience.

Table 7. Nurses' age, experience and education

Nurses	**Mean**
Age	40.23
Unit Experience	6.84
Hospital Experience	12.06
Total Experience	16.27
Level of Education	**Per cent**
Registered Practical Nurse (RPN)	10.8
Registered Nurse (RN) Diploma	69.8
RN Baccalaureate	18.3
Advanced Degree	1.1

For education, Table 7 shows that the majority of nurses in the study were prepared at the level of diploma Registered Nurse (70%), while 18% had baccalaureate education. In comparison, more nurses (22%) in McGillis Hall et al.'s (2003) sample had baccalaureate degrees. This disparity is likely due to a difference in study setting. McGillis Hall et al.'s study involved teaching hospitals, while the present study included both teaching and non-teaching hospitals.

Data for level of education for all of the nurses on the study units were obtained from managers and Human Resources. Only 7% of this group had baccalaureate degrees. A possible explanation is that the information provided by managers and Human Resources was from January 2001, more than a year prior to data collection, which was April to June 2002. With this time gap, and with the recent emphasis on baccalaureate degree for nurses, the difference may not be as large as shown. In terms of possible effect on the study results, several studies (Decker, 1997; McNeese Smith & van Servellen, 2000) found no significant relationship between education and job satisfaction.

Managers' Age, Experience and Education. In the following discussion, median value is used for comparative purposes because the study (Donner & Wylie, 1995) with the data for comparison used the median statistic. Table 7 demonstrates that managers in the study had a median age of 47 years, had been managing on their present unit for 2 years and in the hospital for 6 years, with total management experience of 10 years. The median age of 47 years is similar to the findings (48 years) of a 1995 study by Donner and Wylie (n = 1,352). However, the study's median total management experience of 10 years is

higher than the sample of Donner and Wylie in which 67% had > 6 years management experience, possibly because their study is eight years earlier.

Table 8. Managers' age, experience and education

Managers	Mean	Median
Age	45.47	47.00
Unit Experience	4.78	2.06
Hospital Experience	7.19	6.00
Total Experience	9.82	10.00
Level of education		**Percent**
RN Diploma		22.0
RN Baccalaureate		51.2
Advanced Degree		26.8

Similar results are seen in terms of education. Table 8 shows that 51% of managers had a baccalaureate degree, which is higher than the findings (45%) of Donner and Wylie (1995). Approximately 27% of managers in the present study had an advanced degree compared to 16% in McGillis Hall et al.'s (2003) study (n = 74). Higher education may mean the managers in this study will tend to have a transformational leadership style. Based on Dunham Taylor's (2000) findings, nurse executives with higher educational degrees tended to have a transformational leadership style, as rated by themselves, n = 396 and by staff, n = 1,115.

Unit Demographic Variables

Seven unit demographic variables were examined for their possible influence on independent and dependent variables. Three were excluded in further analyses. The

variable "number of units for which the manager is responsible" presented a problem by not specifically defining unit, resulting in managers reporting Clinics as units. Clinics differ from units largely because they are smaller and have far fewer staff.

Two of the excluded variables, "number of staff resources reporting to the manager" and "roles of the manager", did not have adequate variability. For the variable "number of staff resources for the unit reporting to the manager", 88% of the sample had 1 or 0 response. The charge nurses were not included in this number because all units had the same response. For the variable "roles of the manager", the responses were quite similar among the 41 managers. A description of these three variables is presented in Appendix H.

The remaining four of the seven unit demographic variables were included in subsequent testing of the study hypotheses. First is the number of staff resources for the unit not reporting to the manager. Examples include clinical nurse specialists, clinical or nurse educators and shift supervisors. Part A of Table 9 shows that almost half of the sample (47.1%) reported having three or four resources that did not report to them. On one hand, this factor increases the amount of coordination the manager must do. On the other, staff resources decrease the workload of manager and staff by providing support that otherwise would be provided by the manager or designated staff.

The second variable is the number of staff categories reporting to the manager. Part B of Table 9 shows that more than half of the managers (60%) had 6 to 17 different staff categories reporting to them. Examples of categories identified include: registered nurses, registered practical nurses, clinical assistants, unit clerks, clinical nurse educators, clinical nurse specialists, physiotherapists, physiotherapy assistants, occupational therapists, respiratory therapists, porters, orderlies and housekeeping aides. The greater the number of

staff categories, the greater the variety of functions, knowledge and skills across the entire staff, and the more communicating and coordinating the manager must do. As well, various categories equate with different professional standards and various union contracts. Thus, the more categories of staff reporting to the manager, the more demands placed on the manager's time.

Third is the type of unit. This variable was considered due to its possible effect on job satisfaction based on the findings of several studies (Boumans & Landerweed, 1994; Ingersoll et al., 2002; Kangas et al., 1999). Furthermore, Leatt and Schneck (1982) found that nursing units differed significantly in terms of number and type of groups that nurses interacted with, and the degree to which these groups are involved in the nursing units. The differences between units found in Leatt and Schneck's study may exist in the units in this study. For example, the day surgery units have fewer numbers and types of groups that nurses interact with than do surgical units. Examples of groups that interact more often with surgical units than with day surgery units include, dietitians, radiology staff, pharmacists, social workers and community care access coordinators. Part C of Table 9 demonstrates that the majority of the units in the study were surgical (43%) and medical (37%).

The fourth variable is unit unpredictability. The more unpredictable the unit is, the greater the complexity of planning the assignments for work that must be done, and the greater the degree of unit coordination required. Thus, more demands are placed on the manager. Part D of Table 9 shows that majority (77%) of the units were somewhat to moderately unpredictable.

Table 9. Unit characteristic variables tested

Part A. Staff resources not reporting to manager

Number of resources	Frequency	Percent
0	8	15.7
1	12	23.5
2	7	13.7
3	16	31.4
4	8	15.7

Part B. Number of staff categories reporting to manager

Number of categories	Frequency	Percent
3	4	7.8
4	11	21.6
5	6	11.8
6	5	9.8
7	3	5.9
8	2	3.9
9	2	3.9
10	6	11.8
11	7	13.7
12	2	3.9
13	1	2.0
15	1	2.0
17	1	2.0

Part C. Type of unit

Type of unit	Frequency	Percent
Medical	19	37.3
Surgical	22	43.1
Obstetrics	5	9.8
Day Surgery	5	9.8

Part D. Unit unpredictability

Unit unpredictability		Frequency	Percent
0	Highly predictable	0	0
1	Somewhat predictable	9	17.6
2	Somewhat unpredictable	19	37.3
3	Moderately unpredictable	20	39.2
4	Highly unpredictable	3	5.9

A Pearson correlation of span of control and four unit variables was conducted. The variables with significant correlations are presented in 10. Span of control was found to be positively correlated with unit unpredictability ($r = 0.42$, $p < .01$). This makes sense, as more unpredictable units tend to have more patients with complex and unstable conditions, requiring increased and specialized care, and thus more staff.

Similarly, span of control was found to be positively correlated with the number of staff categories reporting to the manager ($r = 0.45$, $p < .01$), indicating that the more staff categories that report to the manager, the larger the span of control. This also makes sense, as managers with larger spans of control had two or more units and clinics. In some cases, managers are responsible for several units and clinics with diverse clinical foci. Thus, different units and clinics may mean a variety of staff categories reporting to the manager.

Table 10. Pearson correlation of span of control and unit variables

Variable	Span of control	Unit Unpredictabiiity	Type of Unit	Staff not reporting to manager
Unit Unpredictability	.42 **			
Type of Unit	.01	-.17		
Staff not reporting to manager	.08	.06	.01	
Staff categories	.45 **	.27	-.27	.05

** $p < .01$

In summary, four unit variables will be used in further analysis because of their possible influence on the demands placed on managers. The four unit variables are: unit unpredictability, type of unit, staff not reporting to manager and number of staff categories reporting to manager.

Reliability Analysis of the Instruments

Multifactor Leadership Questionnaire

The results of the Multifactor Leadership Questionnaire reliability analysis performed for this study are shown in Table 11. Cronbach's alphas ranged from 0.57 (management-by-exception) to 0.95 (transformational). With the exception of the Cronbach's alpha for the management-by-exception leadership style scale, these results are similar to the reliabilities reported by Bass and Avolio (2000) of 0.74 to 0.94.

Table 11. Reliability Analysis of the Multifactor Leadership Questionnaire

Leadership style scale	Mean	N of items	N of Cases	Alpha
Transformational	46.32	20	558	0.95
Transactional *	30.02	13	591	0.94
Original Transactional *	8.50	4	641	0.82
Management-by-exception	13.94	8	583	0.57
Laissez-faire	4.96	4	664	0.77

* Nine items were added to the original transactional scale.

Possible explanations for the low Cronbach's alphas for the management-by-exception and laissez-faire subscales can be derived from the formula for Cronbach's alpha:

$$\text{Cronbach's alpha} = \frac{N \cdot r}{1 + (N - 1) \cdot r}$$

This formula shows that the number of items (N) per subscale and the inter-item correlation (r) among the items affect the Cronbach's alpha. Thus, if the number of items is increased, Cronbach's alpha is increased. Similarly, if the inter-item correlation is high,

Cronbach alpha is increased. As shown in Table 11, management-by-exception and laissez-faire leadership scales have only eight and four items, respectively. Furthermore, the two main components of management-by-exception subscale, which are management-by-exception active and management-by-exception passive, are not highly correlated, thus contributing to a further lower Cronbach alpha.

McCloskey Mueller Satisfaction Scale

Table 12 shows the reliability analysis of the McCloskey Mueller Satisfaction Scale: Cronbach's alphas ranged from 0.39 (family and work) to 0.84 (control and responsibility). With the exception of the family and work subscale, the results in this study are slightly higher than the reliabilities reported by the instrument developers (Mueller & McCloskey, 1990), which were Cronbach's alphas of 0.52 to 0.84 for each of the eight subscales.

Table 12. Reliability Analysis of the McCloskey Mueller Satisfaction Scale

	Job Satisfaction Subscale	Mean	N of items	N of cases	Alpha
1	External rewards	9.32	3	658	0.70
2	Scheduling	18.96	6	586	0.83
3	Family and work	8.87	3	407	0.39
4	Revised Praise & recognition*	9.23	3	690	0.79
	*Original Praise & recognition**	12.73	4	685	0.78
5	Revised Co-workers*	10.86	3	692	0.63
	*Original Co-workers**	7.34	2	703	0.43
6	Interaction Opportunities	14.29	4	688	0.78
7	Professional Opportunities	11.51	4	589	0.72
8	Control & responsibility	14.49	5	687	0.84
	Overall	96.36	31	629	0.92

* For this study, item 25 "recognition of your work from peers", was considered as part of subscale 5 "co-workers" instead of subscale 4 "praise and recognition" for reasons discussed earlier.

The low alphas may be due to the small number of items for each subscale. As well, the low alpha for "family and work" may be due to item 11 maternity leave time, which in Ontario is part of the benefits (external rewards) outlined in the union contract. Item 11 should probably be part of "external reward" rather than of "family and work".

Descriptive Statistics of the Study Variables

Leadership Style

Part A of Table 13 shows the raw ratings or scores used at the nurse level. Nurses rated transformational and transactional leadership styles as being exhibited more frequently (mean = 2.32 and 2.30, respectively) than management-by-exception and laissez-faire leadership styles (1.74 and 1.24, respectively). Part B of Table 13 shows that the unit mean[a] scores at the unit level were similar to the nurse level.

Table 13. Nurses' ratings of managers' leadership styles.

Part A. Nurses' ratings of their managers' leadership styles, at the nurse level

Leadership style	N	Mean
Transformational	717	2.32
Transactional	717	2.30
Management-by-exception	716	1.74
Laissez-faire	714	1.24
Part B. Nurses' ratings of their managers' leadership styles, at the unit level		
Transformational unit mean	51	2.36
Transactional unit mean	51	2.34
Management-by-exception unit mean	51	1.74
Laissez-faire unit mean	51	1.21

Rating: 0 = not at all; 1 = once in a while; 2 = sometimes; 3 = fairly often; 4 = frequently, if not always

[a] unit mean score = unit average score, which is obtained by dividing the total of the individual scores for the unit by the number of individuals participating on the respective unit.

The Pearson correlation of the four leadership styles (Table 14) shows that transformational and transactional leadership styles ($r = .88$, $p < .01$) are highly correlated. This high correlation raises the question of item redundancy, that is, whether transformational and transactional leadership styles measure the same behaviour. Another possible explanation for the strong correlation may be caused by a third factor. That is, a high correlation between transformational and transactional results is probably caused by the fact that both are related to a positive kind of leadership. This strong correlation was taken into consideration in the discussion of study findings.

Table 14. Pearson correlation of leadership styles

Leadership Style	Transformational	Transactional	Management-by-exception
Transactional	.88**		
Management-by-exception	.12**	-.11**	
Laissez-faire	-.55**	-.52**	.46**

** $p < .01$

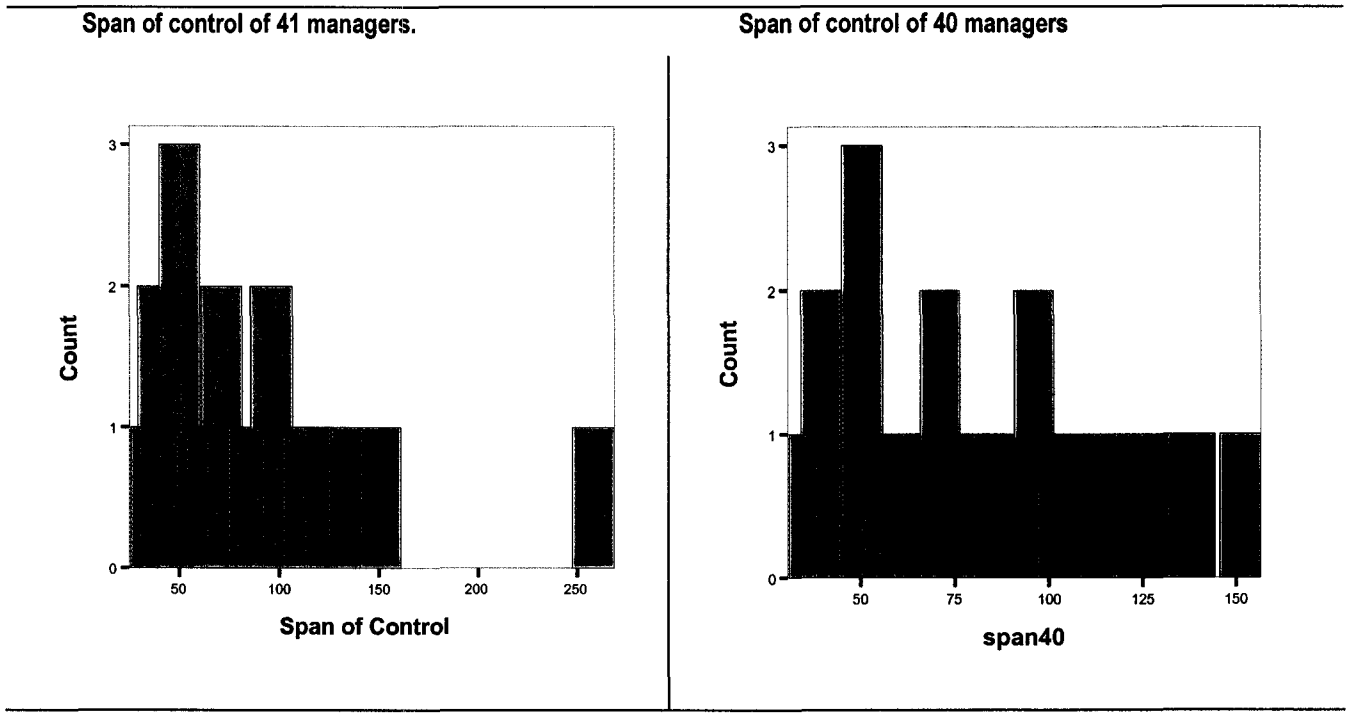
Span of Control

Table 15 and Figure 3 show the span of control of the entire sample of 41 managers. As well, data are presented following removal of outliers. HA11, the unit with a 258 span of control, was considered an extreme value or an outlier. Analyses were done with and without HA11. The managers in this study had a larger span of control (median = 67) than those in the sample (n = 1,352) used by Donner and Wylie (1995), in which only 14.5% had > 60 span of control. This difference is likely due to the mergers after 1995. An explanation of the determination of outliers and a list of outliers are shown in Appendix I.

Table 15. Span of control of managers

	Mean	Median
Span of control of 41 managers	81	67
Span of control of 40 managers (HA11 excluded)	77	67

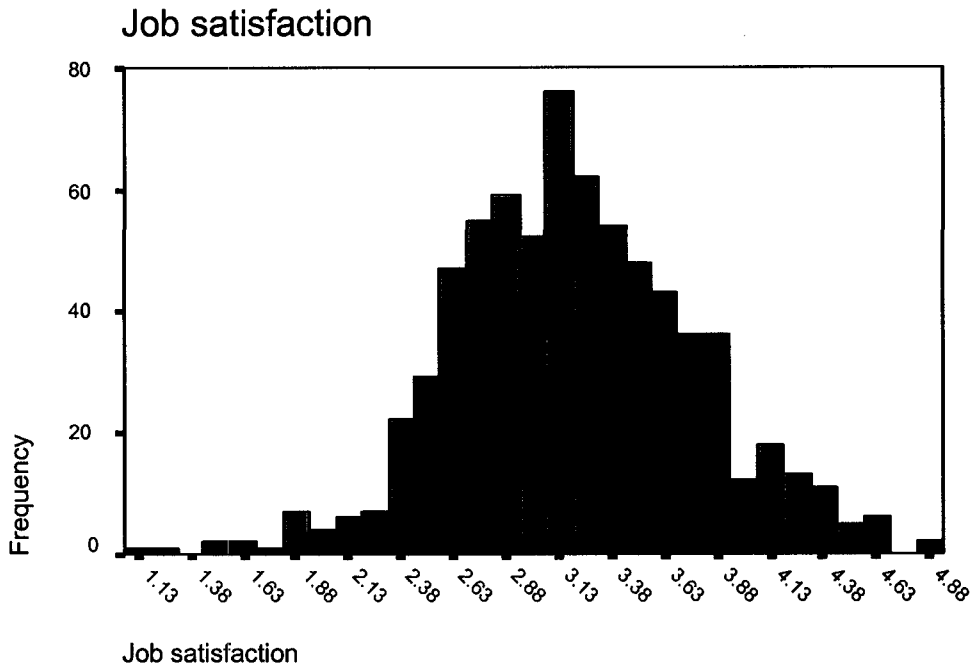
Figure 3. Span of control of managers



Job Satisfaction

Figure 4 presents the distribution of the nurses' job satisfaction scores. Nurses had a mean job satisfaction of 3.20, indicating that they were neither satisfied nor dissatisfied. Table 16 shows that the subscale with the highest mean score was "satisfaction with co-workers" (3.61). Of the eight subscales, "control and responsibilities" subscale had the lowest mean score (2.90).

Figure 4. Distribution of nurses' job satisfaction scores



Scale range: 1 very dissatisfied, 2 dissatisfied, 3 neither satisfied nor dissatisfied, 4 satisfied and 5 very satisfied.

Table 16. Nurses' job satisfaction

Subscales	Mean
External rewards	3.14
Scheduling	3.28
Family & work	3.12
Praise & recognition	3.10
Co-workers	3.61
Interaction opportunities	3.57
Professional opportunities	2.92
Control & responsibilities	2.90
Total	3.20

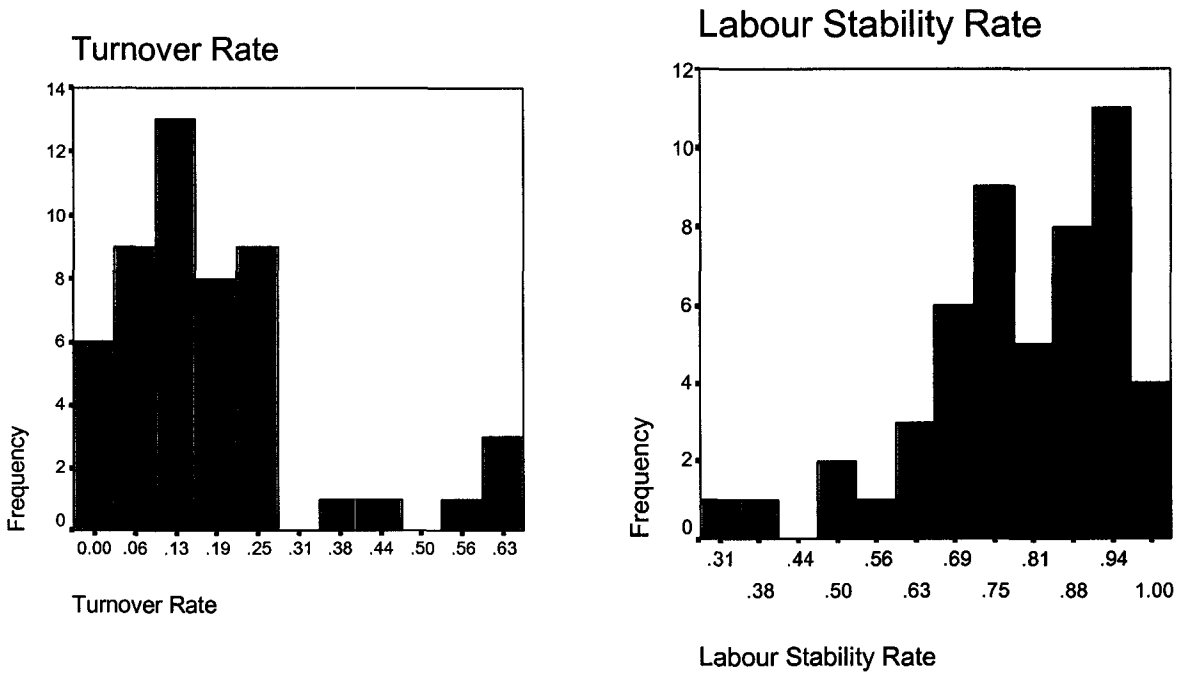
Turnover Rate

Table 17 shows that the mean unit turnover rate is 18%, which is relatively high. This means that on the average, 18 out of every 100 nurses left their unit within the last year. Figure 5, Part A, presents the distribution of turnover scores.

Table 17. Unit turnover and labour stability rates

	N	Mean	Median
Unit turnover rate	51	.18	.13
Unit labour stability rate	51	.79	.83

Figure 5. Distribution of turnover and labour stability scores



Labour Stability Rate

Labour stability rate is the percentage of nurses who survived at least one year of employment on the unit. As shown in Table 17, the mean unit stability rate is 79%. This means that on the average, 79 out of every 100 nurses have more than one year of experience on their current unit. The distribution of labour stability scores is shown in Figure 5, part B.

A combination of high stability and high turnover rates suggests that nurses with less than one year of seniority are leaving, and/or some vacancies are not being filled. A blend of high stability and low turnover rates indicates that nurses with less than one year of unit tenure are leaving. On the other hand, a combination of low stability and high turnover rates implies that nurses with more unit tenure, that is, nurses with at least more than one year of unit tenure, are leaving and/or vacancies are being filled. Lastly, a mix of low stability and low turnover rates indicates that nurses with more unit tenure are the ones leaving.

A list of the span of control, turnover rate, labour stability rate and unit average job satisfaction of the 51 participating units is shown in Appendix J.

Hypotheses Testing

The following section consists of an overview of the data analysis, followed by the findings for each study hypothesis.

Overview of Data Analysis

This study examined the relationships between five predictor variables, which are the four leadership styles and span of control, and their influence on three dependent variables consisting of job satisfaction, turnover and labour stability. Hypotheses were advanced to address these relationships. The Hierarchical Linear Model, a multi-level analysis was used to examine the nurse level outcome variable job satisfaction. The data were collected at two different levels, with one level nested in the other, that is, nurses (Level 1) nested within nursing units (Level 2). In Level 1, also referred to as the nurse level, the model examined the effect of a nurse level predictor variable managers' leadership style. The Level 2 or unit level model captured the effect of a unit level predictor variable span of control.

The nurse level outcome variable job satisfaction was examined using the Hierarchical Linear Model, which consisted of two levels of analyses, Levels 1 and 2. Level 1 analysis consists of Steps 1 and 2, while Level 2 analysis consists of Steps 3 and 4. A one-way analysis of variance, which is step 1, for job satisfaction was conducted. The results provided useful preliminary information about how much variation in nurses' job satisfaction can be attributed to the nurses (variance within) and to the units (variance between). As well, it provided the intraclass correlation, which is the proportion of the total

variance in job satisfaction that can be attributed to variance in job satisfaction between units. Random coefficient regression model, which is step 2, was employed to examine whether leadership style is significantly related to job satisfaction (hypothesis 1), that is, whether the mean of slopes between the manager's leadership style and job satisfaction across groups differs significantly from zero. Step 2 also provided an estimate of the percentage of the level 1 residual in nurses' job satisfaction explained by the manager's leadership style. Intercepts-as-outcomes model, which is step 3, was employed to determine whether span of control, a unit level variable, is significantly related to job satisfaction (hypothesis 2), that is, whether the variance in the intercept term is significantly related to the manager's span of control. Lastly, a slopes-as-outcomes model, which is step 4, was used to investigate whether span of control moderates the relationship between leadership style and job satisfaction (hypothesis 3), that is, to measure whether the variance in the leadership style and job satisfaction slope across units is significantly related to the manager's span of control.

A multiple regression analysis for job satisfaction was also conducted.

For turnover and labour stability, Steps 3 and 4 and multiple regression analyses were conducted to determine the main effects of the unit level predictors leadership style and span of control on the unit level outcome variables turnover and labour stability. Lastly, the effects of the interaction relationships between span of control and leadership style on turnover and labour stability were examined.

Prior to testing the study hypotheses, two procedures were performed to make certain that the variables had a fairly normal distribution and to eliminate possible redundant variables. First, the variation of scores within units for nurse level demographic variables

was examined. The nurses' level of education variable showed limited variability. Specifically, within some units nurses were only at one level of education (RN Diploma) while other units only had one nurse for each of the other three levels of education. This is to be expected since 70% of the sample is diploma-prepared RN. As a result, the nurses' education variable was omitted from further consideration as a demographic variable.

Second, the degree of correlation between the demographic variables was assessed. Table 18 presents the Pearson correlation for nurses' and managers' demographic variables. The top part of Table 18 demonstrates that nurses' age was highly correlated with the three experience variables. As well, the three experience variables were highly intercorrelated. Due to these high correlations, age, hospital experience and total experience variables were excluded from the next steps of the data analysis. Unit experience was retained as it gives an indication of the length of the staff-manager relationship.

Table 18. Pearson correlation of demographic variables

Nurses	Age	Unit experience	Hospital experience	
Unit Experience	.42**			
Hospital Experience	.70**	.63**		
Total Experience	.86**	.49**	.81**	
N	625	711	710	

Managers (N = 51)	Age	Unit experience	Hospital experience	Total experience
Unit Experience	.40**			
Hospital Experience	.49**	.73**		
Total Experience	.62**	.46**	.67**	
Education	-.00	.19	.04	.11

** $p < .01$

Relationships between Leadership Style, Span of Control and Job Satisfaction

The first group of hypotheses, restated below, addresses the relationships between leadership style, span of control and job satisfaction.

Hypothesis 1a: Transformational leadership style is positively related to job satisfaction.

Hypothesis 1b: Transactional leadership style is positively related to job satisfaction.

Hypothesis 1c: Management-by-exception leadership style is negatively related to job satisfaction.

Hypothesis 1d: Laissez-faire leadership style is negatively related to job satisfaction.

Hypothesis 2: Span of control is negatively related to job satisfaction.

Hypothesis 3a: Span of control will decrease the positive effect of transformational leadership style on job satisfaction.

Hypothesis 3b: Span of control will decrease the positive effect of transactional leadership style on job satisfaction.

Hypothesis 3c: Span of control will increase the negative effect of management-by-exception leadership style on job satisfaction.

Hypothesis 3d: Span of control will increase the negative effect of laissez-faire leadership style on job satisfaction.

Hierarchical linear model, which as stated earlier consists of four steps, was used to test the above hypotheses. Step 1, which is a one way Analysis of Variance, was conducted to measure the degree to which total variance in job satisfaction may be attributed to individual nurses' scores (variance within) and how much may be attributed to nursing units (variance between).

The percentage of total variance that may be attributed to the variance between nursing units is measured by the intraclass correlation index, using the following formula:

$$intraclass\ correlation = \frac{variance\ between}{variance\ between + variance\ within}$$

Table 19 shows that the proportion of variance in job satisfaction explained by differences between nursing units is 11.45%.

Table 19. Analysis of variance with random effects for job satisfaction

Overall average	Variance between	Variance within	intraciass correlation
3.20	0.0384	0.2966	0.1145

A random coefficient model was used to measure the main effects of the nurse level control and independent variables on nurses' job satisfaction (Hypotheses 1a to 1d). Table 20 presents the results. Part A shows that the fixed effects of the four leadership styles on job satisfaction are significant. Transformational and transactional leadership styles have a significant positive effect on nurses' job satisfaction. On the other hand, management-by-exception and laissez-faire leadership styles have a negative effect on nurses' job satisfaction. Part C shows how much variance in job satisfaction is explained. Transformational and transactional leadership styles explain a relatively large proportion (22% and 20%, respectively) of the variability in the individual scores for job satisfaction within units.

Table 20. Effect of nurse level predictor variables on job satisfaction

	Part A. Fixed Effects		Part B. Random Effects		Part C.Variance Explained	
Nurse level Predictors	Mean of Intercepts Across Groups	Mean of Slopes Across Groups	Step 2 Variance in Intercepts	Step 3 Variance in Slopes	Level 1 Residual Variance	R^2(% of Variance in Job Satisfaction Explained)
	$\hat{\gamma}_{00}$	$\hat{\gamma}_{01}$	$\hat{\tau}_{00}$	$\hat{\tau}_{11}$	$\hat{\sigma}^2$	$\left(\hat{\sigma}_1^2 - \hat{\sigma}^2\right)/\hat{\sigma}_1^2$
Nurses' Unit Experience	3.20	0.01	0.04	0.00	0.28	0.04
Transformational leadership style	3.20	0.34***	0.04	0.01	0.23	0.22
Transactional leadership style	3.20	0.30***	0.04	0.00	0.24	0.20
Mgmt by exception leadership style	3.20	-0.12**	0.04	0.01	0.29	0.03
Laissez-faire leadership style	3.20	-0.18***	0.04	0.00	0.27	0.08

** p < .01, *** p< .001

Dependent variable: Job satisfaction

In Step 3 an intercepts as outcomes analysis was conducted to test for Hypothesis 2, which states that span of control is negatively related to job satisfaction. The results did not provide support for Hypothesis 2. Span of control is not found to be a significant predictor of job satisfaction.

The results of Steps 2 and 3 are similar to the results of the multiple regression analysis. Table 21 displays the five variables listed in the order entered in the regression, that is, the demographic variables were entered first, then the independent variables. Three variables contribute significantly to explaining the variability in job satisfaction (R^2 = .24, p < .000). The variables, listed in descending order of magnitude of the regression coefficients, are transformational leadership style (t = 4.16), transactional leadership style (t = 2.77) and management-by-exception leadership style (t = -2.43). These findings support Hypotheses 1a, 1b and 1c. Transformational (1a) and transactional (1b) leadership

styles are positively related to job satisfaction. These results suggest that the higher the nurses rated their manager as having a transformational or transactional leadership style, the higher the nurses' job satisfaction. On the other hand, management-by-exception (1c) leadership style is weakly and negatively related to job satisfaction. The higher the nurses rated their managers as having a management-by-exception style, the lower the nurses' job satisfaction. Hypothesis 1d is not supported. Laissez-faire leadership style is not found to have a significant effect on job satisfaction.

Table 21. Regression analysis of nurse level variables and job satisfaction

	Predictor variables	Unstandardized Coefficient B	T		R^2
1	Nurses' Unit Experience	.04	.05		
2	Transformational	.20	4.16	***	.24, p< .000 (df 5, 702)
3	Transactional	.12	2.77	**	
4	Management-by-exception	-.08	-2.43	**	
5	Laissez-faire	.02	.61		

** p < .01, *** p < .001

In Step 4 a slopes as outcomes analysis was conducted to test for Hypotheses 3a to 3d. The test is to determine the difference in slopes, which represents the relationship between leadership style and job satisfaction, when span is brought in the analysis. In other words, the test is performed to examine the interaction effect of span on the relationship between leadership style and nurses' job satisfaction. The results are presented in Table 22. The interactions are depicted in Figures 6 to 9.

The results show four significant cross-level interactions. First, Table 22 shows that span of control moderated the relationship between transformational leadership style and

job satisfaction with the interaction explaining 79% of the variance in slopes. Second, although to a lesser extent, the relationship between transactional leadership style and job satisfaction was moderated by span of control. The interaction effect explained 13% of the variance in transactional leadership style and job satisfaction slopes. The interaction effects on management-by-exception and laissez-faire leadership styles were weaker but significant. The interaction between span of control and management-by-exception leadership style explained 9% of the variance in the management-by-exception leadership style and job satisfaction slopes. Lastly, the interaction between span of control and laissez-faire leadership style explained 8% of the variance in the laissez-faire leadership style and job satisfaction slope.

Table 22. Effect of interaction between span of control and leadership style on job satisfaction controlling for nurses' unit experience

Nurse level	Unit level	Coefficient		% Explained by the Interaction
Transformational	Span of control	-0.0024	**	0.79
Transactional	Span of control	-0.0015	*	0.13
Management-by-exception	Span of control	0.0026	*	0.09
Laissez-faire	Span of control	0.0014	*	0.08

* $p < .05$, ** $p < .01$

Dependent variable: Job satisfaction

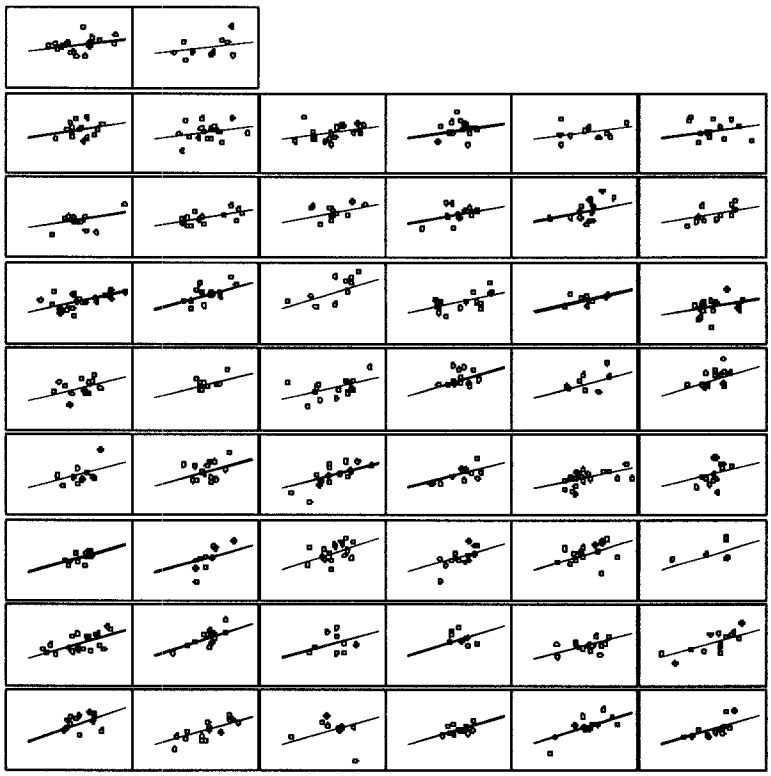
The interactions are depicted in Figures 6 to 9. Figure 6 is the plot graph of the transformational leadership style and span of control interaction. Figure 7 shows the transactional leadership style and span of control interaction. Figure 8 is the management-

by-exception leadership style and span of control interaction. Figure 9 is the laissez-faire and span of control interaction.

For each of the 50 plots, the X-axis is the leadership style, and the Y-axis is job satisfaction. Each plot represents a study unit, while each dot represents the job satisfaction score for each nurse on that unit. The plots are arranged in decreasing order of size of span of control, that is, the unit with the smallest span of control is the bottom left corner plot, and the unit with the widest span of control is the top row right corner. The interaction effect may be seen in the degree of the slope of the regression line, wherein the unit with the lowest span of control, which is the bottom left corner plot, is different from the unit with the widest span of control, located in the top row right corner.

The effect of the interaction between transformational leadership style and span of control on job satisfaction is represented in Figure 6. It shows that in units with lower span of control, which are the plot located in the bottom rows, the positive effect of transformational leadership style on job satisfaction is greater than in unit with wider span of control, which are the plots in the top rows.

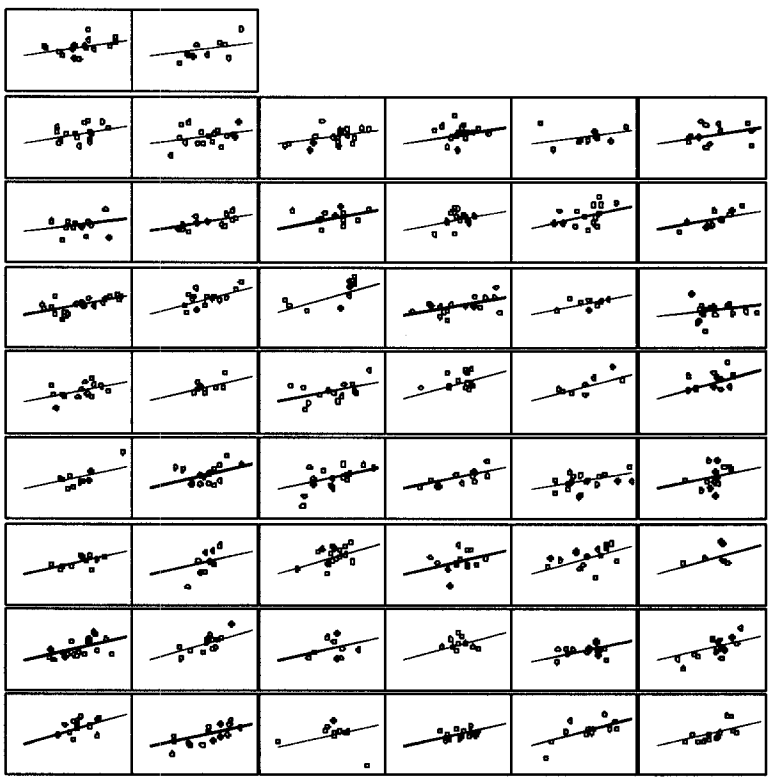
Figure 6. Moderating influence of span of control on the relationship between transformational leadership style and job satisfaction controlling for nurses' unit experience



Note: For each plot, the X-axis is the leadership style, and the Y-axis is job satisfaction. Each plot represents a unit. Each dot represents the job satisfaction score for each nurse on that unit. The plots are arranged in decreasing order of size of span of control; that is, the unit with the smallest span of control is the bottom left corner plot, and the unit with the widest span of control is at the top row right corner plot.

Figure 7 represents the effect of the interaction between span of control and transactional leadership style. It shows a similar pattern, although to a lesser extent, as that of the span of control and transformational leadership style interaction. In units with lower span of control, which are the plots located in the bottom rows, the positive influence of transactional leadership style on job satisfaction is greater than in units with wider span of control, which are the plots in the top rows.

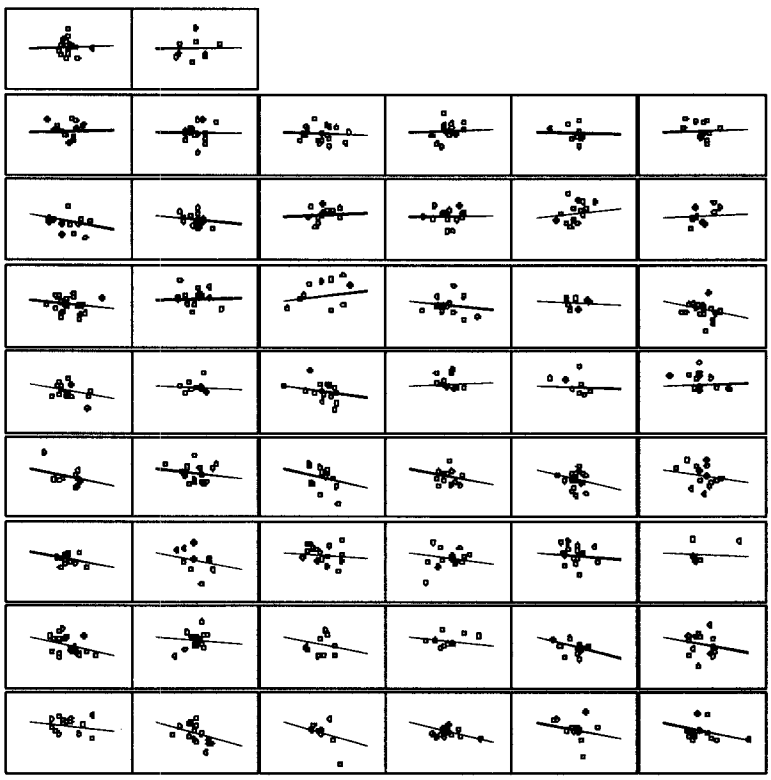
Figure 7. Moderating influence of span of control on the relationship between transactional leadership style and job satisfaction controlling for nurses' unit experience



Note: For each plot, the X-axis is the leadership style, and the Y-axis is job satisfaction. Each plot represents a unit. Each dot represents the job satisfaction score for each nurse on that unit. The plots are arranged in decreasing order of size of span of control; that is, the unit with the smallest span of control is the bottom left corner plot, and the unit with the widest span of control is at the top row right corner.

Figure 8 shows that in general, in units with narrow spans of control, which are the plots in the bottom rows, the negative effect of management-by-exception leadership style on job satisfaction is greater than in units with wider spans of control, which are the plots located in the top rows. However, in some cases, the negative effect of management-by-exception leadership style on job satisfaction is attenuated. Possible reasons for the unexpected effect are explored in the next chapter.

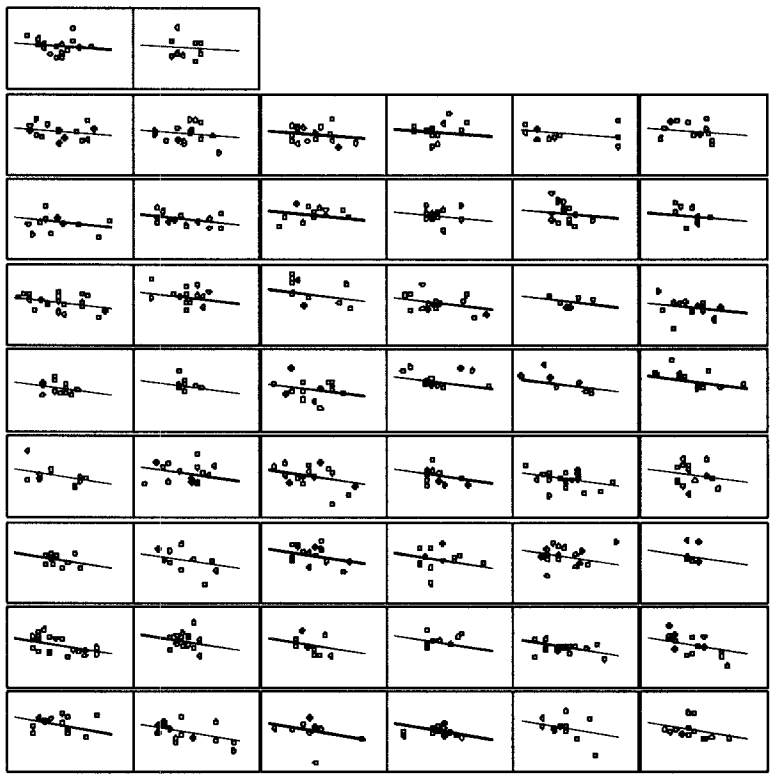
Figure 8. Moderating effect of span of control on the relationship between management-by-exception leadership style and job satisfaction controlling for nurses' unit experience



Note: For each plot, the X-axis is the leadership style, and the Y-axis is job satisfaction. Each plot represents a unit. Each dot represents the job satisfaction score for each nurse on that unit. The plots are arranged in decreasing order of size of span of control; that is, the unit with the smallest span of control is the bottom left corner plot, and the unit with the widest span of control is at the top row right corner.

Figure 9 shows that overall, in units with narrow spans of control, which are the plots in the bottom rows, the negative effect of laissez-faire leadership style on job satisfaction is greater than in the units with wider spans of control, which are the plots located in the top rows. However, in some cases, similar to that of management-by-exception leadership style, the negative effect of laissez-faire leadership style on job satisfaction is attenuated. Possible reasons for the unexpected effect are explored in the next chapter.

Figure 9. Moderating effect of span of control on the relationship between laissez-faire leadership style and job satisfaction controlling for nurses' unit experience



Note: For each plot, the X-axis is the leadership style, and the Y-axis is job satisfaction. Each plot represents a unit. Each dot represents the job satisfaction score for each nurse on that unit. The plots are arranged in decreasing order of size of span of control; that is, the unit with the smallest span of control is the bottom left corner plot, and the unit with the widest span of control is at the top row right corner.

The results presented in Table 22 and depicted in Figures 3 to 6 provide support for Hypotheses 3a, 3b, 3c and 3d. Span of control was found to decrease the positive effect of both the transformational and transactional leadership styles on job satisfaction (3a and 3b), as well as, increasing the negative effect of management-by-exception and laissez-faire leadership styles on job satisfaction (3c and 3d).

Relationships between Leadership Style, Span of Control and Turnover

The next set of hypotheses, restated below, was developed to address the relationships between leadership style, span of control and unit turnover

Hypothesis 4a: Transformational leadership style is negatively related to turnover.

Hypothesis 4b: Transactional leadership style is negatively related to turnover.

Hypothesis 4c: Management-by-exception leadership style is positively related to unit turnover.

Hypothesis 4d: Laissez-faire leadership style is positively related to unit turnover.

Hypothesis 5: Span of control is positively related to unit turnover.

Hypothesis 6: Span of control moderates the effect of leadership styles on turnover, decreasing the positive effect of transformational and transactional leadership styles, and increasing the negative effect of management-by-exception and laissez-faire leadership styles.

Prior to testing the above hypotheses, a Pearson correlation was undertaken to determine the degree of association between unit level variables. The Pearson correlation of all unit level variables is presented in Appendix K.

The variables significantly correlated with turnover are shown in Table 23. Turnover had a significant ($p < .05$) positive correlation with span of control ($r = .31$) and with unit unpredictability ($r = .31$). Conversely, turnover had a significant negative correlation with nurses' unit experience unit mean ($r = -.29$). Of note, a very strong negative correlation exists between turnover and labour stability ($r = -.87$).

Table 23. Pearson correlation of unit level variables with significant correlation with turnover

		Turnover	Labour stability	Nurses' unit experience unit mean	Unit Unpredictability
1	Labour stability	-.87**			
2	Nurses' unit exp unit mean	-.29*	.21		
3	Unit unpredictability	.31*	-.32*	.05	
4	Span of control	.31*	-.25	-.09	.32*

* $p < .05$, ** $p < .01$

To test the hypotheses related to unit turnover and those specific to unit labour stability, Level 2 model, which consists of three steps, was utilized. Step 1 involved the measurement of main effects of the unit level independent and demographic variables, Step 2 determined the effects of predictor variables, and Step 3 tested the interaction relationships between leadership style and span of control at the unit level.

The first step measured the main effects of the unit level predictor and demographic variables. Column 2 of Table 24 shows that three variables have a significant effect on unit turnover rate. Hypothesis 5 was supported: span of control has a significant but small, positive effect on turnover ($R^2 = .09$). In addition, two demographic variables have a

significant small and positive effect on unit turnover: nurses' unit experience ($R^2 = .08$) and unit unpredictability ($R^2 = .18$).

Table 24. Main effects of unit level predictors on turnover and labour stability

Column 1	Column 2	Column 3
Predictor variable (X)	**Turnover**	**Labour stability**
	R^2	R^2
Span of control	.09*	
Nurses' unit experience unit mean	.08*	
Unit unpredictability	.18*	.18*
Staff not reporting to manager		.09*

* $p < .05$

Dependent variables: Turnover and Labour stability

Next, a multiple linear regression analysis measured the effects of unit level predictors and demographic variables on turnover. The regression analysis showing all 11 variables and their effects on turnover, listed in the order entered in the regression, is presented in Table 25. Three variables contribute significantly to explaining the variability in turnover ($R^2 = 44.5\%$, $p < .01$). These variables, listed in descending order of magnitude of the regression coefficients, are span of control (t = 2.33), transformational leadership style (t = -2.21) and managers' unit experience (t = -2.09).

Table 25. Regression analysis of unit level predictors and turnover

	Predictor variables	Unstandardized Coefficient B	T value		R^2
1	Nurses' unit exp unit mean	-.85	-.91		
2	Managers' unit experience	-.87	-2.09	*	
3	Staff not reporting to manager	-..15	-.97		44.5%, p< .01(df 11, 38)
4	Number of staff categories	-.75	-1.12		
5	Type of unit	-.35	-1.47		
6	Unit unpredictability	.40	1.51		
7	Transformational unit mean	-.32	-2.21	*	
8	Transactional unit mean	.29	1.97		
9	Management by exc unit mean	.21	1.74		
10	Laissez-faire unit mean	-.53	-.71		
11	Span of control	.16	2.33	*	

* $p < .05$

Dependent variable: Turnover

The study findings support Hypotheses 4a. Transformational leadership style is negatively related to turnover, indicating that units with higher transformational leadership style unit means have a lower unit turnover rate. On the other hand, the study results do not support Hypotheses 4b, 4c and 4d. Transactional (4b), management-by-exception (4c) and laissez-faire (4d) leadership styles are not found to have a significant effect on turnover.

Hypothesis 5 is supported: span of control is found to be positively related to turnover. This finding indicates that units where managers had wider spans of control had higher turnover.

As well, Table 25 demonstrates that one demographic variable, the manager's unit experience, has a negative effect on turnover. This finding implies that the longer the manager has been on the unit, the lower the unit turnover.

The next step was examining the effect of the interaction between span of control and leadership style on turnover at the unit level. The interactions are not significant with or without covariates. Similarly, the interactions are not significant with or without unit HA11. Thus, Hypothesis 6 is not supported: span of control has no significant moderating effect on the relationship between leadership styles and unit turnover.

Relationships between Leadership, Span of Control and Labour Stability

The last set of hypotheses, restated below, was advanced to address the relationships between leadership, span of control and labour stability.

Hypothesis 7a: Transformational leadership is positively related to labour stability.

Hypothesis 7b: Transactional leadership style is positively related to labour stability.

Hypothesis 7c: Management-by-exception is negatively related to labour stability.

Hypothesis 7d: Laissez-faire leadership style is negatively related to labour stability.

Hypothesis 8: Span of control is negatively related to labour stability.

Hypothesis 9: Span of control moderates the effect of leadership styles on labour stability, decreasing the positive effect of transformational and transactional leadership styles, and increasing the negative effect of management-by-exception and laissez-faire leadership styles on labour stability.

A Pearson correlation was undertaken for labour stability to determine the degree of association between unit level variables. The complete results are shown in Appendix K. Table 26 shows the three predictors significantly ($p < .05$) correlated with labour stability: number of staff providing support for the unit but not reporting to manager ($r = .33$), type of unit ($r = .31$) and unit unpredictability ($r = -.32$).

Table 26. Pearson correlation of unit level variables with significant correlation with labour stability

		Labour stability	Turnover	Nurses' unit exp unit mean	Staff not reporting to manager	Type of Unit
1	Turnover	-.87**				
2	Staff not reporting to manager	.33*	-.26	.08		
3	Type of Unit	.31*	-.19	.16	.03	
4	Unit unpredictability	-.32*	.31*	.05	.01	-.14

* $p < .05$

The next step was measuring the main effects of the unit level predictor and demographic variables. The results are shown in a previous table (Table 24). Two demographic variables have a significant ($p < .05$) effect on labour stability: unit unpredictability ($R^2 = .16$) and staff resources not reporting to the manager ($R^2 = .09$).

Next, a multiple linear regression measured the effects of unit level predictors and demographic variables on unit labour stability rate. Table 27 presents the results of the multiple regression analysis. Variables are listed in the order entered in the regression. Two of the variables contribute significantly to explaining the variability in unit labour stability rate ($R^2 = 44.6\%$, $p = .009$): type of unit ($t = 2.50$) and span of control ($t = -2.13$).

Table 27. Regression analysis of unit level predictors and labour stability

	Predictor variables	Unstandardized Coefficient B	T value		R^2
1	Nurses' unit experience unit mean	.46	-.50		
2	Managers' unit experience	.33	.81		
3	Staff not reporting to manager	.29	1.90		.45, p< .01(df 11, 38)
4	Number of staff categories	.77	1.16		
5	Type of unit	.60	2.50	*	
6	Unit unpredictability	-.40	-1.44		
7	Transformational unit mean	.26	1.79		
8	Transactional unit mean	-.26	-1.83		
9	Management by exc unit mean	-.16	-1.38		
10	Laissez-faire unit mean	-.18	-.03		
11	Span of control	-.15	-2.13	*	

* p < .05

Dependent variable: Labour stability

The results of the multiple regression do not support Hypotheses 7a, 7b, 7c and 7d. Transformational (7a), transactional (7b), management-by-exception (7c) and laissez-faire (7d) leadership styles are not found to have a significant effect on labour stability.

The study findings provide support for Hypothesis 8: span of control is negatively related to labour stability. This finding suggests that units with managers with wider spans of control tend to have a lower labour stability rate.

The last step was examining the interaction effects between span of control and leadership styles on labour stability rate at the unit level. The interaction effects are not significant, with or without covariates, and with or without the outlier unit HA11. The

study findings do not support Hypothesis 9: span of control is not found to significantly moderate the influence of leadership styles on unit labour stability rate.

Summary

Of the 21 hypotheses tested in the study, 10 were supported, shown in Table 28. Appendix L lists all the study hypotheses. Statistically significant relationships were found between three of the four leadership styles and job satisfaction. These relationships were moderated by span of control. A statistically significant relationship was also found between transformational leadership style and turnover. Span of control was found to have a main, but not a moderating, effect on turnover and labour stability.

Table 28. Summary of hypotheses supported

Variable	Job satisfaction		Turnover*		Labour stability*	
	Effect	Hypothesis supported	Effect	Hypothesis supported	Effect	Hypothesis supported
Transformational leadership style*	+	1a	–	4a		
Transactional leadership style*	+	1b				
Management-by-exception leadership style*	–	1c				
Span of control			+	5	–	8
Span of control x transformational**	–	3a				
Span of control x transactional**	–	3b				
Span of control x management by exc**	+	3c				
Span of control x laissez-faire**	+	3d				
Managers' unit experience			–			
Type of unit					+	

* For turnover and labour stability, the unit means were used for leadership styles and nurse level variables.

** Leadership styles and span of control interaction effects.

CHAPTER 6: DISCUSSION

The purpose of this study is to examine the relationships between leadership style, span of control and outcomes as measured by nurses' job satisfaction, unit turnover and unit labour stability. The findings are discussed in this chapter in the same order as presented in the study's theoretical framework: a) the relationship between leadership style and outcomes; b) the relationship between span of control and outcomes; and c) the relationship between leadership style, span of control and outcomes. The implications of the study findings for research and practice are also discussed.

Leadership Style and Outcomes

One of the hypothesized relationships in the theoretical model is the influence of leadership style on outcomes. This was tested by examining the effects of leadership style on outcomes measured by nurses' job satisfaction, unit turnover and unit labour stability. The study findings provide support for these relationships, and are discussed below.

Transformational Leadership Style

Transformational leadership style is a significant predictor of nurses' job satisfaction and unit turnover, but not of labour stability. The findings on job satisfaction correspond with the results reported by studies in the nursing literature (Bakker et al., 2000; Stordeur et al., 2000; Stordeur et al., 2001). Transformational leaders exert a significant positive impact on staff satisfaction by providing support, encouragement, positive feedback and

individual consideration, and promoting open communication. These leadership behaviours tend to generate a favourable climate on the unit, characterized by increased cooperation, teamwork and fewer interpersonal conflicts. As well, these behaviours have been found to decrease nurses' feelings of stress (Stordeur et al., 2000) and emotional exhaustion (Stordeur et al., 2001) and increase nurses' self-esteem (Bakker et al.).

The findings on turnover are congruent with the findings of Leveck and Jones (1996). Leveck and Jones found that leadership style has an indirect effect on staff retention through job satisfaction. More specifically, leadership style affects group cohesion and job stress, which in turn influence job satisfaction, and subsequently, turnover. Shader (2001) found that the higher the job stress, the lower the group cohesion, the lower the work satisfaction, and the higher the anticipated turnover. This indirect effect may also be applicable to the results of this study. This is an important finding because it clarifies the relative importance of leadership style in understanding turnover. Leadership style has not been included in most studies on turnover.

Transactional Leadership Style

Similar to the findings on transformational leadership style, although to a lesser extent, transactional leadership style has a significant positive influence on nurses' job satisfaction. The higher the nurses rated their manager as having a transactional leadership style, the higher the nurses' job satisfaction. Transactional leaders assign tasks, specify procedures and clarify expectations. These transactional leadership behaviours have been shown to decrease emotional exhaustion (Stordeur et al., 2001), reduce role ambiguity and increase job satisfaction (Gray Toft & Anderson, 1985). On the other hand, the study results seem

to be inconsistent with the findings of Medley and Larochelle (1995) who found that transactional leadership style did not influence job satisfaction. This difference in findings is likely attributed to the fact that Medley and Larochelle defined transactional leadership style as consisting of the management-by-exception items, and considered the transactional contingent reward items as part of transformational leadership style.

Transactional leadership style did not have a significant effect on turnover and labour stability. A possible explanation is that benefits, rewards and disciplinary terms are included in the union contract, with most hospitals offering similar terms. Thus these items may not be an issue for nurses deciding to leave. As well, transactional leadership style is highly correlated with transformational leadership style, thus it may be redundant. In other words, once transformational leadership style was accounted for in the regression model, transactional leadership style did not contribute significantly to the explanation of the variation in turnover rates.

Management-by-exception Leadership Style

Management-by-exception leadership style has a significant effect on nurses' job satisfaction, but not on unit turnover and unit labour stability. The more nurses rated their managers as having a management-by-exception leadership style, the lower the nurses' job satisfaction. These results are consistent with the findings of several studies (Bakker et al., 2000; Bass, 1985; Bass & Avolio, 1990; Densten & Gray, 1998; Hater & Bass, 1988; Morrison et al., 1997; Stordeur et al., 2000; Stordeur et al., 2001). Management-by-exception managers are perceived as only available to monitor their staff so as to prevent mistakes. This tends to cause higher levels of anxiety, emotional exhaustion (Stordeur et

al., 2001) and burnout (Bakker et al.). As well, the manager's monitoring may be perceived as a lack of trust by staff. Studies that examined the association between leadership style and turnover are sparse and did not include management-by-exception in the assessment. There are no studies that examined the relationship between leadership style and labour stability.

In summary, the study results have reaffirmed the findings in management and nursing research that some leadership styles, particularly transformational, are better than others. Transformational leadership style increases job satisfaction and decreases turnover.

Span of Control and Outcomes

Another hypothesized relationship in the theoretical model is the influence of span of control on outcomes. This was tested by examining the effects of span of control on outcomes as measured by nurses' job satisfaction, unit turnover and unit labour stability. The study findings provide support for the theorized relationships, which are discussed below.

Span of control is a significant predictor of turnover and labour stability, but not of job satisfaction. The results specific to job satisfaction are not congruent with the findings by Burke (1996). Burke found that wide span of control decreases job satisfaction, that is, staff in larger units report fewer satisfying work outcomes, such as less satisfaction with the firm. A possible explanation is that the effect of span of control on job satisfaction has a moderating influence, rather than a main effect. The moderating effect of span of control is discussed in the next section.

Span of control has a significant positive effect on turnover. The predicted turnover rate increases by 1.6% for a change of 10 in the size of span of control. For example, with a span of control of 50, the unit turnover rate would increase by 8%, and a span of control of 100 by 16%. The wider the manager's span of control, the higher the unit turnover. Possible explanations for this effect may be found in the findings of Green et al. (1996) and Gittell (2001). Green et al. found that when the work unit increases in size, relationships between managers and staff become less positive. Managers are not able to develop close relationships with staff and provide support and individual consideration, while at the same time seeing to the daily operations of their unit. Similarly, Gittell found that small supervisory spans have positive effects on group process, that is, managers with smaller spans are able to relate more with the staff. Managers with smaller spans work with and provide intensive coaching and feedback to their staff.

Another finding is that span of control decreases labour stability, suggesting that the wider the span of control, the lower the unit labour stability rate. The predicted labour stability value decreases by 1.5% for a change of 10 in the size of span of control. A span of control of 50 decreases unit labour stability by 7.5%, and a span of control of 100 decreases unit labour stability by 15%. A possible explanation is related to the screening and selection of new staff, important but time-consuming activities. A manager with minimal available time due to a wide span of control may be less likely to effectively perform the screening and selection of new staff, resulting in the hiring of staff who may not be the "right fit" for the team or the unit. The orientation period and the first year of hire are periods of intensive learning and socialization. Spending time with staff is

particularly critical during these time periods to be able to make an early assessment and achievement of the new staff's needs.

Span of Control, Leadership Style and Outcomes

The third proposed relationship in the theoretical model is the moderating influence of span of control on the relationship between leadership style and outcomes. The proposed relationship was tested by examining the effects of the interaction between span of control and leadership style on outcomes as measured by nurses' job satisfaction, unit turnover and unit labour stability. The study findings provide support for some of the theorized relationships.

The relationship between leadership style and job satisfaction is moderated by span of control. First, the positive effect of transformational leadership style on nurses' job satisfaction is significantly reduced in units where managers have wider spans of control. Similarly, although to a lesser extent, the positive effect of transactional leadership style on nurses' job satisfaction is decreased in units with wider managerial spans of control. The time constraints and demands are likely greater for managers with larger spans of control, resulting in limited opportunities for interaction between the manager and individual staff. The limited interaction may decrease the ability of the manager and staff to develop close and quality relationships. These results are consistent with the findings of Green et al. (1996) that is, as work unit size increases, the relationships between the manager and staff became less positive. As well, Gittell (2001) noted less timely communication in groups with broad spans of control. In such situations the manager does not have time to

consistently provide transformational leadership style, such as encouraging and supporting staff and providing individual consideration. In contrast, managers with small spans of control are able to relate more with staff, provide coaching and feedback to staff, and develop closer relationships.

Lastly, the negative effects of the interaction between span of control and management-by-exception and laissez-faire leadership styles on nurses' job satisfaction are increased in units where managers have wider spans of control. An explanation for this moderating influence also relates to the manager's lack of time due to wide span of control. This lack of time may result in increased practice of management-by-exception leadership style, which focuses only on mistakes rather than on providing support and individual consideration, or in laissez-faire leadership style. Since even at the best of times management-by-exception and laissez-faire managers do not consistently attend to the needs of their followers, it is likely that these managers will turn their attention away from work even more in situations of wider span of control. However, the study findings show that there are exceptions. In some cases, the negative effects of management-by-exception and laissez-faire leadership styles show a decrease, rather than the expected increase. More specifically, some units with wider spans of control have higher nurses' job satisfaction than units with narrow spans of control. This is a surprising finding. A possible explanation is that due to a lack of time, managers with a management-by-exception or laissez-faire leadership styles are able to point out mistakes or errors less frequently under wider spans of control.

Confounding Variables

Two confounding variables, both of which are unit level, have a significant relationship with the dependent variables. These two variables are managers' unit experience and type of unit. Managers' unit experience is found to significantly decrease turnover. In other words, units with managers with longer unit tenure have lower turnover. One possible explanation is that a manager with longer unit tenure has been able to get to know the staff, develop close relationships with the staff, and thus be more responsive to the needs of the staff and the unit. As well, the manager is likely more aware of staff strengths and weaknesses, and therefore more apt to and better able to delegate responsibilities.

There were no studies found in the literature that examined the effect of managers' unit experience on turnover.

The variable type of unit had a significant positive effect on labour stability. A possible explanation for the positive effect of the type of unit on labour stability is its influence on nurses' job satisfaction (Boumans & Landerweed, 1994; Ingersoll et al., 2002; Kangas et al., 1999). In this study, day surgery units had higher job satisfaction scores. The five items specific to scheduling had very high scores because nurses working in day surgery units work only on weekdays and day shifts. In contrast, the nurses in either one of the three other units, medical, surgical and obstetrics, have to work weekends and evening or night shifts.

Implications for Research and Practice

This study is the first to theorize span of control as a moderating variable in the relationship between leadership style and outcomes, using the Transformational Leadership Theory. The primary contributions of the span of control-moderator theory to research and practice follow from its underlying premise that leaders have difficulty in consistently practicing positive leadership behaviours under wider span of control. The theoretical framework developed in the study presents a model of leadership effectiveness that has greater explanatory potential than the simple relationship between leadership style and outcomes. The study's theoretical model also provides an important link between the emphasis on individual relationship quality in Transformational Leadership research and the emphasis on situational factors in Contingency Leadership analysis. Combining the assessment of the manager-nurse relationships and the organizational structure within which staff and managers interact has resulted in an integrated framework for studying leadership style and manager-nurse relationships in organizational contexts. In this study, the traditional area of Transformational Leadership theory has been extended to examine the context of organizational factors that affect the relationship between staff and manager. The theory has been advanced in the following study findings. Transformational leadership has an important effect on staff and unit outcomes, however, not under all circumstances. Span of control moderated the relationships between transformational, transactional, management-by-exception and laissez-faire leadership styles and nurses' job satisfaction.

Measurement Issues

A measurement issue related to the leadership questionnaire was identified in the empirical testing of the theoretical model. Although the Multifactor Leadership Questionnaire has been developed and tested to measure leadership style, the issue of high correlation between transformational and transactional leadership styles needs to be resolved. As well, the following question must be addressed: Are there two, not four, leadership styles, a positive one represented by transformational and transactional leadership styles and a negative one consisting of management-by-exception and laissez-faire leadership styles. The limited number of items in the transactional, management-by-exception and laissez-faire leadership styles subscales suggests additional work is needed to better clarify the concepts that these three subscales represent. First, there is a need to identify other empirical indicators of transactional, management-by-exception and laissez-faire leadership styles. Second, the development of measures of these indicators is necessary.

A second measurement issue concerns the McCloskey Mueller Satisfaction Scale. Two subscales in the Scale, which are extrinsic rewards and scheduling, are stipulated in union contracts or in organizational policies and procedures manuals. The manager has no control over some of the items in these two subscales. It is likely that a scale that excludes some of these items would provide a more accurate measure of nurses' job satisfaction in specific settings such as those in this study.

Further refinement and validation of the Multifactor Leadership Questionnaire and of the McCloskey Mueller Satisfaction Scale to address the issues discussed above are recommended.

Are some Leadership Styles better than others?

Transformational leadership style, and, to a lesser extent, transactional leadership style result in more positive staff outcomes than management-by-exception and laissez-faire leadership styles. Transformational leadership style increases nurses' job satisfaction and decreases turnover. Transactional leadership style increases job satisfaction. In contrast, management-by-exception leadership style decreases job satisfaction. An important issue is whether leaders can consistently exhibit transformational leadership behaviours regardless of organizational context, such as span of control. Research efforts that explore how various organizational contexts affect leaders, staff, work groups and organizations are necessary.

Is there an Optimum Span of Control?

A second significant implication for research and practice concerns the question of optimum span of control. Stieglitz (1962) and Rodger (2002) presented some factors that need to be considered when deciding the size of span of control. These factors include similarity of the workers' functions, geographic proximity of the workers, complexity of functions, direction and control required by the workers, degree of coordination required of the workers, organizational assistance and unit unpredictability. Research that will examine the extent to which these factors affect the size of the span of control is necessary. More importantly, research on the impact of span of control on processes and outcomes is critical. The question is how wide can the manager's span of control be for the manager to still be effective. There are no firm guidelines, but the impact of span of control on the relationship between leadership style and nurses' job satisfaction, and on unit turnover and

unit labour stability can serve as a guide in answering this question. For example, the study results indicate the significant decrease in the positive effects of transformational and transactional leadership styles on job satisfaction. As well, the study findings suggest an increase of 1.6% in unit turnover rate, and a decrease of 1.5% in labour stability for every increase of 10 in the size of span of control. Thus a span of control of 100 is predicted to have an increase of 16% in turnover rate, and a decrease of 15% in labour stability rate. Although organizations are putting tremendous efforts and resources in staff recruitment and retention strategies at the individual level, they fail to consider factors at the unit level, such as the impact of span of control on turnover and labour stability. As well, there is a need to conduct studies to examine the relationships between span of control and other outcomes, particularly patient outcomes such as functional status and patient satisfaction, and organizational outcomes such as cost per weighted case.

What is the Optimum Leadership Style under Differing Spans of Control?

A third important implication for research and practice concerns the question of optimal leadership style under different spans of control. An interesting finding of this study is that no leadership style can overcome the effects of a wide span of control. Research efforts to further explore this finding are necessary. Further empirical evidence supporting the study's propositions would encourage organizations to consider the importance of a manageable size of span of control when determining the structure for the management of patient care units. As well, the study findings support the need to develop guidelines regarding the number of staff a nurse manager may effectively supervise and lead. It is very difficult, if not impossible, to consistently provide positive leadership to a

large staff, while at the same time ensuring, on a daily basis, the effective and efficient operation of a large unit.

Study Limitations

The following limitations that may restrict the generalizability of the study results must be considered when interpreting the study findings. First, due to a limited access to information, only one measure (percentage of nurses with baccalaureate degree) was used to compare respondents with non-respondents. The result of the comparison shows that 18% of participants had a baccalaureate degree, while only 7% of combined participants and non-participants completed a baccalaureate degree. This is consistent with other nursing studies, that is, university prepared nurses tend to participate more in research studies compared to nurses with less education.

The second limitation is related to the determination of the response rate. The total number of nurses scheduled on the day the information sessions were held was based on the average number of nurses on duty per unit, not on actual numbers of nurses scheduled per unit.

The third limitation is that the observations are not longitudinal. Data were obtained using measures collected at a single point in time. Thus the cause and effect relationship cannot be made.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The conclusions are based on the study findings and support for the study hypotheses. Conclusions must be interpreted within the context of the study. Care must be taken in generalizing the study findings to other hospitals, units and staff beyond those comparable to the study participants.

Effect of Leadership Style on Job Satisfaction, Turnover and Labour Stability

The results of the study provide empirical support for the theorized relationships between leadership style and outcomes. Leadership matters, and some leadership styles particularly transformational, are better than others. The higher the nurses rated their manager as having a transformational leadership style, the higher the nurses' job satisfaction, and the lower the unit turnover rate. Conversely, the higher the nurses rated their manager as having a management-by-exception leadership style, the lower the nurses' job satisfaction. The findings in this study are the first to provide empirical evidence demonstrating relationships between leadership and turnover, using the Transformational Leadership Theory.

Effect of Span of Control on Job Satisfaction, Turnover and Labour Stability

The study results provide empirical support for the hypothesized relationships between span of control and outcomes. Span of control matters – the wider the span of control, the

higher the unit turnover rate and the lower the unit labour stability rate. This is the first study to provide empirical evidence on these relationships.

Moderating Effect of Span of Control

The study findings provide empirical support for the theorized moderating relationship between span of control and leadership style. This is one of the most important and exciting findings in this study. There is no leadership style that can overcome a wide span of control. More specifically, the wider the span of control, the less positive the effect of transformational and transactional leadership styles on nurses' job satisfaction, and the more negative the effect of management-by-exception and laissez-faire leadership styles on job satisfaction. Thus, although leadership style has a significant influence on the satisfaction of nursing staff, the impact of the interaction between span of control and leadership style on job satisfaction is significantly greater in scope. This is the first study to demonstrate the moderating effect of span of control on the relationship between leadership style and job satisfaction.

In conclusion, the major contribution of this study is its findings that no leadership style can overcome a wide span of control.

Recommendations

Recommendations for Practice

The results of this study support the importance of the manager's leadership style and span of control in creating a positive work environment. First, these findings point to the importance of measuring staff satisfaction and implementing strategies to address the dimensions of satisfaction that need improvement.

Second, these findings reaffirm the need for organizations to provide mechanisms to help managers become effective leaders. Organizations should design and implement management training and development programs that focus on effective and facilitative leadership styles, such as a transformational style of leadership.

Third, the moderating influence of span of control on the effects of leadership style on nurses' job satisfaction demonstrates that no leadership style can overcome a wide span of control. It is not humanly possible to consistently provide positive leadership to a very large number of staff, while at the same time ensuring the effective and efficient operation of a large unit on a daily basis. There is a need to develop guidelines regarding the number of staff a nurse manager can effectively supervise and lead.

Recommendations for Theory and Future Research

The study's theoretical framework, that is, the moderating influence of span of control on the relationship between leadership style and outcomes, offers a model of leadership effectiveness that has a greater explanatory potential than the simple relationship between leadership style and outcomes. The study findings suggest the need for research that

examines whether leaders consistently exhibit transformational leadership behaviours regardless of the organizational context. As well, the investigation of the relationships between span of control, leadership style and outcomes that are patient-specific such as functional status and patient satisfaction is recommended.

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Appendix A: Study Information & Soliciting Participation Of The Nurse

You are being asked to participate in a study entitled: The impact of the manager's span of control on leadership and performance. The purpose of this study is to understand how the manager's span of control (total number of staff reporting to the manager) affects leadership and staff outcomes such as job satisfaction, turnover and labour stability. The study aims at:
1) examining how the manager's leadership style affects nurse outcomes; 2) examining how the manager's span of control affects nurse outcomes; and 3) investigating which particular leadership style contributes to better nurse outcomes under differing spans of control.

The study is part of the requirements for completing Amy McCutcheon's Doctor of Philosophy degree at the Faculty of Nursing, University of Toronto, and is partly funded by the University of Toronto Nursing Effectiveness, Utilization and Outcomes Research unit. The study is also part of a larger study funded by the Canadian Health Services Research Foundation, Ontario Ministry of Health and Long Term Care and the Canadian Institutes of Health Research.

Rationale for the Study: The manager's leadership style has been shown to be one of the main factors that influence the nursing practice environment, job satisfaction and nurse turnover. Understanding how the manager's span of control and leadership style contribute to nurse satisfaction and turnover will assist hospitals to make decisions about their management structures and to design management education to promote effective leadership.

Procedure: Approximately 700 nurses are being invited to participate in this study. You are invited to participate in this study because you are a staff nurse on a participating unit. Your participation in the study involves answering questions about:

- your feelings toward certain aspects of your work
- your background such as level of education
- leadership behaviours of your manager

The questionnaires will take about 15-20 minutes to complete.

What are the benefits for you?
Although the findings of this study will not benefit you directly, by participating in this study you will be contributing to a better understanding of nursing management. You will receive a copy of the summary of findings from the study, if you wish.

What risks are there for you in participating in this study?
There are no known risks to participating in the study. Names will not be attached to any of the questionnaires or interviews (number-coding will be used). Only the researchers, research assistants and the hospital Research Ethics Board (for the purpose of monitoring the study) will have access to the data that are collected. All the raw data will be kept stored in a locked file cabinet away from the hospital and you will not be identified by name in any publication or presentation of the study findings. These data will be destroyed five years after the study is concluded.

You will be free to raise questions or concerns with me (between 9:00 a.m. to 5:00 p.m., Monday to Friday) throughout the study, and may withdraw at any time if you choose. Please be assured that you are under no obligation to agree to participate. Your decision to participate, or not to participate, or to withdraw participation at a later time will not have any consequences for your employment.

By responding to the questionnaire and by returning it in the envelope to the researcher, you will be giving your agreement/consent to participate in this study.

Amy McCutcheon
PhD Student, Faculty of Nursing
University of Toronto
416-231-1059
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Appendix B: Reminder Letter

About 10 days ago, you and a selected sample of nursing staff were invited to participate in a study entitled "The impact of the manager's span of control on leadership and performance", and were asked to complete questionnaires.

If you have not had a chance to respond yet I would appreciate your reading the attached letter explaining the study and soliciting your participation. If you agree to participate, please complete the attached questionnaires and mail to us in the enclosed pre-stamped and self-addressed envelope.

If you have responded to our invitation, we thank you and ask you to ignore this letter.

Thank you.

Sincerely,

Amy McCutcheon, RN, MScN
PhD Student
Faculty of Nursing
University of Toronto

Appendix C: Study Information & Seeking Participation Of Nurse Manager

You are being asked to participate in a study entitled: **The impact of the manager's span of control on leadership and performance.** The purpose of this study is to understand how the manager's span of control (total number of staff reporting to the manager) affects leadership and staff outcomes such as job satisfaction, turnover and labour stability. The study aims at:
1) examining how the manager's leadership style affects nurse outcomes; 2) examining how the manager's span of control affects nurse outcomes; and 3) investigating which particular leadership style contributes to better nurse outcomes under differing spans of control.

The study is part of the requirements for completing Amy McCutcheon's Doctor of Philosophy degree at the Faculty of Nursing, University of Toronto, and is partly funded by the University of Toronto Nursing Effectiveness, Utilization and Outcomes Research unit. The study is also part of a larger study funded by the Canadian Health Services Research Foundation, Ontario Ministry of Health and Long Term Care and the Canadian Institutes of Health Research.

Rationale for the Study: The manager's leadership style has been shown to be one of the main factors that influence the nursing practice environment, job satisfaction and nurse turnover. Understanding how the manager's span of control and leadership style contribute to nurse satisfaction and turnover will assist hospitals to make decisions about their management structures and to design management education to promote effective leadership.

Procedure: Approximately 40 nurse managers are being invited to participate in this study. You are invited to participate in this study because you are a nurse manager at one of the following units: Medical, Surgical, Obstetrics and Day Surgery. Your participation in the study involves answering questions about your background such as level of education (the questionnaire will take about 5 minutes to complete). You will be asked to identify a staff member, e.g., unit clerk, to assist the research assistant to obtain the total number of staff reporting to you, the number of nursing staff who have left the unit in the last year and the number of nursing staff with a Baccalaureate degree.

The nursing staff will be asked to complete questionnaires about: the leadership behaviours of their manager; their feelings toward certain aspects of their work; and their background. We hope to have about 10 nurses, for each participating nurse manager.

What are the benefits for you?
Although the findings of this study will not benefit you directly, by participating in this study you will be contributing to a better understanding of nursing management. You will receive a copy of the summary of findings from the study, if you wish.

What risks are there for you in participating in this study?
There are minimal risks to participating in the study. The questionnaire asking nurses questions about leadership behaviours of their manager may lead nurses to question their manager's leadership in ways they might not otherwise have. Similarly, the questionnaire asking the nurses their feelings of satisfaction toward certain aspects of their work may make them question the issue more deeply than they ever had before. However, the confidentiality of participants is protected. Names will not be attached to any of the questionnaires or interviews (number-coding will be used). Only the researchers, research assistants and the hospital Research Ethics Board (for the purpose of monitoring the study) will have access to the data that are collected. All the raw data will be kept stored in a locked file cabinet away from the hospital and you will not be identified by name in any publication or presentation of the study findings. These data will be destroyed five years after the study is concluded.

You will be free to raise questions or concerns with me (between 9:00 a.m. to 5:00 p.m., Monday to Friday) throughout the study, and may withdraw at any time if you choose. Please be assured that you are under no obligation to agree to participate. Your decision to participate, or not to participate, or to withdraw participation at a later time will not have any consequences for your employment.

By responding to the questionnaire and by returning it in the envelope to the researcher, you will be giving your agreement/consent to participate in this study.

Amy McCutcheon
PhD Student, Faculty of Nursing
University of Toronto
416-231-1059
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Appendix D: Nurse Manager Questionnaire

Following are questions related to you. Please circle the number associated with the most appropriate response or write your answer in the space provided. Thank you.

1. My age is _____ years

2. Highest degree obtained
   1. Diploma, RPN
   2. Diploma, RN
   3. Baccalaureate
   4. Advanced degree

3. Setting of current unit where you are working
   1. Medical unit _____ (name of unit)
   2. Surgical unit _____ (name of unit)
   3. Obstetrics _____ (name of unit)
   4. Day Surgery _____ (name of unit)

4. Length of experience as a manager on the above unit: _____ (years/months)

5. Length of experience as a manager at this hospital: _____ (years/months)

6. Total length of experience as a manager (at this hospital and other hospitals or organizations): _____(years/months)

7. I perform the following managerial roles:

Not at all	Once in a while	Sometimes	Fairly often	Frequently/always
0	1	2	3	4

a. Communicating – collecting, processing and disseminating information; keeping staff informed. 0 1 2 3 4

b. Controlling – developing systems (e.g., planning, budgeting, staffing), designing structures and providing directives (e.g., delegating responsibilities, authorizing requests). 0 1 2 3 4

c. Leading - encouraging, motivating, inspiring, coaching, nurturing and mentoring staff; building and managing teams; creating and maintaining culture. 0 1 2 3 4

Not at all	Once in a while	Sometimes	Fairly often	Frequently/always
0	1	2	3	4

I perform the following managerial roles (continued):

d. Linking – networking and building contacts and coalitions of supporters beyond own units. 0 1 2 3 4

e. Doing – carrying out action directly, getting things done (e.g., championing change, fighting fires, juggling projects), analyzing issues and deciding. 0 1 2 3 4

f. Dealing – negotiating and making deals. 0 1 2 3 4

8. In terms of my unit unpredictability, I reassign staff on a shift: Please use the following rating scale:

Not at all	Once in a while	Sometimes	Fairly often	Frequently/always
0	1	2	3	4

9. Unit Resource staff reporting to me:

a. Assistant Manager Yes ____ No ____ Number _____
b. Charge Nurse –Day shift Yes ____ No ____ Number _____
c. Charge Nurse –Evening shift Yes ____ No ____ Number _____
d. Charge Nurse –Night shift Yes ____ No ____ Number _____
e. Clinical Nurse Specialist Yes ____ No ____ Number _____
f. Clinical or Nurse Educator Yes ____ No ____ Number _____
g. Other _____(specify) Number _____
h. Other _____(specify) Number _____

10. Hospital Resource staff not reporting to me but provide support to my unit/s:

a. Coordinator/Supervisor –Day shift Yes ____ No ____
b. Coordinator/Supervisor –Evening shift Yes ____ No ____
c. Coordinator/Supervisor –Night shift Yes ____ No ____
d. Clinical Nurse Specialist Yes ____ No ____
e. Clinical or Nurse Educator Yes ____ No ____
f. Other _____(specify)
g. Other _____ (specify)

11. The total number of categories of staff directly reporting to me is _____.

12. a. The number of units I am responsible for _____.
    b. The number of sites these units are located in _____.

13. I report directly to a:
    a. Director
    b. Vice President
    c. Other _____

14. What is the total number of staff (all categories and FT, PT & Casual) who directly reported to you as of January 1, 2001? _____

15. Of the total number of staff reported in question 14, how many are:
    a. RN's _____
    b. RRPN's _____

16. Of the total RN's reporting to you, how many have a Bachelor's Degree? _____

17. As of January 2002, how many have been on the unit for more than a year:
    a. RN's _____
    b. RPN's _____

18. From January 1, 2001 to January 1, 2002, how many nurses have left the unit (including transfers and retirements):

    a. RNs _____
    b. RPN's _____

Appendix E: Nurse Demographic Questionnaire

Nursing Unit Code #: _____ Hospital Code #: _____ Date: _____

Following are questions related to your background and plan to continue to work on your unit. Please provide the following information about yourself, by circling the number associated with the most appropriate response or by writing your answer in the space provided.

1. My age is _____ years

2. Highest degree obtained
   1. Diploma, RPN
   2. Diploma, RN
   3. Baccalaureate
   4. Advanced degree

3. Setting of current unit where you are working
   1. Medical unit _____ (name of unit)
   2. Surgical unit _____ (name of unit)
   3. Obstetrics _____ (name of unit)
   4. Day Surgery _____ (name of unit)

4. Length of experience as a nurse on the above selected unit: _____ (years/months)

5. Length of experience as a nurse at this hospital: _____(years/months)

6. Total length of experience as a nurse (at this hospital and other hospitals/organizations) _____(years/months)

Appendix F: Inter-Item Correlation of the New Transactional Subscale

	M1	M11	M16	M35	M46	M47	MI48	M49	M50	M51	M52	
	M53											
M11	.45											
M16	.56	.62										
M35	.56	.47	.54									
M46	.60	.51	.62	.62								
M47	.50	.50	.61	.53	.77							
M48	.52	.38	.44	.63	.58	.47						
M49	.51	.46	.55	.62	.62	.57	.60					
M50	.50	.45	.55	.57	.63	.59	.52	.78				
M51	.55	.48	.60	.61	.72	.66	.58	.72	.71			
M52	.49	.43	.53	.57	.58	.52	.55	.72	.72	.68		
M53	.41	.32	.35	.51	.43	.31	.62	.48	.39	.46	.53	
M54	.52	.39	.46	.62	.53	.42	.68	.55	.49	.53	.60	.82

N of Cases = 591.0

Reliability Coefficients 13 items

Alpha = .94 Standardized item alpha = .94

Appendix G: Study Variables: Initial List and In Alphabetical Order

	Nurse level	Unit level		
Independent	Manager's Leadership style: 1) Transformational 2) Transactional 3) Management-by-exception 4) Laissez-faire	Unit average of Manager's Leadership Style 1) Transformational 2) Transactional 3) Management-by-exception 4) Laissez-faire 5) Manager's span of control		
Dependent	Nurse job satisfaction	1) Unit turnover rate 2) Unit labour stability rate		
Confounding	Nurses' 1) Age 2) Education 3) Unit experience 4) Hospital experience 5) Total experience	Unit average of Nurses' 1) Age 2) Education 3) Unit experience 4) Hospital experience 5) Total experience	Managers' 1) Age 2) Education 3) Unit experience 4) Hospital experience 5) Total experience	Units' 1) Roles of manager 2) Number of units responsible for 3) Staff resources direct report 4) Staff resources not direct report 5) Number of categories of staff 6) Type of unit 7) Unit Unpredictability

Alphabetical listing of variables

Age of managers
Age of nurses and Age of nurses' unit mean
Education of managers
Education of nurses and Education of nurses unit mean
Hospital experience of managers
Hospital experience of nurses and Hospital experience of nurses unit mean
Total experience of managers
Total experience of nurses and Total experience of nurses unit mean
Unit experience of managers
Unit experience of nurses and Unit experience of nurses unit mean
Job satisfaction of nurses
Labour stability rate of units
Laissez-faire leadership style of managers and Laissez-faire leadership style unit mean
Management-by-exception leadership style of managers and Management-by-exception leadership style unit mean
Number of units responsible for
Staff categories
Staff resources for unit not reporting to manager
Staff resources for unit reporting to manager
Roles of managers
Span of Control of manager
Transformational leadership style of managers and Transformational leadership style unit mean
Transactional leadership style of managers and Transactional leadership style unit mean
Turnover rate of units
Type of unit
Unit unpredictability

Appendix H: Demographic variables Examined But Excluded In Hypotheses Testing

Part A	**Number of units the manager is responsible for**	***0***	***1***	***2***	***3***	***4***	***5***	***6***	***7***
	Frequency		10	20	8	5	3	2	3
	Percent		20	39	16	10	6	4	6
Part B	**Staff resources for the unit reporting to the manager**								
	Frequency	31	14	5	1				
	Percent	61	28	10	2				

Part C. ***Roles of managers***

Role	***Not at all***	***Once in a while***	***Sometimes***		***Fairly often***		***Frequently/ always***	
			N	**%**	**N**	**%**	**N**	**%**
Communicating					7	14	44	86
Controlling					18	35	33	65
Leading					19	37	32	63
Linking			11	22	30	59	10	20
Doing			3	6	23	45	25	49

Part D. Type of unit

Type of unit	**Frequency**	**Percent**
Medical	19	37
Surgical	22	43
Obstetrics	5	10
Day Surgery	5	10

Appendix I: Identifying Influential Outliers

A unit that had a ***leverage*** greater than .1 and a ***studentized residual*** greater than 1.2 (in absolute values), was considered as a potentially influential outlier (Norusis, 1998). ***Leverage*** measures the degree of variance from the mean. ***Studentized residual*** calculates how far the observation is from the fit. Units with high ***leverage*** and ***studentized residual*** **may** possibly have high influence on the estimates of the regression coefficients. The numbers below represent how many times (that is, in how many models) each unit has been identified by these criteria. The two units with the highest number of outliers were HA7, HA 12 and HA11.

	Unit	*Turnover*	*Labour Stability*	*Total*
1	HCB15	0	0	0
2	HCC12B	0	0	0
3	HB2B	0	0	0
4	HDA5	0	0	0
5	HA2	0	0	0
6	HCC18C	0	0	0
7	HCC7	0	0	0
8	HA13	0	1	1
9	HB3A	1	1	2
10	HB4A	0	2	2
11	HCA18A	0	0	0
12	HCA6	1	1	2
13	HDA2	1	1	2
14	HDA3	0	2	2
15	HDB8	0	1	1
16	HCC17	0	1	1
17	HCC16B	0	2	2
18	HCB14	0	0	0
19	HDB6	0	0	0
20	HCB2	0	3	3
21	HA8	0	0	0
22	HCA1A	2	2	4
23	HA4	5	0	5
24	HB1	0	3	3
25	HB3B	4	2	6
26	HB4B	0	1	1
27	HCB18B	1	3	4
28	HA10	1	3	4
29	HA11	**10**	1	11
30	HA12A	8	5	13
31	HA7	0	0	0

Appendix J: Span of Control, Turnover, Labour Stability & Average Job Satisfaction of the 51 Participating Units

Unit	Code	SPAN	TO	LB	JSAT	Unit	Code	SPAN	TO	LB	JSAT
1	HA10	102	0.06	0.94	3.88	27	HCC16A	50	0.13	0.77	3.15
2	HCC18C	102	0.00	1.00	3.74	28	HCB14	57	0.14	0.84	3.12
3	HA18A	71	0.06	0.94	3.72	29	HA1	139	0.12	0.84	3.11
4	HA7	50	0.11	0.86	3.60	30	HB4A	134	0.23	0.63	3.10
5	HB4B	39	0.11	0.88	3.58	31	HA9	129	0.17	0.77	3.09
6	HDB6	151	0.06	0.88	3.54	32	HDB7	258	0.03	0.98	3.09
7	HA2	112	0.38	0.68	3.53	33	HDB8	137	0.06	0.94	3.08
8	HCB18B	66	0.00	1.00	3.50	34	HA8	123	0.21	0.95	3.08
9	HCA10A	39	0.16	0.74	3.48	35	HA6	43	0.13	0.57	3.07
10	HCC7	135	0.16	0.87	3.46	36	HCA5	64	0.28	0.68	3.04
11	HDA3	64	0.10	0.62	3.44	37	HCB11A	96	0.24	0.76	3.04
12	HDB9	74	0.13	0.87	3.42	38	HB3B	123	0.44	0.53	3.03
13	HDA5	40	0.13	0.87	3.36	39	HCC17	83	0.17	0.83	3.03
14	HB2A	134	0.03	0.95	3.35	40	HA13	49	0.05	0.94	3.03
15	HCB15	139	0.08	0.90	3.26	41	HCC12A	46	0.06	0.94	3.02
16	HCC12B	67	0.23	0.71	3.25	42	HCA6	59	0.63	0.49	3.01
17	HA3	84	0.19	0.76	3.25	43	HDB10	129	0.27	0.73	3.00
18	HB2B	96	0.00	0.91	3.25	44	HDA2	85	0.13	0.79	3.00
19	HA12	49	0.60	0.60	3.24	45	HCB2	56	0.26	0.67	2.99
20	HA11	55	0.10	0.70	3.24	46	HCC16B	36	0.04	0.96	2.98
21	HCA10B	44	0.10	0.91	3.23	47	HA4	88	0.27	0.73	2.95
22	HB3A	88	0.60	0.34	3.22	48	HCB9	60	0.08	0.92	2.95
23	HCB11B	45	0.23	0.77	3.19	49	HB1	85	0.14	0.90	2.84
24	HDA1	71	0.24	0.71	3.19	50	HCA1B	85	0.17	0.77	2.74
25	HCC3	151	0.19	0.81	3.16	51	HCA1A	89	0.58	0.39	2.73
26	HDA4	50	0.00	0.99	3.15						

TO = Turnover; LB = Labour Stability; JSAT = Job Satisfaction

Appendix K: Pearson Correlation of Unit Level Variables

		Turnover	Labour stability	Nurses' unit exp unit mean	Nurses' total exp unit mean	Mgrs' unit exp	Mgrs' total exp.	Staff not reporting to manager	Number of staff categories	Type of Unit	Unit Unpredictability	Transformational unit mean	Transactional unit mean	Management by exception unit mean	Laissez-faire unit mean
1	Turnover														
2	Labour stability	-.87**													
3	Nurses' unit exp unit mean	-.29*	.21												
4	Mgrs' unit experience	-.20	.03	.27	-.11										
5	Staff not reporting to manager	-.26	.33*	.08	.04	.06	.04								
6	Number of staff categories	.12	-.10	.02	-.14	-.09	.04	-.02							
7	Type of Unit	-.19	.31*	.16	.65**	-.05	.24	.03	-.24						
8	Unit unpredictability	.31*	-.32*	.05	-.13	-.02	-.11	.01	.20	-.14					
9	Transformational unit mean	-.19	.20	.11	.01	-.08	.06	.19	-.20	-.01	.00				
10	Transactional unit mean	-.12	.12	.05	-.04	-.02	.12	.16	-.17	-.03	-.01	.95**			
11	Mgmt by exception unit mean	.16	-.21	.15	.33*	.15	.04	-.11	-.01	.06	.06	-.38**	-.36*		
12	Laissez-faire unit mean	.08	-.10	-.03	.24	-.02	-.09	.01	.03	.16	.06	-.73**	-.74**	.64**	
13	Span of control	.31*	-.25	-.09	-.08	.01	-.05	-.05	.35*	.11	.32*	-.27	-.31*	-.09	.10

* $p < .05$, ** $p < .01$

Note: The managers' education had no significant correlation with any of the unit level variables, thus, was not included.

Appendix L: Summary Of Hypotheses Supported And Not Supported

Part A. ***Hypotheses supported***

Variable	Job satisfaction		Turnover*		Labour stability*	
	Effect	Hypothesis supported	Effect	Hypothesis supported	Effect	Hypothesis supported
Transformational leadership style*	+	1a	–	4a		
Transactional leadership style*	+	1b				
Management by exc leadership style*	–	1c				
Span of control			+	5	–	8
Span of control x transformational**	–	3a				
Span of control x transactional**	–	3b				
Span of control x management by exc**	+	3c				
Span of control x laissez-faire**	+	3d				
Managers' unit experience			–			
Type of unit					+	

Part B. ***Hypotheses not supported (no significant effect)***

Variable	Job satisfaction	Turnover*	Labour stability*
Transformational leadership style*			7a
Transactional leadership style*		4b	7b
Management-by-exception leadership style*		4c	7c
Laissez-faire leadership style*	1d	4d	7d
Span of control	2		
Span of control x leadership styles**		6	9

* For turnover and labour stability, the unit means were used for leadership styles and nurse level demographic variables.

** Leadership styles and span of control interaction effects