University of Alberta

The Role of Authentic Leadership in Nursing and Healthcare

by

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Abstract

The importance of leadership to our healthcare system is underscored by several challenges: increasing pressures of a large aging population, health and safety concerns associated with stressful work environments, upcoming retirements of current leaders, and projected workforce shortages. Effective leadership is needed to build healthy work environments that promote patient safety and to recruit and retain staff, but research is needed to determine the actual mechanisms by which leadership behaviours influence outcomes. The overall aim of this doctoral research was to examine the influence of authentic leadership on the work outcomes of nurses and other healthcare providers. It is comprised of four papers, two of which are empirical studies. The first paper is a systematic literature review the relationship between nursing leadership and patient outcomes. The findings suggest evidence supporting a positive relationship between transformational nursing leadership styles and improved patient outcomes. In the second paper, the theoretical contribution and relevance of the emerging authentic leadership theory (Avolio et al.,2004) to the advancement of nursing leadership practice and research are assessed. The third paper examines a model that links authentic leadership behaviours with trust in management and perceptions of supportive group and work outcomes, including voice behaviour (speaking up), self-rated job performance, and burnout in clinical and nonclinical staff groups. The fourth paper is an investigation of a set of methodological issues that arose during the testing of the leadership model and offers some general guidance for others who are learning to work with structural equation modeling. The combined findings of these papers show that nursing leadership has an important influence on patient and staff outcomes. Authentic leader behaviours, relational

transparency, balanced processing, ethical behaviour, supportiveness, and empowerment had significant but differential effects on trust in management, voice, performance, and burnout in the two groups examined. However, the effect estimates must be interpreted with caution because only the clinical model fit the data, and there were also important model specification issues, including a collinearity problem in the clinical sample, few significant indirect effects for the intervening mechanisms, and the possibility of other alternative causal specifications.

Dedication

I dedicate my dissertation to my family: my husband, Winston, who gave me endless love, support, and encouragement to carry on; and my mother and my sister, Jan, both of whom believed in me and provided unconditional love and recognition for my efforts.

I also dedicate this dissertation to my late father, Charles Black, who was a role model for me in terms of his intellectual curiosity and his love for books and continuous learning. He would be very proud of what I have accomplished.

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First, I am extremely grateful to my family for their unwavering support: my husband, Winston, who patiently waited while I studied and wrote and gave me endless support and encouragement to carry on; and to my mother, who believed in me and always told me how very proud she was to have a daughter pursuing a PhD.

Although I experienced much of my doctoral study from a distance of several provinces away, my supervisors were always readily accessible, with continuous support and assistance. I am forever indebted to my supervisor, Dr. Greta Cummings, for her time, energy, and advice during my doctoral journey. It was especially meaningful for me to have a supervisor with whom I share a similar experiential background in nursing leadership. I was doubly blessed to have Professor Donna Smith as a co-supervisor; her wise counsel and insightful questions at critical times during my studies provided me with significant consolation and confidence to continue on my path. I offer special thanks to Dr. Les Hayduk, who unselfishly shared his considerable knowledge of theory development and testing. I am indebted to him for the challenging questions that inspired me to think on a deeper level and for the hours of time that he spent reviewing my papers and providing valuable feedback. I also thank Dr. Katherine Moore and Dr. Joanne Profetto-McGrath for their time and insightful feedback as members of my committee.

My colleague Dr. Heather Laschinger at the University of Western Ontario has been a constant source of knowledge and encouragement during my studies. I also appreciate the support I received from the University of Western Ontario in the form of an education leave, which afforded me the devoted time I needed to progress more quickly through the candidacy and proposal development phases of my program. Dr. Jim

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INTEGRATING CHAPTER:

THE ROLE OF AUTHENTIC LEADERSHIP IN NURSING

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Introduction and Overview

The saliency of effective leadership to our healthcare system has never been greater. Increasing pressures of a large aging population, upcoming retirements of current leaders, projected shortages of nurses and other healthcare professionals, anecdotal reports of young peoples' decreasing interest in taking on these roles, stressful and unhealthy work environments, and patient safety concerns are major challenges that healthcare leaders face. A significant body of knowledge has been generated around job satisfaction and retention practices that can promote healthier work environments. However, one gap in our knowledge is in how leadership makes a difference; that is, we do not know the mechanisms involved in influencing the most effective and sustainable changes required. In this research I aimed to address this gap by examining the influence of authentic leadership on the work outcomes of nurses and other healthcare providers.

In my years as a nurse leader in acute care facilities, I was fortunate to have many opportunities to participate in research studies. Several of these studies involved examination of the quality of nursing work environments and the role of leadership in promoting and maintaining healthier and safer climates for nurses and patients in practice settings. As a professional practice leader for nursing in a large, merged tertiary healthcare facility, I was acutely aware of the work environment and practice concerns of nurses and managers and, likewise, of the challenges and realities involved in translating findings to ultimately make valued improvements to address these concerns. I sought

PhD preparation with the goal of integrating my practical knowledge and leadership

experience with advanced theoretical and research knowledge to conduct research that

will help to influence needed policy changes in the area of leadership and nursing work

environments.

Background

Two current themes that dominate the nursing and healthcare literature include a

concern for the creation of positive work environments that will facilitate recruitment and

retention of nurses in a time of a threatened serious nursing shortage and a profiled need

for safer patient-care environments in an effort to reduce adverse events and improve the

outcomes of care in a variety of settings (Canadian Nursing Advisory Committee

[CNAC], 2002; Nicklin, 2003; Page, 2004). Recent research findings have linked these

themes by eliciting the characteristics of nursing work environments associated with

patient outcomes such as adverse events and patient mortality (Aiken, Smith, & Lake,

1994; Estabrooks, Midodzi, Cummings, Ricker, & Giovannetti, 2005; Kazanjian, Green,

Wong, & Reid, 2005; Tourangeau, Giovannetti, Tu, & Wood, 2002).

The current state of hospital work environments is well documented in a series of

national reports and studies (Canadian Institute of Health Information [CIHI], 2006;

CNAC, 2002; Institute of Medicine [IOM], 2004; Lowe, 2006b). Serious service

pressures on the healthcare system and continuing fiscal constraints have resulted in

heavy workloads and patient-care dilemmas for care-provider staff in highly complex and

rapidly changing work environments (Hart, 2005; Nembhard & Edmondson, 2006;

Storch, Rodney, Pauly, Brown, & Starzomski, 2002). Some researchers suggested that

the restructuring impacts of the 1990s and the continuing focus on constrained resources

have eroded healthcare professionals' trust in their leaders and organizations (CNAC, 2002; Laschinger, Finegan, & Shamian, 2001; O'Brien-Pallas et al., 2005; Rogers, 2005). Yet a key element of a healthy work environment is trust between staff and their managers. Furthermore, Lowe (2006a) suggested that trust is the foundation of positive organizational cultures and, in essence, defines healthy workplaces. Nurse managers who are concerned about the well-being of their staff, listen to and acknowledge their input, respond openly and honestly to matters, and act on recognized patient-care values are more apt to garner nurses' trust. Trustworthy managers instil in nurses a sense of commitment and pride in work that is manifested in increased engagement in the exploration of new ideas, a willingness to speak up about problems and make suggestions for workplace changes, and greater sensitivity to others' words and ideas (Edmondson, 1999; Spreitzer, Sutcliffe, Dutton, Sonenshin, & Grant, 2005). Despite the focus on trust as essential to organizational success, there has been little systematic study of trust in healthcare settings, and no studies have examined the influence of nursing leadership behaviour/practices on nurses' trust and work outcomes.

The CNAC (2002) noted that after 20 years of research on health-provider job satisfaction and retention, we know what needs to be improved. Recently, a Canadian consortium of organizations called the Quality Worklife–Quality Healthcare Collaborative came together to develop an action strategy for change in healthcare work environments (Canadian Council on Health Services Accreditation [CHA], 2007). Essentially, this consortium acknowledged that the health and well-being of healthcare providers and the quality of the work environment have a major influence on the effectiveness and efficiency of healthcare services. With staffing shortages expected to

get worse in the near future, there was a broad consensus that leaders must do more to support and develop their current employees for the near future and the long term.

The recent focus on patient safety harkens back to concerns about critical nursing and patient-care issues initiated by financial cutbacks and the reengineering efforts of the 1990s (Nicklin, 2003). In the Canadian Adverse Events Study, Baker et al. (2004) profiled the need for safer patient-care environments and echoed the call for leadership to make the required changes by identifying that 36.9% of the reported adverse events in Canadian hospitals were highly preventable. They identified conditions in hospital work environments such as a lack of resources and nonsupportive management practices as contributing factors. In the United States two landmark reports from the Institute of Medicine ([IOM] 2000, 2004) signalled the problem of errors and adverse events for patients in American healthcare facilities (IOM, 2000) and recommended changes in nursing work environments to increase patient safety (IOM, 2004).

With so much attention directed to the creation of healthier and safer practice environments for both nurses and patients, nursing leadership is called on to advance this agenda within organizations. The IOM specifically targeted the salient role of "transformational leadership" (IOM, 2004, p. 109) and stressed that "strong nursing leadership" (p. 136) is necessary to implement effective management practices to create "cultures of safety" (Page, 2004, p. 253) and improve patient outcomes. The key question though is, How do leaders go about creating and sustaining the changes that are needed? Nurse leaders today need answers anchored in data and research-based evidence to support their decisions (Ritter-Teitel, 2003).

Although there is much speculation about what needs to be done to create healthy and safe practice environments, surprisingly little is actually known about the influence

of nursing leadership on patient outcomes. Many studies have shown relationships between leadership and nurse outcomes such as job satisfaction, productivity, organizational commitment, turnover, empowerment, emotional exhaustion, and work effectiveness (Cummings, Hayduk, & Estabrooks, 2005; Laschinger, Wong, McMahon, & Kaufmann, 1999; Leach, 2005; McNeese-Smith, 1995; Stordeur, D'hoore, & Vandenberghe, 2001). How some of these findings translate to improved patient outcomes has yet to be described. Furthermore, without a focus on the examination of leadership with strong research designs such as longitudinal or experimental, we are hampered in the ability to predict and explain the effects of leader behaviours over time (Ployhart, Holtz, & Bliese, 2002). George and Jones (2000) warned of the ongoing debate in the leadership literature about whether leaders really make a difference in organizations. We need to identify the value of leadership and increase our knowledge of the leader behaviours that do make a difference.

It is essential that we implement research methods that can create a causal picture of the mechanisms or processes by which nursing leadership influences outcomes for patients and healthcare providers. Is it through the creation of structures that maximize the potential of nursing practice and nurses' expertise? Or is it related more to the leadership style of managers and their ability to create positive relationships with their staff? Anderson, Corazzini, and McDaniel (2004) speculated that positive work climates are "the result of managers' intentions in combination with perceptions, reactions, and communication patterns among organizational members" (p. 386). If leadership has a more indirect effect on patient outcomes through staff expertise, then we must be able to understand the myriad of factors that determine how leaders are able to influence staff performance.

Impetus for This Research

My inspiration for this research came from my knowledge and 18 years of experience in several formal healthcare leadership roles, including line management roles as a director for clinical programs and nursing research and development and, most recently, a staff role as a professional practice leader for nursing. Outside of my master's education program, learning to lead was challenging, and determining which behaviours were most effective in the role, setting, or situation always seemed to involve a maze of choices with differing potential outcomes. The demands and stakes involved in leading during and after healthcare restructuring with the subsequent massive organizational changes from moving to program management to implementing nursing professional practice models to developing interdisciplinary models of care to creating more effective decision-making structures to ensuring that staff have a say in policies seemed overwhelming at times. As a new leader, I faced all the stresses and strains of taking on greater responsibilities and making decisions often without a blueprint or guide, let alone evidence, as a support.

For me, this was a personal development process that involved considerable self-directed learning, including taking time for reflection to increase my self-awareness, striving to communicate with nurses and others openly and honestly, acting with integrity by following through on commitments, providing recognition and support to staff for their contributions, empowering and developing others, and, most of all, letting go of the need for control. In essence, my learnings about leadership contributed to a belief that authenticity is key: Being oneself is extremely important to one's own health and well-being and to effectiveness as a leader. When I discovered Avolio, Gardner, Walumbwa, Luthans, and May's (2004) theory of authentic leadership in my literature review, I

experienced a sense of personal meaning and affinity with their description of leadership behaviours and the mechanisms by which they are expected to influence follower outcomes. The questions for me then were, Do these behaviours make a difference to staff and patient outcomes in organizations? And if so, how does this occur?

Research Questions

Four research questions guided this work (see Figure 0.1):

1. What is the relationship between nursing leadership and patient outcomes?

2. How does authentic leadership theory provide guidance for the examination of the mechanisms by which leadership influences outcomes in nursing and healthcare?

3. To what extent do authentic leadership behaviours influence trust in management, perceptions of being in a supportive group, and the work outcomes of healthcare staff?

4. What are the theoretical and measurement implications of a set of methodological issues that arose during the investigation of a model of authentic leadership using structural equation modeling?

The Papers

This paper-based dissertation constitutes the end product of a doctoral research program on the role of authentic leadership in nursing and healthcare. My doctoral research was comprised of three projects that resulted in four manuscripts for publication. The first two projects formed the basis for the third model-testing study. The first study was a systematic review of research studies that examined the relationship between nursing leadership and patient outcomes in healthcare organizations. The second project

was a conceptual paper in which I assessed the theoretical adequacy and relevance of authentic leadership (Avolio et al., 2004) to the advancement of nursing leadership practice and research. Both of these papers informed the development of a model of the influence of authentic leadership on trust and work outcomes of healthcare staff. Specifically, my synthesis of the evidence on the association between leadership and patient outcomes identified a gap in knowledge with regard to the specific mechanisms by which transformational nursing leadership influences patient outcomes. The authentic leadership theory proposes that certain leader behaviours influence follower work outcomes through the mechanisms of increased trust, hope, and optimism. Thus, I developed a model in which I hypothesized that authentic leadership behaviours increase work outcomes through the mediating mechanisms of trust in the manager and supportive workgroup perceptions. Using secondary analysis, I investigated the hypothesized model with structural equation modeling (SEM). The fourth paper explored in detail several methodological issues that arose from the theory-testing study.

Figure 0.1 depicts the relationships between the current context for leadership, my experience, the research questions, and the four papers that emanated from this research. Two empirical studies and the four papers comprise the output of my doctoral research and the groundwork for a future program of research to understand the mechanisms by which effective leaders influence work environments and nurse and patient outcomes. In the following paragraphs I briefly describe each of the papers.

Paper 1: The Relationship Between Nursing Leadership and Patient Outcomes: A Systematic Review

The recent increased focus on promoting healthier and safer practice environments for both nurses and patients has called on nursing leaders to advance this

agenda within organizations. A greater understanding of the role of leadership in patient outcomes is necessary if interventions are to change care environments to make them safer for patients. Nursing leadership has been associated with a number of nurse outcomes, but less is known about the link between leadership and patient outcomes. The purpose of this paper was to describe the findings of a systematic review of studies that examined the relationship between nursing leadership and patient outcomes in healthcare organizations and to make recommendations for further study. I selected published English-only research articles that examined formal nursing leadership and patient outcomes from computerized databases and manual searches. The articles included in the study had to measure leadership (the independent variable) in formal nurse leaders at any level of healthcare organizations, measure patient outcomes (the dependent variable), and evaluate the relationship between the two variables. The review process included examining 1,214 titles and abstracts using the five inclusion criteria and screening and selecting 18 papers. I extracted data and assessed the methodological quality of the final 7 quantitative research articles. All studies reviewed were relatively methodologically sound but utilized nonexperimental, cross-sectional descriptive designs that precluded any interpretation of causality. Fourteen different outcome variables were reported in these seven studies. After extracting the data, I categorized the outcomes into four themes based on content analysis: the relationship between leadership and (a) patient satisfaction, (b) patient mortality and patient safety outcomes, (c) adverse events, and (d) complications.

This review demonstrated evidence of significant associations between positive leadership behaviours, styles, or practices and increased patient satisfaction, reduced adverse patient events, and patient complications. The findings that related leadership to

patient mortality rates were inconclusive. I proposed that further studies of a longitudinal and intervention nature in a variety of settings with more diverse and randomly selected samples are needed to advance knowledge of the complex contextual and multivariate influences among leadership and patient outcomes. The findings of this review suggest that emphasizing the development of transformational nursing leadership is an important organizational strategy to improve patient outcomes. This paper was published in the *Journal of Nursing Management* in 2007 with Dr. Greta Cummings as co-author.

Paper 2: Authentic Leadership: A New Theory for Nursing or Back to Basics?

Authentic leadership is an emerging theoretical model that is purported to focus on the root component of effective leadership. In light of the many complex challenges that nursing leaders face today, authentic leadership may provide guidance in developing positive and sustainable changes in nursing work environments. The purpose of this paper was to describe the relevance of authentic leadership to the advancement of nursing leadership practice and research and address the question of whether this is a new theory for leadership or an old one in new packaging. I outlined the origins and key elements of the model and then assessed the theoretical, conceptual, and measurement issues associated with authentic leadership. I discussed the construct validity of authentic leadership and made comparisons to other leadership theories frequently reported in the nursing literature.

The emerging authentic leadership theory holds promise in explaining the underlying processes by which authentic leaders and followers influence work outcomes and organizational performance. Construct validity of authentic leadership is not yet well documented, but a few studies have shown positive relationships between authenticity and trust. Furthermore, the clarity of the authenticity construct and the

comprehensiveness of the overall theoretical framework provide a fruitful base for future

research on the relationship between authentic leadership and the creation of healthier

work environments. Although there is an overlap with elements of other leadership

theories, the in-depth focus on leader and follower self-awareness/regulation, positive

psychological capital, the moderating role of organizational climate, and sound

propositions that link model constructs contribute to the assessment of authentic

leadership as both a new theoretical perspective and a return to timeless, genuine, and

basic leadership attributes and processes that are core to several leadership theories. A

clear focus on the relational aspects of leadership, the foundational moral/ethical

component, a potential linkage of positive psychological capital to work engagement, and

the emphasis on leader and follower development in the authentic leadership framework

are closely aligned to current and future nursing leadership practice and research

priorities for the creation of sustainable changes in nursing work environments. I have

submitted this paper for review to the *Journal of Health Organization and Management*

with Dr. Greta Cummings as co-author.

Paper 3: The Influence of Authentic Leadership Behaviours on Trust and Work

Outcomes in Healthcare Staff

A key element of a healthy work environment is trust between staff and their

managers. The restructuring and reengineering changes of the 1990s and a continuing

focus on constrained resources have weakened healthcare professionals' trust in their

leaders and their organizations. Authentic leadership is proposed as the root element of

the effective leadership that is needed to build trust and healthier work environments

because special attention is paid to the positive role modeling of honesty, integrity, and

high ethical standards in the development of leader-follower relationships. Building on

the previous two papers, I developed a model based on authentic leadership theory. Specifically, I examined a model that links authentic leadership behaviours with trust in management and perceptions of supportive group and work outcomes, including voice behaviour (speaking up), self-rated job performance, and burnout by using secondary-analysis procedures. I expected leader behaviours that reflect each of the four components of authentic leadership (self-awareness, balanced information processing, authentic behaviour, and relational transparency) to contribute to increased staff trust in management. In addition, I included in the leader behaviours in the model the degree to which the leader genuinely responds to followers' concerns and needs with recognition and support, as well as an essential element in the authentic leadership theory: the development of followers through empowering leader behaviour. I used the *Worklife Improvement Through Leadership Development* (Cummings, Spiers, Sharlow, & Bhatti, 2005-2007) dataset that included survey responses from employees of a western Canadian regional healthcare facility as the data source and tested the hypothesized model by using SEM in two samples of employees: clinical-care providers (n = 147), including nurses, pharmacists, physicians, and other professionals; and nonclinical employees (n = 188) comprised of administrative, support, and research staff.

In our findings the effect estimates must be interpreted with caution because only the clinical model fit the data, and there were also important model specification issues, including a collinearity problem in the clinical sample, few significant indirect effects for the intervening mechanisms, and the possibility of other alternative causal specifications. Based on these model issues, I outlined several theoretical implications that require future investigation. However, the findings indicate that trust in management had a significant positive effect on voice behaviour and that leader supportiveness contributed to the

positive perception of being in a supportive workgroup in both samples. Authentic leader behaviours, relational transparency, balanced processing, ethical behaviour, supportiveness, and empowerment had significant but differential effects on trust in management, voice, performance, and burnout in the two groups. In addition, the findings may suggest that supportive leader behaviour and trust in management have important implications for staff willingness to voice concerns and offer suggestions for improvements in the workplace, including patient care. Managers with multiple groups within their portfolios need to be aware of the potential differences in group perceptions of important leader behaviours and their potential causal connections to work outcomes. I am planning to submit this paper for review to *Health Care Management Review* with Dr. Leslie Hayduk and Dr. Greta Cummings as co-authors.

Paper 4: Methodological Issues in Testing a Causal Model of Authentic Leadership Influence on Work Outcomes

In this paper I investigated several methodological issues that surfaced during the testing of a theoretical model that links the causal effects of leadership behaviours on work outcomes and formulated several conclusions about SEM. These issues include a detailed rationale for the selection of single indicators for latent concepts as well as measurement-error determinations, testing and analysis of a multiple indicator approach, examination of the signs and implications of multicollinearity among exogenous concepts, contradictory effects as indicators of model misspecification, the importance of homogeneity of causal forces in locating a fitting model, and the possibility of reciprocal effects.

First, using single indicators of latent concepts is a viable method of creating proper causally specified models. I described the process of determining measurement

error and judging concept meaning so that the concepts are adjusted for a specific proportion of measurement invalidity in their respective indicators. The explanation of testing multiple indicators—that is, two indicators per concept—showed a link between the number of indicators and model fit and the difficulty involved in finding indicators that work well together with the inability to satisfy proportionality requirements. I also learned that we cannot assume that scales or subscales are true measures of unitary concepts without some critical examination of their causal connections to latent concepts through SEM rather than traditional factor-analysis procedures. My investigation of the multicollinearity problem in the clinical group model showed that linking the meaning of the latent variables more closely to the specific meaning of their respective indicators by reducing measurement error may allow a greater separation of the unique effects of highly interrelated concepts. This troubling issue in the clinical group model reflected an important theoretical dilemma: The indicators of leader behaviours were too similar to be separated and yet too dissimilar to be indicators of one single latent, authentic leadership.

I learned that fastidious diagnostic assessment of model residuals and coefficient estimates is critical in SEM, especially in light of contradictory effects directions that are likely to be evidence of model problems. Misspecification in SEM is a serious issue because it may contribute to biased estimates of effects and, more important, to failure of the model to fit the observed data. Adequate assessment of model features such as the pattern, size, and location of residuals; a review of modification indices and their relevance to theoretical meaning; the degree of explained variance; and an inspection of coefficients and standard errors are essential to recognizing potential model misspecification even with acceptable chi-square fit. I also demonstrated the importance of causal homogeneity to well-specified models with good fit and the requirement to

explore the possibility of alternative causal specifications such as reciprocal effects in model development. Last, I concluded with a discussion of the challenges in developing a report of model-testing results that included not only an evaluation of the effect estimates, but also the substantive elements of the model as a whole and what that means for the articulated theory.

Conclusion

The combined findings of these papers show that nursing leadership has an important influence on patient and staff outcomes. It must be noted that I did not consider the structure and context of nursing leadership roles but focused on leadership processes. I found that trust in management has a significant positive effect on voice behaviour and that leader supportiveness contributes to the positive perception of being in a supportive workgroup. Authentic leader behaviours, relational transparency, balanced processing, ethical behaviour, supportiveness, and empowerment had significant but differential effects on trust in management, voice, performance, and burnout in the two groups examined. My findings suggest that supportive leader behaviour and trust in management have important implications for the willingness of staff to voice concerns and offer suggestions for improvements in the workplace, including patient care, as well as for their overall job performance. Investigation of the methodological issues that I encountered during the model testing with SEM revealed several theoretical implications that require future exploration.

Contribution to Nursing and Leadership Theory

This dissertation will contribute new knowledge to the domain of leadership in nursing and healthcare. My systematic review profiled the progress made in a short

period of time of time, from 1999 to 2004, in establishing a potential link between nursing leadership and patient outcomes. I have identified the strengths and weaknesses of recent studies and made recommendations for advancing research that links nursing leadership with patient outcomes. A key research question that came out of this review was the need to better understand the mechanisms by which leadership influences outcomes and hence the need for research that explores the moderators and mediators that affect the relationship between leadership and outcomes.

My theoretical paper described the relevance of authentic leadership theory to the advancement of nursing leadership practice and research. This is one of the first descriptions of how authentic leadership might provide guidance for nurse leaders in creating and sustaining the essential elements of healthier work climates. I evaluated authentic leadership theory by using a nursing lens to describe four key ways in which the tenets of authentic leadership are closely aligned to nursing leadership practice and research priorities. This is important because authentic leadership's orientation to leader and follower development focuses primarily on the positive capacities that already exist in the nursing workplace, and this may provide critical leverage toward lasting change in work environments.

The findings from my model-testing study reflect those of the first study to examine authentic leadership in healthcare. In an effort to determine which behaviours influence trust, I separated the four authentic leadership behaviours and linked them to trust in management in my model. I also extended authentic leadership theory by adding two leader behaviours and found significant effects on trust, performance, voice, and burnout. These two behaviours, supportiveness and empowerment, require a considerable degree of authenticity in their delivery. Because there has been little systematic study of

trust and outcomes in healthcare, this study was important in terms of identifying the positive link between trust in management and voice behaviour. Increasing the knowledge of factors that contribute to voice or speaking-up behaviour may be important to creating safer care environments where more open reporting and review of errors and active participation of care team members in identifying ways that care can be improved are required. Despite what has been reported in the leadership literature, trust as a mediating mechanism between leader behaviours and outcomes was not well supported in model testing; thus trust as a mediator requires more study. My inclusion of a supportive group as a mediating mechanism in my model addresses another gap in the leadership literature: Little research has examined the effect of leadership on group processes such as cohesion and support. The significant effects among leader supportiveness, trust in management, and performance through supportive group perceptions in the clinical group supports the effect of leader support behaviours on group processes.

Last, my exploration of methodological issues arising from my model investigation pointed to three key theoretical and measurement implications in model estimation using SEM. I raised the dilemma of theoretical collinearity whereby multicollinearity among some of the exogenous variables translates into theoretical collinearity. The authentic leader behaviours were so interrelated that I was unable to separate out the unique effects, but amalgamating the behaviours under the authentic leadership latent was not supported in the data. This is an issue that requires further examination to determine which authentic behaviours actually influence trust in the causal world. The results of testing multiple indicators for each latent concept in the model raised questions about the adequacy of multiple item scales and may indicate that

the validity of scales is best established in the context of causal models. Furthermore, I now see the research literature on leadership and trust in a much different light. Claims of possible causal connections between leader behaviours and trust that are largely based on correlations or, at best, regression must be viewed with wariness in developing models. Perhaps the most useful advances in leadership theory will occur from testing theory with clearly specified causal relationships by using SEM methods.

Future Work in Nursing Leadership Research

My future research in leadership will involve the development of a program of leadership research that includes the following projects: a qualitative exploration of how nurses perceive the phenomenon of trust in their leaders, revision of my authentic leadership model and test using original data collected though a random survey of nurses in Ontario, and development and testing of an instrument to measure authentic leadership.

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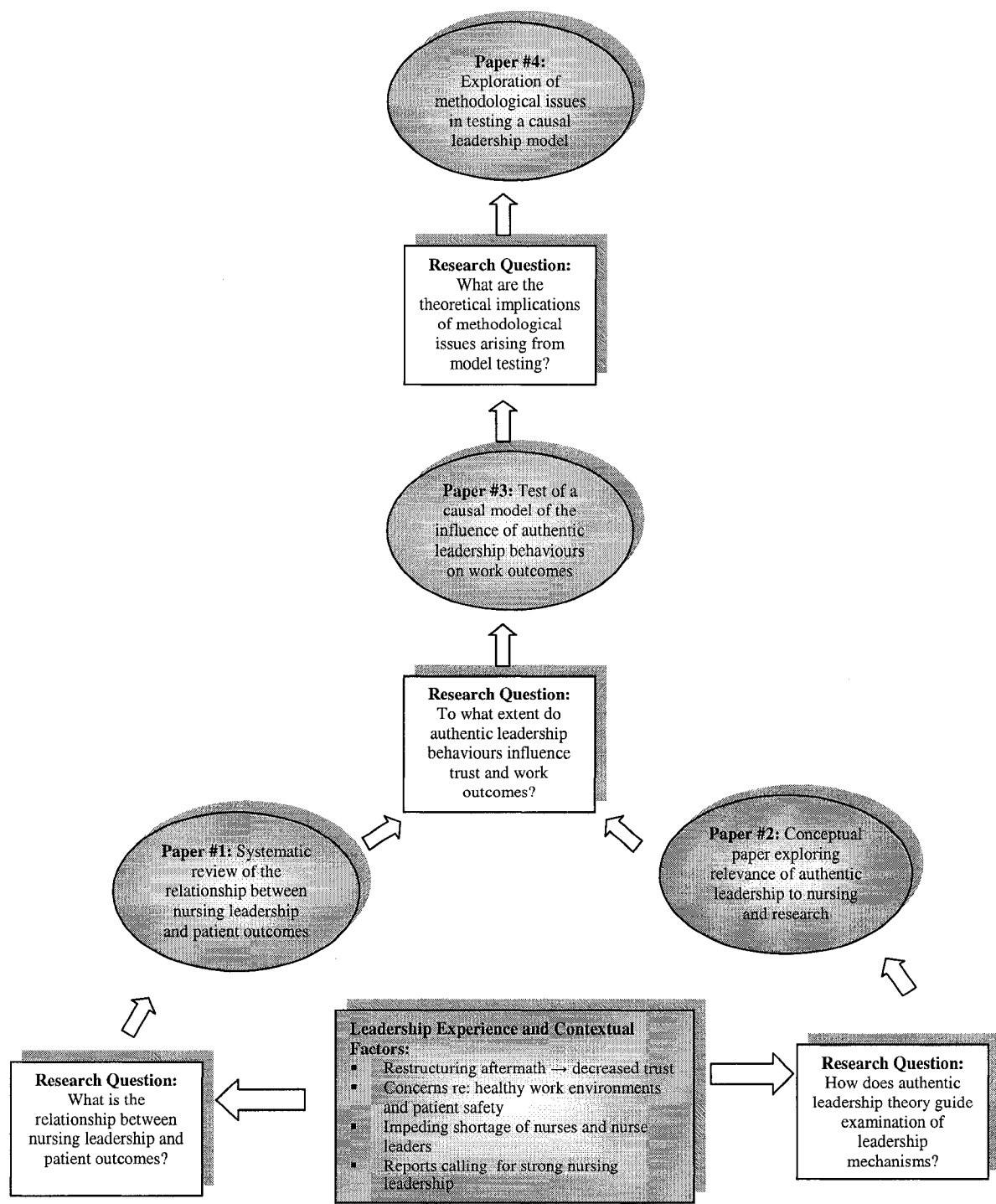
Figure 0.1. Overview of Wong research on the role of authentic leadership in nursing and healthcare.

PAPER 1:

THE RELATIONSHIP BETWEEN NURSING LEADERSHIP

AND PATIENT OUTCOMES: A SYSTEMATIC REVIEW

Background

In Canada several recent documents, including a policy synthesis on workplace factors that influence nurses' health, have emphasized the importance of robust nursing leadership in healthcare settings to ensure effective structures to facilitate nursing input into patient care process issues (Baumann et al., 2001; Canadian Nursing Advisory Committee [CNAC], 2002; Registered Nurses Association of Ontario [RNAO] & Registered Practical Nurses Association of Ontario, 2000). All have warned of a developing shortage of nursing leaders and the need to understand and address forces that contribute to this situation. New organizational models, systems of care organization, and restructuring have radically changed nursing department structures and, ultimately, leadership behaviours and processes in nursing (Baumann et al., 2001; Clifford, 1998; Havens, 2001). In the United States two landmark reports published by the Institute of Medicine ([IOM] 2000, 2004) signalled the problem of errors and adverse events for patients in American healthcare facilities (IOM, 2000) and recommended changes in nursing work environments to increase patient safety (IOM, 2004). The latter report specifically targeted the salient role of "transformational leadership" (p. 109) and stressed that "strong nursing leadership" (p. 136) is necessary to implement effective management practices to create "cultures of safety" (Page, 2004, p. 253) and improve patient outcomes. A similar Canadian report also profiled the need for safer patient care

environments and echoed the call for leadership to make the required changes (Baker et al., 2004).

Significance

This renewed focus on patient safety harkens back to concerns raised about critical nursing and patient care issues initiated by the financial cutbacks and reengineering efforts of the 1990s (Nicklin, 2003). With so much attention directed to creating healthier and safer practice environments for both nurses and patients, nursing leadership is called on to advance this agenda within organizations. Although there is much speculation about what needs to be done, surprisingly little is known about the actual relationship between nursing leadership and patient outcomes. In the most recent review of healthcare leadership research studies published between 1970 and 1999, only two reports included information on the relationship between leadership and the health status of patients (Vance & Larson, 2002). A greater understanding of the role of leadership in patient outcomes is necessary if interventions are to change care environments to make them safer for patients.

Purpose

The purpose of this review was to describe the findings of a systematic review of studies that have examined the relationship between nursing leadership and patient outcomes in healthcare organizations and to make recommendations for further study.

Methods

Inclusion Criteria

In this review *leadership* is defined as "the process through which an individual attempts to intentionally influence another individual or a group in order to accomplish a

goal" (Shortell & Kaluzny, 2000, p. 109). Research studies that addressed the influence of nursing leadership in all healthcare settings on one or more patient outcomes were included. The first inclusion criterion specified that leadership or aspects of leadership including leadership styles, behaviours, or practices must be measured. Measurement methods could include leaders' self-report, direct observation of leader behaviours, or followers' assessments of leader behaviours. The second criterion defined *leader* as a nurse who was in a formal leadership role at any level in a healthcare organization (e.g., first-line, middle, and/or senior leadership/management roles) and who had nurses reporting to him/her. This excluded studies that examined clinical leadership in staff nurses and those that evaluated leadership development programs or tested leadership instruments. The third criterion specified that the study address the impact of leadership on patients, defined as outcomes that describe patient well-being (e.g., functional status), patient satisfaction with care, and the incidence of adverse events involving patients (e.g., nosocomial infections; Pringle & Doran, 2003). The fourth criterion included only research studies, qualitative or quantitative. There was no restriction on the study design, and English-only articles were reviewed. The final criterion required that a relationship (direct or indirect) between leadership and patient outcomes had been reported (see Figure 1.1 for the screening tool).

Search Strategy and Data Sources

This study was part of a larger systematic review that included all research studies (both quantitative and qualitative) that measured leadership. The criteria for the selection of titles and abstracts included those that examined characteristics of leaders or leadership and those that attempted to measure leadership. The electronic databases searched included CINAHL, ABI, EMBASE, ERIC, HealthSTAR, Medline, PsychINFO,

Sociological Abstracts, Academic Search Premier, and the Cochrane database and included publications for the past 20 years—1985 to the end of April 2005 (see Table 1.1). Manual searches of specific journals such as, *Leadership Quarterly, Journal of Nursing Administration, Canadian Journal of Nursing Leadership* and *Journal of Organizational Behavior* were also completed. Eight websites were searched for relevant research reports: Canadian Health Services Research Foundation, Nursing Health Services Research Unit, Institute for Clinical Evaluative Services, Canadian Policy Research Network, the Centre for Health Economics and Policy Analysis, American Association of Nurse Executives, Agency for Healthcare Research and Quality, and National Institute for Nursing Research. The total result from the manual and website searches was eight. Online and manual searches yielded a total of 14,042 titles and abstracts once duplicates were removed. All titles and abstracts were reviewed by a research team and 1,214 titles and abstracts relevant to healthcare leadership were selected.

Screening

The first author reviewed all 1,214 titles and abstracts using the five inclusion criteria and selected 99 abstracts and titles that included nursing leadership and outcomes. To establish interrater reliability, a second reviewer evaluated a random sample of 250 abstracts and titles using these criteria, which resulted in 100% agreement. Twenty-one abstracts addressed nursing leadership and patient outcomes. Seven of these were excluded because 6 were unpublished doctoral dissertations that did not measure patient outcomes and 1 was in a journal that was inaccessible. Four abstracts from the manual searches were retained. Thus, 18 papers were retrieved for screening.

The first author screened all 18 papers using the five inclusion criteria. Several studies were excluded because they described the testing of instruments and did not directly measure patient outcomes or leadership in formal leaders. Only two qualitative studies were reviewed and eliminated by the primary author because they did not address all five criteria (see Figure 1.2 for the search and retrieval process). Seven papers formed the final included group of studies.

Data Extraction

The following data were extracted from the seven remaining quantitative studies: author, journal, country, research purpose and questions, theoretical framework, design, setting, subjects, sampling method, measurement instruments, reliability and validity, analysis, leadership measures, measures of effects on patients, significant and nonsignificant results, discussion, and recommendations.

Quality Review

The first author reviewed each published article twice for methodological quality by using a quality rating tool adapted from an instrument used in two previously published systematic reviews (Cummings & Estabrooks, 2003; Estabrooks et al., 2003). In addition, the second author validated the quality assessments. The adapted tool (Figure 1.3) was used to assess four areas of each study: research design, sampling, measurement, and statistical analysis. Thirteen items comprised the tool, and a total of 14 possible points can be assigned to 13 criteria. Twelve items were scored as 0 (= not met) or 1 (= met), and the item related to outcome measurement was scored as 2. Based on the points assessed, each study was placed in one of three possible categories: strong (10-14), moderate (5-9), and weak (0-4). Definitions for each of the items in the quality assessment and validity tool are in Appendix A.

Results

Summary of Quality Review

In this review all studies were rated strong (scores ranged from 10 to 13) and were

retained (Table 1.2). The strengths in these studies included the following: (a) All but one

utilized a theoretical or conceptual framework to ground their work, and (b) most were

judged to have acceptable sample sizes. Sample size was justified if it was based on

appropriate power calculations (power = .80) or followed other rules of thumb such as a

sample size of at least 10 per independent variable studied. Four studies collected data

from multiple sites, which allowed for larger sample sizes and greater heterogeneity in

the resulting samples. Instrument reliability was reported in five studies and validity in

three, but all studies with measures for leadership and patient satisfaction used

instruments with established reliability and validity. The researchers validated this

through a review of the literature. All studies measured leadership by asking staff nurses

to complete instruments in which they rated the leadership of their formal leader. This

added to the construct validity of the measurement of leadership beyond leader self-report

to a more "observed" measure of actual leadership (Bass & Avolio, 1995; Dunham, 2000;

Xin & Pelled, 2003). Self-report measures of leadership are subject to the influence of

social desirability response bias (Polit & Beck, 2004). Acceptable levels of reliability

(alpha coefficients $\geq$.70) were achieved in four of the seven studies. Reliabilities were not

reported in two studies and were above .6 in the other. Because the overall quality scores

were high, these three studies were retained. Four studies used advanced multivariate

statistical procedures, hierarchical linear modeling (HLM), or structural equation

modeling (SEM).

The most common weaknesses in the seven studies reviewed related to design, measurement, and analysis. All studies utilized nonexperimental, cross-sectional, or descriptive designs that limit interpretations of causality. All studies were prospective in design in that data requirements were developed in advance and collected concurrently. Only two studies utilized random sampling. A low (less than 60%) or nonreported response rate was evident in more than half of the studies. The use of self-report measures only for patient outcomes—specifically, satisfaction with care—was found in three studies. Failure to address the management of outliers was observed in three studies.

The unit of analysis for leadership and patient outcomes was the unit/ organizational level in six studies, three of which also used the individual level of analysis and four, the unit/organizational level only. Issues related to data aggregation from individual to unit levels, without appropriate validation that the concepts measured at the individual level were representative of the group, were identified in four studies (Verran, Gerber, & Milton, 1995).

Search Results

The final set of included studies and their characteristics is presented in Table 1.3. Of the seven studies published between 1999 and 2004, six were conducted in the United States and one in Canada. The studies reflected the association between leadership and resident outcomes in nursing homes (Anderson, Issel, & McDaniel, 2003), neonatal intensive care units (Pollack & Koch, 2003), acute care inpatient units of teaching hospitals (Boyle, 2004; Larrabee et al., 2004; McNeese-Smith, 1999), acute care inpatient units of both teaching and community hospitals (Doran et al., 2004), and acute care and long-term care inpatient units of a nonteaching integrated delivery system (Houser,

2003). Despite differences in the types of clinical settings in these studies, the findings were combined because there were so few studies on nursing leadership and patient outcomes.

The demographics of patients and nurses were reported in six of the seven studies, albeit not in comparable ways to facilitate calculation of demographics across all studies. The total sample of patients and neonates in five studies was 15,222. Two studies had no patient sample numbers because patient outcome data were pulled from administrative databases. In the study of nursing homes, the average number of beds was 113, and resident numbers across the 164 homes in the sample approximated at least 18,532 more patients/residents. The mean age of patients was reported in only two studies, with a mean of 41.75 years—ranging from 18 to 87 years—and 53% were female. Across all seven studies 2,014 nurses comprised the total sample, in addition to 73 physicians and 77 respiratory therapists sampled in one study that examined leadership from the perspective of interdisciplinary teams. Nurse demographics were reported in only five studies and were comparable in three. The mean age of RNs over three studies was 37 years, with an average of 13 years' experience. A total of 274 managers ($n = 110$) and directors of nursing ($n = 164$) were reported in six of the studies. Manager demographics were reported in three studies, with an average age of 40 years and 10 years' experience in management.

Study Results: Leadership

Leadership was measured in these studies as practices, styles, behaviours, and competencies. Four studies used two specific leadership models/theories: Bass and Avolio's (1995) transformational leadership (Doran et al., 2004; Larrabee et al., 2004), and Kouzes and Posner's (1995) leadership practices model (Houser, 2003; McNeese-

Smith, 1999). Additionally, Houser based the key model constructs for evaluating the context of care on qualitative findings from nurse focus groups. The construct of leadership was operationalized utilizing Kouzes and Posner's Leadership Practices Inventory (LPI), which Houser deemed consistent with nurses' descriptions of effective leadership as visionary and relationship oriented. Anderson et al. (2003) provided a strong theoretical description of the impact of leadership on outcomes, which suggests that relationship-oriented leaders utilize practices that increase information flow and change, facilitate interpersonal connections among staff, and present a diversity of cognitive perspectives, all of which facilitate more positive patient/resident outcomes. Using the theoretical model of complex adaptive systems, Anderson et al. suggested that effective management practices influence outcomes by creating "system parameters for self-organization" (p. 18) and that *self-organization* refers to an individual's ability to adjust his/her behaviour based on changing environmental demands. In this study leadership was measured using Sheridan et al.'s (1992) relationship-oriented leadership instrument.

Finally, two studies measured leadership using instruments in which leadership was one aspect of several organizational processes or factors being measured (e.g., Aiken & Patrician, 2000; Shortell et al., 1991). Boyle (2004) used Aiken, Sochalski, and Lake's (1997) conceptual model of organizational characteristics to examine the impact on patient mortality and adverse events. Leadership in this model was measured as nurse manager/organizational support, a subscale of a four-factor version of the Nursing Work Index-Revised ([NWI-R] Aiken & Patrician, 2000). Nurse-manager support in this instrument includes the provision of human and material resources for care and support for nurses' participation in decision making that affects patient care. Similarly, Pollack

and Koch (2003) used a modified version of Shortell et al.'s (1991) organizational

assessment instrument in which the construct of leadership was one of several

dimensions. *Leadership* in this instrument refers to the ability of individuals to influence

others in achieving relevant organizational goals through setting standards and clear

expectations and providing resource support.

In the reviewed studies the mechanisms by which leadership was related to patient

outcomes were applied indirectly through changes in the work context or through

influencing aspects of nurse behaviour that facilitate patient care and, hence, improve

outcomes. Four studies postulated that positive leadership behaviours (transformational,

empowering, supportive, etc.) may be associated with outcomes through the facilitation

of more effective teamwork (Anderson et al., 2003; Doran et al., 2004; McNeese-Smith,

1999; Pollack & Koch, 2003). Houser (2003) explained that empowering leadership may

relate to patient outcomes by promoting greater nursing expertise through increased staff

stability and reduced turnover. Nurses' job satisfaction was correlated with both positive

leadership and patient satisfaction in one study (McNeese-Smith, 1999). Thus, it may be

that effective leadership is related to patient outcomes through nurses' increased job

satisfaction. However, in two other studies there was no relationship between nurses' job

satisfaction and patient satisfaction (Doran et al., 2004; Larrabee et al., 2004). In

addition, several authors hypothesized that when leaders communicate clear expectations

for practice, patient care processes are facilitated, which, in turn, leads to improved

outcomes (Anderson et al., 2003; Boyle, 2004; Doran et al., 2004; McNeese-Smith,

1999). It is interesting to note that McNeese-Smith found a positive association between

managers' motivation for power and patient satisfaction even when nurses' ratings of

leadership were negative.

Study Results: Relationship Between Leadership and Patient Outcomes

Fourteen different outcome variables were reported in these seven studies. After extracting data, the researchers decided that outcome variables could be categorized into four themes based on content analysis: relationship between leadership and (a) patient satisfaction, (b) patient mortality and patient safety outcomes, (c) adverse events, and (d) complications. A summary of the findings is presented in Table 1.4.

Patient satisfaction. In two of the three studies that measured the relationship between leadership and patient satisfaction, an increase in patient satisfaction was significantly associated with positive leadership behaviours. Moreover, in Doran et al.'s (2004) study the nurse managers' span of control had a moderating influence on the relationship between leadership style and patient satisfaction. Specifically, a wide span of control (total number of staff reporting directly to the manager) decreased the positive effects of transactional leadership style on patient satisfaction.

Patient mortality. All three studies that measured mortality rates found an association between leadership and mortality rates, but only one was statistically significant and required further explanation. In Houser's (2003) study the relationship was indirect through a positive relationship to greater staff expertise and staff stability, which, in turn, was associated with lower patient mortality. It may be that effective leadership plays a key role in retaining and supporting experienced staff because experienced staff play a role in reducing mortality rates (Tourangeau, Giovannetti, Tu, & Wood, 2002).

Patient safety outcomes: Adverse events. The strongest relationship between leadership and patient outcomes was in reduced adverse patient events and complications. Three studies addressed nine outcomes in this category. Anderson et al. (2003) found a

significant relationship between positive leadership practices (communication openness, formalization, participation in decision making, and relationship-orientated leadership) and reduced prevalence of adverse events in nursing home residents, which underscores a strong association between leadership and safer patient care environments. Houser (2003) found a significant indirect relationship between leadership and reduced patient falls and medication errors through increased staff expertise and stability. Both studies tracked adverse events using patient administrative databases rather than processes to review the records directly.

Patient safety outcomes: Complications. Patient complication rates were examined in two studies. Pollack and Koch (2003) found a reduced incidence of neonatal periventricular hemorrhage/periventricular leukomalacia (PIVH/PVL) associated with higher leadership ratings. Houser (2003) also found a reduced incidence of pneumonia and urinary tract infections (UTIs) associated with positive leadership behaviours.

Discussion

This study focused on a review of research that examined the relationship between nursing leadership and patient outcomes. Since the publication of Vance and Larson's (2002) leadership research review that pointed to a glaring lack of studies addressing this linkage, all of the reviewed seven studies have been conducted and published. The findings reflect a promising picture of a methodologically sound, albeit small, group of studies that advance the understanding of the relationship between leadership and patient outcomes. The most useful outcome from this review is documentation of a significant shift in the size and scope of nursing leadership studies

with a commitment to multisited studies using advanced multivariate statistical procedures.

The findings on mortality outcomes were clearly inconclusive. However, recent studies have documented significant relationships between nurse staffing and reduced mortality rates in hospital settings (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Estabrooks, Midodzi, Cummings, Ricker, & Giovannetti, 2005). The important connection may be that effective nursing leadership is essential to the creation of practice environments with appropriate staffing levels that support nurses in preventing unnecessary deaths. Overall, these findings highlight an important relationship between leadership and the reduction of adverse events, perhaps because leaders play a key role in managing the context, staffing, and financial resources required to deliver effective care (Patrick & White, 2005).

Recommendations

To further advance knowledge in the area of leadership and patient outcomes, several recommendations are proposed based on this review.

Design and Analysis

There is a need for greater emphasis on intervention and longitudinal studies that address the effects of various leadership styles and strategies on the work environment and the impact on patients in a larger array of clinical settings. Several studies in this review were multisite, and this should be continued. However, the lack of random sampling is a key issue that future studies should address. The application of multivariate statistical procedures (e.g., HLM and SEM) should be continued and attention paid to appropriate sample sizes and management of outliers. The issues of data aggregation for

individual, unit/group, and organizational analysis must be adequately and openly addressed in publications. Finally, qualitative approaches to the examination of leadership and patient outcomes must be encouraged and, if possible, used to complement quantitative approaches to develop richer contextual descriptions of nursing leadership and the connection to outcomes. Qualitative findings may help to elucidate the mechanisms by which effective leadership influences the responses and behaviours of nurses in relation to their care of patients.

Theoretical Framework

It is promising that the majority of studies used an explicit conceptual framework to guide their research questions. However, only five studies revealed strong conceptual definitions of leadership and clarity of the mechanisms by which leadership is related to outcomes. One study extended knowledge of the moderating influence of managers' span of control between leadership and patient outcomes (Doran et al., 2004). In discussing the role of theory in research, Mark, Hughes, and Bland Jones (2004) cautioned that organizations represent complicated entities in which the relationship between contextual variables such as leadership and patient outcomes will not be modeled in a simple set of bivariate relationships. The need for research that explores the moderators and mediators that affect the relationship between independent and dependent variables is essential. In particular, attention should be directed to understanding the moderating effects of organizational climate and culture on leadership and outcomes (Sheridan, Vredenburgh, & Abelson, 1984).

Clear and cogent theoretical explanations of the mechanisms by which leadership influences organizational parameters such as those of Anderson et al. (2003) are warranted in future work. Using the theoretical model of complex adaptive systems,

Anderson et al. implied that effective leadership may be associated with patient outcomes indirectly through an effect on nurse performance. Future testing of models should incorporate nurse performance as one of many potential mediating variables between specific leadership behaviours and patient outcomes.

Measurement of Leadership

Continued use of subordinates' observed measures of leaders' styles and behaviours strengthens the validity of results. Followers' leadership measures are free of the social desirability response bias that is often associated with leaders' self-report measures (Polit & Beck, 2004; Xin & Pelled, 2003). Perhaps peer ratings as well as measures of actual performance of leaders should be incorporated into future studies. If the mechanism of leadership has a more indirect relationship with patient outcomes through staff, one must be able to understand the myriad of factors that determine how leaders are able to influence staff performance. As noted earlier, in two studies leadership was embedded within broader instruments (Aiken & Patrician, 2000; Shortell et al., 1991). Although these instruments have demonstrated reliability and validity, they are limited in explaining the complexity of processes involved in leadership and may even now be dated or too simplistic to advance the understanding of modern-day challenges of leadership in rapidly changing organizations.

One study suggested that "operationalizing context of care variables [such as leadership] from the patients' perspective" (Larrabee et al., 2004, p. 263) should be developed in future research. Although challenging to consider, this idea may offer better evidence to support the theorized leadership-patient outcomes relationship. A clearer description of the mechanisms by which certain leadership practices contribute to positive changes in staff performance, work environments, and patient outcomes may be

achieved by using a wider array of leadership measures beyond the Multifactor

Leadership Questionnaire (Bass & Avolio, 1995) and the LPI (Kouzes & Posner, 1995)

in future studies.

Outcome Measures

Multiple data sources for outcomes in studies should continue to be used as well

as efforts to mine administrative databases related to adverse patient events. Although

administrative data are subject to quality concerns, there is evidence that such data in

Canada are "reasonably well-defined and coded" (Estabrooks et al., 2005, p. 82).

Measures of providers' perceptions of patient outcomes should be developed to better

reflect the concerns and issues of providers in today's safety-conscious climate, keeping

in mind that there may be real differences in how patients and providers perceive which

outcomes are important (Jennings & McClure, 2004). For example, two studies that were

excluded because nurses rather than patients provided the measure of patient outcomes

are worth mentioning. Both examined the relationship between leadership and patient

outcomes using nurses' perceptions of unmet patient needs in one and unit effectiveness

in the other; the findings showed that positive leadership (resonant leadership and

transformational leadership, respectively) had significant positive effects on both

(Cummings, Hayduk, & Estabrooks, 2005; Stordeur, Vandenberghe, & D'horre, 2000).

Cummings et al. completed a secondary analysis of data using causal modeling to test

Goleman, Boyatzis, and McKee's (2002) theory of emotionally intelligent leadership and

found marked differences between the associations of resonant (emotionally intelligent)

and dissonant (command and control) leadership styles and nursing outcomes and nurse-

assessed patient outcomes. Resonant leadership reduced the number of unmet patient care

needs, whereas dissonant leadership increased them. In the second study Stordeur et al.

found that transformational leadership is significantly related to nurses' perceptions of unit effectiveness. The degree of unit effectiveness was developed from items that measured the perceptions of quality of care (e.g., "given the severity of patients we treat, our unit's patients experience very good outcomes" and "ability of the unit to meet family members' needs"; Stordeur et al., p. 40). However, these items were combined with those that measured perceptions of unit turnover, thereby diluting the concept of patient outcomes. Both Cummings et al.'s and Stordeur et al.'s findings warrant further development of valid and reliable indicators of nurse-assessed patient outcomes.

Limitations

This review has two potential limitations. First, few studies reported a relationship between leadership and patient outcomes. A variety of outcome measures and heterogeneity of samples and settings precluded meta-analysis procedures and limited the consolidation of findings. Second, a reporting bias may exist because only studies published in English were included, and published studies tend to overreport positive findings.

Conclusion

This review has shown that research that examines the relationship between nursing leadership and patient outcomes is relatively recent, with most studies being published in the past five years. The findings of this review suggest evidence that supports a positive relationship between transformational nursing leadership and improved patient outcomes (increased patient satisfaction and reduced adverse patient events and complications), a relationship presumably mediated by the influence of staff performance on outcomes. Most studies have been conducted primarily in acute care

hospitals, but they also indicated that similar relationships exist in nursing homes. It is proposed that further studies of a longitudinal and intervention nature in a variety of settings with more diverse and randomly selected samples are needed to advance knowledge of the complex contextual and multivariate influences among leadership and patient outcomes.

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Table 1.1

Literature Search: Electronic Databases

Database: 1985-April, 2005	Search terms	Number of articles
ABI Inform	• Leadership AND research (Subject) evaluation (Subject) measurement (Subject)	338
Academic Search Premier	• Leadership AND research (KW) evaluation (KW) measurement (KW)	26
CINAHL (limited to research)	Leadership AND exp research	1,307
Sociological abstracts	• Leadership AND research (KW) evaluation (KW) measurement (KW)	905
Cochrane Library (CDSR, ACP Journal Club, DARE, CCTR)	• Leadership AND research (MP) evaluate$ (MP) measure$ (MP)	138
EMBASE	• Leadership AND research (MP) evaluate$ (MP) measure$ (MP)	1,435
ERIC	• Leadership AND research (MP) evaluate$ (MP) measure$ (MP)	6,929
HealthSTAR/Ovid Healthstar	• Leadership AND research (MP) evaluate$ (MP) measure$ (MP)	2,644
Ovid MEDLINE	• Leadership AND research (MP) evaluate$ (MP) measure$ (MP)	4,200

(table continues)

Database: 1985-April, 2005	Search terms	Number of articles
PsychINFO	• Leadership AND research (MP) evaluate$ (MP) measure$ (MP)	4,730
Manual search		8
Total		22,660
Total minus duplicates		14,042
First selection		1,214
Second selection (nursing only)		99
Final selection		7

Table 1.2

Summary of Quality Assessment (Seven Included Quantitative Papers)

Criteria	No. of studies	
	YES	NO
Design:		
Prospective studies	7	0
Used probability sampling	2	5
Sample:		
Appropriate/justified sample size	5	2
Sample drawn from more than one site	4	3
Anonymity protected	7	0
Response rate >60%	3	4
Measurement:		
Reliable measure of leadership	7	0
Valid measure of leadership	7	0
*Effects (outcomes) were observed rather than self-reported	4	3
Internal consistency $\geq$ .70 when scale used	4	3
Theoretical model/framework used	6	1
Statistical analyses:		
Correlations analyzed when multiple effects studied	7	0
Management of outliers addressed	4	3

*This item scored 2 points. All others scored 1 point.

Table 1.3

Characteristics of Included Studies

Author(s)/ journal	Framework	Subjects	Measurement/ instrument	Scoring	Reliability	Validity	Analysis
Anderson et al. (2003). *Nursing Research* USA	Complexity theory –Complex adaptive systems(CAS)	164 Nursing Homes 164 DONs 201 RNs Res. Outcomes in 164 NHs	Management Practices: • Communication openness (Roberts & Reilly, 1974) – 5 items	Mean score	$\alpha = .83$	Construct	All data aggregated to org level
			• Participation in decision making (Anderson, Ashmos, McDaniel, & Hsieh, 1997) – 48 items	Mean score	$\alpha = .92$	As above	ANOVA Multiple regression
			• Relationship oriented leadership (Sheridan, White, & Fairchild, 1992) – 8 items	Mean score	$\alpha = .90$	As above	
			• Formalization (Hage & Aiken, 1969) – 6 items Resident Outcomes: facility level prevalence: resident behaviours, complications of immobility, restraint use and fractures	Mean score 1995 MDS database – mean for each	$\alpha = .83$	As above	

(table continues)

Author(s)/journal	Framework	Subjects	Measurement/instrument	Scoring	Reliability	Validity	Analysis
Boyle, S. M. (2004). *Nursing Economics* USA	Aiken, Sochalski, & Lake (1997) model of organizational characteristics and impact on adverse events and failure to rescue	21 units 390 RNs 11,496 pt. discharges	Nursing Work Index (NWI-R[B]) – four factor version of NWI-R (Aiken & Patrician, 2000) – nurse manager support/leadership subscale	Not reported	α = .95 (all factors)	Not reported	Data aggregated to unit level
			Nurse-sensitive adverse events: falls, nosocomial pressure ulcers, UTIs, pneumonia, cardiac arrest, mortality, failure to rescue, LOS	Admin. Database – 6 mos. – frequency /1000 pt. days			Bivariate correlations Linear regression
Doran, D., et al. (2004) *CHSRF Report* Canada	Theoretical framework developed by integrating concepts from transformational leadership theory, span of control theory and contingency leadership theory	41 managers and 51 units 717 nurses (RNs & RPNs) 680 patients	Multifactor Leadership Questionnaire 5X (Bass & Avolio, 2000) – 4 leadership subscales – 45 items	Mean on each subscale	Not reported	Not reported	Data analyzed at individual level and aggregated to unit
			Patient Satisfaction – 21 items from the Patient Judgments of Hospital Quality Questionnaire (PJHQ) (Rubin, Ware, & Hayes, 1990) – satisfaction with nursing care	Not reported	Not reported	Not reported	HLM
Houser, J. (2003). JONA & Diss. Abstracts (2001) USA	Qualitative inquiry phase – RN focus groups→ themes for model to be tested	46 patient care units 50 NMgrs 177 RNs Patients – not reported	Leadership Practices Inventory ([LPI] Kouzes & Posner, 1995 – 5 subscales	Not reported	α = .69-.85	Construct & discriminant	Data aggregated to unit level
			Patient outcomes – # hospital infections (pneumonia & UTI), mortality rates, med errors, patient falls	Not reported	α = .69-.86		SEM

(table continues)

Author(s)/ journal	Framework	Subjects	Measurement/ instrument	Scoring	Reliability	Validity	Analysis
Larrabee, J. H., et al. (2004) *Research in Nursing & Health* Canada	Adaptation of nursing systems outcomes research (NSOR) model (Mark, Sayler, & Smith, 1996) and structural contingency theory	90 RNs 362 patients (7 units)	Multifactor Leadership Questionnaire (MLQ-5X short; Bass & Avolio, 1995) – used 5 TL subscales of the 12 subscale instrument – 5-point Likert	Mean of each subscale	$\alpha = .63-.95$ for subscales and .95 for TL mean of 5 subscales	Not reported	Data analyzed at individual level and aggregated RN sat. to patients
			Patient Satisfaction – Patients' Judgments of Nursing Care (Larrabee, Engle, & Tolley, 1995)– 9-item subscale of PJHQ (Meterko, Nelson, & Rubin, 1990)	1-item global & other 8 are summed and averaged	$\alpha = .94$	Content	SEM (using AMOS)
			Patient-perceived nurse caring – Caring Behaviours Inventory ([CBI]; Wolf, Giardino, Osborne, & Ambrose 1998) – 42 items	Items summed	$\alpha = .98$	Not reported	
McNeese-Smith, D. K. (1999). *Journal of Organizational Behavior* USA	Based on managerial motivation theory derived from McClelland (1987) and Stahl (1986)	19 pt. care units 19 NMgrs 221 RNs 299 patients	Leadership Practices Inventory ([LPI] Kouzes & Posner, 1995P – 5 subscales – 30 items	Mean score for total scale subscales	$\alpha = .98$ for composite .84-.85 for subscales	Construct & discriminant	Data analyzed at individual level and aggregated some pt. sat. to units
			Patient Satisfaction (PJHQ) Meterko, Nelson, & Rubin (1990) – 5 items of total scale	Total score	$\alpha = .85$	Content, construct, predictive	Regression Correlations

(table continues)

Author(s)/ journal	Framework	Subjects	Measurement/ instrument	Scoring	Reliability	Validity	Analysis
Pollack, M.M., & Koch, M.A. (2003) *Critical Care Medicine* USA	No discussion of CF – reference made in discussion section to comparison to theoretical model of Mitchell & Shortell (1997)	8 units 522 infants All staff of units 218 RNS 73 MDs 77 RTs	Managerial practices & org processes – (Shortell, Rousseau, Gillies, Devers, & Simons, 1991) – ICU nurse-physician questionnaire – 109 items, 5-point Likert – 7 subscales of leadership, communication, coordination, effectiveness, problem solving, authority and job satisfaction Patient Outcomes: -28-day mortality rates -Morbidities: bronchopulmonary dysplasia & others (PIVH/PVL) & BOP	Sum items for total and subscales scores – all 3 prof. groups rated nursing leadership Measured prospect-ively until infant discharge – risk adjusted	Not reported	Not reported	Data aggregated to unit level HLM regression

Table 1.4

Summary of Study Outcomes: Relationship Between Leadership and Patient Outcomes

Patient outcomes	Source	Significant findings	Comment
Patient satisfaction	Doran et al. (2004)	Increased	Transactional leadership style
	Larrabee et al. (2004)	NS	
	McNeese-Smith (1999)	Increased	Positive leadership behaviours
Patient mortality	Houser (2003)	Reduced	Through increased staff expertise and stability
	Pollack & Koch (2003)	NS	Only respiratory therapists' composite ratings were significant
	Boyle (2004)	NS	Inverse association with Nurse Manager support
Patient safety: (a) Adverse events			
• Behaviour problems	Anderson et al. (2003)	Decreased	Greater RN participation in decision-making & Director of Nursing experience
• Restraint use		Decreased	Higher communication openness & Director of Nursing experience
• Complications of immobility		Decreased	Greater relationship-orientated leadership and less formalization
• Fractures		Decreased	Greater relationship-orientated leadership
• Patient falls	Houser (2003)	Decreased	Through greater staff expertise & stability
	Boyle (2004)	NS	
• Medication errors	Houser (2003	Decreased	
• Pressure ulcers	Boyle (2004)	NS	Inverse association

(table continues)

Patient outcomes	Source	Significant findings	Comment
(b) Complications:			
• hospital infections (pneumonia & UTI)	Houser (2003)	Decreased	Through greater staff expertise
• neonatal PIVH/PVL	Boyle (2004)	NS	
• retinopathy of prematurity (ROP)	Pollack & Koch (2003)	Decreased	Higher values of leadership subscales (overall combined ratings of RNs, MDs & RTs)
	Pollack & Koch (2003)	Decreased	Only MDs composite scores

The Relationship Between Nursing Leadership and Patient Outcomes: A Systematic Review (2005) Screening Tool for Inclusion/Exclusion		
Study: _____ First Author: _____		
Publication Information: Date: _____ Journal: _____		

Instructions for completion:
1. Circle Y or N for each criterion
2. Record inclusion decision: article must satisfy all 3 criteria
3. Record if additional references are to be retrieved

Inclusion/exclusion criteria:		
1. Does the study measure formal nursing leadership? How measured? Specify: ☐ Leadership behaviours _____ ☐ Leadership style _____ ☐ Other(specify) _____	YES	NO
2. Does the study measure: Patient outcomes? How measured? Specify:	YES	NO
☐ Functional Status _____ ☐ Satisfaction _____	YES	NO
☐ Adverse events _____	YES	NO
☐ Other(specify) _____	YES	NO
	YES	NO
3. Is the relationship between nursing leadership and patient outcomes in healthcare organizations evaluated? (a) Is there evidence of direction? Text only: _____YES _____NO (b) Is there a P-value? (c) Is there a statistic identified? Which one(s)? _____ (d) Is there an indication of magnitude?		
4. Final decision: include in study: **Comments:**	YES	NO

Figure 1.1. Screening tool (adapted from Estabrooks, Floyd, Scott-Findlay, O'Leary, & Gushta, 2003).

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│  4 abstracts    │───────▶│ Articles requested and│───────▶│  2 qualitative      │
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                           │ 16 quantitative papers│──────▶│  9 papers screened  │
                           │ screened for inclusion│        │   and excluded      │
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                           │ 7 quantitative papers│
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                           │ and data extraction. │
                           │    All retained      │
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Figure 1.2. Search and retrieval process.

The Relationship Between Nursing Leadership and Patient Outcomes: A Systematic Review (2005) Quality Assessment and Validity Tool for Correlational Studies		
Study: _____ First Author: _____		
Publication Information: Date: _____ Journal: _____		
Design:	**NO**	**YES**
1. Was the study prospective?	0	1
2. Was probability sampling used?	0	1
Sample:		
1. Was sample size justified?	0	1
2. Was sample drawn from more than one site?	0	1
3. Was anonymity protected?	0	1
4. Response rate more than 60%	0	1
Measurement:		
■ **Leadership (IV) [assess for IVs correlated with DVs only]**		
1. Is leadership measured reliably?	0	1
2. Was leadership measured using a valid instrument?	0	1
■ **Effects of leadership on patients (DV)**		
1. Are effects of leadership observed rather than self-reported?	0	2
2. If scale was used for measuring effects, is internal consistency $\geq$ .70? ...	0	1
3. Was a theoretical model/framework used for guidance?..........	0	1
Statistical Analysis:		
1. If multiple effects studied, are correlations analyzed?	0	1
2. Are outliers managed?	0	1
Overall Study Validity Rating (circle one)........................ (key: 0-4 = LO; 5-9 = MED; 10-14 = HI)	**TOTAL:** _____ **LO MED HI**	

Figure 1.3. Quality assessment and validity tool for correlational studies
(adapted from Cummings & Estabrooks, 2003).

PAPER 2:

AUTHENTIC LEADERSHIP: A NEW THEORY FOR NURSING

OR BACK TO BASICS?

The pressures on nursing leaders have never been greater. With an impending

shortage of practicing nurses and imminent retirements of current leaders, the health and

safety challenges associated with stressful work environments, ever-advancing

technology, increasing ethical dilemmas, and the very uncertain economic climate, nurse

leaders at all levels and in all types of healthcare organizations are facing the challenge of

declining optimism and confidence in a better future. Recent reports have called for

strong, positive nursing leadership to create and sustain cultures of safety founded on an

atmosphere of trust (Canadian Nursing Advisory Committee [CNAC], 2002; Institute of

Medicine [IOM], 2004). Authentic leadership has been proposed as the root component

of effective leadership needed to build trust and healthier work environments to promote

patient safety and, excellence in care and to recruit and retain nurses (Avolio & Gardner,

2005; Kerfoot, 2006; Shirey, 2006).

The purpose of this paper is to describe the relevance of the emerging theory of

authentic leadership to the advancement of nursing leadership practice and research. Is it

actually a new theory of leadership, or does it overlap with previous theories?

Specifically, we present an overview of this leadership model, including its historical and

philosophical origins, with definitions and explanations of its key elements. Next, we

assess the theoretical, conceptual, and measurement issues associated with authentic

leadership and review its construct validity as well as compare other leadership theories

frequently reported in the nursing literature. Last, we discuss four themes that encompass the applicability of authentic leadership to current nursing leadership.

Conceptual Foundation and Definitions

Historical and Philosophical Roots

Unprecedented challenges from corporate scandals to the SARS crisis to terrorism and a threatened flu pandemic have created the call for higher standards of integrity, character, and accountability of leaders (May, Chan, Hodges, & Avolio, 2003). The study of leadership is currently influenced by the field of positive organizational scholarship, which is based on the tenets of positive psychology and aimed at understanding positive human processes and organizational dynamics that make life meaningful (Ilies, Morgeson, & Nahrgang, 2005; Luthans, 2002). Emerging from theoretical discussions on the moral and ethical foundations of leadership is a focus on distilling the core elements of leadership (Luthans & Avolio, 2003; May et al., 2003). This effort has resulted in the concept of authentic leadership, which is envisioned as the root concept for positive leadership models such as transformational, charismatic, ethical, and servant leadership (Avolio & Gardner, 2005).

The conceptual and theoretical origins of authentic leadership include humanistic psychology and the work of Maslow (1968) and Rogers (1961), and the notion of authenticity also has philosophical roots in the work of Heidegger (1962) and Sartre (1943). Avolio, Gardner, Walumbwa, Luthans, and May's (2004) model extends previous work on authentic leadership in the field of education (Hoy & Henderson, 1983). Evident in the model is the concerted integration of knowledge from several fields, including positive psychology (hope, optimism, and resiliency; Seligman, 2002), positive

organizational behaviour (Luthans, 2002), transformational leadership (Bass & Avolio, 1994), and ethical and moral perspectives (Schulman, 2002).

Purpose of Authentic Leadership Theory

Avolio, Gardner, and Walumbwa (2005) claimed that the intent of the authentic leadership model was not to develop another new theory for leadership. In fact, the concept of authentic leadership may in essence be a return to fundamental aspects of leadership—"perhaps the oldest, oldest, oldest wine in the traditional leadership bottle!" (p. xxii). Avolio et al.'s goal was to investigate the common core of all leadership theories to discover, test, and explain the essence of authentic leadership intrinsic to a wide variety of leadership approaches. Avolio and Gardner (2005) proposed that authentic leadership makes a difference in organizations by helping people to find meaning at work, building optimism and commitment among followers, encouraging transparent relationships that build trust, and promoting inclusive and positive ethical climates.

The Concept of Authenticity

The notion of authenticity ("know thyself") has Greek roots, and Shakespeare encapsulated it in *Hamlet*: "To thine own self be true" (Avolio et al., 2004, p. 801; Harter, 2002). According to authentic leadership, sharing transparently and acting with integrity requires self-awareness (Hughes, 2005). Authentic leadership originated with the work of Kernis (2003), who conceptualized authenticity as important to delineating optimal self-esteem. He described four underlying elements for the authenticity construct: (a) self-awareness of one's strengths and weaknesses, emotions, and values; (b) unbiased processing of self relevant information or an objective acceptance of one's attributes;

(c) authentic behaviour or "acting in accord with one's true self" (p. 13); and

(d) relational authenticity: striving for and attaining openness and honesty in close relationships. Kernis referred to the work of Carl Rogers (1961) and his concept of self-actualizing individuals whom he described as tolerant of ambiguity, open to experience, adaptable, and flexible. This definition of authenticity was reinterpreted into four components for authentic leadership and is viewed as being on a continuum from more to less authentic rather than as an either/or condition (Gardner, Avolio, Luthans, May, & Walumbwa, 2005).

The Proposed Authentic Leadership Model

In the proposed theory (see Figure 2.1), Luthans and Avolio (2003) defined *authentic leadership* as "a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviours on the part of leaders and associates, fostering positive self-development" (p. 243). Authentic leaders are persons who are hopeful, optimistic, resilient, and transparent (Hannah, Lester, & Vogelsang, 2005). They operate consistently with values that are visible to others, focus on the ethical or right thing to do, take the lead even at personal risk, make the development of others a priority, and work to ensure that their communication is transparent and that others perceive it as intended (Avolio et al., 2004; May et al., 2003). This view of leaders is grounded in moral intentions and behaviour (Bass & Steidlmeier, 1999). Avolio et al. suggested that authentic leaders are able to enhance follower attitudes such as engagement, commitment, and motivation to improve their work and, ultimately, performance outcomes through the processes of personal identification with followers and social

identification with the organization. These authors contended that their model goes beyond outlining leader behaviours to emphasizing the linking mechanisms or intervening variables such as hope, trust, positive emotions, and optimism between authentic leaders and followers' attitudes and behaviours. The focus on positive emotions in this model also emphasizes the recent recognition of the role of emotions in the development of leader effectiveness (Dasborough & Ashkanasy, 2005; McColl-Kennedy & Anderson, 2002).

Components of Authentic Leadership

Gardner, Avolio, Luthans, et al. (2005) described four underlying components of authentic leadership: self-awareness, balanced information processing, authentic behaviour, and relational transparency. A basic tenet of authentic leadership is the notion that authenticity in leadership requires heightened levels of self-awareness (Avolio et al., 2004). Gardner, Avolio, Luthans, et al. defined *self-awareness* as "a process where one continually comes to understand his or her unique talents, strengths, sense of purpose, core values, beliefs and desires" (p. 349). In this conception of authenticity, values, cognitions regarding personal identity, emotions, and motives/goals are the key elements of self-awareness.

Self-regulation is a process in which authentic leaders "align their values with their intentions and actions" (Avolio & Gardner, 2005, p. 325), which involves exerting self-control by setting internal standards, evaluating discrepancies between these standards and outcomes, and identifying intended actions to resolve these discrepancies. The other three components of authentic leadership are self-regulatory processes. *Balanced processing* is the processing of self-esteem and non–self-esteem relevant

information from a fairly objective view that incorporates both positive and negative

attributes and qualities (Gardner, Avolio, Luthans, et al., 2005). Authentic leaders engage

in more accurate and balanced self-assessments as well as social comparisons and act on

these assessments without being diverted by self-protective motives.

Authentic behaviour involves acting in accord with one's values and needs rather

than acting to please others, receive rewards, or avoid punishments. In addition, authentic

leaders are responsive to the fit between their true selves and their environment, and the

potential implications of their behaviour (Kernis, 2003). To be truly authentic, leaders

must align their core and espoused values and actions. Because followers' trust in leaders

is largely based on the leaders' actions, for the leaders' to be seen as acting with integrity,

their espoused values must be consistent with their actions (Gardner, Avolio, Luthans,

et al., 2005). Moreover, authentic leaders are expected to act in concert with their self-

concept to make the "right" and "ethical" decision (Hannah et al., 2005).

Relational transparency is the final component of authentic leadership and

involves the presentation of one's genuine self. It is achieved through openness and

appropriate self-disclosure of one's values, identity, emotions, and motives/goals. The

transparent sharing of information enhances followers' trust in leaders (Norman, 2006).

Authentic leaders value and work to achieve transparency and truthfulness in their

relationships by asking for feedback, listening to and accepting others' points of view,

and acting on suggestions. In summary, authentic leadership is presented as an approach

that creates conditions of higher trust in leaders and increased hope and optimism for the

future, which allows individuals to focus more positively on their strengths, expand their

thinking, heighten their awareness of the moral implications of their decisions, and facilitate the overall performance of followers (May et al., 2003).

Theoretical, Conceptual and Measurement Issues

Theoretical Strengths and Weaknesses

Strengths. A consideration of theoretical strengths and weaknesses of authentic leadership begins with an overview of its potential contribution to leadership theory. Whetten's (1989) features by which a theory can be judged include comprehensiveness, parsimony, reasonableness, and sensitivity to context. Authentic leadership effectively integrates relevant elements of other theories and is founded on some formerly well-known psychological constructs (e.g., authenticity), which thereby contributes to its comprehensiveness. It links leadership competencies and attributes with follower responses in terms of attitudes and behaviours that are postulated to influence work outcomes. Each theoretical element is pertinent to the hypothesized leadership process creating a sense of parsimony. Deletion of any element hinders understanding of the proposed leadership process (Whetten, 1989). A sound articulation of rationale for hypotheses in terms of the underlying psychological and social processes involved in leader-follower development attempts to open up the "black box" of leadership-follower mechanisms and lends reasonableness to the theory. Empirical bases for many proposed relationships in the model are provided but not all have yet been tested in relation to authentic leadership; thus, the theory is a useful guide for research. Sensitivity to context is evident in that the model could be tested in a variety of leadership situations, although the role of context requires greater development. The focus on authenticity is very timely and relevant to current social, political, and organizational concerns for honesty,

integrity, and transparency in leader-follower relationships as prompted by the after-effects of recent leadership ethical breaches. However, it will be necessary for this theory to transcend the temporality of current conditions.

New and value-added elements. Authentic leadership theory contributes new and value-added elements to current thinking about leadership in four ways. First, a narrower and deeper focus on leader behaviours that is postulated to be more closely linked to the development of follower responses addresses some weaknesses of transformational and charismatic leadership theories. Both conceptualizations of leadership have been criticized for being too broad and having overlapping leader competencies (Northouse, 2004; Yukl, 1999). Second, the concentration on positive psychological capacities (hope, optimism, resilience, etc.) and their connections to leader-follower processes instead of the predominant focus on weaknesses is a proactive orientation to leadership development. Third, the positive moral/ethical perspective as an integral component of leadership behaviour receives much stronger emphasis in authentic leadership than it does in previous models. Ethical behaviour has usually been assumed or briefly addressed in leadership theories. In fact, ethical leadership has only recently been an addition to leadership texts. An ethical orientation has often been viewed as one of many important attributes of leaders, but in authentic leadership it is foundational to leadership processes (May et al., 2003). Last, the notion of connectivity or the capacity of authentic leadership theory to "bridge the gap between two or more different theories" (Bacharach, 1989, p. 511) and reveal fresh connections between theories creates new knowledge. For example, the hypothesized relationship between authentic leader behaviours such as relational transparency and the development of follower trust in the leader has the

potential to expand knowledge of the mechanisms by which effective leadership creates

trust (Gardner, Chan, Hughes, & Bailey, 2006; Mayer, Davis & Schoorman, 1995).

Weaknesses. In the analysis of the literature we found three areas of weakness in

authentic leadership theory: the role of culture and context, issues related to the

moral/ethical element of the theory, and leader-follower influence processes. The

definition of authentic leadership includes a reference to "a highly developed

organizational context" (Luthans & Avolio, 2003, p. 243) that is not well developed in

the model considering the well-documented need to include context in leadership studies

(Berson, Shamir, Avolio, & Popper, 2001; Dickson, Den Hartog, & Mitchelson, 2003;

Osborn, Hunt, & Jauch, 2002; Yukl, 1999). Gardner, Avolio, Luthans, et al. (2005)

discussed the importance of empowering organizational climates (Kanter, 1977) that

include open access to information, inclusive structures, resources, support, and

opportunities for learning and development as necessary for individual growth and

empowerment. They acknowledged that leaders play a major role in fostering such a

climate and that transparency in the culture is pivotal to learning and growth. Avolio and

Gardner (2005) proposed four dimensions of context (uncertainty, inclusion, ethical, and

positive strengths based) that moderate the effect of leadership on performance .

However, they provided no definitions of these dimensions or explanations of how

context relates to other elements in the model. The model is intended to include multiple

levels of analysis, but there was little discussion of authentic leadership at the group and

organizational levels. Perhaps this can be attributed to the early stage of model

development. In a recent publication Gardner, Avolio, and Walumbwa (2005) asserted a

clear statement of the context's importance: "Authentic leadership . . . [is] inseparable

from the context in which it is embedded" (p. 395). Moreover, another authentic

leadership collaborator, Chan (2005), suggested that conceptualizing leadership as

"embedded in its context" (p. 240) might allow measurement of authentic leadership

using social network analysis.

Although the moral/ethical dimension is a central theme of authentic leadership

theory, one troubling aspect is the assumption that the true self of an authentic leader is

actually an ethical one. The question of whether adults' ethical behaviour can actually be

influenced is another criticism and an important area for future research (Cooper,

Scandura, & Schriesheim, 2005). Price (2003) also cautioned that authenticity may not

necessarily prevent authentic leaders from being "blinded by" (p. 79) their own altruistic

values for organizational good. Moreover, the theory may not adequately address the

issue of differences in leader-follower value congruence. Avolio and Gardner (2005)

postulated that "followers internalize values and beliefs espoused by the leader" (p. 327)

through the process of identification. What is not currently explained in the model is how

leaders manage situations in which the values of the followers are different from their

own.

The last area of potential weakness is a possible implication of leadership as a one-

way influence process with little room for reciprocal influences between leaders and

followers. The balanced processing mechanism requires that authentic leaders be open

and receptive to other points of view and act inclusively. However, Yukl (1999)

attributed a hint of the "heroic leadership bias" (p. 292) to transformational leadership.

For the organizational climate for authentic leadership to be empowering requires an

explicit description of leadership as a shared process that encourages and supports

collective leadership behaviour of the members of a group or organization, not just the formal leaders.

Conceptual Clarity, Construct Validity, and Measurement

One of the criticisms levelled against the definition of authentic leadership is that it is too broad, ambiguous, and multidimensional in that it includes "elements from diverse domains—traits, states, behaviours, contexts and attributions" (Cooper et al., 2005, p. 478) and that it should be refined by utilizing qualitative research methods However, the definition that Luthans and Avolio (2003), Avolio et al. (2004), Avolio and Gardner (2005), and Avolio et al. (2005) proposed has been markedly consistent and inclusive of all elements of the theoretical model described earlier. The delineation of authenticity that forms the conceptual definition for the measure of authenticity is comprised of four subdimensions that are very consistent with Kernis's (2003) definition of authenticity. Osigweh (1989) cautioned against conceptual definitions so broad that they "nurture redundancy" (p. 582) with other measures and hence include attributes that are only loosely connected to a construct. Consideration of a balance between the universality of a concept so that it is applicable in different contexts and precise in terms of the number of attributes required to make the meaning clear is important in judging conceptual clarity (Morrow, 1983; Osigweh, 1989). The authentic leadership developers stated outright that their theory overlaps deliberately with other forms of positive leadership such as charismatic or transformational leadership. Perhaps the idea of a universal leadership theory that contains all the elements of effective leadership is not realistic and is ill advised. It may be more important to establish foundational/core

elements and show clear empirical connections to follower attitudes, behaviours, and work outcomes.

The major challenge regarding conceptual clarity in authentic leadership is the self-awareness component, which is difficult to measure in observable terms. The concept of self-awareness or self-reflection has long been considered an important attribute of effective leadership, and thus various leadership models include it (Bass & Avolio, 1994; Goleman, 1995). Although Cooper et al. (2005) claimed that there are no existing measures of self-awareness, which makes validation of this component of authentic leadership difficult, there is indeed a self-awareness cluster in the Emotional Competency Inventory (ECI 2.0) (HayGroup, 2002) based on the work of Boyatzis, Goleman, and Rhee (2000). Self-awareness in this measure concerns knowing one's emotions, preferences, and intuitions and includes three competencies: emotional awareness, accurate self-assessment, and self-confidence. Cronbach's alphas for self and other ratings of the three competencies ranged from .61 to .88 in measures in instrument testing. This measure of self-awareness could be used to establish the validity of this element of authentic leadership.

Avolio and colleagues developed a 16-item *authenticity scale* to measure the construct of authentic leadership (Avolio & Luthans, 2006). To date, the scale and results of instrument testing have not yet been published except in a doctoral dissertation (Norman, 2006). The authenticity scale was designed to measure the degree of leader authenticity using both self-report and observer-report forms of the instrument. The initial results showed a consistent factor structure: relational transparency (five items), moral/ethical (four items), balanced processing (three items), and self-awareness (four

items; Norman, 2006). All scale items are rated on a 5-point Likert scale ranging from 1 (*not at all*), 2 (*once in a while*), 3 (*sometimes*), 4 (*fairly often*), to 5 (*frequently if not always*). Overall scale reliability has a reported alpha coefficient of 0.96 (Gardner et al., 2006; Norman, 2006). Subscale reliabilities have been reported only for transparency ($\alpha = 0.878$; Norman, 2006). No other measures of authentic leadership are available, so it will be difficult to demonstrate convergent validity with other existing measures (Polit & Beck, 2003). Because authentic leadership is considered to be a root construct of other leadership theories such as transformational leadership, it is possible to examine how it correlates with other instruments that purport to measure some aspects of the authentic leadership construct. For example, in discussions with Dr. Avolio (personal communication, November 2, 2006), he reported, "These scales [transformational leadership] correlate .6 or so with authentic, which is what we expect." This suggests that the scale is tapping some elements of transformational leadership consistent with the interpretation of authenticity as a root construct of leadership. Some items in the authenticity scale are similar to items from the Multifactor Leadership Questionnaire ([MLQ] Bass & Avolio, 1995), which measures the following subscales: idealized influence, individualized consideration, and intellectual stimulation. According to Avolio (personal communication, August 15, 2006), the scale also correlates .65 with the 10-item Ethical Leadership Scale (Brown, Treviño, & Harrison, 2005) in which items are similar to four moral/ethical authenticity items. Because a generalized 44-item authenticity inventory (AI) based on Kernis's conceptualization of authenticity (Goldman & Kernis, 2002) has been developed and initial psychometric properties have been reported, a study comparing its results with the 16-item authentic leadership scale could be conducted.

Higher total scores on the AI were positively related to higher self-esteem and life satisfaction. The scale has an overall reliability coefficient of .83, but subscale reliabilities have been problematic, ranging from .32 (for relational orientation) to .74 (self-awareness). Discriminant validity could be assessed comparing authentic leadership to constructs such as passive avoidant leadership (four items from the MLQ) and abusive supervision (Tepper, 2000). One would expect authentic leadership to be negatively correlated with both of these constructs.

Although research in authentic leadership is relatively new, a few studies have demonstrated promising results of scale validity and beginning work to establish the nomological network of the authenticity construct (i.e., support for some of the theoretically proposed relationships between authentic leadership and its correlates and outcomes). Three studies using the authenticity scale have reported that relational transparency is a key component of authentic leadership and a significant predictor of trust in the leader (Gardner et al., 2006; Hughes, 2005; Norman, 2006). Gardner et al. found positive relationships among perceived leader authenticity, trust in the leader, and organizational advocacy and concluded that authentic leaders who exhibit consistency between their expressed values and ethical conduct generate higher levels of trust and organizational advocacy among followers. In another study Jensen (2003) established that the perceptions of authentic leadership were significantly related to followers' job satisfaction, organizational commitment, and work happiness. Because the authentic scale was in the early stages of development and no other scale was available, Jensen utilized 30 items from the MLQ to measure the dimensions of leader authenticity. Additionally, Norman reported large correlations between authentic leadership and effective leader

ratings and a measure of psychological capital, which includes positive psychological

capacities such as confidence, hope, optimism, and resilience (Avolio & Luthans, 2006).

Comparison With Related Leadership Theories

As stated earlier, authentic leadership is the root construct of positive forms of

leadership, known as transformational, charismatic, servant, and spiritual. Authentic

leaders may also exhibit any one of these leadership styles, but it is also possible to be

authentic and not be transformational or charismatic and so on. Given the current focus in

the nursing leadership literature on transformational leadership (Bass & Avolio, 1994),

Kouzes and Posner's (1995) leadership practices model (a type of transformational

leadership), emotional intelligence/resonant leadership (Boyatzis & McKee, 2005;

Goleman, 1995) and charismatic leadership (Conger & Kanungo, 1998), and leader-

member exchange theory (Graen & Uhl-Bien, 1995), these models are compared with

authentic leadership (see Table 2.1) by using a similar format to the one that Avolio and

Gardner (2005) used.

Authentic and Transformational Leadership

The key differentiating feature from transformational leadership is that authentic

leaders influence via their strong sense of who they are and where they stand on issues,

values, and beliefs; whereas transformational leaders influence though a powerful and

positive vision. Transformational leaders may also have the same deep sense of self, but

vision is the distinguishing feature of transformational leadership. Authentic leaders may

also have vision, but it is not a necessary condition for authentic leadership.

Transformational leadership theory has been criticized for conceptual overlap because it

covers a wide range of behaviours, including visionary, change agent, trust builder, supporter, and so on (Northouse, 2004).

Kouzes and Posner's (1995) leadership practices model has the same focus on the development and sharing of vision as does transformational leadership and an emphasis on leader integrity and openness. Although the theoretical model is based on research findings from interviews with leaders and followers, it is not fully developed in terms of describing how the responses of followers to leadership are linked with outcomes.

Authentic and Charismatic Leadership

Conger and Kanungo's (1998) version of charismatic leadership does not include attention to leader and follower self-awareness/regulation, the role of psychological capital, or the relationship of leadership to sustainable outcomes. Charismatic leaders use rhetoric to energize and persuade followers, whereas authentic leaders energize by creating meaning and influencing social reality for themselves and others (Avolio & Gardner, 2005).

Authentic and Emotional Intelligence/Resonant Leadership

The focal elements of emotional intelligence include self-awareness, emotional management, self-motivation, empathy, and relationship management (Goleman, 1995). So far, research that links emotional intelligence and leadership is limited but some evidence supports the notion that authentic leaders are emotionally intelligent (Klenke, 2005). There is clearly some similarity between the construct of authenticity and emotional intelligence and a strong focus on leader-follower relationships. Boyatzis and McKee's (2005) work on resonant leadership has also described the role of positive emotions (especially hope) in leadership. However, the theoretical framework for

emotional intelligence/resonant leadership has not been fully outlined in terms of leader-follower mechanisms and the associated link to organizational outcomes as proposed in the authentic leadership model.

Authentic Leadership and Leader-Member Exchange Theory (LMX)

In leader-member exchange (LMX) theory, leadership is a process centred on the interactions between leaders and their followers. There is little focus on the attributes or characteristics of effective leaders, but as in authentic leadership, communications between leaders and followers that build trust, respect, and commitment are emphasized. Also, LMX theory does not include an explanation of how effective exchanges are developed even though leader communications are very important to quality exchanges and the creation of partnerships between leaders and followers. The linkage that LMX theory makes between effective LMXs and outcomes is similar to the leader behaviour and outcome propositions in authentic leadership theory. However, a solid body of research has linked the quality of LMX with positive individual and organizational outcomes such as job satisfaction, performance, commitment, and reduced turnover (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995).

Although there is overlap with elements of other leadership theories, the unique combination of and in-depth focus on leader and follower self-awareness/regulation, positive psychological capital, and the moderating role of organizational climate contributes to the assessment that authentic leadership is both a new theoretical perspective and a return to timeless, genuine, and basic leadership attributes and processes.

Relevance to Nursing Leadership

Current Nursing Interest in Authentic Leadership

No studies of authentic leadership in healthcare have yet been published, but a model of leadership that provides direction for the creation of healthier work environments has been cited recently in the nursing literature (Kerfoot, 2006; Shirey, 2006). Nurse managers play a key role in improving the work environment, and, until recently, few guidelines were available on how to accomplish this critical task. In Canada the Registered Nurses Association of Ontario (2006) and the Canadian Council on Health Services Accreditation (2007), in collaboration with other organizations, have developed guidelines for the development of healthy workplaces in healthcare. The American Association of Critical-Care Nurses ([AACN] 2005) published a document that specifies authentic leadership as one of six standards essential for creating and sustaining healthier work environments (Shirey, 2006). Shirey did not define authentic leadership but defined authentic as "conforming to fact and therefore worthy of trust, reliance or belief" (AACN, 2005, p. 36). In AACN's view, lack of attention to authentic leadership is a significant barrier to patient safety, effective nurse recruitment and retention, and viable organizational financial performance (Kerfoot, 2006). Because some nursing organizations and professional experts are advocating authentic leadership, it is important to demonstrate the empirical link between authentic leadership and healthy work environments (Kerfoot, 2006; Shirey, 2006).

Authentic Leadership Themes That Resonate with Nursing Leadership

Relational focus. Although the concept of authenticity is defined as the quality of being true to oneself, but not necessarily to others, the notion of authentic leadership

shifts attention to the leader's relationships with others (Avolio & Gardner, 2005). Many authors have acknowledged that the core of leadership is relationships, and this is also a central belief in the nursing leadership literature (Cummings, 2004; Graen & Uhl-Bien, 1995; Kouzes & Posner, 1995; Porter-O'Grady, 2003; Upenieks, 2002). The relational elements of nurse-client interactions have long been the foundation of nursing theories and clinical practice (Laurent, 2000; Parse, 1997; Peplau, 1997; Watson, 2006). Moreover, recent nursing research findings have shown that a positive relational orientation of nurse leaders ameliorated the emotional exhaustion of nurses and resulted in greater satisfaction with supervision and their work (Cummings, Hayduk, & Estabrooks, 2005).

Many leadership theories focus primarily on leader or follower characteristics or behaviours, and very few on the leader-follower relationship (Northouse, 2004). Although authentic leadership concentrates significantly on leader self-awareness and relational transparency, it also incorporates what happens between leader and follower in terms of the processes of personal and social identification and the principle that leader behaviour triggers a similar focus on self-awareness among followers. In addition, the model recognizes the role of emotions and trust in leader-follower relationships. Because current reports have highlighted a state of damaged trust between nurses and managers in healthcare settings, there is an urgent need to repair trust (CNAC, 2002; IOM, 2004; O'Brien-Pallas et al., 2005; Priest, 2006). Serious service pressures on the healthcare system and continuing fiscal constraints have resulted in heavy workloads and patient-care dilemmas for nurses in highly complex and rapidly changing work environments (Hart, 2005; Nembhard & Edmondson, 2006; Storch, Rodney, Pauly, Brown, &

Starzomski, 2002). Despite the focus on trust as essential to organizational success, there has been little systematic study of trust in health care settings and no studies that examine the influence of nursing leadership practices on nurses' trust and work outcomes. The authentic leadership model offers a logical theoretical framework for understanding how patient-care managers can engage in leadership practices that may facilitate higher levels of nurses' trust in management and, in turn, influence work results.

Moral/ethical component. A positive moral perspective is a pivotal component of authentic leadership in that leaders are expected to engage in ethical and transparent decision-making processes. Authentic leaders draw on their moral capacity, courage, and resiliency (May et al., 2003) to address ethical issues and achieve "sustained moral actions" (Avolio & Gardner, 2005, p. 324). Interest in this theory seems to stem from a recent shift in social, political, and business climates in which timeless and genuine attributes are sought in leaders (Shirey, 2006). This shift reflects an orientation away from charismatic, visionary leadership to a more sustaining type of leadership that exemplifies character and integrity (Sarros & Cooper, 2006). In nursing administration the demands of the 1990s restructuring and systems changes required transformational leaders who were able to energize and lead vast system changes in healthcare (Porter O'Grady, 2003). More recently, the demands for visionary leadership have not abated, but there is a strong emphasis on improving and sustaining work environments through positive capacities such as trust, hope, optimism, and resiliency (CNAC, 2002; IOM, 2004; Shirey, 2006).

A small pocket of nurse researchers has focused on the importance of ethical climates in healthy work environments. According to Olson (1998), ethical climate is one

component of organizational climate that serves as a frame of reference for how individuals perceive their work environment and behave in it. Hart (2005) defined *ethical climate* as "the organizational conditions and practices that affect the way difficult patient care problems, with ethical implications, are discussed and decided" (p. 174). Olson and Hart further contended that these practices are based on the presence of trust, power, inclusion, role flexibility, and inquiry. How nurses perceive their workplace may determine whether and how ethical issues are raised and discussed as well as shape the nature of decisions that are made or not made (Olson, 1998; Storch et al., 2002). In a recent study 25% of the nurses identified their hospital ethical climate as a key predictor of their intent to leave their positions (Hart, 2005). Control over practice, staffing adequacy, and advocacy for patients were additional variables that influenced turnover intentions, and all of these are related to leadership's role in ethical decision making, fair allocation of resources, and issues of power and influence.

The challenges that nurses face in accessing structural or interpersonal resources for everyday ethical practice are embedded in the culture of the context in which they work, including their relationships with leaders (Rodney & Street, 2004). Because of the focus on authenticity and high moral standards, authentic leadership is believed to be an important factor in the development of an ethical climate of trust in nursing practice environments (Grojean, Resick, Dickson, & Smith, 2004; Hosmer, 1995; Rogers, 2005). The ultimate goal of an ethical climate of trust is to ensure that nurses can be free to practice as moral agents and provide safe and ethical care for patients (Storch et al., 2002). Positive ethical climates make a difference in terms of nurses' satisfaction with their work and, ultimately, influence the quality and safety of the care they provide to

patients. Thus, an ethical perspective of the leader's role in creating and sustaining

trusting practice environments is needed. We posit that the conception of authentic

leadership addresses this necessary ethical perspective.

Positive leadership orientation. An increased awareness of the relative

importance of positive psychological strengths and capacities such as hope, optimism,

confidence, and resiliency in this model supports a leadership approach focused on

strengths and the development of wellness rather than weaknesses and vulnerabilities.

Similarly, the discipline of nursing has for many years focused on health promotion,

well-being, and client capabilities rather than disabilities. Unfortunately, recent rhetoric

on the condition of nursing work environments, especially within hospitals, and nurses'

overall health and well-being within them has been fairly negative (CNAC, 2002; IOM,

2004; O'Brien-Pallas et al., 2005; Shamian, Kerr, Laschinger, & Thomson, 2002). Not to

deny the accuracy of reports on health care workplaces or to oversimplify the complexity

of the situation, perhaps it is time for a positive and action-oriented approach to changing

and sustaining the work environment (Kerfoot, 2006; Shirey, 2006). The authentic

leadership model prominently incorporates hope, trust, positive emotions, and optimism

as mediating variables by which authentic leaders influence follower's attitudes such as

work engagement. An American study of nurses recently confirmed a positive

relationship between nurses' psychological capital (self-efficacy, hope, and optimism)

and their commitment to the mission of their organization and their intent to stay in their

jobs (Luthans & Jensen, 2005). Authentic leadership proponents have contended that

positive psychological capacities can be measured, developed, and managed for effective

performance (Luthans, 2002). The concept of supporting and developing the positive

capacities that already exist in the nursing workplace may provide critical leverage toward lasting change.

Based on the authentic leadership model, increased employee engagement in response to authentic leadership may contribute to a healthy work environment (Shirey, 2006). Psychological engagement and its connection to hope, trust, and positive emotions may be key mechanisms. When work environments feature honest information sharing and a climate of trust and respect, individuals are more likely to be psychologically engaged in task focus, exploration and experimentation, and thoughtful relating with others and thus experience a sense of thriving at work (Spreitzer, Sutcliffe, Dutton, Sonenshin, & Grant, 2005). The polar opposite of engagement, burnout, has been a topic of much interest in the nursing literature (Cho, Laschinger, & Wong, 2006; Vahey, Aiken, Sloan, Clarke, & Vargas, 2004). Perhaps not being able to engage meaningfully with colleagues and managers in addressing issues in the work environment is an underlying cause of burnout (Storch et al., 2002). Nurses need to feel safe and healthy at work, be able to speak openly in a trusting and nonpunitive atmosphere about the issues that concern them, and do so without fear of organizational reprisals. They must also be supported and encouraged to identify their requirements to practice in a safe, ethical, and responsive manner. Listening to nurses, asking about their visions for practice, keeping promises made to them, faithfully representing them, and celebrating their accomplishments are signals of authentic leadership that fosters work engagement (Rogers, 2005; Storch et al., 2002).

Importance of leader-follower development. The current challenge of managing and sustaining healthcare systems in light of the imminent retirements of current nursing

leaders has heightened attention on the issue of leadership development in nursing (Jeans, 2006; Mass, Brunke, Thorne, & Parslow, 2006). Many experts acknowledge that there is no "quick fix" to the development of future leaders because leadership is "a continuing journey of development" (Jeans, 2006, p. 29) that occurs within organizational contexts in which individual learning and growth for leaders and followers should be supported (Luthans & Avolio, 2003). Avolio et al.'s (2004) developmental perspective is that personal history and trigger events (such as a personal loss, organizational crisis, job loss, critical decision points, etc.) shape leaders' values, beliefs, and behaviours. Psychological capacities such as hope, optimism, self-efficacy, self-awareness, and resiliency are statelike and can be influenced through reflection and learning (Avolio et al., 2005; Luthans & Avolio, 2003). Authentic leadership is an approach that intentionally promotes a priority of and insight into the mechanisms that underlie leader and follower development. The development of followers in terms of self-awareness, self-regulation behaviours, and authentic behaviour is considered a key part and product of authentic leadership (Gardner, Avolio, Luthans, et al., 2005).

Development is explained in terms of a number of processes through which leaders influence followers (Gardner, Avolio, Luthans, et al., 2005). Personal and social identification is described as the process whereby followers come to identify with authentic leaders and their values. Positive role modeling with a focus on demonstrating self-awareness and self-regulation behaviours, positive psychological states, and positive moral perspectives is a primary mechanism that leaders use to influence and develop followers (Gardner, Avolio, Luthans, et al., 2005). Likewise, leading by example and mentoring current and future leaders have been promoted within nursing as priorities for

leader development (Jeans, 2006; Mass et al., 2006). Supporting self-determination is another leader-influence process that is reflected in leaders who support followers' autonomy, provide unconditional positive feedback, and acknowledge others' viewpoints (Ilies et al., 2005). Finally, authentic leaders establish positive social exchanges with followers by engaging in the unbiased processing of information and presenting an authentic relational orientation that should create high levels of respect, trust, and honesty (Ilies et al., 2005; Michie & Gooty, 2005). The model's emphasis is on leader-follower communication and the formation of positive and open relationships, similar to Cummings' (2004) notion of investing relational energy in leader-nurse relationships.

Creating supportive leader-follower relationships with a developmental view requires time, energy, and visibility on the part of the leader, all of which need to be considered in the creation of reasonable spans of control for nurse leaders (Doran et al., 2004). The configuration of nurse-leader roles and responsibilities needs to be congruent with the mandate for ongoing leadership development, including consideration of authentic leadership influence processes (Mass et al., 2006). An organization could enhance authentic leadership development in two ways. First, in choosing leaders, priority could be given to those who exemplify each of the four components of authentic leadership. Second, planned leadership programs or interventions (also considered trigger events) might include an analysis of one's life context and trigger events related to leadership behaviours, strategies to build positive psychological capacities, assessment of the organizational context in which the leader is embedded, inclusion of multisource feedback on performance, and coaching/mentoring that centres on self-awareness, relational transparency, and authentic behaviour. In summary, the authentic leadership

model is a potentially useful guide for the implementation and evaluation of leadership-development initiatives in nursing.

Conclusions

The emerging authentic leadership theory is in the early stages of development and testing, but it holds promise for explaining the underlying processes by which authentic leaders and followers influence work outcomes and organizational performance. Construct validity of authentic leadership is not yet well documented, but a few studies have shown positive relationships between authenticity and trust. Furthermore, the clarity of the authenticity construct and the comprehensiveness of the overall theoretical framework provide a fruitful base for future research on the relationship between authentic leadership and the creation of healthier work environments. Although it overlaps with elements of other leadership theories, the in-depth focus on leader and follower self-awareness/regulation, positive psychological capital, the moderating role of organizational climate, and sound propositions that link model constructs contribute to the assessment that authentic leadership is both a new theoretical perspective and a return to timeless, genuine, and basic leadership attributes and processes core to several leadership theories. Unmistakable focus on the relational aspects of leadership, the foundational moral/ethical component, a potential linkage of positive psychological capital and work engagement, and the emphasis on leader and follower development in the authentic leadership framework are closely aligned with current and future nursing leadership practice and research priorities for the creation of sustainable changes in nursing work environments.

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Table 2.1

Comparison of Authentic Leadership With Other Leadership Theories

Components of authentic leadership development theory	Transformational (Bass & Avolio)	Leadership practices (Kouzes & Posner)	Emotional intelligence/resonant (Goleman/Boyatzis & McKee)	Charismatic (Conger & Kanungo)	Leader-member exchange theory (Graen & Uhl-Bien)
Positive psychological capital	□	□	□	□	
Positive moral perspective	✱	✱	□	✱	□
Leader self-awareness:					
• Values	✱	✱	✱	✱	
• Cognitions	✱	✱	✱	✱	
• Emotions	✱	✱	✱	✱	
Leader self-regulation:					
• Balanced processing	✱	✱	✱		
• Relational transparency	✱	✱	✱		
• Authentic behaviour	□	✱	✱	□	
Leadership processes:					
• Positive modeling	✱	✱	✱	✱	
• Personal and social identification	✱			✱	
• Emotional contagion			□		
• Supporting self-determination	✱	✱		✱	✱
• Positive social exchanges	✱	✱	□	□	✱
Follower self-awareness	✱				
Follower Self-regulation	✱				
Follower development			□		□
Organizational context:					
• Uncertainty	✱		□	✱	
• Inclusion	✱				
• Ethical	✱				
• Positive, strengths-based					
Performance:					
• Veritable					✱
• Sustained	✱				✱
• Beyond expectation	✱	□	□	✱	✱

✱ = key component; □ = discussed

*Note.*From "Authentic leadership development: Getting to the root of positive forms of leadership" by B.J. Avolio and W.L., Gardner, 2005, *The Leadership Quarterly, 16*, p.323. Copyright 2005 by Elsevier, Inc. Adapted with permission.

Authentic Leadership Model
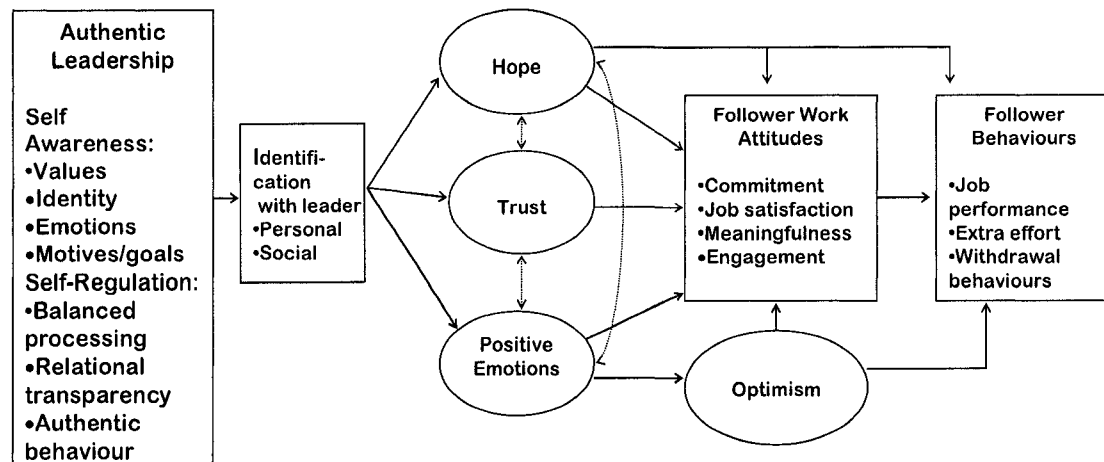
Figure 2.1. Proposed framework linking authentic leadership to followers'
attitudes and behaviours (Avolio et al., 2004).

*Note.*From "Unlocking the mask: A look at the process by which authentic leaders
impact follower attitudes and behaviours" by B.J. Avolio, W.L., Gardner, W.L.,
F.O. Walumbwa, F. Luthans, F., and D.R. May, 2004, *The Leadership Quarterly,
15*, p 803. Copyright 2004 by Elsevier, Inc. Adapted with permission.

PAPER 3:

THE INFLUENCE OF AUTHENTIC LEADERSHIP BEHAVIOURS ON TRUST AND WORK OUTCOMES OF HEALTHCARE STAFF

Background and Significance

Recently, a great deal of attention has been directed to the key role of leaders in advancing an agenda for change in healthcare organizations to create healthier and safer practice environments for both nurses, other professionals, and patients (Canadian Nursing Advisory Committee [CNAC], 2002; Nicklin, 2003; Page, 2004). Furthermore, there is increasing emphasis on the connection between healthy work environments and patient safety and the health and well-being of nurses and other professionals (Laschinger, 2004; Vahey, Aiken, Sloan, Clarke, & Vargas, 2004). A key element of a healthy work environment is trust between staff and their managers. The restructuring and reengineering changes of the 1990s and a continuing focus on constrained resources has weakened healthcare professionals' trust in their leaders and their organizations (CNAC, 2002; Laschinger, Finegan, & Shamian, 2001; Rogers, 2005). Several recent reports have called for strong nursing leadership to create cultures of safety that ultimately are founded on a climate of trust (CNAC, 2002; Institute of Medicine [IOM], 2004). Authentic leadership is proposed as the root component of the effective leadership needed to build trust and healthier work environments that promote patient safety and excellence in care and to recruit and retain staff (Avolio, Gardner, Walumbwa, Luthans, & May, 2004). Specifically, this model of leadership focuses on the positive role modeling of honesty, integrity, and high ethical standards in the development of leader-follower relationships.

Trust is considered the foundation of positive organizational cultures and, in essence, defines healthy workplaces (Lowe, 2006b). Trustworthy managers instil in healthcare staff a sense of commitment and pride in work that is manifested in increased engagement in the exploration of new ideas, a willingness to speak up about problems and make suggestions for workplace changes, and greater sensitivity to others' words and ideas (Edmondson, 1999; Spreitzer, Sutcliffe, Dutton, Sonenshin, & Grant, 2005). However, recent reports have highlighted a state of damaged trust between nurses and managers in healthcare settings (CNAC, 2002; IOM, 2004; O'Brien-Pallas et al., 2005; Priest, 2006; Rogers, 2005). Serious service pressures on the healthcare system and continuing fiscal constraints have resulted in heavy workloads and patient-care dilemmas for care provider staff in highly complex and rapidly changing work environments (Hart, 2005; Nembhard & Edmondson, 2006; Storch, Rodney, Pauly, Brown, & Starzomski, 2002). Healthcare professionals need to be able to speak openly in a trusting and nonpunitive atmosphere about the issues that concern them and do so without fear of organizational reprisals. Moreover, they need to feel supported and encouraged if they are expected to identify what they require to practice in a safe, ethical, and responsive manner (Malloch, 2002; Rogers, 2005; Storch et al., 2002; Williams, 2006).

Despite the focus on trust as essential to organizational success, there is little systematic study of trust in health care settings and no studies that have examined the influence of leadership behaviour on staff trust and work outcomes. Specific aims of this study are (a) to hypothesize and examine a model linking authentic leadership behaviours with trust in management, perceptions of supportive group, and work outcomes; and (b) to estimate this model using a healthcare-employee dataset and structural equation

modeling (SEM) procedures. Specifically, we investigated the structure of individual

effects from authentic leader behaviours through trust in management and supportive

group to work outcomes (Figure 3.1).

Literature Review

Healthcare Leadership and Work Outcomes

There is evidence in the nursing research literature that leadership has an

important influence on care environments, including nurse and patient outcomes.

Leadership has been associated with empowerment of staff (Morrison, Jones, & Fuller,

1997; Laschinger, Wong, McMahon, & Kaufman, 1999), nurses' job satisfaction (Bratt,

Broome, Kelber, & Lostocco, 2000; Upenieks, 2002), role tension (McGillis-Hall et al.,

2001), organizational commitment (Leach, 2000; Lok, Westwood, & Crawford, 2005),

productivity (Laschinger & Wong, 1999; Loke, 2001; McNeese-Smith, 1999), emotional

exhaustion (Cummings, Hayduk, & Estabrooks, 2005; McCain, 1994; Stordeur, D'hoore,

& Vandenberghe, 2001), quality of care (Cardin, 1995), recruitment and retention

(Taunton, Boyle, Woods, Hansen, & Bott, 1997; Houser, 2003), and performance

(Brown, 1989). Less is known about the specific mechanisms that link effective

leadership to improved outcomes.

A recent systematic review of studies that linked nursing leadership and patient

outcomes showed evidence of a positive relationship between transformational nursing

leadership practices and improved patient outcomes, including increased patient

satisfaction and reduced patient adverse events and complications (Wong & Cummings,

2007a). Presumably, this relationship is mediated by the influence of leadership

behaviour on staff performance and outcomes. Researchers have postulated that positive

leadership behaviours (transformational, empowering, supportive, etc.) may be associated with outcomes by facilitating more effective teamwork (Anderson, Issel, & McDaniel, 2003; Doran et al., 2004; McNeese-Smith 1999; Pollack & Koch, 2003), by empowering staff to improve performance, and by promoting greater clinical expertise through increased staff stability and reduced turnover (Houser, 2003). Our research aimed to study "the black box" of leadership by more closely examining leader-outcome relationships and the role of potential mediators such as trust and workgroup support to create a clearer understanding of the mechanisms through which leadership influences the work outcomes of healthcare staff.

Authentic Leadership

Increasing pressures on leaders from corporate scandals to the SARS crisis to terrorism and a threatened flu pandemic have led to calls for higher standards of integrity, character, and accountability of leaders (May, Chan, Hodges, & Avolio, 2003). The study of leadership is currently influenced by the field of positive organizational scholarship (POS). Based on the tenets of positive psychology, POS is aimed at understanding positive human processes and organizational dynamics that make life meaningful (Ilies, Morgeson, & Nahrgang, 2005; Luthans, 2002). Emerging from theoretical discussions on the moral and ethical foundations of leadership is a focus on distilling the core elements of positive approaches to leadership (Luthans & Avolio, 2003; May et al., 2003). This effort has resulted in the concept of authentic leadership, which is envisioned as the root concept for positive leadership models such as transformational, charismatic, ethical, and servant leadership (Avolio & Gardner, 2005; Wong & Cummings, 2007b).

Authenticity is a psychological construct that reflects knowing, accepting, and acting in accord with one's values, beliefs, preferences, and emotions (Ilies et al., 2005; Kernis, 2003). Avolio et al. (2004) proposed the theory of authentic leadership, which Luthans and Avolio (2003) had defined as "a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviours on the part of leaders and associates, fostering positive self-development" (p. 243). Authentic leaders are seen as persons who are hopeful, optimistic, resilient, and transparent (Hannah, Lester, & Vogelsang, 2005). They operate consistent with a set of values that is visible to others, focus on the ethical or right thing to do, take the lead even when there is personal risk, make the development of others a priority, and work to ensure that their communication is transparent and that others perceive it as intended (Avolio et al., 2004; May et al., 2003). This view of leaders is grounded in moral intentions and behaviour (Bass & Steidlmeier, 1999).

Gardner, Avolio, Luthans, May, and Walumbwa (2005) described four underlying components of authentic leadership: self-awareness, balanced information processing, authentic behaviour, and relational transparency. A basic principle of authentic leadership is the notion that authenticity in leadership requires heightened levels of self-awareness (Avolio et al., 2004). Gardner et al. (2005) defined *self awareness* as "a process where one continually comes to understand his or her unique talents, strengths, sense of purpose, core values, beliefs and desires" (p. 324). *Balanced processing* is the processing of self-esteem–relevant and non–self-esteem–relevant information from a relatively objective view that incorporates both positive and negative attributes and qualities

(Gardner et al., 2005). Authentic leaders engage in more accurate and balanced self-assessments as well as social comparisons and act on these assessments without being diverted by self-protective motives. *Authentic behaviour* involves acting in accord with one's values and needs rather than acting to please others, receive rewards, or avoid punishments. To be truly authentic, leaders must align their core and espoused values and actions (Kernis, 2003). Because followers' trust in leaders is largely based on the leaders' actions, the leaders' espoused values must be consistent with their actions for them to be seen as acting with integrity (Gardner et al., 2005). Role modeling of positive values and ethical behaviour is a primary mechanism that authentic leaders use to influence the development of followers.

Relational transparency is the final component of authentic leadership and involves the presentation of one's genuine self. It is achieved through openness and appropriate self-disclosure of one's values, identity, emotions, and motives; and this transparent sharing of information enhances followers' trust (Norman, 2006). Transparency is a key component of authentic leadership that is proposed to build trust in followers. In summary, authentic leadership is presented as an approach that creates conditions of higher trust in leaders and allows followers to focus more positively on their strengths, to expand their thinking, to heighten their awareness of the moral implications of their decisions, and to facilitate followers' overall performance (May et al., 2003).

In Avolio et al.'s (2004) leadership framework, trust is a key intervening variable that links authentic leadership to followers' attitudes and behaviours. Although research on authentic leadership is relatively new, three studies have shown that relational

transparency is a key component of authentic leadership and a significant predictor of trust in the leader (Gardner, Chan, Hughes, & Bailey, 2006; Hughes, 2005; Norman, 2006). There have been no studies of authentic leadership in healthcare; however, there is keen interest in a model of leadership that provides direction in creating healthier work environments largely as a result of the heightened concerns about a projected worldwide shortage of nurses and other health professionals, continuing reports of stressed and overworked staff, and calls to make health care settings safer for patients. The American Association of Critical-Care Nurses ([AACN] 2005) published a document that identified authentic leadership as one of six standards essential to creating and sustaining healthier work environments (Shirey, 2006). Because some nursing organizations and professional experts are advocating authentic leadership, it is important to empirically demonstrate the link between authentic leadership and healthy work environments (Kerfoot, 2006; Shirey, 2006).

Mediating Mechanisms

Leadership and trust. Trust, along with fairness and respect, are key values associated with healthy organizations (Lowe, 2005). In a meta-analysis of research findings on trust in leadership, Dirks and Ferrin (2002) reported significant relationships between trust and job satisfaction, organizational citizenship behaviour, job performance, intention to quit, and organizational commitment. Specifically, transformational and transactional leadership styles that ensure fair procedures, outcomes, and interactional processes; participative decision-making practices; organizational support; and the meeting of expectations are related to greater trust in leadership. Outside of organizational support, all of these variables were more related to trust in direct unit

leaders rather than organizational leaders. There is also some indication that workgroup or team processes such as group identification or support play a role in the development of trust in the leader (Shamir & Lapidot, 2003).

Little empirical research in healthcare has linked trust in management with organizational variables, but nursing has produced a few recent studies. Laschinger and colleagues demonstrated that trust in management mediates the relationship between structural empowerment, organizational commitment (Laschinger, Finegan, Shamian, & Casier, 2000), and nurses' job satisfaction (Laschinger, Shamian, & Thompson., 2001) in restructured health care settings in Ontario. The participants rated trust in management lower than trust in peers, and the findings support the key role of empowerment activities such as supervisory support and access to information in creating trust. Respect and organizational justice have also been shown to contribute to trust in management, job satisfaction, and organizational commitment (Laschinger & Finegan, 2005). A study of staff nurses in Taiwan (Tseng, Chen, & Chen 2005) showed that nurses' trust behaviour is a mediator of perceived supervisor trustworthiness and the extent to which they identify with their organization. All of these studies concluded that trust is an important mediator of the relationship between key work environment factors and outcomes (Laschinger & Finegan, 2005; Simmons, Nelson, & Neal, 2001; Williams 2005). No studies were found in the healthcare literature that examined the impact of leadership style on followers' trust in management.

Leadership and supportive group. Both transformational and authentic leadership theorists contend that leaders influence group as well as individual performance by promoting consideration of group needs and interests and commitment to a shared

mission (Bass, 1998; Gardner et al., 2005). However, little research has examined the effect of leadership on group processes such as group cohesion and support (House & Aditya, 1997; Jung & Sosik, 2002). Transformational leadership has contributed to increased group cohesion (Jung & Sosik, 2002), and group cohesion mediates the relationship between transformational leadership and group performance (Bass, Avolio, Jung, & Berson, 2003; Pillai & Williams, 2004). In the healthcare literature, researchers identified social support from colleagues as an important feature of healthy work environments (Lowe, 2006b; Pearson et al., 2006). Several recent nursing studies also documented the important role of workgroup cohesion (also termed *peer support*) in nurses' work satisfaction (Kovner, Brewer, Wu, & Suzuki, 2006; Larrabee et al., 2003; Shader, Broome, Broome, West, & Nash, 2001).

Mediating Mechanisms and Work Outcomes

As we proposed in this study, authentic leadership influences followers' attitudes and behaviour through trust in the leader and perceptions of a supportive workgroup. The outcomes of concern were voice behaviour (speaking up), self-rated role performance, and burnout.

Voice behaviour. A current goal of the patient-safety movement is to eliminate the longstanding culture of blame for errors, in part by promoting more open reporting of errors as a matter of routine and by encouraging active participation of care team members in identifying ways to improve quality of care (IOM, 2004; Nicklin, 2003). However, if increased speaking up about issues such as errors, breaches of procedure, mistakes, or competency concerns is required, then high levels of trust in management are required to address individuals' fears of potential consequences (Firth-Cozens, 2004).

Voice (or speaking-up) behaviour was conceptualized as an *organizational citizenship behaviour* (OCB), also known as *extra-role behaviour* that is positive and discretionary (VanDyne & LePine, 1998). These behaviours are categorized as conscientiousness, altruism, civic virtue (includes voice), and sportsmanship (Fields, 2002). Voice behaviour is an act of speaking up that occurs without prompt and is not necessarily a reaction to an injustice, but rather occurs when an individual has an idea or opinion to share for the betterment of a situation (VanDyne & LePine (1998). Trust in leadership was found to have a significant relationship to OCBs, although few studies have specifically focused on voice behaviour or speaking up (Dirks & Ferrin, 2002; Premeaux & Bedeian, 2003).

Trust in the supervisor and top-management openness moderated the effect of self-monitoring behaviours and speaking up in a sample of telecommunications workers in the United States (Premeaux & Bedeian, 2003). Similarly, employee willingness to report safety issues (a specific type of voice behaviour) was related to management openness and support for speaking up about safety concerns in a Canadian sample of manufacturing employees (Mullen, 2005).There is little empirical work related to health professionals' voice behaviour, although two studies are relevant. The results of a 2004 survey of 1,700 health professionals in 13 American hospitals indicated that more than 50% of the respondents had occasionally witnessed incidents such as mistakes, broken rules, the cutting of corners, and incompetence in the work setting; but only 1 in 10 shared their concerns with co-workers or management (VitalSmarts & AACN, 2005). Edmondson's (2003) mixed-methods study of speaking-up behaviours among interdisciplinary team members of multiple teams in 13 operating rooms revealed that team leaders facilitated the staff's willingness to speak up about care issues openly. Team

leaders' enabling behaviours included providing inspiring rationale for changes and creating a sense of psychological safety within the team that supported speaking up. Edmondson (1999) articulated and measured the concept of psychological safety, which is similar to the notion of trust in management but refers to "a team climate characterized by interpersonal trust and mutual respect in which people are comfortable being themselves" (p. 354). The facilitative role of leadership in creating team psychological safety was further validated in a study of clinical staff in 23 neonatal intensive care units (Nembhard & Edmondson, 2006). As we hypothesized in our study, trust in the leader mediates the relationship between leader authenticity and staff members' voice or speaking-up behaviour.

Performance. Trust has been found to have a small but significant effect on job performance (Dirks & Ferrin, 2002). Although trust was long assumed to be related to performance, the mechanisms through which it has an effect are not well understood (Mayer & Gavin, 2005). Positive relationships between trust and various performance measures such as facilities' sales and profits (Davis, Schoorman, Mayer, & Tan, 2000), the performance of basketball teams (Dirks, 2000), job performance (Earley, 1986; Pettit, Goris, & Vaught, 1997), and the performance of salespeople (Rich, 1997) were documented; whereas in other studies no relationship was found between trust and various performance measures (Cropanzano, Prehar, & Chen, 1999; MacKenzie, Podsakoff, & Rich, 2001). Mayer and Gavin (2005) asserted that when employees trust their manager, they can focus effectively on their work. But when they believe that their manager cannot be trusted, they spend energy "covering one's back" (p. 876) and are less able to focus on the tasks at hand. A recent study provided empirical support for this link

between trust and performance (Mayer & Gavin, 2005). It is important to note that trust in management does not guarantee effective performance given other key determinants of performance such as knowledge, skills, ability, motivation, and support. In general, few studies have linked health professionals' performance with key organizational variables, and we found no studies that linked nurses' trust in their manager with role performance.

Burnout. In essence, burnout is either physical or emotional exhaustion usually caused by stress at work, and affected workers are most often found among human-services professionals (Felton, 1998). Burnout has been studied extensively in nursing and health care in general. Leiter and Maslach (2004) described burnout as "a psychological syndrome of exhaustion, cynicism, and inefficacy which is experienced in response to chronic job stressors" (p. 93). Burnout is currently most frequently measured using the Maslach Burnout Inventory (MBI), which construes burnout as a three-dimensional construct that includes emotional exhaustion as the core dimension, depersonalization or cynicism (which refers to a detached attitude toward one's job), and reduced personal accomplishment or efficacy (feelings of lack of achievement or productivity at work; Maslach, Jackson, & Leiter, 1996). Lee and Ashforth's (1996) meta-analysis of the correlates of burnout confirmed that supervisor and co-worker support and peer-team cohesion are associated with lower burnout. Aiken, Clarke, Sloane, Sochalski, and Silber (2002) reported high levels of emotional exhaustion and greater job dissatisfaction in nurses with high patient-care workloads, and Janssen, deJonge, and Bakker (1999) found that emotional exhaustion is predicted primarily by a lack of social support and demanding work. Laschinger and colleagues have documented a relationship between lower trust in management and burnout in nurses (Laschinger &

Finegan, 2005; Laschinger, Shamian, & Thomson, 2001). Finally, research has also

shown a link between staff burnout and effective leadership styles such as empowering

leadership behaviour (Greco, Laschinger, & Wong, 2006), and Cummings et al. (2005)

found that resonant (emotionally intelligent) leadership contributed to reduced fatigue

and emotional exhaustion among nurses in restructured hospital settings. Leiter and

Laschinger (2006) tested a causal model of five nursing worklife features in which

nursing leadership demonstrated a significant role in reducing burnout indirectly through

staffing adequacy, effective nurse-physician relations, and policy impact.

Theoretical Framework

The model for this study (Figure 3.1) was derived from Avolio et al.'s (2004)

authentic leadership theory and Mayer, Davis, and Schoorman's (1995) framework of

dyadic trust. We expected leader behaviours that reflect each of the four components of

authentic leadership (self-awareness, balanced information processing, authentic

behaviour, and relational transparency) to contribute to increased staff trust in

management, and we added the degree to which the leader genuinely responds with

recognition and support for followers' concerns and needs to the leader behaviours in the

model. Moreover, we included an essential element in the authentic leadership theory, the

development of followers through empowering leader behaviour. We also hypothesized

that supportiveness and empowering leader behaviour would influence self-rated

performance and burnout indirectly through increased perceptions of being in a

supportive group and expected that empowering behaviour would directly affect

performance and burnout. In Mayer, Davis, and Schoorman's notions of dyadic trust, the

development of trust in a relationship between two specific parties—a trusting party

(trustor-staff) and the party to be trusted (trustee-manager)—depends on the perceived

trustworthiness of the trustee. Perceived manager trustworthiness also influences

followers' trust in their manager, and we hypothesized that increased trust in the manager

would have a positive effect on staff voice behaviour and self-rated performance and a

negative effect on burnout. Furthermore, we expected that supportive leader behaviour

would increase trust through staff perceptions of support within the workgroup.

Methods

Data Source

We obtained ethical approval from both the University of Alberta Health

Research Ethics Review Board and the review board of the respective healthcare facility

to conduct a secondary analysis of data from the *WILD Study*: *Worklife Improvement*

Through Leadership Development (Cummings, Spiers, Sharlow, & Bhatti, 2005-2007).

The purpose of the WILD study was to examine the outcomes of a cohort-based

leadership-development initiative by using a pretest-posttest design to evaluate the impact

of the leadership intervention on the worklife of leaders and staff. The current study used

only the baseline data collected at Time 1 in March 2006 through a quantitative survey of

employees of a western-Canadian agency that operates 17 cancer treatment facilities

within the boundaries of several health regions. A random sample of 800 employees

yielded completed surveys from 353 employees who worked for leaders in the

organization. We used this dataset for this secondary analysis.

Sample. We divided the employee dataset into two groups based on the primary

area of work: the clinical group, which included 147 clinical provider staff—registered

nurses, pharmacists, physicians, and other healthcare professionals; and the nonclinical

group, which included 188 administrative, research, and support staff. Because 18 staff

members did not respond to the primary work area survey question, the total sample

dataset was reduced to 335. We considered the individual sample sizes adequate for

model testing with SEM. Hayduk, Pazderka-Robinson, Cummings, Levers, and Beres

(2005) demonstrated that a sample as small as N = 72 had sufficient power to clearly

reject a model and provide guidance for model revisions (Hayduk, Cummings, Boadu,

Pazderka-Robinson, & Boulianne, 2007). Precise categorization of employees by

profession was not available in the dataset, but we deemed primary area of work as

clinical or nonclinical a reasonable criterion for the division of the dataset into the

respective samples. Demographic characteristics of the two groups by age, gender, work

experience, and work status are included in Tables 3.1 and 3.2.

Measures in the Dataset

The survey focused on staff perceptions of their emotional health and well-being,

worklife conditions, and immediate supervisors' leadership practices. The Leadership

Practices Inventory (LPI), a 30-item reliable and valid tool used in multidisciplinary

leadership research (Kouzes & Posner, 2003), measured the leadership practices of

immediate supervisors. It contains six statements for each of five leadership practices:

challenging the process, modeling the way, inspiring a shared vision, enabling others to

act, and encouraging the heart. The staff reported their perceptions of worklife on the

Areas of Worklife Scale ([AWS] Leiter & Maslach, 2004) which is comprised of 29

items that produce distinct scores for each of the six areas of worklife: workload (6),

control (3), reward (4), community (5), fairness (6), and values (5). The Maslach Burnout

Inventory General Survey ([MBI-GS] Maslach et al., 1996) measured the emotional

health and well-being of staff. The MBI was developed to measure burnout in physicians

and other health professionals and has recently been validated and found reliable in

measuring nursing leaders' burnout (Tourangeau & McGilton, 2004). The MBI-GS

consists of 16 questions that contain three subscales: emotional exhaustion, cynicism, and

professional efficacy. We also collected information on age, gender, work status, primary

area of work, and tenure in the organization, profession, and department.

Analysis

We tested the conceptual model shown in Figure 3.1 by using SEM procedures

and SPSS 15.0 (2006) for MS Windows and LISREL 8.54 for model estimations

(Jöreskog & Sörbom, 2003). Maximum likelihood estimation and the χ^2 test-of-fit

statistic were used to estimate and evaluate the overall fit of the model (Hayduk et al.,

2007; Hoyle & Panter, 1995).

Model Development

The theoretical model depicted the causal relationships between seven authentic

leadership behaviours (background causal variables) and work outcomes for staff,

including voice or speaking-up behaviour, self-rated performance, and burnout

(Figure 3.1). We hypothesized that five of the leadership behaviours—specifically, self-

awareness, relational transparency, balanced processing, ethical behaviour, and

trustworthiness—would influence work outcomes, with trust in management as a

mediating mechanism; and that the other two behaviours, supportiveness and

empowering, would influence performance and burnout, with perceptions of being in a

supportive group as a mediating mechanism. We expected some of the behaviours to

influence outcomes directly as well as indirectly through the mediating variables. The

proposed causal model contained 19 causal relationships among the model variables. The primary author's extensive review of the literature and leadership experience in two large acute care hospital settings informed this model.

We identified the model in this study as an "all-eta(η)" model (Hayduk, 1987). Specifically, we replaced all of the latent variables, conventionally labelled *exogenous variables*, identified as ξ in the LISREL nomenclature, with ηs. Accordingly, there were no phi (Φ), lamda-x (Λ_x) or theta delta (θ_δ) matrices. The change in specification does not alter the estimates in LISREL but permits diagnostics concerning some effects that are conventionally not available in LISREL. In particular, the diagnostics can pertain to the effects leading to the exogenous latent variables or direct linkages between exogenous latent concepts and endogenous manifest variables or between endogenous latent concepts and exogenous manifest variables.

Latent concepts. We selected behaviour statements that reflected the causal latent concepts of the seven leadership behaviours from the items in the LPI in which employees rated the extent to which they had observed their immediate supervisors exhibiting these behaviours. Responses were rated on a 10-point scale from *almost never* (1) to *almost always* (10; Kouzes & Posner, 2003). The specific indicator wordings of the latent concepts are outlined in Table 3.3. Differences in the means, standard deviations, and variances for each indicator in the two samples suggested initially that these two samples may reflect different responses to leadership behaviours (Table 3.4). Pairwise correlations among the indicator variables are presented in Table 3.5. We selected items that represent the mediating variables, trust in management and supportive group, from the AWS (Table 3.3). These items were rated on a 5-point scale from *strongly agree* (1)

to *strongly disagree* (5). The work outcome variables were voice behaviour, performance and burnout. We selected the indicators representing performance and burnout and answered on a 7-point scale from *never* (1) to *daily* (7), from the *MBI-GS*. The voice behaviour variable was measured using an item from the *AWS*.

Measurement indicators. We indexed each latent concept in the model to a single indicator, with the λ value fixed at 1.0 to set the scale for the latent variables to equal the scale of the observed indicator. Based on our assessment of how accurately each indicator reflected the corresponding underlying latent concept, we adjusted the measurement quality of each indicator by assigning 10%-25% of its variance to error (Table 3.6). We were thus able to compensate for problematic wordings, lack of clarity in some items, and other measurement concerns. We created pairwise covariance matrices because listwise deletion would have resulted in the loss of too many cases. The average number of cases that contributed to pairwise covariances was 143 and 182 in the clinical and nonclinical samples, respectively. (The variance/covariance matrices for the clinical and nonclinical groups are included in Appendices B and C, respectively.)

Results

Model Estimation, Testing, and Modification

The same model was estimated using LISREL 8.54 maximum likelihood estimation ((Jöreskog & Sörbom, 2003) for the clinical and nonclinical groups. The initial χ^2 for the clinical group was 39.81 ($df = 26$, $p = 0.041$) and 62.72 ($df = 26$, $p = 0.00$) for the nonclinical group, and the adjusted goodness-of-fit index (AGFI) was 0.87 and 0.84 for the clinical and nonclinical groups, respectively, which indicates sizeable inconsistencies between the model and the covariance data (Table 3.7; Hayduk, 1987).

Model Modifications

In considering model modifications, we looked for modification indices that were over 4 in value and for changes that were theoretically reasonable and avoided reciprocal effects that would have contributed to underidentified models. The same changes in both samples would have been ideal but were not possible because each sample indicated generally different modification indices. In the end, we added one coefficient to the clinical model and three to the nonclinical model. We report the diagnostics connected to each model separately here.

Clinical sample. Examination of the standardized residuals showed seven residuals that exceeded a value of 2.0. The largest standardized residual was 4.02 for the covariance between the indicators CONTROL (voice) and PHILOS (relational transparency). The other six residuals ranged from 2.14 to 2.80 and occurred between CONTROL (voice) and four leader behaviour indicators—SUPPORT (supportiveness), CHOICE (empowering), FOLTHRU (ethical behaviour), and LISTENS (balanced processing)—between CONTROL (voice) and MBIPE1 (performance), and between MBIEX2 (burnout) and SUPPORT (supportiveness). Only one residual was less than a value −2.0 (-2.18) and was located between FAIR1 (trust in management) and LISTENS.

Thirteen modification indices (MIs) over a value of 4 ranged from 4.25 to 11.63, and three would have created reciprocal effects if the corresponding coefficients had been freed for estimation. The largest MIs were between the background leader behaviour latent concepts of relational transparency (11.63) and balanced processing (10.63) and voice and were theoretically reasonable. The third largest (9.86) MI was between empowering and voice and had the strongest theoretical connection to voice behaviour.

Freeing of the empowering to voice coefficient resulted in an improved and fitting model

with a χ^2 = 29.60 (df = 25, p = 0.24; Table 3.7). In that model the standardized residuals

ranged from -1.68 to 2.92. A standardized residual of 2.18 between the MBIEX2

(burnout) and SUPPORT (supportiveness) covariance and an MI of 4.73 for an effect

leading from supportiveness to burnout might improve the model fit. Freeing that

coefficient improved the fit (χ^2 = 24.75, df = 24, p = 0.42) but yielded a direct positive

effect between supportiveness and burnout that was theoretically counterintuitive. The

observed correlation for that indicator pair was negative and nonsignificant, so we

attempted this modification but did not include it (Table 3.5). The only other standardized

residual over 2 was between CONTROL and PHILOS (2.92). Because freeing the voice

to relational transparency coefficient (MI = 7.52) would have resulted in a reciprocal or

feedback effect and was not theoretically reasonable, we did not free this coefficient for

estimation.

The final clinical model included a problematic and just barely significant (p =

≤.05) negative effect between trust and performance, which implies that increased trust in

management contributes to lower self-rated performance, and this too may be illogical.

There was a very small (.001) and nonsignificant observed correlation between the

corresponding two indicators (Table 3.5). This negative effect was present in the initial

model estimates but did not become significant (T-value = -1.97) until the first

modification was made.

Nonclinical sample. The initial run of the nonclinical sample showed a poorer fit

in terms of χ^2 = 62.72 (df = 26) and significance (p = 0.00). In addition, the standardized

residuals were more numerous than in the clinical group, which reflected sizeable

inconsistencies between the actual covariances (S) among the indicators and those implied by the model (Σ). Ten residuals exceeded a value of 2.0, and the largest had a value of 3.36 and occurred between LISTENS (balanced processing) and MBIPE1 (performance). The second largest residual (2.92) occurred between FOLTHRU (ethical behaviour) and MBIPE1 (performance), and the rest were between 2.06 and 2.74 and occurred between CONTROL and LISTENS, and FOLTHRU and CHOICE. Six negative standardized residuals had a value of less than -2.0, ranging from -2.29 to -2.96. The largest of these occurred between SUPPORT and LISTENS (-2.96), SUPPORT and MBIEX2 (-2.69), and LISTENS and FAIR1(-2.59).

Sixteen modification indices higher than a value of 4.0 (ranging from 4.07 to 9.43) were recommended. Nine of these would create reciprocal or feedback relationships if the corresponding coefficients were freed for estimation, and we therefore avoided them. The remaining seven MIs ranged from 4.24 to 9.43, and the largest (9.43) occurred between balanced processing and performance. However, we made the three most theoretically reasonable modifications: freeing supportiveness to burnout (MI = 8.61), ethical behaviour to performance (MI = 8.18), and burnout to voice (MI = 6.43). Although it was still not a fitting model, these changes improved the overall fit to $\chi^2 = 41.64$ ($df = 23, p = 0.01$). Standardized residuals then ranged from -2.60 (between LISTENS and FOLTHRU) to 2.30 (between LISTENS and MBIPE1). Four MIs had a value of over 4 (4.97-9.69), and all would have created reciprocal or looped effects if freed. The largest was 9.69 for the performance to balanced processing relationship. The other MIs were for performance to trustworthiness (6.74), performance to self-awareness (4.97), and burnout to trust in management (5.93).

Measurement Error

We explored the sensitivities of the final models to measurement error in a series

of 24 runs for each sample. The measurement error variances (theta epsilon [θ_ε] values)

were individually fixed at half and then at double the assigned measurement variance

value displayed in Table 3.6 for each indicator (Hayduk, 1987, 1996).

Clinical sample. We observed no noteworthy changes in fit or estimates for the

measurement respecifications for CONTROL (voice), MBIPE1 (performance), MBIEX2

(burnout), and LISTENS (balanced processing). Doubling the measurement error

worsened the fit with estimates for four leader behaviours: FEEDBK (self-awareness),

PHILOS (relational transparency), FOLTHRU (ethical behaviour), and SUPPORT

(supportiveness); and for COM1 (supportive group). Doubling the error on the trust

indicator (FAIR1) caused a slightly better model fit ($\chi^2 = 29.05$, $p = 0.26$) and four

increased estimates (about 20%-30%), but two of these were nonsignificant, and the other

involved the negative effect between trust and performance noted earlier. Halving the

measurement error for PHILOS (relational transparency) and CHOICE (empowering)

worsened model fit and improved the fit for RESPECT (trustworthiness), SUPPORT

(supportiveness), and COM1(supportive group). The χ^2 probabilities of the models ranged

from 0.17 to 0.30, and 10 models had the same probability as the reported final model

($p = 0.24$). Nine models demonstrated lower probability, and five provided higher

probabilities. In summary, this model seems reasonably insensitive to the alterations in

the precise measurement specifications that we used.

Nonclinical sample. In the nonclinical sample we observed no noteworthy

changes in fit or estimates for altering the measurement error on CONTROL (voice) and

MBIPE1 (performance). Doubling the measurement error improved the fit for LISTENS (balanced processing), FOLTHRU (ethical behaviour), RESPECT (trustworthiness), CHOICE (empowering), COM1 (supportive groups), and FAIR1 (trust). As in the clinical group, doubling the error on the trust indicator caused a slightly better model probability ($\chi^2 = 40.03$, $p = 0.015$), but only two increased estimates (about 30% in size), and one again involved the dubious but insignificant negative effect of trust on performance. In three models doubling the error for CHOICE (empowering), LISTENS (balanced processing), and RESPECT (trustworthiness) resulted in a few extremely large increased effects of 300%-400%, which we viewed as problematic changes indicative of estimation difficulties. Halving the measurement error improved the fit for RESPECT (trustworthiness) and worsened the fit for PHILOS (relational transparency), LISTENS (balanced processing), CHOICE (empowering), COM1 (supportive group), FAIR1(trust), and MBIEX2 (burnout). The model probabilities ranged from 0.0035 to 0.016, and eight models displayed the same probability as the reported final model ($p = 0.010$). Nine models showed a lower probability, and seven provided a slightly higher probability than the final model did. Thus, the nonclinical model was also relatively insensitive to alterations in the specific measurement specifications detailed in Table 3.6.

Testing Multiple Indicators

For additional understanding of the measurement portion of our model, we completed a series of runs to investigate whether the addition of a second indicator for each latent concept individually improved or worsened model fit. The latent was modeled as the true value of the latent causing now both the first and second indicators. This introduced constraints that might lead to model failure to fit some of the covariances of

the second indicator with the other modeled indicators. For a second indicator to be working well it should have a high R^2, not increase model ill-fit more than would be expected by increasing degrees of freedom because of more data covariances (with the p value as proxy for this), and it should leave the effect estimates essentially the same.

From the review of the dataset, we selected the best two indicators for five (self-awareness, relational transparency, balanced processing, ethical behaviour, and supportiveness) of the seven background variables. No reasonable second indicators of the remaining concepts were available in the dataset (Table 3.3). We also selected second indicators for each of the latents: trust in management, performance, and burnout. The λ and θ variances for the second indicator of each concept were left free. We added the second indicators one latent at a time to each of the final models discussed earlier. We examined the estimates, overall model fit, standardized residuals, modification indices, and R^2 for each of the 16 different models to determine which of the second-best indicators would function adequately as measures of the corresponding latent variables (Table 3.8).

Generally, in the clinical sample the overall model fit worsened with the addition of a second indicator for each of the leader behaviour latent concepts, but effect estimates did not change or changed very slightly with each additional indicator. The best pairs of indicators were those selected for burnout, relational transparency, and supportiveness as assessed by the least reduction in overall model fit from the best model described earlier, minimal changes in effect estimates, and large R^2 for the second indicator (81% for the supportiveness indicator, 76% for the relational transparency indicator, and 72% for burnout).

As in the clinical sample, the addition of a second indicator for each of the leader behaviour latent concepts worsened overall model fit in the nonclinical sample. The best pairs of indicators were those selected for relational transparency and burnout. The R^2 of the indicators ranged from 42%-88%, with the indicators for relational transparency (88%), supportiveness (74%) and burnout (61%) showing the greatest explained variance by their respective concepts. These R^2 values were similar to the values in the clinical sample for the same indicators within 7%-12%. The lowest R^2 value was for the self-awareness indicator (42%), which indicates that this second indicator was problematic.

Thus, the only two indicators that came close to satisfying all three conditions for effective second indicators in both groups were for burnout and relational transparency. All of the others were questionable because they presented one or more of the concerns discussed—that is, low R^2—which created model ill-fit and caused considerable changes in effect estimates. In general, model chi-square increased markedly with the addition of each second indicator. We noted only slight changes in beta effects and only very slight changes (average increase or decreases of 0.01 to 0.03) in significance of effects among the latents for any of the 16 runs. Most important, the majority of even the most similar pairs of indicators did not function well to measure the same concept despite the fact that the indicators came from validated instruments.

"Stacked" or Multisample Analysis

We applied the multisample or "stacked" modeling procedures of LISREL 8.54 to determine whether there were differences in the estimates of effects in the two samples (Hayduk, 1987). We conducted these analyses for the best fitting model in each of the clinical and nonclinical samples. First, we estimated the stacked model with the

coefficients unconstrained between the two groups (Model 1) and checked that the model χ^2 (71.25, $df = 48$, $p = .016$) was the sum of the prior model χ^2 values. Second, we estimated a stacked model with the variances and covariances among the background variables (leader behaviours: η_6 through η_{12}) constrained to be equal across both groups, but with the other coefficients free to receive different estimates in the two groups (Model 2). Model 2 showed a considerable increase in χ^2 (108.62), with many more degrees of freedom ($df = 76$) and a lower probability ($p = .0084$) than in the other two models. However, the difference in χ^2 between Model 1 (unconstrained) and Model 2 was 37.37 ($df = 28$, $p = .10$) and insignificant, which indicated that the variances and covariances of the exogenous variables were collectively not significantly different between the groups. Last, we constrained all of the common effect paths (but not the modification prompted effects or the exogenous variances and covariances) to be equal between the two groups (Model 3). Model 3 resulted in a $\chi^2 = 96.30$ ($df = 67$, $p = 0.011$). The χ^2 differences between Model 1 and Model 3 was 25.05 ($df = 19$, $p = .10$) and insignificant, which indicated no significant collective difference between the groups on the initially postulated effects common to both models.

Basically, the initially postulated effects collectively tended to be sufficiently similar that "compromise estimates" could be applied to the two groups without significantly worsening the model fit. Although differences exist between the estimates in the groups (Tables 3.9 and 3.10) for the initially postulated effects, these differences are not so pronounced as to be collectively significant. Thus, the models differ in terms of the effects prompted by the residuals and modification indices, but they do not differ significantly with respect to the initially postulated effects.

Effect Estimates of Leadership Behaviours on Outcomes

The 20 coefficient effects in the clinical group and the 22 effects in the

nonclinical group are reported in Tables 3.9 and 3.10, respectively. Only standardized

effects of coefficients in the individual models are discussed here.

Clinical sample. Six (30%) of the estimated 20 effects were significant in the

clinical sample (see Table 3.9 and Figure 3.2). Empowering was the only leadership

behaviour that showed significant direct effects on two of the work outcomes: voice

($\beta = .32$, $p \leq .01$) and performance ($\beta = .33$, $p \leq .01$). A series of individually significant

effects run from leader supportiveness to supportive group ($\beta = .50$, $p \leq .01$), supportive

group to trust ($\beta = .30$, $p \leq .01$), and, finally, trust to voice ($\beta = .22$, $p \leq .05$). The indirect

effect from supportiveness to trust was significant ($\beta = .15$, $p \leq .05$), but the indirect

effect of supportiveness on voice ($\beta = .03$) was not statistically significant. We observed

no significant direct effects between leadership behaviours and trust in management. The

significant negative effect leading from trust in management to performance ($\beta = -.26$,

$p \leq .05$) was contrary to the hypothesized effect. Notice that the standard error for this

coefficient was large ($SE = .20$).

Thus, in the clinical group only two of the seven leader behaviours

(supportiveness and empowering) display effects on the outcome variables, and only one

of these (supportiveness) shows any indication of working through the anticipated

mediating variables of group support and trust in management. The lack of significant

effects despite several standardized effects substantial in size, yet not statistically

significant, could be a sign of multicollinearity. The large correlations among some of the

exogenous latents (η_6 through η_{10}) in the clinical group (.62-.92) were high enough to inflate the standard errors of the corresponding effect estimates.

Nonclinical sample. In the nonclinical sample, eight (36.4%) of the estimated 22 effects were significant (see Table 3.10 and Figure 3.3). Four of the leadership behaviours demonstrated significant direct effects or chains of direct effects on the three work outcomes. Relational transparency had a small but significant positive indirect effect on voice through trust in management ($\beta = .19, p \leq .05$). This was the only leadership behaviour that directly and significantly influenced trust in management ($\beta = .64, p \leq .05$). Balanced processing had a direct and significant negative effect on burnout ($\beta = -.66, p \leq .05$), and leader ethical behaviour had a large direct significant positive effect on performance ($\beta = .37, p \leq .01$). Leader supportiveness had a significant indirect effect on performance through supportive group ($\beta = .14, p \leq .05$) and also directly reduced burnout ($\beta = -.50, p \leq .05$). But the indirect effect of supportiveness on voice through burnout was not significant ($\beta = .11$). In addition, notice that, unlike in the clinical group, all of the substantial effects were significant in the nonclinical group.

Explained variance. In general, the R^2 values were generally similar in size in both groups even though the causal paths were different. The amount of explained variance for burnout in the nonclinical group was about double that in the clinical. In fact, although 17% of the variance in burnout is explained by the model in the clinical group, there were no significant effects to burnout. The largest explained variance was for trust in management (50% and 43% for the clinical and nonclinical groups, respectively), although this came from mostly insignificant effects. Thus, this was not a trustworthy finding, particularly in the clinical group where no leader behaviours significantly

influenced trust except for an indirect path from supportiveness to trust through supportive group.

Discussion

Although we found a fitting model in the clinical group with a few significant effect estimates and a nonfitting model with several significant effect estimates in the nonclinical group, there are some important issues to discuss that influence the integrity of the estimates. We highlight the noteworthy aspects of our work according to (a) the theoretical implications of the model; (b) the effects of leader behaviours on work outcomes, including implications for management; and (c) study limitations that should guide future research.

Theoretical Implications

The findings of model testing give rise to several concerns that influence the trustworthiness of the effect estimates obtained. First, the differences between the two groups indicate that the hypothesized model was not precise enough to fit the observed data. The final models of each group look different in terms of patterns of effects: One model fits and the other does not, and one model displays a problem that the other does not. Only about a third of the hypothesized effects in the original model were significant in each group, so the theory seems incorrect in a number of areas.

Second, trust in management and supportive group were specified as mediating mechanisms between leader behaviours and outcomes in the model, and yet there were few significant indirect effects between leader behaviours and outcomes. All of the model modifications directly bypassed these mechanisms by going directly from exogenous variables to the outcome variables or as effects between the outcome variables (e.g.,

empowering to voice in the clinical model and burnout to voice in the nonclinical model). Thus, many data promptings tend toward the rejection of these two mediating mechanisms.

Third, the lack of significant effects for several of the leadership behaviours despite substantial estimates of the effects is one sign of potential collinearity problems. It seems that sizeable correlations among the exogenous latents (η_6 through η_{10}) in the clinical group (.62-.92) could result in enlarged standard errors of the estimates (because of mathematical uncertainty regarding which variables were really producing the effect); hence the statistical insignificance of seemingly substantial effects (see the trust-in-management row in Table 3.9). Specifically, the standard errors for the effects on trust are about one and a half to twice as large in the clinical group, as are the corresponding standard errors in the nonclinical group, where the corresponding latent correlations are somewhat lower (.52-.79). One effect in the nonclinical group from relational transparency to trust was significant at $\beta = .64$ ($p \leq .05$).

To investigate the impact of the degree of measurement error on the collinearity issue in the clinical model, we halved the originally asserted measurement error on the exogenous variables, η_{6-10}, that showed some of the highest intercorrelations, and scrutinized the effect estimates (size, standard errors, and significance) of these variables with trust. All estimates that previously ranged from -.49 to .60 (standardized) in the original final modeled decreased in size, as expected, to a range of -.17 to .30. The standard errors decreased as well, from a range .16 to .27 by almost a third to a range of .05 to .07. In all cases the significance level increased, although none of the estimates reached significance (*T* values ranged from -.67 to 1.24 in the original model and

increased to a range of -.94 to 1.53). These observations suggest that linking the meaning of the latent variables more closely to the specific meaning of their respective indicators by reducing measurement error allows a greater separation of the unique effect of each leader behaviour on trust.

Combining the leader behaviour indicators under one latent variable may seem to be a potential solution if indeed the indicators represent highly interrelated concepts. We investigated this in the clinical group by specifying the four indicators of self-awareness, relational transparency, balanced processing, and ethical behaviour (the four components of authentic leadership) as indicators of an authentic leadership latent variable. Initial model fit was poor ($\chi^2 = 140.0$, $df = 41$, $p = 0.00$). We added the same modification as in the original clinical model (coefficient from empowering to voice), and this improved chi-square very slightly, with no change in significance ($\chi^2 = 130.42$, $df = 40$, $p = 0.00$). The path from authentic leadership to trust was significant ($\beta = .39$, $SE = .09$, $p \le .05$), as was the path from trust to voice ($\beta = .22$, $SE = .11$, $p \le .05$). In this failing model there is a significant effect between the exogenous variable (authentic leadership) and trust, but we are no further ahead in being able to determine which of the leader behaviours actually had significant effects on trust. Thus, the statistical collinearity problem translates to the potential for theoretical collinearity in that several highly interrelated concepts are collectively amalgamated and effects to another latent are asserted and demonstrated, but the individual effects of each indicator within the latent are left unknown.

Last, we purposely did not include reciprocal effects in our model to avoid identification problems, but it is possible that a reciprocal effect exists between burnout

and voice. We added an effect from burnout to voice in the nonclinical group based on the diagnostics. But a case could be made for an effect running from voice to burnout. It is plausible that if staff members cannot get the equipment to do their job, they might perceive that they are doing the best they can under the circumstances, but feel exhausted or burned out due to inefficiency. Thus effects may be in both directions, and possibly simultaneously. Ignoring real reciprocal effects can lead to biased estimates of effects in an otherwise recursive model or to the missed realization that the addition of reciprocal effects in a recursive model may actually provide an equivalent or nearly equivalent explanation of causal forces (Hayduk, 1996).

Effects of Authentic Leadership Behaviours on Work Outcomes

The only authentic leader behaviours to have an effect on voice were relational transparency (indirect effect) in the nonclinical sample and empowering (direct effect) in the clinical sample. Although little research has examined relational transparency, Hughes (2005) and Norman (2006) found in experimental studies that leaders perceived to be more relationally transparent also elicited higher ratings of follower trust. Authentic leaders value and work to achieve transparency and truthfulness in their relevant relationships (Avolio et al., 2004). Asking for feedback, listening to and accepting others' points of view, openly sharing information, and acting on suggestions are important leader signals that set a standard for others in the organization. If transparent leader communications enhance trust and encourage others to be open and voice ideas and concerns, then this may be an important leader behaviour to facilitate patient safety in healthcare organizations (Nembhard & Edmondson, 2006). Though the amount of model-explained variance for voice behaviour was slightly higher in the clinical group, the

findings show that a moderate amount (17%-22%) of voice behaviour was explained in both groups, which may lend support to the transparency to trust to voice relationship. Empowering leader behaviour also had a direct effect on voice as well as performance in the clinical sample, which suggests that allowing staff freedom and choice in performing their work may have a more meaningful effect for clinical professionals than for other staff in terms of voicing concerns and assessing the value of their work contributions.

In the nonclinical sample, leader supportiveness (indirectly) and ethical behaviour (directly) had significant effects on performance. The amount of model-explained variance for performance was the smallest in this study but was very similar in both groups (15% clinical and 16% nonclinical). It is very likely that many additional factors within individuals as well as in the work environment are not included in our model, which may influence performance. Even though we accounted for measurement error in our indicator for performance, the use of a self-rated rather than an objective measure of performance may have contributed to biased responses in this study. Researchers have argued that some current subjective measures of job performance have a high potential for bias because of factors such as negative affectivity and social desirability (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Taris, 2006).

Balanced processing by the leader, measured as "listening to diverse points of view," had a moderate negative effect on burnout in the nonclinical group, which indicates that sensitivity to varying opinions and ideas may play a role in preventing or reducing burnout. Also, leader supportiveness had a moderate negative effect on burnout in the nonclinical sample, which suggests the importance of managers' recognizing and supporting their staff. In fact, the amount of explained variance for burnout was double

(30%) that in the clinical sample (15%), which suggests different processes related to burnout in these groups. The prevalence and pattern of burnout has been shown to vary considerably across occupations, and nurses have reported some of the highest levels of burnout compared to other groups (Bakker & Heuven, 2006). It may be that these differences accounted for the lack of any significant effects on burnout in the clinical group because nurses were aggregated with other health professionals. The significance of excessive workloads for clinicians in hospital settings has been well documented (Aiken et al., 2002; CNAC, 2002; IOM, 2004). Perhaps no amount of supervisor support can compensate for overwhelming workloads. It is interesting that burnout was negatively related to voice in the nonclinical group and that this relationship has not been reported in the literature. As mentioned earlier, the possibility of a reciprocal relationship between voice and burnout should be explored.

The contradictory negative path between trust and performance may be additional evidence of model misspecification because previous research has shown the positive mediating role of trust in the link between leadership and performance (Jung & Avolio, 2000). Dirks and Ferrin (2002) found a small (.17) but significant positive correlation between trust in the direct leader and job performance in their meta-analysis of trust-in-leadership research. It is possible that there were omitted variables or a problem with the selected indicator for trust in management. For example, the mediating role of procedural justice between transformational leadership and trust has been documented (Pillai, Schriesheim, & Williams, 1999).

In both groups, supportive leader behaviour had significant effects on perceptions of being in a supportive group, which signals the value of authentic recognition and

support behaviour in setting the tone and climate for positive group perceptions. The fact that supportive group had a mediating effect between supportiveness and trust in management in the clinical group may indicate, as Shamir and Lapidot (2003) asserted, that workgroup identification or support may influence perceptions of the development of trust in management. Supportive group mediated the relationship between leader supportive behaviour and self-rated performance in the nonclinical group, but not in the clinical group. The nonclinical group of healthcare employees may rely more on supportive group perceptions in terms of rating their own contributions to their organization, whereas clinicians may derive more evidence from their interactions with clients/patients in terms of evaluating their performance. In many healthcare settings patient-care managers have large spans of control that often include clinicians and support and administrative staff. Based on our findings, managers need to be aware of the potential differences in group perceptions of important leader behaviours and their potential causal connections to work outcomes.

Differences in the model effects in each group point to the importance of testing theory in homogeneous groups. The differences here may indicate that healthcare professionals interpret leader behaviours differently from other staff. They may need a different degree of direction or support, as evidenced by the positive effect of empowering leader behaviour in the clinical group.

Study Limitations

A key limitation was the fact that this study was a secondary analysis of data, which created a challenge in finding items that fit the concepts in the proposed model. For example, it was difficult to find an indicator that reflected the element of a

respondent's "trust in my manager," and the item selected may not have adequately differentiated trust in one's immediate supervisor from trust in the organization's management. To mitigate this limitation, we explored the sensitivity of this model to measurement error in a series 24 runs for each sample, as described earlier. The results demonstrate that the model was reasonably insensitive to the alterations in the precise measurement specifications that we used.

It must be noted that the estimation results of the final model showed inconsistencies between theory and data, reflected in the significant χ^2 results of the final stacked model. Signs of model misspecification in terms of omission of important variables in the trust-performance relationship may have contributed to the negative contradictory path in both samples. Thus, the estimates of coefficients may be biased. The multicollinearity problem noted in the clinical group may also affect the trustworthiness of effect estimates. Because we used the baseline dataset for model testing, the reliance on cross-sectional data is a limitation, and a prospective or longitudinal design to test the model is warranted. The respondents represented clinical-care providers and nonclinical staff in cancer settings, which precludes generalizability to similar groups in other settings. Selection bias may be inherent in those who chose to respond to the survey, although a random sample was chosen for survey distribution. The size of the span of control of managers is a key variable that may affect managers' visibility and relationships with staff. That is, when large numbers of staff report to managers, their ability to be present and engage staff in dialogue is challenged. This information was not available in the dataset and may have had an influence on staff perceptions of leader behaviours in each sample.

Future research should include a prospective study using a valid measure of leader authenticity and a trust-in-management scale that taps into the extent to which staff have trust in their immediate supervisor. Incorporation of both leader and staff perceptions of authentic leadership behaviours and an objective measure of performance should be included in future studies. Given the significant effect of supportive group on outcomes, this should be explored in future work as a key leadership mechanism.

Conclusion

We developed and investigated a theoretical model of causal relationships between authentic leadership behaviours and work outcomes of voice behaviour, self-rated performance, and burnout. We also compared this model in a sample of clinical care providers with a sample of support and administrative staff in a large, multisited cancer-care organization. The effect estimates must be interpreted with caution because only the clinical model fit the data. Moreover, important specification issues arose from collinearity among some variables, few significant indirect effects, and the possibility of alternative causal specifications. However, our findings indicate that trust in management has a significant positive effect on voice behaviour. Leader supportiveness contributed to positive perceptions of being in a supportive workgroup in both groups. Authentic leader behaviours, relational transparency, balanced processing, ethical behaviour, supportiveness, and empowering had significant but differential effects on trust in management, voice, performance, and burnout in the two groups. These findings suggest that supportive leader behaviour and trust in management have important implications for staff willingness to voice concerns and offer suggestions for improvements in the workplace, including patient care.

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Table 3.1

Demographics: Means and Standard Deviations for Age and Tenure by Group

Demographics	Clinical (n = 147)			Nonclinical (n = 188)		
	N	Mean	*SD*	*n*	Mean	*SD*
Age	139	42.02	10.21	181	41.04	11.44
Tenure in profession	147	16.39	10.13	187	12.43	9.83
Tenure in organization	147	10.73	9.41	186	7.24	6.67
Tenure in department	147	8.63	7.36	186	5.65	5.94

Table 3.2

Frequencies for Group Demographic Characteristics

Demographics		Clinical		Nonclinical	
Characteristic	Category	*n*	%	*n*	%
Gender	Female	105	71.4	149	79.3
	Male	39	26.5	36	19.1
	No response	3	2	3	1.6
Work status	Full-time	104	70.7	151	80.3
	Part-time	39	26.5	35	18.6
	Casual	4	2.7	2	1.1
Education	High school	3	2.0	24	12.8
	Certificate	17	11.6	36	19.1
	Diploma	56	38.1	61	32.4
	Baccalaureate	45	30.6	42	22.3
	Masters	9	6.1	14	7.4
	PhD	12	8.2	9	4.8
	No response	5	3.4	2	1.1

Table 3.3

Wordings of the Indicators of the Latent Concepts

Latent concepts	Indicator name	Indicator wording	Score range
η_1–Voice	CONTROL	I can influence management to obtain the equipment and space I need for my work.	1-5
η_2–Performance	MBIPE1	I feel I'm making an effective contribution to what this organization does.	1-7
• 2nd indicator	MBIPE2	At my work, I feel confident that I am effective at getting things done.	1-7
η_3–Burnout	MBIEX2	I feel burned out from my work.	1-7
• 2nd indicator	MBIEX1	I feel emotionally drained from my work.	1-7
η_4–Trust in management	FAIR1	Management treats all employees fairly.	1-5
• 2nd indicator	FAIR2	There are effective appeal procedures available when I question the fairness of a decision.	1-5
η_5–Supportive group	COM1	I am a member of a supportive work group.	1-5
η_6–Self-awareness	FEEDBK	Asks for feedback on how his/her actions affect other people's performance.	1-10
• 2nd indicator	TESTSKLS	Seeks out challenging opportunities that test his/her own skills and abilities.	1-10
η_7–Relational transparency	PHILOS	Is clear about his/her philosophy of leadership.	1-10
• 2nd indicator	CONVIC	Speaks with genuine conviction about the higher meaning and purpose of our work.	1-10
η_8–Balanced processing	LISTENS	Actively listens to diverse points of view.	1-10
• 2nd indicator	LEARN	Asks "What can we learn?" when things don't go as expected.	1-10
η_9–Ethical behaviour	FOLTHRU	Follows through on promises he/she makes.	1-10
• 2nd indicator	EXAMPLE	Sets a personal example of what he/she expects of others.	1-10
η_{10}–Trustworthiness	RESPECT	Treats others with dignity and respect.	1-10
η_{11}–Supportiveness	SUPPORT	Gives the members of the team lots of appreciation and support for their contributions.	1-10

(table continues)

Latent concepts	Indicator name	Indicator wording	Score range
• 2nd indicator	PRAISE	Praises people for a job well done.	1-10
η_{12}– Empowering behaviour	CHOICE	Gives people a great deal of freedom and choice in deciding how to do their work.	1-10

Table 3.4

Means and Standard Deviations of Clinical and Nonclinical Groups

Indicator variable name (concept)	Mean (SD)	
	Clinical	Nonclinical
CONTROL (Voice, η_1)	2.76 (1.112)	3.18 (1.047)
MBIPE1 (Performance, η_2)	5.62 (1.657)	5.74 (1.599)
MBIEX2 (Burnout, η_3)	3.39 (1.720)	3.18 (1.624)
FAIR1 (Trust in management., η_4)	2.68 (1.110)	3.06 (1.083)
COM1 (Supportive group, η_5)	3.50 (1.049)	3.78 (.922)
FEEDBK (Self-awareness, η_6)	4.29 (2.785)	4.58 (2.991)
PHILOS (Relational transparency, η_7)	6.09 (3.081)	6.85 (2.635)
LISTENS (Balanced processing, η_8)	6.29 (2.905)	7.25 (2.548)
FOLTHRU (Ethical behaviour, η_9)	6.74 (2.632)	7.40 (2.496)
RESPECT (Trustworthiness, η_{10})	7.46 (2.563)	8.17 (2.196)
SUPPORT (Supportiveness, η_{11})	5.67 (2.999)	6.70 (2.767)
CHOICE (Empowering, η_{12})	6.69 (2.632)	7.86 (2.171)

Table 3.5

Pairwise Correlations for the Indicator Variables in the Clinical Group and Nonclinical Group

	1	2	3	4	5	6	7	8	9	10	11	12
1. CONTROL (Voice, η_1)	-	.188*	-.202*	.296**	.143	.248**	.452**	.318**	.373**	.322**	.370**	.346**
2. MBIPE1 (Performance, η_2)	.059	-	-.064	.001	.145	.035	.133	.144	.101	.129	.184*	.253**
3. MBIEX2 (Burnout, η_3)	-.251**	-.149*	-	-.279**	-.303**	-.132	-.207	-.279**	-.249**	-.257**	-.130	-.131
4. FAIR1 (Trust in mgt., η_4)	.273**	.066	-.235**	-	.424**	.451**	.458**	.412**	.492**	.470**	.457**	.353**
5. COM1 (Supportive grp., η_5)	.230**	.246**	-.241**	.282**	-	.348**	.331**	.331**	.379**	.391**	.456**	.270**
6. FEEDBK (Self-awareness, η_6)	.141	.086	-.279**	.305**	.234**	-	.659**	.604**	.577**	.511**	.666**	.478**
7. PHILOS (Rel. transparency, η_7)	.214**	.226**	-.211**	.452**	.345**	.607**	-	.626**	.751**	.644**	.724**	.557**
8. LISTENS (Bal. processing, η_8)	.338**	.264**	-.360**	.461**	.357**	.516**	.593**	-	.689**	.777**	.673**	.619**
9. FOLTHRU (Ethical behaviour, η_9)	.287**	.271**	-.276**	.421**	.366**	.523**	.642**	.700**	-	.704**	.639**	.603**

(table continues)

	1	2	3	4	5	6	7	8	9	10	11	12
10. RESPECT (Trustworthiness, η_{10})	.222**	.112	-.243*	.453**	.304**	.426**	.550**	.786**	.689**	-	.665**	.585**
11. SUPPORT (Supportiveness, η_{11})	.236**	.202**	-.392**	.528**	.447**	.558**	.653**	.709**	.664**	.679**	-	.665**
12. CHOICE (Empowering, η_{12})	.280**	.081	-.157*	.387**	.286**	.329**	.491**	.667*	.502**	.680**	.621**	-

Note. Shaded area = clinical group; unshaded area = nonclinical group.

* Correlation is significant at the 0.05 level (two-tailed)

** Correlation is significant at the 0.01 level (two-tailed)

Table 3.6

Measurement Error Specifications for the Indicators of the Latent Variables in the

Structural Model for the Clinical and Nonclinical Groups

Indicator name (concept)	% assessed measurement error	Indicator variance from covariance matrix		Measurement error for the indicator	
		Clinical	Nonclinical	Clinical	Nonclinical
CONTROL (Voice, η_1)	15.0	1.237	1.096	0.186	0.164
MBIPE1 (Performance, η_2)	20.0	2.744	2.557	0.549	0.511
MBIEX2 (Burnout, η_3)	15.0	2.958	2.686	0.444	0.395
FAIR1 (Trust in mgt., η_4)	20.0	1.232	1.172	0.246	0.234
COM1 (Supportive grp., η_5)	20.0	1.101	.850	0.220	0.170
FEEDBK (Self-awareness, η_6)	20.0	7.755	8.948	1.551	1.790
PHILOS (Rel. transparency, η_7)	25.0	9.492	6.945	2.373	1.736
LISTENS (Bal. processing, η_8)	10.0	7.638	6.492	0.764	0.649
FOLTHRU (Ethical behaviour, η_9)	10.0	6.927	6.231	0.693	0.623
RESPECT (Trustworthiness, η_{10})	15.0	6.569	4.824	0.985	0.724
SUPPORT (Supportiveness, η_{11})	10.0	8.997	7.656	0.900	0.766
CHOICE (Empowering, η_{12})	15.0	6.930	4.715	1.040	0.707

Table 3.7

Fit of Initial and Final Models

	Clinical group ($n = 147$)	Nonclinical group ($n = 188$)
Theoretical model		
Chi-square	39.81	62.72
Significance	0.04	0.00
Degrees of Freedom	26	26
AGFI	0.86	0.84
RMSEA	.06	.09
Following modifications:	1 change	3 changes
Chi-square	29.60	41.64
Significance	0.24	0.01
Degrees of Freedom	25	23
RMSEA	.04	.07
AGFI	0.90	0.88

Table 3.8

Model Fit and R^2 With the Addition of Second Indicators

Latent concept	Original model indicator	Second indicator added	R^2 - 2nd indicator	χ^2	df	p	Change in effects (β)
Clinical group							
Model with single indicators				29.60	25	.24	
Performance	y_2 MBIPE1	MBIPE2	.15	37.78	36	.390	noΔ
Burnout	y_3 MBIEX2	MBIEX1	.72	49.14	36	.071	noΔ
Trust in mgt.	y_4 FAIR1	FAIR2	.43	37.97	36	.380	<15%Δ
Self-awareness	y_6 FEEDBK	TESTSKLS	.61	62.01	36	.005	noΔ
Rel. transparency	y_7 PHILOS	CONVIC	.76	50.87	36	.051	<10%Δ
Bal. processing	y_8 LISTENS	LEARN	.49	69.05	36	.001	noΔ
Ethical behaviour	y_9 FOLTHRU	EXAMPLE	.70	78.08	36	.000	noΔ
Supportiveness	y_{11} SUPPORT	PRAISE	.81	49.66	36	.064	noΔ
Nonclinical group							
Model with single indicators				41.64	23	.010	
Performance	y_2 MBIPE1	MBIPE2	.08	56.04	34	.010	noΔ
Burnout	y_3 MBIEX2	MBIEX1	.61	50.33	34	.035	<10%Δ
Trust in mgt.	y_4 FAIR1	FAIR2	.34	51.59	34	.027	<10%Δ
Self-awareness	y_6 FEEDBK	TESTSKLS	.42	110.59	34	.000	<10%Δ
Rel. transparency	y_7 PHILOS	CONVIC	.88	61.04	34	.003	<10%Δ
Bal. processing	y_8 LISTENS	LEARN	.55	107.47	34	.000	<10%Δ
Ethical behaviour	y_9 FOLTHRU	EXAMPLE	.50	59.68	34	.004	<10%Δ
Supportiveness	y_{11} SUPPORT	PRAISE	.74	85.79	34	.000	<10%Δ

Table 3.9

Effect Estimates and R^2 in the Clinical Group

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Effect variables in rows	Trust in mgt.	Supportive group	Self-awareness	Relational transparency	Balanced processing	Ethical behaviour	Trustworthiness	Supportiveness	Empowering	R^2
Voice	.23*								.14**	.22
	(.11)								(.04)	
	.22*								**.32***	
Performance	-.39*	.33							.21**	.15
	(.20)	(.20)							(.07)	
	-.26*	**.13**							**.33***	
Burnout	-.25	-.38			.02	-.06	-.10			.17
	(.23)	(.21)			(.16)	(.12)	(.21)			
	-.16	**-.27**			**.11**	**-.17**	**-.30**			
Trust in mgt.		.31**	.21	-.18	-.18	.19	.23			.50
		(.11)	(.17)	(.27)	(.16)	(.17)	(.18)			
		.30*	**.54**	**-.49**	**-.48**	**.49**	**.60**			
Supportive group							.08	.16**	-.07	.30
							(.06)	(.06)	(.06)	
							.21	**.50***	**-.18**	

Note: Each triplicate numerical set is unstandardized effect estimate, (standard error), and standardized effect estimate (bold)

* Estimate $\geq$ 2 standard errors

** Estimate $\geq$ 3 standard errors

Table 3.10

Effect Estimates and R² in the Nonclinical Group

Effect variables in rows	Trust in mgt.	Supportive group	Burnout	Self-awareness	Relational transparency	Balanced processing	Ethical behaviour	Trustworthiness	Supportiveness	Empowering	R²
Voice	.29** (.09) **.30****		-.14* (.06) **-.22***								.17
Performance	-.17 (.17) **-.12**	.43* (.18) **.24***					.21** (.07) **.37****			-.09 (.08) **-.14**	.16
Burnout	-.04 (.17) **-.02**	-.14 (.19) **-.08**				-.41* (.17) **-.66***	.09 (.11) **.14**	-.23 (.23) **.31**	-.26* (.10) **-.50***	.26 (.13) **.35**	.30
Trust in mgt.		.11 (.11) **.09**		-.09 (.07) **-.25**	.27* (.11) **.64***	.07 (.11) **.17**	-.07 (.08) **-.17**	.09 (.13) **.18**			.43
Supportive group								-.02 (.08) **-.04**	.19** (.05) **.60****	-.02 (.07) **-.04**	.29

Note: Each triplicate numerical set is unstandardized effect estimate, (standard error), and standardized effect estimate (bold).

* Estimate ≥ 2 standard errors

** Estimate ≥ 3 standard errors

Figure 3.1. Leadership model: Latent concepts with indicators.

Note: Latent conce pts, Etas 6-12, are treated as exogenous variables because they were modeled as originating entirely from unknown sources. The d otted arrows represent error sources which are permitted to freely covary with one another.
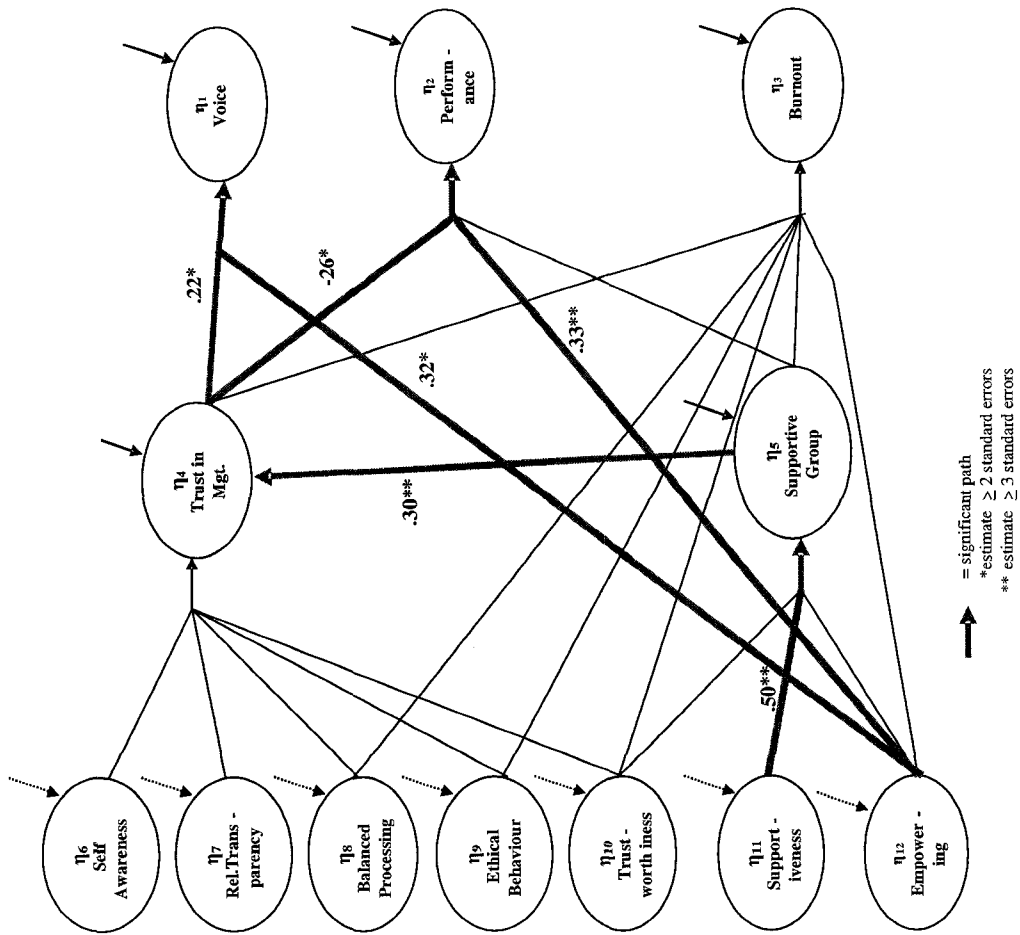
Figure 3.2. Leadership model: Significant paths in clinical group.
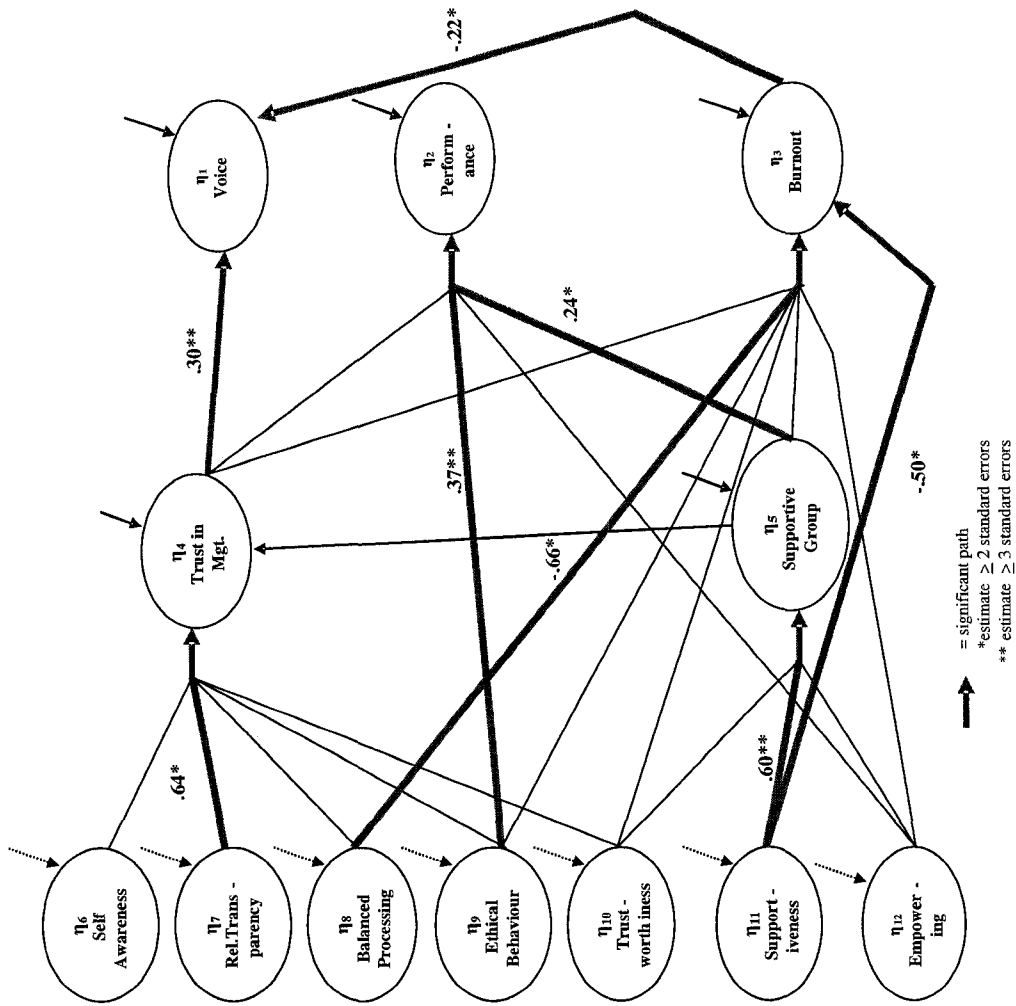
Figure 3.3. Leadership model: Significant paths in nonclinical group.

PAPER 4:

METHODOLOGICAL ISSUES IN INVESTIGATING A CAUSAL MODEL OF AUTHENTIC LEADERSHIP INFLUENCE ON WORK OUTCOMES

In formulating a theoretical model for research testing, a great deal of energy goes into reviewing the literature and determining the gaps and areas of agreement in research findings to develop a plausible theory for testing. But once the model is envisioned, attention turns to ensuring that it is properly specified in terms of including appropriate relationships among the concepts consistent with the theory. Some of the key aspects of model specification include the essential latent concepts and their indicators, the direct and indirect effects among variables, the correct directionality and sequencing of effects, and the delineation of common causes where warranted. Structural equation modeling (SEM) is a powerful statistical procedure for theory testing because it permits simultaneous estimation of all hypothesized paths and estimation of indirect or mediating effects (Tabachnik & Fidell, 2001). However, the importance of theory in creating the basic model for statistical testing is intricately tied to the SEM procedures, so much so that "one literally cannot do good structural equation modeling without being a good theorist" (Hayduk, 1987, p. 31).

In healthcare, theory-testing research is needed to 'open the black box' of leadership. That is, we need to more closely examine leader-follower outcome relationships and the role of potential mediators such as trust to create a clearer understanding of the mechanisms by which leadership influences outcomes in the work environment. The findings from a model that examines the influence of authentic leadership behaviours on the work outcomes of clinical and nonclinical healthcare staff

are reported in Paper 3, "The Influence of Authentic Leadership Behaviours on Trust and Work Outcomes in Healthcare Staff." In this paper we investigate a set of methodological issues that arose during the testing of the leadership model and offer some general guidance to others who are learning to work with SEM.

Summary of Model and Methods

The purpose of the prior study was to test a model linking authentic leadership behaviours with trust in management, perceptions of supportive group, and work outcomes in two samples of healthcare staff differentiated by their primary type of work as clinical or nonclinical. Specifically, we examined the structure of individual effects from authentic leader behaviours through trust in management and supportive group to work outcomes. We used four components of authentic leadership theory (self-awareness, balanced information processing, authentic behaviour, and relational transparency; (Avolio, Gardner, Walumbwa, Luthans, & May, 2004) to derive our model (Figure 4.1), in which we expected leader behaviours reflecting each component to contribute to increased staff trust in management. We also added two more leader behaviours to the model: supportiveness (the degree to which the leader responds to followers with genuine recognition and support) and empowering (the extent to which the leader provides freedom and choice in how work is accomplished).

In this secondary analysis, we used the *Worklife Improvement Through Leadership Development (WILD)* dataset, which included survey responses from employees of a Western Canadian regional health care facility, as the data source (Cummings, Spiers, Sharlow, & Bhatti, 2005-2007). We conducted the analyses with SPSS 15.0 (2006) for MS Windows and LISREL 8.54 (Jöreskog & Sörbom, 2003) for

model estimations. Maximum likelihood estimation and the χ^2 test-of-fit statistic to were

used to evaluate the overall fit of the model (Hayduk, Cummings, Boadu, Pazderka-

Robinson, & Boulianne, 2007; Hoyle & Panter, 1995).

We tested the hypothesized model in two samples of employees: clinical care

providers (n = 147), including nurses, pharmacists, physicians, and other professionals;

and nonclinical employees (n = 188), comprised of administrative, support, and research

staff. The models for the two groups are presented in Figures 4.2 (clinical) and 4.3

(nonclinical), with significant effects represented as thick lines and nonsignificant effects

as thin lines. The estimates of the effects in the models are presented in Tables 4.1-4.3.

In-text discussions of effects include unstandardized effects unless otherwise specified.

In the model-testing study, we found one fitting model (Figure 4.2) in the clinical

group, with a few significant effect estimates, and a nonfitting model (Figure 4.3) in the

nonclinical group, with a slightly greater number of significant effect estimates.

However, the findings of the model testing gave rise to some concerns that cast doubt on

the trustworthiness of the effect estimates that we obtained. Our intent in this paper is to

investigate further our model in terms of several methodological problems that might

have influenced our results. First, we provide more detailed rationale for the selection of

the single indicators that represent the latent concepts as well as the measurement-error

determinations. Then we investigate multiple indicators for each concept to examine the

measurement portion of our model. The lack of significant effects for several of the

leadership behaviours despite substantial estimates of the effects pointed to potential

collinearity problems, so we include a detailed analysis of the signs and implications of

multicollinearity in SEM. Because our model testing resulted in a troublesome

contradictory effect to the one hypothesized, we examine this potential sign of model

misspecification. To demonstrate the importance of homogeneity of causal forces in locating a fitting model, we compare the results of testing the same model in two separate groups with testing the same model in a combined groups approach. Last, although we purposely did not include reciprocal effects in our model to avoid identification problems, this decision had important ramifications for finding a model that reflects the real-world causal forces.

Methodological Issues and Their Implications

Asserting Meaning of Concepts: Deriving Indicators and Measurement Error

We chose single indicators of each latent concept in the model from the *WILD* data (Table 4.4). In this method we selected the indicator closest to the intended meaning of the latent variable as the best indicator and fixed the "effect" from the latent to a value of 1.0. Fixing this coefficient provides a measurement scale for the concept, which aids interpretation and avoids model identification problems (Hayduk, 1987). The measurement-error variance of the selected indicator is also fixed to a value that the researcher judges representative of the degree of measurement error in the indicator. Obviously, the amount of error here should be small if the indicator reflects the meaning of the latent variable and is free of methodological errors such as data-entry mistakes, missing values, participant recollection problems, and so on. Thus, the concepts are adjusted for a specific proportion of measurement invalidity in their respective indicators. In this way, information about the quality of the measurement is incorporated into the model. Specifically, measurement error for each indicator is fixed at a value equivalent to a particular proportion of the indicator variance. The remaining variance is then attributed to its corresponding concept. In other words, the meaning of concepts is influenced by

decisions about measurement quality through the process of fixing measurement-error

variance at specified values (Hayduk, 1987, 1996).

It is possible that the specified measurement-error variances were incorrect. We

address this concern by considering the second-best indicator of each latent concept as a

way to check on the potential adequacy of a single indicator. Once we had chosen the

second-best indicators, we left their error variances free and used them in a separate

multiple indicator analysis that we will discuss later. If these second indicators are also

good indicators of each concept, the proportion of error variance in these indicators

should not be far off the value that we fixed for the first variable.

Based on our assessment of how accurately each indicator reflected the

corresponding underlying latent concept, we adjusted the assessed quality of each

indicator by assigning 10%-25% of its variance as error (Table 4.5). We explain the logic

involved in determining the assessed proportion of each indicator's variance set as error

in the next section. The exact wording of the indicators selected for each latent are

presented in Table 4.4.

Voice. Voice behaviour is an act of speaking up that occurs without prompt and

when an individual has an idea or opinion to share for the betterment of a situation

(VanDyne & LePine, 1998). We measured voice behaviour by using an item (see

Table 4.4) from the *Areas of Worklife Scale* ([AWS] Leiter & Maslach, 2004) and rated

on a 5-point scale from *strongly agree* (1) to *strongly disagree* (5). This indicator, judged

closest to the concept meaning, was the idea of influencing management on the resources

needed to do one's job. We assumed that speaking up is a strategy that staff can use to

influence their immediate supervisor. We assigned 15% error variance because this item

was not as close to the meaning of speaking up as we desired.

Performance. We defined *performance* as an employee's appraisal of his or her functioning related to specific work tasks and role (Roe, Zinovieva, Dienes, & Ten Horn, 2000). The indicators selected to represent performance and burnout (see Table 4.4) were answered on a 7-point scale from *never* (1) to *daily* (7) in *The Maslach Burnout Inventory General Survey* (*MBI-GS*) (Maslach, Jackson, & Leiter, 1996). The item that we chose was a positive statement regarding one's self-rating of making an effective contribution to the organization. Subjective or self-rated measures of job performance have been criticized for high potential for bias due to factors such as negative affectivity, halo effect, and social desirability (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Taris, 2006). For this reason we assigned 20% of the measurement-error variance to this indicator.

Burnout. *Burnout* is either physical or emotional exhaustion usually caused by stress at work, with affected workers most often found among human-services professionals (Felton, 1998). We selected the indicator for burnout (Table 4.4) from the *MBI*, and the respondents specified their degree of agreement with the very direct statement "I feel burned out from my work." This item calls for some understanding of the term *burnout*, which we did not define in the survey, and because of its very subjective nature, it may be subject to self-report bias. We therefore assigned a 15% error variance to this indicator.

Trust in management. *Trust* is defined as "the willingness to be vulnerable to another party when that party cannot be controlled or monitored" (Mayer & Gavin, 2005, p. 874). The respondents' perceptions of the degree to which they felt trust in their immediate manager was the desired meaning. We selected the indicator (Table 4.4) from the fairness subscale of the *AWS* (Leiter & Maslach, 2004) and asked the respondents to

assess their degree of agreement/disagreement with the statement "Management treats all employees fairly." This item lacks a direct reference to the notion of trust in the immediate manager, which can potentially lead to confusion with overall organization management. However, we viewed this item as being closest to the concept of trust in manager and assigned an error variance of 20%.

Supportive group. The concept of *supportive group* means the extent to which members of the work group perceive that the group is helpful, understanding, and encouraging. We selected this item (Table 4.4) from the community subscale of the *AWS* (Leiter & Maslach, 2004) and asked the respondents to assess their degree of agreement/ disagreement with the statement "I am a member of a supportive work group." We assigned an error variance of 20% because of the potential for confusion over the definition of *work group* because many healthcare staff work varying shifts and with differing teams of colleagues.

We defined the following latent concepts as leader behaviours and selected their indicators from the items in the *Leadership Practices Inventory* (LPI), in which employees rated the extent to which their immediate supervisor engaged in these behaviours. They rated their responses on a 10-point scale from 1 (*almost never*) to 10 (*almost always*; Kouzes & Posner, 2003). We selected statements that best represented authentic leadership behaviours.

Self-awareness. *Self-awareness* is defined as "a process where one continually comes to understand his or her unique talents, strengths, sense of purpose, core values, beliefs and desires" (Gardner, Avolio, Luthans, May, & Walumbwa, 2005, p. 324). The indicator that we chose ("Asks for feedback on how his/her actions affect other people's performance"; Table 4.4) was not as close to the concept of self-awareness as our

definition was, but it did describe an important strategy to increase leader self-awareness: asking for feedback from others on the leader's performance. We considered this behaviour difficult for followers to accurately assess and therefore assigned a higher error variance of 20%.

Relational transparency. *Relational transparency* entails openness and appropriate self-disclosure of one's values, identity, emotions, and motives, as well as honest and transparent sharing of information and presentation of one's genuine self (Norman, 2006). The closest item to this concept, "Clear about his/her philosophy of leadership," did not entail the idea of genuine self-disclosure or the need for words and deeds to match intentions, although leadership philosophy should reflect one's genuine personal beliefs. We assigned the highest measurement error used in the model, 25%, to this indicator.

Balanced processing. *Balanced processing* involves processing self-esteem and non–self-esteem relevant information from a reasonably objective view that incorporates both positive and negative attributes and qualities (Avolio et al., 2004). The selected item seemed relatively close to this meaning because it stated, "Listens to diverse points of view," and we assigned an error variance of 10%.

Ethical behaviour. Ethical behaviour refers to acting in accordance with one's values and needs rather than acting to please others, receive rewards, or avoid punishments (Gardner et al., 2005). The item that we chose ("Follows through on promises he/she makes") was very close to this concept, and we therefore assigned it an error variance of 10%.

Trustworthiness. We defined *trustworthiness* of the manager by using three attributes that lead to a person's being more or less trusted: ability, benevolence, and

integrity (Mayer, Davis, & Schoorman, 1995). We assigned a 15% error variance to the item related to treating others with dignity and respect that seemed to capture the notion of trustworthiness, but contained a substantial social desirability bias. It might be difficult for healthcare workers to judge their manager harshly on such a basic human behaviour.

Supportiveness. *Supportiveness* refers to the degree to which the leader genuinely responds to followers' concerns and needs with recognition, support, and encouragement. We chose an item that was fairly straightforward and assigned a lower error variance of 10%.

Empowering. The concept of *empowering* encompasses the notion of enabling, giving, or delegating power and/or authority to others for the purpose of developing competencies in others. The item that we chose was close to this concept ("Gives people a great deal of freedom and choice in deciding how to do their work") but did not include the notion of authority or development. We assigned it 15% error variance.

Once we had determined the proportion of error variance in each indicator, we multiplied the variance of each indicator by the proportion of error variance to obtain the corresponding measurement-error values (Table 4.5). In the previous study we explored the sensitivity of this model to these measurement-error specifications in a series of 24 runs with each of the clinical and nonclinical groups and individually fixed each measurement-error variance at half and then at double the assigned measurement-error variance value displayed in Table 4.5 (Hayduk, 1987, 1996). The results demonstrate that these models were reasonably insensitive to alterations in the precise measurement specifications because no noteworthy changes in model fit and effects estimates arose from halving or doubling the measurement-error variance specifications.

Testing Multiple Indicators

To further understand the measurement portion of our model, we completed a new series of runs to investigate whether the addition of a second indicator for each latent concept individually improved or worsened the model fit or altered the model in other important ways. The addition of a second indicator may or may not change the meaning or identity of the latent variable. Thus, the issue is not fit, but what ill fit and changes in effect estimates claim about the possible theoretical latent variable's identity.

In considering what makes a second indicator reasonable or not, one must take into account the proportionality constraints inherent in structural equation models with double indicators for each latent variable. The simplest style of model constraint is that the covariance between two indicators that share a common latent cause must equal the product of two entities: the magnitude of the effects of the latent common cause on two indicators and the variance of the latent common cause. The covariances must be "strictly proportional to the magnitude of the effects of the common cause on each indicator" (Hayduk, 1996, p. 11) no matter how many indicators there are. When there are two indicators for each of two different latent concepts, it is the proportionality of these two indicators with the indicators of the other latent that display proportionality. These are "solid, rigid and uncompromising" (p. 11) constraints. The double-indicator model will fail if the data do not follow this proportionality. It becomes clear that adding more indicators increases the number of proportionality demands and hence increases the potential that the model will fail because it becomes more and more difficult to maintain these unavoidable proportionality requirements in the observed data unless the world's causal forces are similarly structured.

In testing our second indicators, we modeled the latent as the true value of the latent that now caused both the first and second indicators. This introduces constraints that might lead to the model's failure to fit some of the covariances of the second indicators with the other modeled indicator. There are two estimated coefficients, lamda (λ) and theta epsilon ($\theta\varepsilon$), for the second indicators, and these should result in a high R^2 or proportion of explained variance if the second indicator is working well. If the second indicator attempts to change the identity of the latent (tries to change what is being measured), this will appear as changes in the latent-level causal impacts sent or received by the latent variable. Therefore, changes in effects are the downside of the second indicators, which alters the meaning/identity of the latent. Therefore, for a second indicator to be working well it should have a high R^2, not increase the overall ill fit of the model more than would be expected by increasing the degrees of freedom due to more data covariances (with the p value as proxy for this), and leave the effect estimates essentially the same.

From the review of the dataset, we selected the best two indicators for five (self-awareness, relational transparency, balanced processing, ethical behaviour, and supportiveness) of the seven background latent variables. No reasonable second indicators of the remaining two concepts were available in the dataset (Table 4.4). We also selected second indicators for each of the endogenous latents, trust in management, performance, and burnout. We added the second indicators one at a time to each of the final models that we discussed earlier. We examined the estimates, overall model fit, standardized residuals, modification indices, and R^2 for each of the 16 different models to determine which of the second-best indicators would function adequately as measures of

the corresponding latent variables. We discuss our evaluations according to each latent concept in the following section (see Table 4.6).

Performance. In the clinical group, when we added a second indicator for performance, the model fit improved and effect estimates remained the same. In the nonclinical group the model fit remained the same, as did effect estimates. However, the R^2 indicator was very low in both models (15% in the clinical and 8% in the nonclinical), which indicates considerable measurement error, and not as much of their variance is explained by the respective latent variable.

Burnout. Adding the second burnout indicator resulted in a worsened fit, with no changes in effects in the clinical sample and an improved fit and a few very slight (+.01) changes in two effects in the nonclinical sample. In both models the R^2 for that indicator was moderately high (72% and 61%, respectively).

Trust in management. Model fit improved in both samples with the addition of the second trust indicator, but the R^2 values were low—43% and 34%—in the clinical and nonclinical models, respectively. The effect estimates increased in size for four trust coefficients, ranging from 4% to 12% in the clinical model and changing only slightly in the nonclinical model.

Self-awareness. Model fit was worsened by the addition of the second indicator for self-awareness in both groups, and effect estimates remained the same in the clinical group and changed only slightly in the nonclinical group. In the nonclinical group the addition of this second indicator caused the highest chi-square and lowest *p* value. The R^2 for this indicator was moderate (61%) in the clinical group and lower (42%) in the nonclinical group.

Relational transparency. Model fit decreased, but not markedly, with the addition of the second indicator for relational transparency in both groups. Effect estimates changed slightly, and the R^2 was moderately high—76% and 88%—in the clinical and nonclinical groups, respectively.

Balanced processing. The addition of this second indicator contributed to considerable model ill fit in both groups, no changes in effect estimates in the clinical group, and slight changes in the nonclinical groups. The R^2 in both groups was similar: 49% (clinical) and 55% (nonclinical).

Ethical behaviour. In the clinical group the weakest performing second indicator occurred for ethical behaviour, which caused the highest chi-square and lowest p value, but there were no changes in effect estimates. Along with the balanced-processing second indicator, these pairs had the largest number and size of standardized residuals. However, the second indicator for ethical behaviour in the nonclinical group performed better than it did in the clinical sample, with much less model ill-fit and only slight changes in effects. Surprisingly, this indicator had a much higher R^2 value of 70% in the clinical sample than in the nonclinical (50%).

Supportiveness. The addition of this second indicator worsened the model fit in both groups, but the degree of ill fit was much greater in the nonclinical group. There were no effect estimates changes in the clinical group and only slight changes in the nonclinical group. The R^2 values were high in both groups: 81% (clinical) and 74% (nonclinical).

Summary of the second indicator investigations. In general, in the clinical sample the overall model fit decreased with the addition of a second indicator for each of the leader behaviour latent concepts, but effect estimates did not change or changed very

slightly with each additional indicator for leader behaviours. The best pairs of indicators were those that we selected for burnout, relational transparency, and supportiveness, as determined by the least reduction in overall model fit from the best model described earlier, minimal changes in effects estimates, and large R^2 for the second indicator (81% for the supportiveness indicator, 76% for the relational transparency indicator, and 72% for burnout). As in the clinical sample, the addition of a second indicator for each of the leader behaviour latent concepts decreased the overall model fit in the nonclinical sample. The best pairs of indicators were those that we selected for relational transparency and burnout. The R^2 of the indicators in the nonclinical group ranged from 42% to 88%; the indicators for relational transparency (88%), supportiveness (74%), and burnout (61%) showed the greatest explained variance by their respective concepts. These R^2 values are similar to the values in the clinical sample for the same indicators within 7%-12%. The lowest R^2 value was for the self-awareness indicator (42%), which demonstrates that this indicator is problematic.

Thus, the only two indicator pairs that came close to satisfying all three conditions for effective second indicators in both groups were for burnout and relational transparency. All of the others are questionable because they presented one or more of low R^2, model ill fit, or considerable changes in effects estimates.

In general, the model chi-square increased markedly with the addition of each second indicator. We noted only slight changes in beta effects and only very slight changes (average increase or decreases of 0.01 to 0.03) in significance of effects among the latents for any of the 16 runs. In the models that we tested, the proportionality constraints implied by the model for trust in management and performance indicators in the clinical sample and trust in management and burnout indicators in the nonclinical

sample were similarly proportional in the data covariances to result in improved overall model fit. Most important, the majority of even the most similar pairs of indicators did not function well to measure the same concept despite the fact that the indicators came from validated instruments. This suggests that we should not assume that scales or subscales are true measures of unitary concepts without some critical examination of their causal connections to latent concepts through SEM rather than traditional factor-analysis procedures. The need for more precise conceptualization of latent concepts that clearly distinguish between the items that fail to reflect a single latent is warranted. The use of a single or the few best indicators optimizes measurement and allows for the investigation of more definitive and precise latent concepts (Cummings, Hayduk, & Estabrooks, 2006).

Multicollinearity Among Exogenous Variables

Collinearity (or multicollinearity) can occur when two or more variables are so highly correlated that it becomes difficult or impossible to distinguish their individual causal actions. When the intercorrelations among some variables or sets of variables are high (>.85-.95), certain mathematical operations can become either impossible or unstable (Kline, 2005). In SEM, multicollinearity can contribute to empirically underidentified models in that, if the variables are highly correlated, then they become redundant and hence reduce the effective number of informative covariances in the data (Kenny, 1979). Full-blown underidentification is not relevant here because all of the models converged. But we remain concerned about borderline underidentification, which can result in incorrect coefficient estimates with inflated standard errors (Grewal, Cote, & Baumgartner, 2004). Reviewing the correlation matrix among the estimates is one useful method of locating collinearity problems.

High collinearity becomes a concern with correlations over 0.9. Yet Grewal et al. (2004) demonstrated in a series of Monte Carlo simulations that when multicollinearity is between 0.6 and 0.8, Type II errors can be greater than 50% if measure reliability is low (<0.7), explained variance in the endogenous concepts is low, and sample size is small (ratio of 3:1 or less [i.e., number of observations to number of parameters]). Solutions to multicollinearity have generally consisted of dropping one of the collinear variables, creating a scale of the collinear variables, or using collinear items as multiple indicators of a concept (Hayduk, 1987; Kline, 2005). Reducing the amount of measurement error by using high-reliability scales or clean single indicators may be another approach to resolving the estimation issues connected to high indicator correlations.

In our leadership model the lack of significant effects for several of the leadership behaviours despite substantial estimates of the effects is one potential sign of collinearity problems. High correlations among the exogenous latents could result in large standard errors of the estimates (because of mathematical uncertainty regarding which of the collinear variables were really producing the effect). Hence, the statistical insignificance of seemingly substantial effects (see the trust in management row of Table 4.1). The amount of explained variance was greatest for trust in management in both groups (50% and 43% in clinical and nonclinical, respectively) even though there were no significant effects from the exogenous variables to trust in the clinical group and only one in the nonclinical group. The large correlations among some of the exogenous latents (η_6 through η_{10}) in the clinical group (.62-.92) were high enough to inflate the standard errors of the corresponding effect estimates. Specifically, the standard errors for the effects on trust are about one and a half to twice as large in the clinical group, as are the

corresponding standard errors in the nonclinical group, where the corresponding latent correlations are somewhat lower (.52-.79; compare Tables 4.1-4.2).

The correlation coefficient (r) between two exogenous variables/concepts is equal to the covariance between these concepts divided by the square root of the product of the concepts' variances. Thus, increasing the variances of the exogenous latents increases the size of the denominator in this formula, thereby decreasing the size of the correlation between the concepts. We can increase the variance of each latent concept by decreasing the proportion of measurement error assigned to the indicator of each concept. To investigate whether reducing the measurement error would allow for greater separation of leadership effects, we ran a model with the clinical sample using reduced measurement-error assignments ranging from 5% to 10% on all variables instead of the previously assigned 10% to 25%. We made the same modification as in the first version and found a fitting model and ($\chi^2 = 29.78$, $df = 25$, $p = 0.23$). We assigned the exogenous leadership variables η_6, η_7, and η_{12} a 10% measurement error; η_8, η_9, η_{10} and η_{11}, 5%; and all others, 10%. As before, none of the coefficient estimates for η_6 to η_{10} and trust were significant, although the standard errors for the coefficient estimates were much lower (0.05 to 0.07) than in the original model (.16 to .27). Hence, the T-values tended to be higher (-0.88 to 1.62) than those in the final model (-0.67 to 1.24) with the original measurement errors. The unstandardized effect size for η_6 to η_{10} on trust were lower (-.05 to .09) than in the original model (-.18 to .23), and R^2 was reduced because of the implicitly larger latent variable variances. The correlations among the exogenous variables were indeed reduced, but only modestly (.53 to .82). Some degree of multicollinearity is still present even if we assume that what we view is unrealistically optimistic measurement error (little measurement error).

To address the multicollinearity issue, combining the leader behaviour indicators under one latent variable may seem to be a potential solution if indeed the indicators represent highly interrelated concepts. We investigated this in the clinical group by specifying the four indicators of self-awareness, relational transparency, balanced processing, and ethical behaviour (the four components of authentic leadership according to Avolio et al., 2004) as indicators of an authentic leadership latent variable. We fixed the self-awareness indicator and its effect to the latent to a value of 1.0, which provided a measurement scale for the concept that aids in interpretation and helps to avoid model "identification problems" (Hayduk, 1987, p. 147). We fixed the variance of this indicator to include 20% of the variance, which reflected our assessment of a representative degree of measurement error in the indicator. We added the second, third, and fourth indicators and left their loadings and measurement-error variances free. We left the estimated latent paths the same in this model as in the originally hypothesized model, except that we replaced the previous individual paths from the four former latent concepts (self-awareness, relational transparency, balanced processing, and ethical behaviour) with effects from the new latent, authentic leadership, to trust, performance, and burnout.

The initial fit of this model was poor (χ^2 = 140.0, df = 41, p = 0.00). We added the same coefficient in the original clinical model (coefficient from empowering to voice), which improved chi-square slightly, but the model remained significantly inconsistent with the data (χ^2 = 130.42, df = 40, p = 0.00). The path from authentic leadership to trust was significant (β = .17, SE = .09, $p \leq$ .05), as was the path from trust to voice (β = .23, SE = .11, $p \leq$ .05). There is still a negative relationship between trust and performance, but not significant. This failing model has a significant effect between the exogenous variable (authentic leadership) and trust.

We are no further ahead in being able to determine which of the leader behaviours actually had significant effects on trust. Our concern is how a theorist can claim that a concept such as a particular type of leadership can have effects on outcomes when in fact the subconcepts (behaviours) within are too interconnected to differentiate which are causing effects. Yet they are also so disparate that they may not all reflect the same concept of authentic leadership. More important, there is evidence that all four indicators do not effect the same latent called trust.

In one additional examination of the effect of the degree of measurement error on the collinearity issue, we simultaneously halved the originally asserted measurement error for the set of exogenous variables η_6 to η_{10} that showed some of the highest intercorrelations and scrutinized the effects estimates (size, standard errors, and significance) of these variables with trust. This procedure was different from that with the models that we previously estimated in which we halved the measurement-error specification on one variable at a time and reduced the proportion of measurement error on all of the model variables simultaneously, not just the indicators of η_6 to η_{10}. Model fit improved very slightly ($\chi^2 = 29.45$, $df = 25$, $p = .25$), and correlations among the estimates decreased by about 10% in size from .62 to .92 in the original model to .55 to .74. All estimates that previously ranged from -.18 to .23 (unstandardized) in the original final model decreased in size as expected to a range of -.06 to .10. The standard errors decreased as well from a range .16 to .27 to almost a third of their prior values, a range of .05 to .07. In all cases, the significance level increased, although none of the estimates reached significance (T values ranged from -0.67 to 1.24 in the original model and increased to a range of -.94 to 1.53). These observations suggest that collectively linking the meaning of the latent variables more closely to the specific meaning of their

respective indicators by reducing measurement error allows a greater separation of the unique effect of each leader behaviour on trust. However, the very modest reduction in the correlations among the estimates suggests that this procedure did not help much to reduce the collinearity problem.

Detecting Signs of Model Misspecification: Counterintuitive/Contradictory Effects

A significant χ^2 is one indication of possible model specification problems. But fit of the implied model to the covariance matrix does not necessarily mean that the model is properly causally specified (Hayduk, 1987). Hayduk, Cummings, et al. (2007) recommended assessing the "distribution, location and size of the residual discrepancies" because they might provide more insights into model problems, especially in the case of models that fit via the traditional level of significance in the χ^2 test (p. 849). For example, if there is a large discrepancy between the model-implied and observed covariance because of an omitted missed direct effect of one variable on another, this might be spotted in the pattern of residuals or in the modification indices. A small but patterned set of residuals may also be a sign of important model misspecification problems (e.g., see Hayduk, Pazderka-Robinson, Cummings, Levers, & Beres, 2005). No obvious large or patterns of smaller residuals were evident in the models that we considered.

Inspection of coefficient estimates for direction of effects is another important diagnostic procedure. An unexpected sign for an estimate—for example, a negative effect estimate when a positive one is expected—could be a sign of a model problem or incorrect specification. That is precisely what occurred in both the clinical and nonclinical leadership models. Surprisingly, the final clinical model showed a borderline significant negative effect of trust on performance ($\beta = -0.39$, $SE = .20$, T-value $= -1.97$), which implies that increased trust in management contributes to lower self-rated

performance, which is counter to our theory and previous research findings. This remains a noteworthy concern despite the fact that this estimate appeared in the clinical model, which fit the data by displaying a nonsignificant χ^2. We observed a similar negative coefficient in the nonclinical model, although it did not reach significance (β = -0.17, SE = .17, T-value = -1.00) in the final model. This negative effect was present in the initial clinical model estimates (β = -0.38, SE = .20, T-value = -1.86) but became significant when we made the first modification; thus improving other model features may have made more apparent whatever it was that drove the unexpected negative estimate. The standardized residual was small, between the trust and performance indicators in the initial model (-0.34), but increased and changed the sign to +0.47 when we made the only model modification (when we freed the empowering to performance effect). The fact that the trust to performance effect becomes strange when an effect of empowering on performance is introduced implicates the coordination between trust and empowering as one location for a misspecification. That is, by adding a control variable (empowering) to the equation for performance, the value of a preexisting slope or effect coefficient changes because the newly entered control variable is both causally effective and correlated with the other tentative cause (trust; Hayduk, 1987, p. 47). A variety of model features contribute to correlations between these variables; therefore, precisely where an offending misspecification might be remains unclear.

One possibility is that other variables not measured or included in the current model could influence the specified relationships. That is, we should not necessarily expect to resolve this issue by making changes to the current model. The resolution of this troubling feature may require variables that are not currently available to us and/or theorizing in fundamentally different ways. It is interesting to note that when we reduced

the measurement error on all the variables in the clinical model described above (trust to

10% and performance to 10%), the same negative effect remained, although it was

slightly smaller and slightly further from significance (β = -0.30, *SE* = .16,

T-value = -1.83). This example highlights the point that in SEM one must consider all the

diagnostics as interconnected rather than trying to fix one problem at a time. Inspection

of the coefficients for the direction of effects such as a negative effect when a positive

one is expected could be a sign of incorrect model specification, in which case the effect

estimates cannot be trusted to be free of bias.

Causal Homogeneity: Separate Groups versus Combining Groups

Homogeneity of the causal forces that link leader behaviours to work outcomes is

important to attain properly specified and fitting models (Hayduk, 2001). Because

maintaining an adequate sample size is an important consideration in SEM, the

examination of specific homogeneous group effects is often overlooked when the sample

size is limited. Although the subjects in both samples were members of the same regional

organization, we hypothesized that, within a sample of healthcare employees in the same

facility, the responses of some groups to leadership influences would differ. Specifically,

we expected that professional groups with direct clinical responsibilities for patient care

would have precise and demanding expectations of their organizational leaders in relation

to support for the delivery of patient care (Laschinger, Finegan, & Shamian, 2001; Lowe,

2006). On the other hand, nonclinical employees may have very different expectations of

their leaders based on their specific work requirements.

We can demonstrate the salience of causal homogeneity by comparing the results

of testing the hypothesized model in each of the two groups with the results of testing the

model with the two groups combined. The same initial model was estimated for the

clinical, nonclinical, and combined groups. The covariance matrix for the combined

group model was a matrix of data from all the respondents. (The variance/covariance

matrices for the clinical, nonclinical, and combined groups are included in Appendices B,

C, and D, respectively). The initial χ^2 for the clinical group was 39.81 ($df = 26$,

$p = 0.041$), 62.72 ($df = 26$, $p = 0.00$) for the nonclinical group, and 52.81 ($df = 26$,

$p = 0.0014$) for the combined model. The adjusted goodness of fit index (AGFI) was

0.87, 0.84, and 0.92 for the clinical, nonclinical, and combined groups, respectively,

which indicates sizeable inconsistencies between the model and the covariance data

(Table 4.7). First, we will report a summary of the modifications and fit results connected

to each model because the detailed descriptions of diagnostics for the separate groups are

reported in Paper 3. Then we will compare the effect estimates, explain variance, and

present a summary interpretation.

Model modifications. We made only one modification to the clinical model.

Freeing the empowering to voice coefficient resulted in an improved and fitting model,

with a $\chi^2 = 29.60$ ($df = 25$, $p = 0.24$; Table 4.7). The initial run of the nonclinical sample

showed a poorer fit in terms of χ^2 (62.72) and probability ($p = 0.00$). We made the three

most theoretically reasonable modifications: We freed supportiveness and burnout,

ethical behaviour and performance, and burnout and voice. Although still not a fitting

model, these changes improved the overall fit to a $\chi^2 = 41.64$ ($df = 23$, $p = 0.01$). In the

initial combined model, freeing the empowering to voice and the burnout to voice

coefficients resulted in an improved and fitting model with a $\chi^2 = 28.95$ ($df = 24$,

$p = 0.22$).

Effect estimates. As for significant effects, there were six in the clinical, eight in

the nonclinical, and nine in the combined groups (Tables 4.1-4.3 and Figures 4.2-4.4).

Five of the significant effects in the clinical model (the only fitting single-group model) were present in the combined model. The only two significant effects (trust to voice and supportiveness to supportive group) common to both the clinical and the nonclinical model were also significant in the combined model. The combined model included three additional significant effects from the nonclinical model, but we did not free the other two from the nonclinical model, ethical behaviour to performance and supportiveness to burnout, for estimation because the review of the diagnostics in the combined sample did not warrant it. As well, the balanced processing to burnout coefficient in the final nonclinical model was not significant in the combined group model.

All models exhibited the same lack of significant effects from the exogenous leader behaviour variables through the mediating mechanisms of trust and supportive group. The nonclinical and combined models showed a large significant positive effect between relational transparency and trust ($\beta = .27, p \leq .05$ and $\beta = .20, p \leq .05$, respectively), although the same effect in the clinical sample was large, nonsignificant, and in the opposite direction ($\beta = -.18$). The previously described multicollinearity problem in the clinical group was not as evident in the combined group.

Trustworthiness, supportiveness, and empowering were hypothesized to effect burnout, performance, and trust through supportive group. However, supportiveness was the only variable to significantly influence supportive group, and this was the case in all three groups. There were significant indirect effects from supportiveness through supportive group to trust ($\beta = .04, p \leq .05$), performance ($\beta = .07, p \leq .01$), and burnout ($\beta = -.07, p \leq .05$) in the combined model; whereas only the supportiveness to trust indirect effect in the clinical group ($\beta = .05, p \leq .05$) and the supportiveness to performance indirect effect in the nonclinical group ($\beta = .08, p \leq .05$) were significant.

Thus, the combined group reflected the supportiveness routing of both separate groups plus an additional route to burnout. Empowering had a significant positive effect on performance in the clinical ($\beta = .21, p \leq .01$) and combined ($\beta = .13, p \leq .01$) models only, and supportive group had a positive significant effect on performance in the nonclinical ($\beta = .43, p \leq .05$) and combined ($\beta = .41, p \leq .01$) groups. As discussed earlier, the final clinical model included a problematic and borderline significant negative effect between trust and performance ($\beta = -.39, p \leq .05$), and both the nonclinical ($\beta = -.17$) and combined ($\beta = -.22$) models had the same negative effect between trust and performance, although not significant.

In general, the combined group has all but one (the problematic negative effect trust to performance) of the significant effects from the clinical model and five out of eight (62.5%) significant effects from the nonclinical model. One additional coefficient that was not significant in each of the clinical and nonclinical samples was significant in the combined group (supportive group to burnout). The pattern of lack of significant effects from the exogenous variables is evident in all three models. The R^2 values were generally similar in size in all three groups even though the causal paths that provided the explanation were different. The R^2 values in the combined model seemed to be situated between the clinical and nonclinical model values for burnout and trust, though the explained variance was highest for voice (24%) and supportive group (31%) and lowest (10%) for performance in the combined model.

Stacking analysis. Another way to investigate the possibility of causal nonhomogeneity is to use the multisample or "stacked" modeling procedures. A stacked model two or more groups that are "stacked" together in the same model run for simultaneous model estimation. In this way, differences in the estimates of effects in the

groups can be investigated by between-group constraints, and one overall χ^2 test of model fit is produced. This procedure allows for some of the effect coefficients to be constrained to make them equal between groups, whereas other coefficients are allowed to vary between groups. First, we estimated the stacked model with the coefficients unconstrained between the two groups and checked that the model χ^2 was the sum of the prior model χ^2 values ($\chi^2 = 71.25$, $df = 48$, $p = .016$). Second, we constrained all of the common effect paths to make them equal between the two groups. This model resulted in a larger and significant $\chi^2 = 96.30$ ($df = 67$, $p = 0.011$). The χ^2 difference between the unconstrained and constrained models was not significant by traditional standards ($\chi^2 = 25.05$, $df = 19$, $p = .10$), but this is far from reassuring. Although differences exist between the estimates in the groups (Tables 4.1-4.2) for the initially postulated effects, these differences are not so pronounced as to be collectively significant. Some effects may differ between the groups; others may not. In terms of model fit, it is interesting that we achieved a nonsignificant chi-square in the combined group model after two modifications (Table 4.7), but using the stacked approach to model estimation with the two separate groups resulted in a failing model. That is, the combining of the groups obscured differences that we detected when we investigated the groups separately.

Summary. We suggest that starting with a single model applied to two groups is the best way to reflect the causal forces that underlie the leadership mechanisms that we believed might be operating within the respective staff groups and create a more specific understanding of effects within each group rather than beginning with a combined-groups approach. As it turned out, we could see from the stacked model approach that there were no significant differences collectively or as a set in the separate groups on the common estimated effects between the groups. However, there were some differences in terms of

the different modifications that we made (one in the clinical and three in the nonclinical) in each group, and we did not find a fitting model in the nonclinical group, whereas the clinical model fit. Perhaps the nonclinical group was more heterogeneous than the clinical group because it included several subgroups of employees, support workers, clerical and administrative staff, and research personnel, and perhaps differing causal effects contributed to their attitudes. Of course, heterogeneity in one group would argue against even combining the groups at all. The picture was different in terms of finding a fitting model when the heterogeneous nonclinical and the clinical groups were combined in an "all-cases-in-one" model compared to the stacked approach, in which each group is allowed to have some differences, but other coefficients are constrained to be equal. The all-cases-in-one combined model contains even more widely heterogeneous set of cases. An increase in sample size (n = 335) should have resulted in an improved ability to detect differences between the observed and model-implied combined variance matrices; thus the fact that this model fit despite the group differences in effects suggests that the combined data covariance matrix tended to obscure real group causal differences. This was not the case when we used the stacked approach to compare the separate groups. Comparison of unconstrained and constrained stacked models showed no collective differences in effects even though there were some clear specific differences. The combined model seems to be a hybrid of the separate groups, which obscures the specific variations within each group in terms of significant effects.

Reciprocal Effects

Mutual causation among two variables in cross-sectional data is known as *reciprocal effect*, and models that contain reciprocal effects are called *nonrecursive*. Some authors have argued that cross-sectional data are inappropriate for estimating

reciprocal relations because of the time factor (Hunter & Gerbing, 1982). The argument

is that if a reciprocal relationship exists, it cannot be observed at the same time. But

others have disagreed, stipulating that with nearly synchronous effects, it is difficult to

identify the exact time lag; and if it is fairly small, then nonrecursive cross-sectional data

may be a practical representation of the reality for synchronous reciprocal effects (Wong

& Law, 1999). Estimation of reciprocal effects with cross-sectional data requires the

assumption of equilibrium, which means that any changes underlying the system for the

presumed feedback relationship have already manifested their effects, and the system is

in a steady state (Kline, 2005). In addition to the issue of the time factor, nonrecursive

models can present problems in terms of parameter identification (Schaubroeck, 1990).

Identification problems in nonrecursive models might be another reason that reciprocal

paths are avoided. Underidentification is guaranteed to occur when the number of

parameters/coefficients to be estimated exceeds the number of data variances and

covariances; that is, the data contain insufficient information for parameter estimation.

Reciprocal effects can contribute to underidentification unless variables are included that

"cause one or the other, but not both, of the reciprocally related variables" (Hayduk,

1987, p. 145; Rigdon, 1995).

Lack of understanding of and apprehension about the difficulty of models with

reciprocal effects is another reason that they are avoided. Although reciprocal effects in a

model add to the complexity of analysis and a potential identification issue, they should

not be avoided because it is important to develop the correct model in the search for an

understanding of the causal effects in the real world. If all theorists in a particular field

avoided reciprocal effects in their modeling, we would be in potential danger of routinely

operating on faulty interpretations by selectively missing whatever real reciprocal effects

exist. Ignoring real reciprocal effects can lead to biased estimates of effects in a recursive model. A more serious theoretical concern is that overlooking reciprocal effects may provide a nearly covariance-equivalent explanation of the observed indicator correlations (Hayduk, 1996). As theorists, we aim to achieve the best theoretical explanation of how causal actions operate, not merely "explanations" that are consistent with some data (the covariance data) while misrepresenting the underlying causal forces.

Not having been sufficiently attentive to the necessity of seeking proper model specifications, even if it meant tackling reciprocal effects, we purposely did not include reciprocal effects in our model to avoid potential identification problems and because none were posited in our interpretation of the effects of leadership behaviours on work outcomes. However, it is quite possible that there could be a reciprocal effect between burnout and voice (or speaking-up behaviour) in our model. There was a location where the data-prompted model modifications might have actually pointed to reciprocal effects even if we had not initially been receptive to the idea. We added an effect from burnout to voice in the nonclinical group based on the diagnostics. But a case might also be made for an effect that runs from voice to burnout. Employees who are exhausted from overwork may have little energy or inclination to speak up about their work conditions or the equipment they need to do their work. It is plausible that if staff members do not feel free to speak up to get the conditions or equipment they need to do their jobs, they might perceive that they are doing the best they can under the circumstances, but end up feeling exhausted or burned out as a result of inefficiency. Thus there may be both effect directions, and possibly even both simultaneously.

We investigated this in the nonclinical group, where we added the burnout to voice coefficient in the final model prompted by an MI = 6.43 (versus an MI = 2.81 for

voice to burnout). The burnout to voice effect estimate was significant (β = -.14[unstd.],

-.22[std.], SE = .06, $p \leq .05$), and the final model had a χ^2 = 41.64 (df = 23, p = 0.01).

When we estimated the nonclinical model with a voice to burnout coefficient freed for

estimation instead of the burnout to voice path, that path was also significant and similar

in size, but the standard error was about double the size of the other path (β = -.31 [unst.],

-.20 [std.], SE = .13, $p \leq .05$). In addition, the final model did not fit quite as well as the

previous one had (χ^2 = 43.00, df = 23, p = 0.0069). But this does not really address the

potential for reciprocal effects because both models would be misspecified if reciprocal

effects existed.

When we entered both paths in the final nonclinical model, we found an increase

in the number of iterations required for convergence to the final estimates (from 7 to 11),

the model fit decreased very slightly to χ^2 = 41.36 (df = 22, p = .0075) from the original

final model, and the R^2 for both burnout and voice decreased from that in the final

nonclinical model. The estimated effect sizes increased for both burnout to voice

(β = -.23, SE = .12) and voice to burnout (β = +.25, SE = .33), but these effects remained

insignificant because the standard errors also increased substantially. The voice to

burnout effect changed from negative to positive, which is counterintuitive and a clear

warning that the estimates of this model are not to be trusted.

Model identification should not have been an issue when we added the reciprocal

effects because each variable, voice and burnout, had different predictor variables (e.g.,

trust to voice and supportiveness to burnout). But identification is also responsive to the

strength and significance of the effects from the "unique predictors." The inflated

standard errors suggest that although these effects may have been strong enough to avoid

severe underidentification, they may not be strong enough to obtain small standard errors

for the estimates. The large standard errors for the reciprocal effects and the change in sign of the voice to burnout path may indeed signify identification problems. Chi-square was essentially the same, but with one less degree of freedom.

An additional way to investigate reciprocal effects is by specifying one of the reciprocal effects as a fixed value and estimating the other value. The estimation difficulties are reduced because only one effect is estimated, and it is estimated conditional on the "hopefully reasonable" value specified for the other fixed effect. Selecting the anticipated smaller effect, provided that this is the smallest reasonably signed value that would be substantially important, gives us the ability to estimate the other of the reciprocal effects conditional on, or as if there was, a small return effect. We tried this by specifying the voice to burnout effect as -0.10 based on the findings from the previous model. When we added this effect as a one-way direct effect, the voice to burnout effect was smaller in size (standardized) than the burnout to voice effect. This model converged easily (seven iterations), and the burnout to voice effect was not significant (β = -.10[unstd.], -.16[std.], SE = .06, T-value = -1.87), but was more strongly standardized than the fixed weaker effect of voice to burnout. The model fit decreased very slightly from the original nonclinical model (χ^2 = 41.93, df = 23, p = .0092) and the explained variance for burnout increased 2% to 32% from the original model.

We tested one additional model in which we lowered the fixed value for voice to burnout to -.08. In this model the burnout to voice effect was significant (β = -.11[unstd.], -.17[std.], SE = .06, T-value = -2.01). The model fit improved very marginally (χ^2 = 41.87, df = 23, p = .0094) and the explained variance for burnout decreased by 1% from the previous model. Thus there is no definitive determination. The model and data are insufficient to clearly speak for or against this possible loop-creating effect (it could

not be cleanly estimated), but it seems that fixed values of -.1 or larger render the return effect insignificant, so defending a larger value of voice to burnout would require weakening or abandoning a burnout to voice effect.

Reporting SEM Results: Moving Beyond Estimates as Conclusions

For beginners who are learning the "mechanics" and substance of testing theory using SEM, it is very possible to become so absorbed in the complexity and details of model features and the technical side of testing models that we miss the overall picture of what the results are telling us about the model. Perhaps, in an attempt to focus on what seems tangible and interpretable, the effect estimates become the center of attention in results reporting. How do we describe "Our model did not work as intended?" Because the practitioner in us wants to know and describe the implications of the research for leaders/managers, our discussion of the results started there with a full articulation of what seemed positive and clear, such as the significant effect estimates, how they compare to past and current literature, and how they translate to the practice situation. After all, one model fit the data reasonably well by displaying a nonsignificant chi-square. However, establishing model fit and locating significant effects are only the first steps in beginning to appreciate the overall meaning of the results.

Initially, our reconsideration concentrated on details such as large standard errors in the clinical sample and the contradictory negative effect between trust and performance in both groups, which may have distracted us from observing additional and more critical signs of model problems. For example, what does it mean that one model fit the data and the other did not? Moreover, of what value is model fit when there are many nonsignificant effects that we hypothesized to be significant? What we did not appreciate prior to more detailed model investigations was the need for all of the results to match all

of the hypothesized paths. What do high R^2 values for endogenous variables really mean when there are no/few significant effects leading to them? What are the consequences of not entertaining the notion of reciprocal effects when such a possibility might exist? How does the collinearity problem in one model—specifically, in the one fitting model— influence the effects estimates in size, standard errors, and significance? Why did the clinical model seem so affected by multicollinearity and the other not? The two mediating mechanisms, trust and supportive group, were important elements of the model, and yet there were few significant indirect effects involving these variables, and there was a tendency for the modification indices to bypass these variables by going directly from exogenous variables to the outcome variables.

All of these questions and observations are important to developing the "big picture" of model results, and there seem to be no rules of thumb or simple routes to put together the pieces to see what it all means. In fact, without an overall assessment of model trustworthiness or lack thereof, the effects are really secondary and somewhat doubtful. We now see that model fit does not guarantee that the model is correct or that it has no theoretical competitors. The process takes open-mindedness to explore other alternatives, a willingness to entertain the possibility of a failing model, perseverance in going back and forth between model details and thinking about what the details mean; and, above all, some patience to simply wait for the insights to filter into consciousness.

Conclusions

Our discussion of the methodological issues that we encountered during the investigation of a theoretical model that links the causal effects of leadership behaviours on work outcomes led to the formulation of several conclusions on the features of SEM.

First, using single indicators of latent concepts is a viable method to create precise causally specified models. We described the process of determining measurement error and judging concept meaning to adjust the concepts for a specific proportion of measurement invalidity in their respective indicators. The explanation of testing multiple indicators—that is, two indicators per concept—showed the link between the number of indicators and model fit and the difficulty involved in finding indicators that work well together by demonstrating their compliance with causally required proportionality constraints. Also, we should not assume that scales or subscales are true measures of unitary concepts without a critical examination of their causal connections to latent concepts through SEM rather than traditional factor-analysis procedures. Our investigation of the higher correlations among the exogenous variables in the clinical group showed that linking the meaning of the latent variables more closely to the specific meaning of their respective indicators by reducing measurement error may allow a greater separation of the unique effects of highly interrelated concepts. In fact, we identified an important theoretical dilemma in that the indicators were too similar to be separated and yet too dissimilar to be indicators of one single latent, authentic leadership.

The value of fastidious diagnostic assessment of model residuals and coefficient estimates is essential, especially in light of contradictory effect directions that are liable to be evidence of model problems. The potential for model misspecification in SEM is a serious issue because it may contribute to biased estimates of effects, to failure of the model to fit the observed data, or, most important, to model fit when the model does not properly represent the worldly causal forces. Overall, we advocated adequate assessment of features such as the pattern, size, and location of residuals; review of modification indices and their relevance to theoretical meaning; and inspection of coefficients,

standard errors, and degree of explained variance because they are critical to recognizing potential model misspecification even when there is acceptable chi-square fit. We then demonstrated the importance of causal homogeneity to well-specified models with good fit. That is, the premature combining of groups may obscure differences detected when groups are investigated separately. Our model investigation underscored the need to explore the possibility of alternative causal specifications such as reciprocal effects in model development. We have concluded with a discussion of the challenges in developing a report of model testing results that includes not only an evaluation of the effect estimates, but also the substantive elements of the model as a whole and what that means for the articulated theory.

We are convinced of the difficulty of the challenge in realizing the overall importance and substantive contributions of a model. It is easy, yet misleading, to become trapped in seeing only the details of effects and their significance or the modifications that were made, or even the precise model-fit statistics, and thereby to get lost in the myriad of statistical details. It takes a real effort to see each kind of detail, and it takes substantial additional effort to see the place of these details in the big picture of what the model tells us about the substantive research area. Our theory seems to be incorrect in a number of places in suggesting effects that we were not able to locate. This and a multitude of other details tell us that there is much more to learn about the causal forces that link leadership behaviour to trust and work outcomes such as performance, trust, and burnout. Furthermore, we now see the research literature on leadership and trust in a much different light. Claims of possible causal connections between leader behaviours and trust that are largely based on correlations or, at best, regression must be viewed with wariness. Useful advances in leadership theory are likely to occur from the

development, testing, and diagnostic investigation of theory with clearly specified causal

relationships by using SEM methods.

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Table 4.1

Effect Estimates and R² in the Clinical Group

Effect variables in rows	Trust in mgt.	Supportive group	Self-awareness	Relational transparency	Balanced processing	Ethical behaviour	Trustworthiness	Supportiveness	Empowering	R^2
Voice	.23*								.14**	.22
	(.11)								(.04)	
	.22*								**.32****	
Performance	-.39*	.33							.21**	.15
	(.20)	(.20)							(.07)	
	-.26*	**.13**							**.33****	
Burnout	-.25	-.38			.02	-.06	-.10		.09	.17
	(.23)	(.21)			(.16)	(.12)	(.21)		(.10)	
	-.16	**-.27**			**.11**	**-.17**	**-.30**		**.19**	
Trust in mgt.		.31**	.21	-.18	-.18	.19	.23			.50
		(.11)	(.17)	(.27)	(.16)	(.17)	(.18)			
		.30**	**.54**	**-.49**	**-.48**	**.49**	**.60**			
Supportive group							.08	.16**	-.07	.30
							(.06)	(.06)	(.06)	
							.21	**.50****	**-.18**	

Note: each triplicate numerical set is unstandardized effect estimate, (standard error), and standardized effect estimate (bold)

* Estimate ≥ 2 standard errors

** Estimate ≥ 3 standard errors

Table 4.2

Effect Estimates and R² in the Nonclinical Group

Effect variables in rows	Trust in mgt.	Supportive group	Burnout	Self-awareness	Relational transparency	Balanced processing	Ethical behaviour	Trustworthiness	Supportiveness	Empowering	R^2
Voice	.29** (.09) **.30****		-.14* (.06) **-.22***								.17
Performance		.43* (.18) **.24***					.21** (.07) **.37****			-.09 (.08) **-.14**	.16
Burnout		-.14 (.19) **-.08**				-.41* (.17) **-.66***	.09 (.11) **.14**	-.23 (.23) **.31**	-.26* (.10) **-.50***	.26 (.13) **.35**	.30
Trust in mgt.		.11 (.11) **.09**		-.09 (.07) **-.25**	.27* (.11) **.64***	.07 (.11) **.17**	-.07 (.08) **-.17**	.09 (.13) **.18**			.43
Supportive group								-.02 (.08) **-.04**	.19** (.05) **.60****	-.02 (.07) **-.04**	.29

Note: each triplicate numerical set is *unstandardized effect estimate, (standard error), and standardized effect estimate (bold)*

* Estimate ≥ 2 standard errors

** Estimate ≥ 3 standard errors

Table 4.3

Effect Estimates and R² in the Combined Groups

Effect variables in rows	Trust in mgt	Supportive group	Burnout	Self-awareness	Relational transparency	Balanced processing	Ethical behaviour	Trustworthiness	Supportiveness	Empowering	R^2
Voice	.18* (.08) **.21***		-.12** (.04) **-.18***							.13** (.03) **.24***	.24
Performance	-.22 (.13) **-.15**	.41** (.13) **.22***								.13** (.05) **.18***	.10
Burnout		-.38** (.13) **-.24***				-.23 (.12) **-.37**	-.03 (.07) **-.02**	.09 (.16) **.05**		.11 (.08) **.19**	.20
Trust in Mgt		.22** (.08) **.19***		-.03 (.06) **-.09**	.20* (.10) **.51***	-.01 (.08) **-.04**	-.04 (.07) **-.11**	.12 (.10) **.29**			.44
Supportive Group								.04 (.05) **.10**	.18** (.04) **.56***	-.05 (.04) **-.12**	.31

Note: each triplicate numerical set is unstandardized effect estimate, (standard error), and standardized effect estimate (bold)

* Estimate $\geq$ 2 standard errors

** Estimate $\geq$ 3 standard errors

Table 4.4

Wordings of the Indicators of the Latent Concepts

Latent concepts	Indicator name	Indicator wording	Score range
η_1–Voice	CONTROL	I can influence management to obtain the equipment and space I need for my work.	1-5
η_2–Performance	MBIPE1	I feel I'm making an effective contribution to what this organization does.	1-7
• 2nd indicator	MBIPE2	At my work, I feel confident that I am effective at getting things done.	1-7
η_3–Burnout	MBIEX2	I feel burned out from my work.	1-7
• 2nd indicator	MBIEX1	I feel emotionally drained from my work.	1-7
η_4–Trust in management	FAIR1	Management treats all employees fairly.	1-5
• 2nd indicator	FAIR2	There are effective appeal procedures available when I question the fairness of a decision.	1-5
η_5–Supportive group	COM1	I am a member of a supportive work group.	1-5
η_6–Self-awareness	FEEDBK	Asks for feedback on how his/her actions affect other people's performance.	1-10
• 2nd indicator	TESTSKLS	Seeks out challenging opportunities that test his/her own skills and abilities.	1-10
η_7–Relational transparency	PHILOS	Is clear about his/her philosophy of leadership.	1-10
• 2nd indicator	CONVIC	Speaks with genuine conviction about the higher meaning and purpose of our work.	1-10
η_8–Balanced processing	LISTENS	Actively listens to diverse points of view.	1-10
• 2nd indicator	LEARN	Asks "What can we learn?" when things don't go as expected.	1-10
η_9–Ethical behaviour	FOLTHRU	Follows through on promises he/she makes.	1-10
• 2nd indicator	EXAMPLE	Sets a personal example of what he/she expects of others.	1-10
η_{10}–Trustworthiness	RESPECT	Treats others with dignity and respect.	1-10
η_{11}–Supportiveness	SUPPORT	Gives the members of the team lots of appreciation and support for their contributions.	1-10

(table continues)

Latent concepts	Indicator name	Indicator wording	Score range
• 2nd indicator	PRAISE	Praises people for a job well done.	1-10
η_{12} –Empowering behaviour	CHOICE	Gives people a great deal of freedom and choice in deciding how to do their work.	1-10

Table 4.5

Measurement Error Specifications for the Indicators of the Latent Variables in the

Structural Model for the Clinical, Nonclinical, and Combined Groups

Indicator names (concepts)	% assessed measure-ment error	Indicator variance from covariance matrix			Measurement error for the indicator		
		Clinical	Nonclinical	Combined	Clinical	Nonclinical	Combined
Eta1 CONTROL (Voice)	15.0	1.237	1.096	1.224	0.186	0.164	0.184
Eta2 MBIPE1 (Performance)	20.0	2.744	2.557	2.616	0.549	0.511	0.523
Eta3 MBIEX2 (Burnout)	15.0	2.958	2.686	2.825	0.444	0.395	0.424
Eta4 FAIR1 (Trust in mgt.)	20.0	1.232	1.172	1.224	0.246	0.234	0.245
Eta5 COM1 (Supportive Grp.)	20.0	1.101	.850	.953	0.220	0.170	0.191
Eta6 FEEDBK (Self-awareness)	20.0	7.755	8.948	8.370	1.551	1.790	1.674
Eta7 PHILOS (Rel. transp.)	25.0	9.492	6.945	8.146	2.373	1.736	2.037
Eta8 LISTENS (Bal. processing)	10.0	7.638	6.492	7.203	0.764	0.649	0.720
Eta9 FOLTHRU (Ethical behav.)	10.0	6.927	6.231	6.574	0.693	0.623	0.657
Eta10 RESPECT (Trustworthiness)	15.0	6.569	4.824	5.639	0.986	0.724	0.846
Eta11 SUPPORT (Supportiveness)	10.0	8.997	7.656	8.411	0.900	0.766	0.841
Eta12 CHOICE (Empowering)	15.0	6.930	4.715	5.997	1.040	0.707	0.900

Table 4.6

Model Fit and R^2 With the Addition of Second Indicators

Latent concept	Original model indicator	Second indicator added	R^2 - 2nd indicator	χ^2	Df	p	Change in effects (β)
Clinical group							
Model with single indicators				29.60	25	.24	
Performance	y_2 MBIPE1	MBIPE2	.15	37.78	36	.390	NoΔ
Burnout	y_3 MBIEX2	MBIEX1	.72	49.14	36	.071	NoΔ
Trust in mgt.	y_4 FAIR1	FAIR2	.43	37.97	36	.380	<15%Δ
Self-awareness	y_6 FEEDBK	TESTSKLS	.61	62.01	36	.005	NoΔ
Rel. transparency	y_7 PHILOS	CONVIC	.76	50.87	36	.051	<10%Δ
Bal. processing	y_8 LISTENS	LEARN	.49	69.05	36	.001	NoΔ
Ethical behaviour	y_9 FOLTHRU	EXAMPLE	.70	78.08	36	.000	NoΔ
Supportiveness	y_{11} SUPPORT	PRAISE	.81	49.66	36	.064	NoΔ
Nonclinical group							
Model with single indicators				41.64	23	.010	
Performance	y_2 MBIPE1	MBIPE2	.08	56.04	34	.010	NoΔ
Burnout	y_3 MBIEX2	MBIEX1	.61	50.33	34	.035	<10%Δ
Trust in mgt.	y_4 FAIR1	FAIR2	.34	51.59	34	.027	<10%Δ
Self-awareness	y_6 FEEDBK	TESTSKLS	.42	110.59	34	.000	<10%Δ
Rel. transparency	y_7 PHILOS	CONVIC	.88	61.04	34	.003	<10%Δ
Bal. processing	y_8 LISTENS	LEARN	.55	107.47	34	.000	<10%Δ
Ethical behaviour	y_9 FOLTHRU	EXAMPLE	.50	59.68	34	.004	<10%Δ
Supportiveness	y_{11} SUPPORT	PRAISE	.74	85.79	34	.000	<10%Δ

Table 4.7

Fit of Initial and Final Models

	Clinical group (n = 47)	Nonclinical group (n = 188)	Combined groups (n = 335)
Theoretical model			
Chi-square	41.85	62.72	52.81
Significance	0.025	0.00	.0014
Degrees of Freedom	26	26	26
AGFI	0.86	0.84	0.92
RMSEA	.060	.086	.057
Following modifications	1 change	3 changes	2 changes
Chi-square	29.60	41.64	28.97
Significance	0.24	0.01	0.22
Degrees of Freedom	25	23	24
RMSEA	.036	.066	.026
AGFI	0.90	0.88	0.95
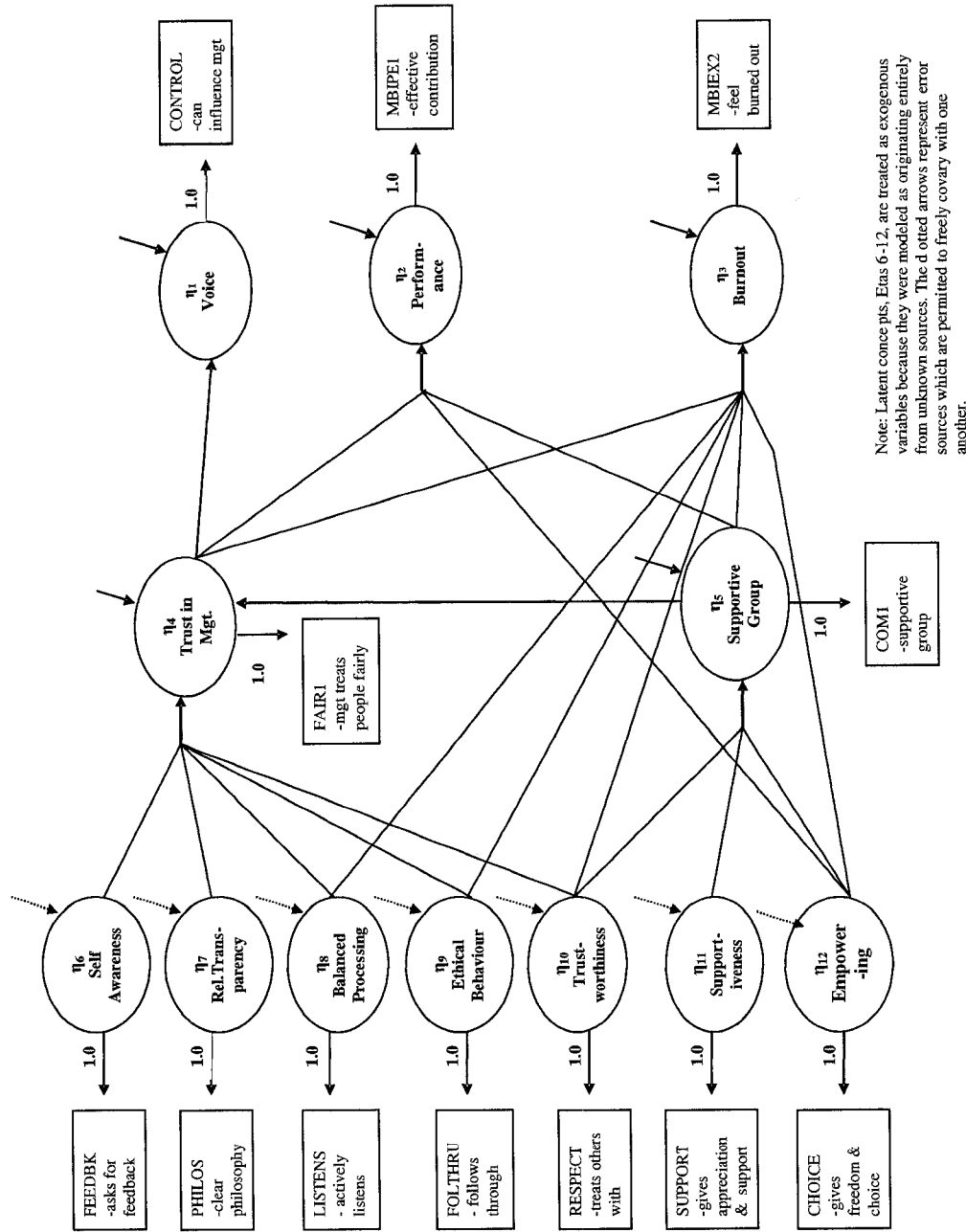
Figure 4.1. Leadership model: Latent concepts with indicators.

Note: Latent conce pts. Etas 6-12, are treated as exogenous variables because they were modeled as originating entirely from unknown sources. The d otted arrows represent error sources which are permitted to freely covary with one another.

CONTROL -can influence mgt

MBIPEI -effective contribution

MBIEX2 -feel burned out

η_1 Voice

η_2 Perform-ance

η_3 Burnout

η_4 Trust in Mgt.

η_5 Supportive Group

FAIR1 -mgt treats people fairly

COM1 -supportive group

η_6 Self Awareness

η_7 Rel.Trans-parency

η_8 Balanced Processing

η_9 Ethical Behaviour

η_{10} Trust-worthiness

η_{11} Support-iveness

η_{12} Empower-ing

FEEDBK -asks for feedback

PHILOS -clear philosophy

LISTENS - actively listens

FOLTHRU - follows through

RESPECT -treats others with

SUPPORT -gives appreciation & support
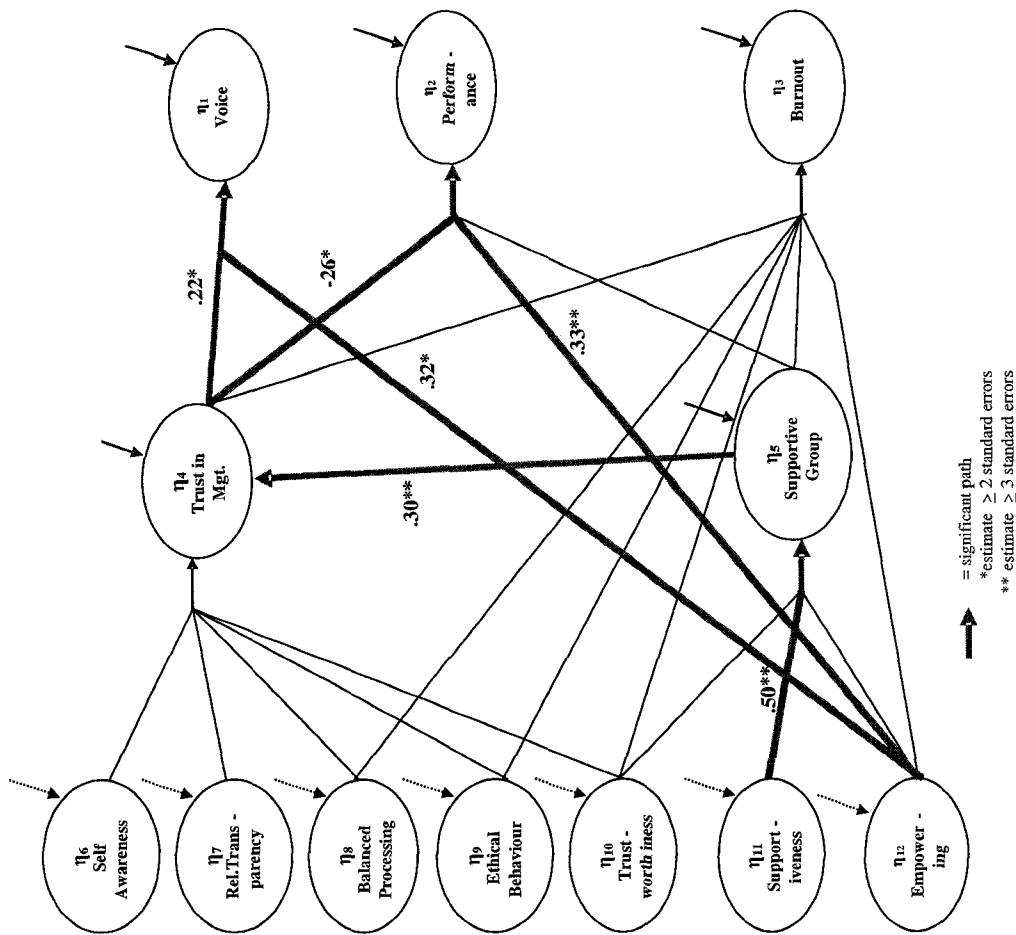
CHOICE -gives freedom & choice

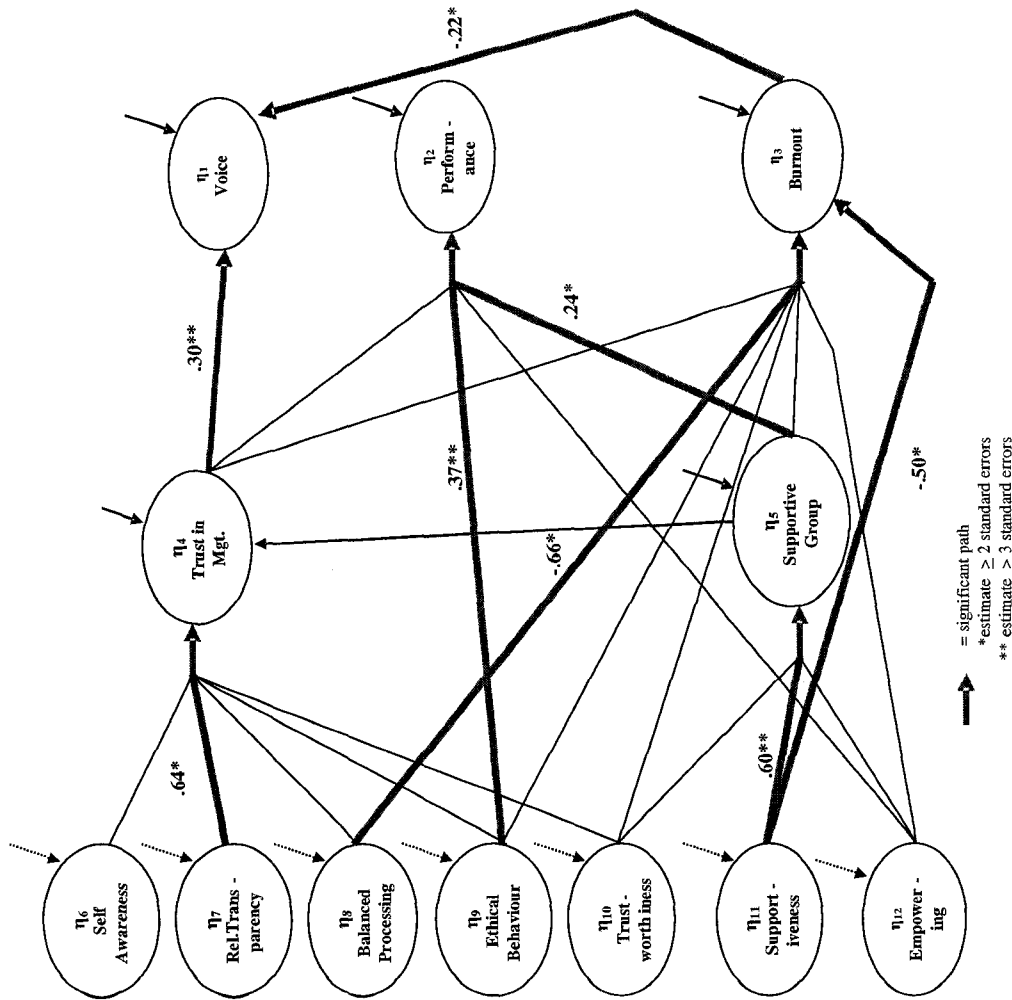*Figure 4.2.* Leadership model: Significant paths in clinical group.

Figure 4.3. Leadership model: Significant paths in nonclinical group.

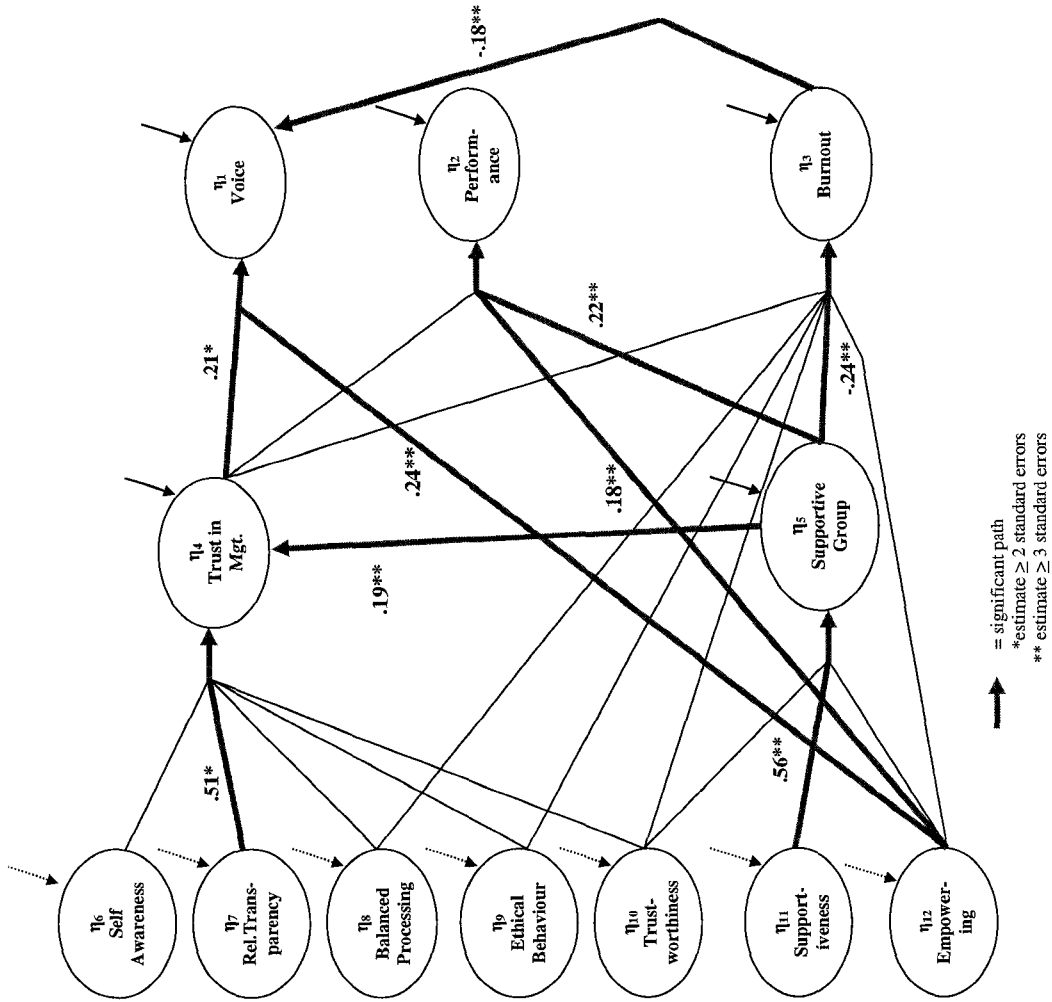*Figure 4.4.* Leadership model: Significant paths in combined groups.

APPENDIX A:

QUALITY ASSESSMENT AND VALIDITY TOOL: DEFINITIONS

DESIGN

1. **Was the study prospective?**

   Most studies are probably retrospective, but prospective studies would be preferable.

2. **Was probability sampling used?**

   A random sample of some form or a systematic sample with a random start is acceptable. Most researchers probably used a convenience sample, i.e., studying all the patients available to them in one or more setting(s) that agreed to participate which is scored zero.

SAMPLE

1. **Was sample size justified?**

   Sample size is justified if it is based on appropriate power calculations (power = 80), or follows other rules of thumb such as an N of at least 10 per IV studied. Even if researchers try to justify lower standards, a zero is cored if these cut-offs are not met. This assessment is a judgment based on available information. Two rules of thumb will apply:
   - If using a multivariate approach 10 cases per IV are required
   - If using several correlations or t-tests, a sample of 80 or more reflects adequate power

   Sample sizes that suggest very high power, e.g., because it is so large, will also be noted.

2. **Was sample drawn from more than one site?**

   This refers to physical location –multiple groups belonging to the same system count as multi-site. Several units within the same hospital do not count as multi-site, but several hospitals within the same system or region do.

3. **Was anonymity protected?**

   If researcher studied nurses in is/her own facility, the researcher may be able to determine the identity of responders. Subjects who think their responses are identifiable tend to give more politically correct or socially desirable responses.

4. **Response rate more than 60%?**

   Operationally defined as the number of people who participated divided by the number of people who were sampled (e.g., given or sent or offered a questionnaire). If not reported, information that allows calculation will be sought and the same rule applied.

MEASUREMENT

Leadership (IV) [assess for IVs correlated with DV only]

1. **Is leadership measured reliably according to one of the following categories?**
   - Any level of nursing leadership is examined (e.g., first line, middle, and/or senior leadership)
   - Leadership/management or aspects of leadership/management is measured in some manner
   - Leadership behaviours or styles
   - Management behaviours or styles

2. **Was leadership measured using a valid instrument?**
   Did researchers make the link between the extent of leadership behaviours or type of leadership and its effects? If so, 1 is scored. A zero is scored if important determinants were missing. Only those IVs that were correlated with the DV were of interest.

Effects of leadership on patient (DVs) outcomes

1. **Are the effects of leadership observed rather than self-reported?**
   1 is scored for patients self-report of the effects of leadership. 2 is scored for independent measure or observation of the effects of leadership on patients.

2. **If a scale was used for outcomes, is internal consistency $\geq$ .70?**
   The coefficient needs to be for the sample studied in order to score as 1.

3. **Was a theoretical model/framework used for guidance?**
   0 for no and 1 for yes.

STATISTICAL ANALYSIS

1. **If multiple determinants studied, are correlations analyzed?**
   If more than one outcome of leadership was studied, study scored zero if results reported using numerous bivariate statistics (e.g., reports multiple t's, r's, etc.) only. 1 is scored if there was an attempt to explore relationships among determinants, i.e., correlations are reported, multiple regression is used, or interactions are reported (the discussion noted that specific predictors were or were not highly correlated with each other.)

2. Are outliers managed?
   If not, relationship could be spurious. If one of the following was reported to decrease the disproportionate effect of outliers, I is scored:
   - Outliers removed,
   - A technique used to moderate their effect (e.g., winsorizing, jack-knifing), or
   - Non-parametric statistics used (Spearman's rho or MWU, etc.)
   Omitting any discussion of outliers or mentioning-but-not-managing was scored as 0.

(Adapted from instrument provided by Dr. Greta Cummings and Dr. Carole Estabrooks)

APPENDIX B:

VARIANCE/COVARIANCE MATRIX FOR THE CLINICAL MODEL

	y_1 CONTROL	y_2 MBIPE1	y_3 MBIEX2	y_4 FAIR1	y_5 COM1	y_6 FEEDBK
y_1 CONTROL	1.2374					
y_2 MBIPE1	0.3470	2.7443				
y_3 MBIEX2	-0.3851	-0.1805	2.9582			
y_4 FAIR1	0.3673	0.0016	-0.5384	1.2320		
y_5 COM1	0.1670	0.2521	-0.5494	0.4967	1.1010	
y_6 FEEDBK	0.7648	0.1614	-0.6261	1.3828	1.0227	7.7552
y_7 PHILOS	1.5403	0.6857	-1.0945	1.5696	1.0755	5.6569
y_8 LISTENS	0.9741	0.6633	-1.0456	1.2629	0.9663	4.6486
y_9 FOLTHRU	1.0891	0.4407	-1.1233	1.4407	1.0512	4.2487
y_{10} RESPECT	0.9136	0.5482	-1.1292	1.3376	1.0571	3.6565
y_{11} SUPPORT	1.2263	0.9198	-0.6681	1.5176	1.4414	5.5909
y_{12} CHOICE	1.0044	1.1110	-0.5929	1.0315	0.7474	3.5003

	y_7 PHILOS	y_8 LISTENS	y_9 FOLTHRU	y_{10} RESPECT	y_{11} SUPPORT	y_{12} CHOICE
y_7 PHILOS	9.4917					
y_8 LISTENS	5.3348	7.6277				
y_9 FOLTHRU	6.1146	5.0119	6.9275			
y_{10} RESPECT	5.1012	5.5061	4.7489	6.5692		
y_{11} SUPPORT	6.7265	5.5762	5.0740	5.1152	8.9969	
y_{12} CHOICE	4.5198	4.4886	4.1897	3.9489	5.0108	6.9296

APPENDIX C:

VARIANCE/COVARIANCE MATRIX FOR THE NONCLINICAL MODEL

	y_1 CONTROL	y_2 MBIPE1	y_3 MBIEX2	y_4 FAIR1	y_5 COM1	y_6 FEEDBK
y_1 CONTROL	1.0958					
y_2 MBIPE1	0.0982	2.5574				
y_3 MBIEX2	-0.4263	-0.3931	2.6361			
y_4 FAIR1	0.3099	0.1147	-0.4091	1.1724		
y_5 COM1	0.2221	0.3632	-0.3618	0.2818	0.8495	
y_6 FEEDBK	0.4389	0.4167	-1.3217	0.9760	0.6519	8.9484
y_7 PHILOS	0.5913	0.9276	-0.8858	1.2723	0.8544	4.7984
y_8 LISTENS	0.8828	1.0846	-1.4603	1.2637	0.8471	3.9489
y_9 FOLTHRU	0.7415	1.0855	-1.1055	1.1316	0.8467	3.9237
y_{10} RESPECT	0.5054	0.3948	-0.8467	1.0735	0.6191	2.8161
y_{11} SUPPORT	0.6774	0.8992	-1.7514	1.5790	1.1513	4.5953
y_{12} CHOICE	0.6359	0.2845	-0.5474	0.9063	0.579	2.1394

	y_7 PHILOS	y_8 LISTENS	y_9 FOLTHRU	y_{10} RESPECT	y_{11} SUPPORT	y_{12} CHOICE
y_7 PHILOS	6.9451					
y_8 LISTENS	3.9747	6.4922				
y_9 FOLTHRU	4.2433	4.4406	6.2311			
y_{10} RESPECT	3.1449	4.4059	3.7789	4.8243		
y_{11} SUPPORT	4.7774	5.0237	4.5918	4.1340	7.6555	
y_{12} CHOICE	2.7558	3.6925	2.7214	3.2449	3.7311	4.7153

APPENDIX D:

VARIANCE/COVARIANCE MATRIX FOR THE COMBINED MODEL

	y_1 CONTROL	y_2 MBIPE1	y_3 MBIEX2	y_4 FAIR1	y_5 COM1	y_6 FEEDBK
y_1 CONTROL	1.1982					
y_2 MBIPE1	0.2210	2.6355				
y_3 MBIEX2	-0.4730	-0.3157	2.8773			
y_4 FAIR1	0.3743	0.0775	-0.5224	1.2305		
y_5 COM1	0.2268	0.3215	-0.4880	0.4014	0.9772	
y_6 FEEDBK	0.6097	0.3130	-1.0529	1.1772	0.8326	8.4207
y_7 PHILOS	1.0858	0.8482	-1.0981	1.4770	1.0069	5.2239
y_8 LISTENS	1.0237	0.9274	-1.4247	1.3488	0.9631	4.3106
y_9 FOLTHRU	0.9619	0.8197	-1.2138	1.3240	0.9797	4.0998
y_{10} RESPECT	0.7584	0.4826	-1.0858	1.2523	0.8599	3.2285
y_{11} SUPPORT	1.0183	0.9382	-1.4318	1.6486	1.3496	5.0798
y_{12} CHOICE	0.9120	0.6816	-0.7527	1.0697	0.7359	2.8128

	y_7 PHILOS	y_8 LISTENS	y_9 FOLTHRU	y_{10} RESPECT	y_{11} SUPPORT	y_{12} CHOICE
y_7 PHILOS	8.1945					
y_8 LISTENS	4.7612	7.2011				
y_9 FOLTHRU	5.1805	4.8300	6.6231			
y_{10} RESPECT	4.1425	5.0451	4.3073	5.6980		
y_{11} SUPPORT	5.8179	5.4962	4.9511	4.7251	8.4753	
y_{12} CHOICE	3.7543	4.3134	3.5430	3.7525	4.5706	6.0085