Organizational learning and nursing home quality of care in New York State

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Organizational Learning and Nursing Home Quality of Care in New York State

By

Ting-Wei Chiang

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**Acronyms and Abbreviations**

ADLs: Activities of Daily Living  
CMS: Centers for Medicare and Medicaid Services  
IADLs: Instrumental Activities of Daily Living  
MDS: Minimum Data Set  
NA: Nurse Assistant  
NHQC: Nursing Home Quality of Care  
NHQIs: Nursing Home Quality Indicators  
LPN: Licensed Practical Nurse  
LTC: Long-Term Care  
OBRA: Omnibus Budget Reconciliation Act  
QI: Quality Improvement  
OL: Organizational Learning  
OLMs: Organizational Learning Mechanisms  
OSCAR: On-Line Survey Certification and Reporting System  
QIOs: the Quality Improvement Organizations  
RN: Registered Nurse  
SEM: Structural Equation Modeling
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Abstract

The primary purpose of the present study is to examine the relationship between organizational learning (OL) and nursing home quality of care (NHQC). The present study addresses OL through both descriptive and prescriptive approaches. The descriptive approach proposes a prism model that defines OL from psychological perspectives, structural perspectives, and cultural perspectives. The prescriptive approach illustrates how each dimension of OL can be improved by its corresponding organizational learning mechanisms (OLMs).

Using the prism model of OL as a conceptual framework, the present study also aims to empirically test whether OL helps improve organizational performance. The study population is all the nursing homes in New York State and organizational performance is measured in terms of NHQC, which is examined by three dimensions: quality of care indicators (QIs), survey deficiencies, and complaints. A survey research was conducted to collect information about NYS nursing homes’ learning attitudes and behaviors. Information about the three dimensions of NHQC was collected through the secondary data published by Centers for Medicare and Medicaid Services (CMS). 23 hypotheses were proposed to address the general research question: whether nursing homes with good learning attitudes and behaviors also provide better quality of care to
the residents. To empirically test the hypotheses, structural equation modeling (SEM) was conducted.

The SEM results suggest that the proposed three dimensions underlie the concept of OL. The SEM structural model also partially supports most of the proposed hypotheses in that at least one dimension of NHQC is significantly influenced by each of the OLMs. Each OLM, however, exerted different effects on each dimension of NHQC. The structural OLMs had the most influential effects on QIs and the psychological OLMs would better reduce the number of complaints and survey deficiencies. The effects of the cultural OLMs were not as influential and there were not as many significant relationships as with the psychological and structural OLMs, probably due to its delayed effects on NHQC. It is hoped that the study results would contribute not only to the existing academic studies on OL but also to the improvement of quality of care for nursing facility residents.
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This dissertation is dedicated to my parents for their endless and unconditional love and support as well as to my little sister and my old brother for their understanding and for taking care of our parents.

I thank God for his blessings during these years. May I be a witness to spread his love and wisdom throughout my life and throughout the world!
I. INTRODUCTION

Much evidence points to the aging of the US population. The trend promises to impose tremendous impacts on long-term care, especially nursing home care. Along with the increasing demands for the delivery of nursing home care services would inevitably come continuous concerns for better quality of nursing care. Nevertheless, quality of care problems in US nursing homes have persisted on a substantial scale.

Although a variety of means have been proposed by health care advocates to improve quality of care, seldom are quality improvement (QI) initiatives in health care trumpeted under the banner of organizational learning, despite the fact that a large number of industrial and managerial studies have documented the positive impact of organizational learning on performance. In general, health care advocates still lack a fundamental understanding of organizational learning and its implications for quality of care.

The present study seeks to fill this gap by proposing a conceptual framework of organizational learning that depicts the underlying dimensions of organizational learning and learning mechanisms. The theoretical framework will then be empirically tested using a survey instrument to examine the relationship between organizational learning and nursing home quality of care (NHQC). In short, the purpose of this study is to examine empirically whether NHQC can be improved by organizational learning attitudes and behaviors.

In addition to this brief introduction, this dissertation is composed of five chapters: Chapter II - Statement of the Research Problems, Chapter III - Literature Review, Chapter IV - Research Methods and Design, Chapter V - Study Results, and Chapter VI -
Discussions.

The focus of Chapter II – Statement of the Research Problems is to illustrate how the research problems are framed and why solving the problems is important. There are five subsections to accomplish this purpose. The first subsection will present population statistics to reveal trends regarding the US aging population and address how the current and potential aging population will have tremendous impacts on the health care delivery systems, especially nursing home care. The second subsection will reveal how scholars, regulatory agencies, and the media have reported the epidemiology of quality of care problems in the US nursing homes. The third subsection will address how organizational learning has served as a means to improve organizational performance in other disciplines. In the fourth subsection, several research questions are raised in terms of what organizational learning is and whether/how organizational learning could help improve NHQC. Finally, it is argued that the present study will not only help examine organizational learning from a more complete framework but also suggest means to better integrate the currently proposed QI initiatives to improve NHQC.

Chapter III – Literature Review is the elaboration of how the present study is inspired by both the organizational learning literature and the quality of care literature. This chapter is composed of three subsections. The first subsection aims to examine what organizational learning is from a descriptive perspective. It will argue that current literature on organizational learning, its essence and underlying dimensions, could be reflected in psychological, structural, and cultural perspectives. The second subsection further elaborates how organizational learning could be improved from a prescriptive perspective. It will illustrate how organizational learning mechanisms (OLMs) that are
proposed can improve each dimension of organizational learning. The third subsection presents the applications of the proposed learning mechanisms and their effects on quality of nursing home care. Although a number of OLMs have been prescribed to improve organizational learning and organizational performance, organizational theorists are still uncertain about how organizational learning helps improve performance. In addition, although health care scholars have applied some of the OLMs to improve quality of care, the applications are often implemented without the integration and recognition of other OLMs. As a result, it is still not clear about how OLMs really affect quality of care. This subsection will present how the OLMs proposed by organizational theorists from each perspective have been applied in the health care industry and whether they effectively improve quality of care.

The primary purpose of Chapter IV – Research Method and Design is to illustrate how to empirically test the triangular framework of organizational learning inspired by the current literature. The primary focus of the present study is to empirically test the theoretical framework of organizational learning and whether/how NHQC can be improved by developing good organizational learning attitudes and behaviors. The independent variables are organizational learning attitudes and behaviors. The dependent variables are the underlying dimensions of NHQC.

The first subsection will present a conceptual model that illustrates the underlying dimensions of organizational learning and how they could be associated with NHQC. The left-hand side of the conceptual model depicts the three organizational learning perspectives and the theoretically defined OLMs in each of the three perspectives. The right-hand side of the conceptual model indicates the three dimensions of NHQC: clinical
quality indicators, survey deficiencies, and complaints. The definitions and measures of these dependent variables will be addressed in detail in the second subsection.

In the third subsection, a list of hypotheses will be presented to illustrate the relationships between each organizational learning dimension and NHQC and between each OLM and NHQC. The empirical testing of the hypotheses aims to explore the relationship between each OLM and NHQC. Along with the presentation of each hypothesis, there is a discussion of how OLMs in each dimension will be operationalized.

The relationships between organizational learning and NHQC, however, cannot be accurately examined without discussing confounding/control variables. Since NHQC could still be affected by variables other than organizational learning, controlling these variables is necessary to clarify the relationship between organizational learning and NHQC. The fourth subsection is dedicated to illustrating these variables.

Furthermore, since both the concept of organizational learning and the concept of NHQC are multidimensional and abstract, they will be measured from multiple dimensions and by multiple items. How valid and reliable these measures are also plays an important role in the process of examining the association between organizational learning and NHQC. The fifth subsection will discuss these issues.

The sixth subsection will elaborate the process of collecting the datasets. Given the fact that important dimensions of NHQC have been collected and measured by the Centers for Medicare & Medicaid Services (CMS), the present study will utilize the datasets from CMS’s website. As to the independent variables, since no instrument is currently available to comprehensively measure organizational learning attitudes and behaviors, a survey questionnaire was designed and implemented to measure
organizational learning from the three dimensions. How the survey research was conducted is also illustrated in this subsection.

Having addressed the data collection method, the dissertation will proceed to the discussion of the data analytic method. This subsection will justify the use of structural equation modeling (SEM) in the present study, followed by the discussion of its implementation and its underlying assumptions.

Chapter V – Study Results will begin with a discussion of how the present study attempts to comply with the SEM assumptions. The discussion will then proceed to the presentation of the univariate, bivariate, and multivariate statistical results and the testing of each hypothesis proposed in the study.

In the last chapter, Chapter VI – Discussion, the study results will be examined first for both OL students and health care advocates. This is followed by a discussion of the limitations and the theoretical and practical implications of the study results. In the end, a number of suggestions for future research will also be proposed.
II. STATEMENT OF THE PROBLEM

A. The Older US Population and Long-Term Care (LTC)

A legion of demographic statistics has revealed the trend of the aging of the US population and suggested that the trend will continue in the next several decades. According to the US Census Bureau’s report, “65+ in the United States: 2005” (He et al., 2005), in 2003 the U.S. older population (those aged 65 and older) was about 35.9 million, representing 12.4 percent of the U.S. population. The older population has not only increased by more than ten times from 3.1 million in 1900 but it has also been projected to increase continuously. By 2011, when the first Baby Boomer reaches 65, the older population is expected to grow rapidly during the 2010-2030 period and projected to be 72 million in 2030, growing twice as large as in 2003 and representing nearly 20 percent of the U.S. population. Moreover, it is also projected that the oldest-old population (those aged 85 and older) will be doubled from 4.7 million in 2003 to 9.6 million in 2030.

The aging population could be attributed to a number of factors such as significant improvements in living standards, nutritional intake, municipal sanitation, and public/personal hygiene in the past century (McKeown, 1976). As a result, not only has life expectancy been prolonged considerably but also mortality rates have declined dramatically at each age level. For example, life expectancy at birth has been prolonged from 47.3 in 1900 to 77.5 in 2003 (National Center for Health Statistics, 2005). The age-adjusted death rate from 1950 to 2003 also decreased from 1,446 to 832.7 deaths per 100,000 standard population (National Center for Health Statistics, 2005).
Implications of the aging U.S. population are profound and comprehensive. In addition to its effects on the U.S. family, social, and economic structures, the aging U.S. population will have tremendous impacts on the supplies and demands of long-term care (LTC) services. Along with increasing age inevitably comes disabilities and increasing dependence on assistance either in instrumental activities of daily living (IADL), such as cooking, shopping, cleaning, and telephoning; or in activities of daily living (ADL), such as toileting, dressing, bathing, transferring, and dieting. Moreover, a recent report, Changes in Nursing Home Care, 1996-2005: New York State, published by the United Hospital Fund, indicates that between 2000 and 2006 there were “more short-stay patients and fewer long-stay residents” and that “patients and residents are sicker and more disabled” (Dennison, 2008: p. 11). Among the variety of LTC service providers, nursing homes have played a major and important role, given that more than 90 percent of institutionalized older people live in nursing homes (He et al., 2005), which is defined as “a facility with three or more beds that provides either nursing care or personal care (such as help with bathing, correspondence, walking, eating, using the toilet, or dressing) and/or supervision over such activities as money management, ambulation, and shopping” (Federal Interagency Forum on Aging-Related Statistics, 2004: p. 138).

As one of the impacts of the aging population, the increasing utilization of nursing home care is reflected in several statistics. In 1999, there were 43 people per 1,000 aged 65 or older and 183 people per 1,000 aged 85 or older residing in nursing homes. The number of older Americans admitted to nursing home increased from 1.3 million in 1985 to 1.5 million in 1999, despite the fact that the total age-adjusted nursing home residence rate between 1985 and 1999 declined from 54 to 43 people per 1,000 aged 65 or older.
Moreover, Kemper and Murtaugh (1991) estimated that for older people the lifetime chance of entering a nursing home at least once was about 43 percent (52 percent for old women and 33 percent for old men).

Apart from the potential demands from the aging population, the health status of the current nursing home residents also suggests the increasing and urgent needs for intensive nursing care services. According to the National Nursing Home Survey conducted in 1999 (U.S. Department of Health and Human Services, 2002), 90.3 percent of nursing home residents were older people aged 65 and over. Their health conditions often demand intensive nursing care services. For example, 29 percent of the elderly residents had impaired vision, 23 percent had impaired hearing, 34 percent needed help in walking, and 45 percent cannot control both bowels and bladder. About 76 percent of the elderly residents needed assistance in three or more ADLs. The most needed assistances were bathing or showering (95 percent) and dressing (88 percent). In addition, with respect to the IADLs, 74 percent of the elderly residents needed help in caring for personal possessions, 73 percent in securing personal items, 71 percent in managing money, and 62 percent in using the phone.

B. Quality of Care Problems in Nursing Homes

Although there has been increasing demands for and dependence on nursing home care from both potential and actual elderly people, quality of care problems in nursing homes have plagued health care professionals for more than three decades. The emergence of considerable and persistent concerns about poor quality of care date back to the 1970s, soon after the establishment of Medicare and Medicaid in 1965. Since then,
health care professionals and researchers have been dedicated to improving quality of care in a variety of health care settings. Within the broad picture of general health care quality issues, quality of care in nursing homes is the subset area that has attracted constant attention from a variety of stakeholders in the health care industry, such as providers, patients, consumers, insurers, regulators, policy makers, researchers, and the media. There has also been a wealth of studies aimed at examining whether nursing home residents across the US have received good quality of care. The answers, however, are rather disappointing.

The epidemic of nursing home quality problems has been revealed in myriads of reports and studies, suggesting that quality problems in nursing homes are not only prevalent but also continuous and recurrent. The 1986 Institute of Medicine (IOM) study found that serious deficiencies and violations of regulatory standards in nursing home care were prevalent in the U.S. (IOM, 1986). The 1999 report by the Office of Inspector General (OIG) concluded that serious quality of care problems still persisted in nursing homes. Not only had 13 out of 25 quality-of-care deficiency indicators increased in recent years, but ombudsman complaints had been steadily increasing since 1989 (OIG, 1999). Moreover, a series of reports by the General Accounting Office (GAO) (GAO, 1998, 1999a, 1999b, 2000) asserted that 25 percent of the US nursing homes that actually harmed residents or potentially placed them in life threatening conditions. What is worse, the GAO reports maintained that serious deficiencies had repeatedly occurred in 40 percent of these homes.

The recurrent pattern was also observed by Consumers Union (Lieberman & Cheemalapati, 2003). In its Watch List from 2000 to 2002, which flagged about 10
percent of nursing homes in each state whose inspection reports raised quality of care problems, there were 78 facilities exhibiting the “yo-yo” pattern of compliance, meaning that deficiencies happened in 2000 and 2002 but not in 2001. With a more specific focus on the types of deficiency citations, Consumers Union further reported that, from 2001 to 2002, the number of states in which 10 percent or more of their facilities were cited at least once for immediate jeopardy violations increased from six states to eleven states. In addition, the number of states in which 15 percent or more of their facilities were cited at least once for substandard care also increased from 17 states in 2001 to 24 states in 2002.

Given the vulnerable health conditions of elderly nursing residents and their needs for intensive care services, quality deficiencies in nursing homes are largely manifested in clinical problems that threaten nursing home residents’ health. A large body of research has documented these persistent but preventable clinical problems in nursing homes, such as falls (Rubestien et al., 1988, 1994; Rubestien, 1997; Fuller, 2000), malnutrition and dehydration (Rudman et al., 1990, 1995; Abassi & Rudman, 1994; Kayser-Jones et al., 1999), pressure ulcers (Bates-Jensen, 2001; Thomas, 2001; Margolis, et al., 2002; Scott, et al., 2006), physical restraint use (Graber & Sloane, 1995; Sullivan et al., 1999; Castle, 2002), infections (Li et al., 1996; East, 1999; Mody et al., 2005), and medication errors (Gurwitz, et al., 2000; Briesacher et al., 2005; Perri et al., 2005).

C. How Organizational Learning can Help Improve Quality of Care?

Plagued by the continuous and prevalent quality problems, health care professionals and scholars have proposed a variety of quality improvement (QI) initiatives. For example, in its recommendations for crossing the quality chasm and
improving the quality of long-term care, IOM suggests building organizational capacity and supports, utilizing information systems, and preparing the workforce for health care providers to improve quality. In addition, the Malcolm Baldrige National Quality Program establishes health care criteria for performance excellence, which aim to enhance organizational performance, facilitate communication and sharing of best performance, and guide organizational planning and opportunities for learning (Baldrige National Quality Program). The desired organizational performance is the one that delivers ever-improving value to patients and other stakeholders, improves organizational effectiveness and capabilities, and facilities organizational and personal learning. Moreover, the Quality Improvement Organizations (QIOs), working under the auspices of the CMS and representing a new federal initiative to improve quality of care provided to Medicare beneficiaries, also suggest improving NHQC by increasing public awareness, building on experiences and partnerships, sharing methods and best practices, and offering hands-on assistance (American Health Quality Association).

It is intriguing to observe that common to those proposed QI initiatives is the essence of organizational learning. The underlying assumption is that organizational learning can help nursing homes provide better quality of care to residents through enhancing organizational capabilities, reducing errors, and improving residents’ health outcomes and satisfaction. In addition, organizational learning is also expected to boost nursing homes’ competitiveness and adaptability by improving productivity, efficiency, effectiveness, and cost containment.

The positive effects of organizational learning on organizational performance have been documented in a legion of studies in business and manufacturing settings,
especially those on learning curves (Argote et al., 1990; Epple et al., 1991; Irwin & Klenow, 1993; Levin, 2000). The kernel of the learning curve is that the more the learner repeats a task, the better the learner performs with lower time and lower costs. The merits of learning curves in health care are mostly reflected in studies that support the positive relationship between the volume of medical practices and health outcomes (Hillner et al., 2000; Dimick et al., 2003; Druss et al., 2004).

Nevertheless, the current literature on learning in health care is limited to the simple presentation of the observable relationship between the volume of medical practices and health outcomes and the focus at the individual level. Organizational learning is more than the mastery of health care professionals’ surgical and medical skills. What underlies personal mastery is the more intangible, complicated, and essential cooperation of cultural and structural factors in the organization, which is rarely discussed in the health care literature. In addition, organizational learning is more than the aggregation of individual learning. Current literature on learning in health care is lacking any discussion of how individual learning contributes to organizational learning and how individuals learn from each other. Moreover, the effects of organizational learning are more than improvements in productivity and reduced costs. Much literature in business has documented the positive relationship between organizational learning and innovation, market competition, customers’ satisfaction, and adaptability (Baker & Sinkula, 1999; Celuch et al., 2002; Brockman & Morgan, 2003; Hult et al., 2004). Literature in health care, however, is still insufficient to document the relationship between organizational learning and health care performance.
D. Research Questions

Despite the numerous benefits of organizational learning, there is a paucity of research that examines the relationships between organizational learning and performance in health care organizations. Triggered by this inadequacy in the health care literature and the expected benefits of organizational learning, the present study argues that NHQC could be improved if nursing homes developed good learning attitudes and behaviors. The study will first present a conceptual framework that not only illustrates the important dimensions of organizational learning but also addresses the underlying critical mechanisms of organizational learning. In addition, an empirical study will be conducted to examine the relationship between the dimensions proposed in the organizational learning framework and quality of care in nursing homes. In essence, the present study is trying to answer the following research questions:

1). What is organizational learning?
2). What are the dimensions underlying the concept of organizational learning?
3). What are the mechanisms that underlie each dimension of organizational learning?
4). How can organizational learning help improve quality of care?
5). How does each dimension of organizational learning affect quality of care?
6). How do interactions among dimensions of organizational learning affect quality of care?
7). How do learning mechanisms affect quality of care?
8). How do interactions among learning mechanisms affect quality of care?
E. Importance and Contributions of the Study

Answering these questions is important for both organizational learning theorists and for health care practitioners. As to organizational theorists, it is important for them to first understand what organizational learning is and what are its underlying dimensions so that observation, examination, and communication of organizational learning could be conducted on the same basis, as Osigweh (1989) states “the development of clear definitions for concepts is important to improving organizational research and theory building” (p. 580). In addition, given the fact that numerous factors could affect the relationship between organizational learning and performance, controversies still exist among organizational theorists regarding whether organizational learning can help improve performance. Examining these questions could contribute to the current literature by providing empirical evidence not only on the relationship between organizational learning and performance but also on how different dimensions of organizational learning and organizational learning mechanisms affect quality of care. Answering these questions would contribute to both theory testing and theory building.

With respect to health care practitioners, understanding what organizational learning is, its dimensions, and learning mechanisms is critical for them to improve organizational learning capability and health care performance. As Tukey (1962) states, “far better an approximate answer to the right question, which is often vague, than an exact answer to the wrong question, which can always be made precise” (pp. 13-14). Incomplete, incorrect, and insufficient understanding of organizational learning would not only diminish their efforts to improve learning but also make QI initiatives ineffective and inefficient. In addition, understanding how dimensions of organizational learning and
organizational learning mechanisms affect organizational performance is vital for health care professionals to prioritize resources and attention to the practice of organizational learning. Moreover, these questions would help health care professionals think more systematically and comprehensively so as to avoid stressing one dimension and/or learning mechanism and ignoring the importance of others.

F. Summary

Numerous demographic statistics have suggested that the US population is aging, which will lead to not only the demand for more nursing care but also for better quality of nursing care. Nevertheless, academic research, governmental reports, and consumer advocacy groups have all indicated that quality problems in the US nursing homes are prevalent, continuous, and recurrent. Despite the fact that a variety of QI initiatives have been proposed, the effects of these initiatives are often separately studied and not systematically incorporated and examined. The present study argues that common to these QI initiatives is the essence of organizational learning. Although positive effects of organizational learning on organizational performance have been suggested in many management and business studies, whether NHQC could be improved by organizational learning has never been studied. The present study will begin to fill these gaps by examining organizational learning from both descriptive and prescriptive perspectives. The former maintains that organizational learning should be examined from three perspectives: psychological, structural, and cultural. The latter examines whether/how NHQC could be improved by good organizational learning attitudes and behaviors. It is believed that answering these questions from both descriptive and prescriptive
perspectives will not only advance organizational learning theories but also provide health care advocates with a more complete framework to improve NHQC.
III. LITERATURE REVIEW

The purpose of this study is to examine the relationship between organizational learning and quality of health care. This chapter is composed of three subsections. The first subsection examines the current literature on organizational learning theories from the descriptive perspective and reveals how organizational learning, its essence and underlying dimensions are reflected in three perspectives: psychological, structural, and cultural. The second subsection further elaborates how organizational learning could be improved from the prescriptive perspective. It illustrates how learning mechanisms are proposed to improve each dimension of organizational learning. The third subsection presents the applications of the proposed learning mechanisms and their effects on quality of care.

A. Organizational Learning Theories- What is Learning?

Although the concept of learning has been studied by psychologists for more than a century, the concept of organizational learning, representing the anthropopathism of learning into organizational studies, had its first debut in Cyert and March’s 1963 book, *A Behavioral Theory of the Firm*. Since then, inconsistent and controversial definitions of organizational learning have been proposed (Shrivastava, 1983; Fiol & Lyles, 1985; Garvin, 1993; Macintosh & MacLean, 1999; Berends et al., 2003). Berends et al. (2003) argue that even after almost 40 years “this notion is still surrounded by conceptual confusion” (p. 1036). The inconsistent and controversial definitions of organizational learning reflect the fact that scholars have not reached a widely accepted definition of
organizational learning. Scholars from different academic backgrounds view organizational learning from different angles with different foci and methods and thus derive different definitions, descriptions, and prescriptions of organizational learning phenomena.

Although each perspective has its own strengths and weaknesses, each alone cannot completely and accurately describe the organizational learning phenomenon. The parable of the blind men and the elephant vividly appears in the study of organizational learning. For example, unidimensional discussions of organizational learning have been presented by scholars such as Weick (1991) and Maier et al. (2001), using only a psychological perspective, by scholars such as Duncan and Weiss (1979) and Berends et al. (2003), using only a structural perspective, and by scholars such as Schein (1996b) and Mahler (1997), using only a cultural perspective. In addition, although other scholars have recognized multiple dimensions of organizational learning in their studies (Hedberg, 1981; Shrivastava, 1983; Argyris & Schon, 1996; and Lipshitz et al., 2002), systematic discussions about the underlying theories, assumptions, and their strengths and weaknesses are still absent in the literature.

To bridge this gap, one of the primary objectives of the present study is to present a conceptual framework that could facilitate a clearer, more complete, and more accurate understanding of what organizational learning is. It is argued that the elephant of organizational learning is a multidimensional concept that cannot be fully comprehended from a single perspective. The study suggests that the concept of organizational learning must be triangulated from three perspectives: psychological, structural, and cultural, all of which together could function as a prism to reflect the different facets of organizational
learning. The first section of the literature review illustrates how each perspective helps define organizational learning and how literature on organizational learning can be categorized into these three perspectives. The facets and definitions of organizational learning from the three perspectives are tabulated in Table III-1.

### 1. Definitions of OL from the Psychological Perspective

Organizational learning theories have deep intellectual roots in psychology. To appreciate what learning is from a psychological perspective, it is essential to address the three important schools of psychological learning theories: classical conditioning theory, operant learning theory, and social learning theory.

**Classical Conditioning Theory:** This theory describes the learning phenomenon in terms of having a repeated pairing of an unconditioned stimulus (food) and a conditioned stimulus (footstep) several times such that a conditioned response (a dog’s salivation) will occur even with the unconditioned stimulus alone (Griggs, 2005). The acquired conditioned response (CR), however, could then be eliminated by repeatedly presenting the unconditioned stimulus (UCS) without preceding the conditioned stimulus (CS). The essence of classical learning theory is that learning is the process whereby the learner responds to the stimulus, which could be either conscious and intentional or unconscious and unintentional.

Inspired by the classical conditioning theory and drawing an analogy between individual learning and organizational learning, organizational theorists have viewed organizational learning as a stimulus-response (SR) process (Hedberg, 1981; Weick, 1991; Argyris & Schon, 1996). By analogy with individual learning, Hedberg (1981) uses the
SR model to explain how organizations gather experience and knowledge in response to stimuli. From Hedberg’s viewpoint, as organizations encounter stimuli from situations, they will identify and select the stimuli to which they should respond by mapping their environments and inferring the causal relationships therein. These maps serve to elaborate and refine the encountered new situations and constitute organizations’ theories of action. Responses that match the stimuli well are likely to be retained and evoked the next time organizations encounter similar situations. In a nutshell, according to Hedberg, learning is a process whereby organizations identify and select stimuli, infer their causal relationships, and respond to them accordingly. The SR model is also applied by Argyris and Schon (1996) to explain how organizational learning occurs. From their viewpoints, organizational learning is a process of organizational inquiry triggered by “a surprising mismatch between expected and actual results of action” (p. 16), followed by a process of thought and further action, which leads to further modifications of situation identification. The purpose of organizational inquiry is to minimize the difference between the outcomes and the expectations through restructuring their activities, thereby changing the organization’s theory-in-use. Weick (1991) also views organizational learning in the strictest way. Having examined the four combinations of stimulus and response: same stimulus-same response, different stimulus-different response, different stimulus-same response, and same stimulus-different response, he argues that only same stimulus-different response qualifies as learning, which, however, is rare in organizations, because organizations build up routines that tend to respond to different stimuli in the same way.

**Operant Learning Theory**: Unlike classical conditioning, which focuses on the
association between stimuli and responses, operant conditioning theory focuses on the association between behaviors and their consequences. According to operant learning theory (Griggs, 2005), behaviors can be encouraged through positive reinforcement (e.g., reinforce a child’s better grade by a toy) or negative reinforcement (e.g., induce students’ better grade in the mid-term exam by waiving the final exam). On the contrary, behaviors can also be discouraged through positive punishment (e.g., correct a student’s late submission of the homework by refusing to take it) or negative punishment (e.g., correct a child’s cheating by canceling a promised vacation). Thus, learning, from the perspective of the operant learning theory, is not just simple, unconscious, and unintentional responses to stimuli, but also conscious, purposeful, and effective responses to achieve rewards, accomplish objectives, and avoid punishments.

In line with operant learning theory, Hedberg (1981) argues that learning is the process by which learners receive positive rewards for mastering frequently encountered stimuli, which would improve not only the way the organization maps the environment but also its responses to stimuli. Following the same reasoning, organizational learning is viewed either as “the process within the organization by which knowledge about action-outcome relationships and the effects of the environment on these relationships is developed” (Duncan & Weiss, 1979: p. 84) or as the process of modifying the proposed trial movement to improve the unsatisfying conditions (Lindblom, 1959). In addition, how learning behaviors could be strengthened and weakened by reinforcement and punishment is also borrowed by organizational learning theorists. For example, Maier et al. (2001) maintain that the learner’s motivation is critical to both the initiation and continuity of learning behaviors. However, just presenting the incentives is not good
enough. In stressing the importance of rewarding learning behaviors, Garvin (1993) contends that rewards should be provided not only to the best performer but also to those who make the substantial progress.

**Social Learning Theory**: if there was no person around us, our behaviors would be formed mostly on the basis of classical conditioning and operant conditioning. Most of us, however, do not live hermetically, but rather are influenced by our relatives, friends, and even strangers. Observational learning theory, also known as social learning theory, imitation, or social modeling, says that people learn from others by perceiving and attending to the imitated behaviors and then coding and retaining learned behaviors into memory (Griggs, 2005). Further, learning behaviors could be affected by three sources of behavioral modeling: family members, the media, and the environment. In essence, learning, from the social learning perspective, is viewed as a social process of imitating other people’s behaviors to obtain rewards and/or to avoid punishments.

Social learning theories that stress learning together and learning from each other have had tremendous impacts on organizational learning theorists in their discussion of organizational learning from others, imitation, and vicarious learning. For example, Hedberg (1981) views organizational imitation as the process by which “organizations occasionally learn by imitating others’ behaviors or by accepting behavior repertoire from others” (p. 7). At the individual level, Argyris & Schon (1996) also state that “a theory-in-use must be constructed from observation of the patterns of interactive behavior produced by individual members of the organization” (pp. 13-14). Similarly, Kim (1993) maintains that individual learning is not sufficient to achieve organizational learning. “There needs to be a way to get beyond the fragmented learning of individuals and spread
the learning throughout the organization” (p. 48). Furthermore, the merits of social learning have been illustrated in institutional theory, which argues that in addition to learning directly from trial-and-error, vicarious learning or imitation is important to organizations because it not only minimizes sanctions from a variety of stakeholders but also reduces risks especially when organizations are not clear about their goals or the technology involved (Singh & House, 1986).

2. Definitions of OL from the Structural Perspective

In contrast to psychological perspectives, which mainly focus on individual learning and its effects on organizations, organizational theorists using structural perspectives argue that organizational learning should be viewed as a social process that involves personal interactions. Structuralists tend to view the development of organizational knowledge as the outcome of organizational learning. What they are most concerned with is how the acquired organizational knowledge is institutionalized into structures. Moreover, despite the fact that some structuralists try to take a broader perspective to include informal aspects of organizational learning such as tacit knowledge, non-institutionalized organizational practices, and culture, many others mainly focus on how organizational knowledge is formally institutionalized in organizational structures. Briefly, organizational learning, from a structural perspective, is viewed as a social and organizational process by which organizational knowledge and skills are developed and institutionalized into organizational memory.

From the structural viewpoint, Duncan and Weiss (1979) argue that organizational learning is the process by which organizations develop knowledge about action-outcome
relationships and environmental impacts. The focus of organizational learning, thus, is not on behavioral changes but on the development of knowledge (Duncan & Weiss, 1979) and on its potential impacts on changing organizational activities (Berends, et al., 2003). Second, the process of developing knowledge must not only be a social process in which individual knowledge needs to be shared, evaluated, and integrated, but also an organizational process reflecting the “socially constructed and accepted paradigm, the political nature of the organization, and the nature of communication within the organization” (Duncan & Weiss, 1979: 97). One critical assumption that underlies structural perspectives is that organizational learning is not equal to individual learning and should be even more than the aggregate of individual learning (Duncan & Weiss, 1979). Individual learning is not meaningful and organizational unless it is related to organizational goals and is based on organizational positions. Organizational learning, in this sense, refers to knowledge that is not only socially accepted but is also applicable in organizational activities (Berends et al., 2003).

Apart from the emphasis on the social and organizational process of developing knowledge, organizational theorists also view organizational learning in terms of institutionalized organizational practices. For example, Cangelosi and Dill (1965) maintain that organizational learning is a “process in which growing insights and successive restructurings of the problem … reflect themselves in the structural elements of the organization itself” (pp. 175-176). Similarly, Levitt and March (1988) view organizational learning as the process of formulating routines that capture past experiential lessons about the relationship between observations and aspirations. Organizational theorists further argue that organizational routines can be institutionalized
both formally and informally (Shrivastava, 1983; Levitt & March, 1988). For example, Levitt & March (1988) argue that routines could be recorded formally as “the forms, rules, procedures, conventions, strategies, and technologies” as well as informally in the forms of “the structure of beliefs, frameworks, paradigms, codes, cultures, and knowledge that buttress, elaborate, and contradict the formal routines” (p. 320). Simply put, structural perspectives of organizational routines focus on how patterns of thoughts and behaviors are institutionalized either formally or informally.

Reasoning by analogy with individual memory, organizational theorists have also coined the concept of organizational memory to describe the organizational learning process. Organizational memory, from their viewpoint, could also exist either explicitly in the form of routines or implicitly in the form of beliefs (Huber, 1991; Simon, 1991; Kim, 1993). Those that are encoded could be in the form of routines, rules, standard operating procedures. Those that are not encoded are often viewed as part of the culture. Although used interchangeably, organizational routines seem broader and less strict compared to organizational memory where organizational knowledge and skills are generally consciously encoded. For example, Argyris & Schon (1996) argue that in addition to rules and standard operating procedures, organizational routines could also be in the forms of maps (such as diagrams of work flow, organization charts, drawings or photographs of the workplace), and memories (such as files, records, data bases, financial accounts). Regardless of the forms, what concerns organizational theorists are those things “that define what an organization pays attention, how it chooses to act, and what it choose to remember from its experience” (Kim, 1993: 44). Furthermore, it is valuable to notice Huber’s contention that how organizations effectively memorize the things they
learn holds the key to both the demonstrability and usability of learning (Huber, 1991).

The relationship between learning and structures is complicated and reciprocal. On the one hand, structures are manifestation of what organizations learn; on the other hand, the previous learning experiences also affect how organizations are structured. The enabling and disabling effects of structure on learning are described by Berends et al. (2003) in a structurationist model of organizational learning, based on Gidden’s (1976, 1979, 1984) theory of structuration, which views social structures as a reflection of both rules and resources. Applying structuration theory, Berends et al. (2003) argue that structures have both enabling and constraining effects on learning in that human actions are both made possible and constrained by existing rules and resources. To these structuralists, formal organizations are those “whose rules are to some degree explicit and grounded in the legal system of the society” (Argyris & Schon, 1996: 10). Features of formal organizations and their task systems are viewed by Argyris and Schon (1996) as resembling properties of Weber’s bureaucracy.

3. Definitions of OL from the Culture Perspective

Despite the fact that organizational structuralists notice the informal processes of institutionalizing organizational skills and knowledge and the implicit forms of organizational memory, their foci are often utilitarian and centered on how to improve organizational efficiency and effectiveness. Organizational theorists who use a culturist viewpoint often view organizational learning from a rather different perspective from organizational structuralists. To comprehend the cultural perspective of organizational learning, it is necessary to illustrate how culture is defined.
Efforts to define organizational culture have been reflected in scholars’ dedication to identify cultural elements. Schein (1985) specifies three levels of organizational culture: artifacts, values, and assumptions. **Artifacts** are most obvious and include such observable things as physical environments, technology, language, products, and the overt behaviors of its members. **Values** are less obvious and refer to someone’s view of what ought to be, as distinct from what is. **Assumptions** often are gradually and unconsciously formed when a hunch, value, or hypothesis works successfully and repeatedly as the solution of a problem. Trice and Beyer (1993) also classify cultural elements into two types: the overt **signifiers** of culture and the **meanings and interpretations** of the signifiers. The former refers to “icons, rituals, stories, myths, argot, ceremonies, office layout and space use, and decorative displays,” and the latter includes “the beliefs, values, philosophies, norms, and justifications that actors collectively hold about the meaning of the organization and their work in it” (Mahler, 1997: 526).

Further examination of the literature on organizational culture reveals that definitions of organizational culture are various and confusing, depending on which side one stands in terms of the explicit vs. implicit, objective vs. subjective, rational vs. nonrational perspectives. **Explicit** views of organizational culture focus on myths and rituals (Ouchi & Wilkins, 1985), artifacts (Schein, 1985), or signifiers (Trice & Beyer, 1993). **Implicit** views of organizational culture focus on the symbolic representations that are deeper and more fundamental to organizational life (Ouchi & Wilkins, 1985), values and assumptions (Schein, 1985), or meanings and interpretations of signifiers (Trice & Beyer, 1993). In line with the implicit perspectives, Schein (1985) contends that the essence of culture lies in the deeper level of basic assumptions and beliefs that are shared
collectively and come to be taken for granted by organization members. Assumptions and beliefs represent the learned responses to external environments and internal integration and are different from artifacts and values, which generally represent only manifestations or surface levels of the culture. **Rational** views stress the importance of structure as bases of organizational rationality; while **nonrational** views enlighten the importance of informal norms and the role of leadership on organizational life.

Ouchi and Wilkins (1985) further divide studies of organizational culture into macroanalytic and microanalytic perspectives. Scholars holding a **macro** perspective view culture in terms of employee practices, corporate ceremonies, and company legends. Their unit of analysis is on a group or society as a whole. What they are concerned with is how those cultural elements function to maintain social structure. By contrast, the unit of analysis of the **microanalytic** view is the individual. Scholars holding this viewpoint are interested in the individual unconscious mind and the individual cognitive processes of sense-making, learning, and causal attribution. Generally speaking, organizational culture scholars who take the macro view are also more likely to take the explicit, rational, and descriptive perspectives, while those who take the micro view are more likely to hold the implicit, nonrational, and prescriptive perspectives.

The strong relationship between culture theories and learning theories is revealed by the fact that theoretical controversies in organizational culture theories, such as rational vs. nonrational and explicit vs. implicit perspectives, also exist in organizational learning theories. Organizational scholars holding the **rational-analytic** perspective view organizational learning as an analytic activity in which organizational members learn how to identify problems and search out solutions by focusing on information about past
efforts and seek to improve their responses via incremental or fundamental changes in operations, routines, or standards (Mahler, 1997). By contrast, the interpretative theories of learning stress that organizational learning is an inter-subjective process in which organizational members have to share their interpretations of events and reflect on these interpretations (Mahler, 1997). Moreover, organizational learning scholars who take the explicit viewpoint assert that organizational learning should be viewed as a process of improving actions through better knowledge and understanding (Fiol & Lyles, 1985), as permanently embedded behavioral changes reflected in theories-in-use (Argyris & Schon, 1996), or new responses or actions based on the interpretation (Daft & Weick, 1984). By contrast, those who take the implicit viewpoint contend that organizational learning is a process of interpreting organizational events (Daft & Weick, 1984), the development of a shared understanding and conceptual schemes (Hedberg, 1981), or “a social construction that transforms acquired cognition into accountable abstract knowledge” (Nicolini & Meznar, 1995: 727).

The relationship between organizational culture theory and organizational learning is also revealed in the five research themes identified by Smirich (1983): comparative management, corporate culture, organizational cognition, organizational symbolism, and unconscious processes and organization, which can be easily related to organizational learning theories presented in the triangular framework used in the present study. For example, corporate culture approach stresses how an organization’s culture develops in the process of interacting with its environment and how culture management is related to decision making and adaptive aspects of organizational learning theory. Organizational cognition, focusing on how rules reflect the way members see and
describe their world, is related to structural perspectives of organizational learning theory. Organizational symbolism, which is concerned with how employees interpret their experience and how the interpretations relate to their actions, is more related to operant learning theory in terms of stressing action-outcome relationships. Unconscious processes and organization, stressing how the hidden and unconscious human mind works as the objective foundation of social arrangements, is more related to classical learning theory in terms of focusing on the unconscious learning.

In terms of the impact of culture on learning, Schein (1985) describes how each cultural element could affect organizational learning. From his viewpoint, artifacts are obvious and explicit and are the reflection of the learned behavioral responses. They could be either formalized or unformalized. Values, close to what Argyris and Schon (1996) called the espoused theories, usually serve either as the normative or moral function or as a source of identity and core mission to deal with the uncertainty and to predict behaviors. Assumptions, congruent with what Argyris and Schon (1996) called theories-in-use, are usually nonconfrontable and nondebatable. They, however, hold the key to double-loop learning. In addition, Mahler (1997) illustrates in detail how organizational culture could influence learning in five different ways: (1) via the forms of professional norms and definitions of good performance, (2) via the understanding of routines, programs, or procedures symbolized in organizational rituals, argot, stories, routines, and norms, which could further help us cope with resistance to change, (3) via the improvement of information flow through the examination of why some channels or types of communication are preferred over others, (4) via organizations’ responses to demands from external environments, clients, and other organizations, and (5) via the
examination of how subcultures arise and how they could spark new learning. Moreover, Mahler (1997) argues that the importance of culture to the study of organizational learning is that behaviors or activities, either individually or collectively, depend not only on information and technology but also on the interpretation of that information.

On the other hand, learning theories could reciprocally contribute to culture theories by helping scholars develop the concept of organizational culture in a more dynamic way as well as by helping practitioners manage and change culture in terms of revealing the beliefs and assumptions that underlie social behaviors (Schein, 1985). In line with this perspective, Simon (1991) argues that learning could bring new knowledge to bear within an existing culture or could bring knowledge that changes the culture itself. Fiol and Lyles (1985) further state that “culture consists of the shared beliefs, the ideologies, and the norms that influence organizational action-taking” (p. 804). Organizational learning, from this viewpoint, is not unilaterally affected by organizational culture. It could help not only form organizational culture but also nurture and enrich its contents dynamically.

In sum, from the cultural perspective, organizational learning is viewed as “sharing of knowledge, beliefs, or assumptions among individuals” (Shrivastava, 1983: p. 17) and involves fundamental changes in organizations’ frames of reference, theories-in-use, and worldviews. Given this understanding, it is easier to comprehend why scholars such as Berends et al. (2003) argue that organizational learning should be interpreted as changes in organizational culture and why scholars such as Lyles and Schwenk (1992) and Boje (1994) maintain that organizational learning is the process of working out of controversies.
4. The Triangular Perspective of Organizational Learning

Aside from the confusion and inconsistent definitions of organizational learning, the traditional unidimensional views of organizational learning have their own strengths and weaknesses. For example, psychological perspectives, despite the advantages of viewing learning as both rational and nonrational, conscious and unconscious activities, and providing the best explanations of organizational learning at the individual level, are weak in terms of equating individual learning to organizational learning, ignoring learning at the organizational level, and failing to explain structural effects on individual learning. Second, even though structural perspectives are strong at explaining learning from a rational perspective, the relationship between structure and behavior, and the institutionalization of organizational knowledge, they suffer from ignoring nonrational parts of organizational learning and substituting unity and specialization for diversity and innovation. Third, in spite of the fact that cultural perspectives better explain beliefs, values, and assumptions underlying organizational learning and hold the key to continuous and spontaneous learning, cultural explanations of organizational learning are often hindered by the problems of abstractness, difficulties of measuring concepts, and prolonged effects.

Having appreciated the three important dimensions of organizational learning, the present study would define organizational learning as the process that triggers an organization and/or individuals on behalf of the organization to acquire and distribute knowledge and skills either through directing learning or through imitation, which would then be institutionalized either formally in organizational routines or informally in shared beliefs, values, and assumptions. It is believed that the triangular framework in
the present study could best remedy each perspective’s weaknesses and take advantage of each perspective’s strengths. For example, as Figure III.1 indicates, psychological perspectives could best explain how individual learning affect group learning and organizational learning. Structural perspectives are powerful in explaining how organizational learning affects group learning and individual learning. Cultural perspectives contribute to the explanations of the effects of group learning on organizational learning and individual learning. In addition, the framework covers the crucial learning entities at three different levels: individual, group, and organization.

**Figure III-1 Relationships among the Three Dimensions of OL**

Moreover, by integrating the different perspectives, studies on organizational learning can take the advantages of different disciplines. For example, psychological perspectives are closely related to psychology, social psychology, and neurology. Scholars holding structural perspectives often come from sociology and political science. Cultural perspectives are also closely related to anthropology, sociology and social psychology (Ouchi and Wilkins, 1985). It is believed that studies of organizational
learning should be interdisciplinary and could be much more advanced if scholars from different disciplines could reach more agreed-upon conclusions.

Nevertheless, it is important to note that although different perspectives have their different viewpoints and foci and approach the learning phenomenon from different angles, they also overlap with each other to some extent. For example, structuralists have developed the concept of organizational memory to a great extent by analogy with psychological and neurological perspectives of individual memory. Macro-structural perspectives view routines to be both formal and informal. The informal routines largely overlap with cultural elements. Conversely, the rational-analytic viewpoint of culture and cultural artifacts is also closely related to structural perspectives. Lastly, the micro-analytic views of culture also overlap with psychological perspectives considerably. Learning from others, stressed by social learning theories, is even closely related to the cultural perspectives.

B. Organizational Learning Mechanisms (OLMs) for Productive Learning

Apart from the controversy associated with the different definitions of organizational learning, studies of organizational learning can also be divided into two groups according to their focus on organizational learning vs. learning organization (Tsang, 1997). The former tries to answer the question of what learning is at the organizational level and how it works from the descriptive viewpoints. The latter advocates what learning ought to be at the organizational level and how to perfect the process from the prescriptive viewpoint. Unlike scholars who take the descriptive perspectives and talk about organizational learning in a more objective way, scholars who
advocate learning organizations tend to take more normative and prescriptive perspectives, view learning as instrumental to improve organizational effectiveness and performance, and stress behavioral changes as essential in their definitions of organizational learning.

From prescriptive perspectives, organizational theorists have proposed a variety of prescriptions to improve an organization’s learning capability. Popper and Lipshitz (1998) term these prescriptions as organizational learning mechanisms (OLMs), meaning “institutionalized structural and procedural arrangements that allow organizations to systematically collect, analyze, store, disseminate, and use information relevant to the performance of the organization and its members” (p. 170). This definition, however, suffers from the problem of narrowly focusing on “institutionalized” structural and procedural arrangements. The present study would extend the meaning of OLM and define it as psychological, structural, and cultural arrangements that aim to enhance an organization’s learning attitudes and behaviors, which could be institutionalized formally or informally.

Prescriptions to improve organizational learning capabilities are legion. A theoretical groupings and listings of OLMs can be very confusing to organizational learning students and practitioners. Aiming to improve this insufficiency in the literature, the triangular framework again could provide a framework for the grouping of currently proposed OLMs with both theoretical and empirical supports.

1. OLMs from Psychological Perspectives

On the whole, the psychological prescriptions of organizational learning focus on
how to improve awareness of stimuli, how to stimulate ideas and responses correctly and efficiently to achieve successes and avoid failures, how to improve leaning between individuals, and how to motivate individual learning.

**Classical Conditioning Theory** Improving organizational learning capabilities, from a classical learning theory perspective involves identifying, organizing, and selecting stimuli by promoting and directing awareness (Hedberg, 1981). A learning organization not only needs to scan and research internal and external environments for stimuli but also has the capability to select and enact its environments (Weick, 1995). Environments can be categorized into several different dimensions: cultural, legal, political, social, technological, economic, and physical (Hatch, 1997). Stimuli would come from each of the dimensions. Organizations, thus, need to improve their antenna for acquiring the information from each of the dimensions. A variety of means have been proposed to help organizations broaden and remedy cognitive limitations and further detect and identify changes and demands quickly and accurately. These prescriptions include journal subscriptions, conferences, seminars or workshops, consulting services, site visits, and tours (Garvin, 1993; Marquardt, 1996; Stewart, 1997).

**Operant Learning Theory** The primary concern from an operant learning theory perspective is how to correctly interpret stimuli and responses and derive the action-outcome relationships, which are crucial to the avoidance of failures and the attainment of rewards. To achieve this objective, Kim (1993) argues that organizations need first make mental models explicit. Additionally, they need to know not only what people learn but also how they understand and apply that learning. Similarly, Garvin (1993) also calls for moving from superficial knowledge to deep understanding.
Moreover, Argyris and Schon (1996) maintain that organizations should not limit themselves to single-loop learning (changes in strategies only) but conduct double-loop learning (changes in values and assumptions) as well. Prescriptions for these purposes are legion. To directly learn the causal relationships, organizational theorists call for experimentation to search for and test new ideas and knowledge (Hedberg, 1981; Huber, 1991; Garvin, 1993). In addition, computer simulations and learning laboratories are also helpful to derive causal relationships in the decision-making process (Shrivastava, 1983; Kim; 1993; Senge, 1990). Moreover, to learn from their own experiences, organizations need to focus on “monitoring more objective measures of performance, such as assessing adherence to prior plans” (Huber, 1991: 92). Garvin (1993) also asserts that “companies must review their success and failures, assess them systematically, and record the lessons in a form that employees find open and accessible” (p. 85). Aiming at those purposes, learning mechanisms such as program evaluation, post-project review, and case studies have been proposed to facilitate the performance appraisal processes (Huber, 1991; Garvin, 1993).

**Social Learning Theory**  From the viewpoint of social learning theory, learning occurs when individuals learn together and learn from each other. Unlike classical learning theory and operant learning theory, which view learning barriers as the interruptions between knowing and acting, social learning theory views learning hurdles as the absence of learning models and the interpersonal and/or communication problems between learning models and learners.

Thus, the key to productive learning, from social learning theory, lies in both finding the best learning models and distributing and sharing information between
learning models and learners. Prescriptions aimed at improving the distribution of acquired skills and knowledge include job rotation, mentoring and apprenticeship, internal benchmarking, teamwork, and public forums (Garvin, 1993). In addition, external benchmarking and grafting (in the form of acquisition, merger, and joint adventure) have also been proposed to remove those learning hurdles (Huber, 1991).

**Motivation** A common assumption underlying the three schools of learning theories in psychology is that learning can be motivated either internally or externally. From the classical conditioning perspective, learning could be triggered by satisfying physiological needs. From the operant learning perspective, learning could be enhanced by receiving rewards and avoiding punishments. From the social learning perspective, learning could be motivated by satisfying social needs.

There are two concerns between these motivation theories and organizational learning theories. First, organizational theorists have debated what triggers learning. For example, learning could be a response to stress, as suggested by Cangelosi and Dill (1965); a way to deal with problematic situations, as suggested by Hedberg (1981) and Argyris & Schon (1996); or a tool to grow and survive through competitive advantages and innovation, as suggested by Fiol and Lyles (1985) and Stata (1989). Nevertheless, learning should not be viewed simply as a passive response to stress or problematic situations, as Hedberg (1981) observed, “it is usually the case that scarcity, conflict, and substandard performance lead to actions, whereas wealth, harmony, and goal accomplishment breed complacency and reinforce current behaviors” (p. 16). To be prominent, organizations should view learning as an opportunity-recognition process and as an innovation-generating process (Lumpkin, 2005).
Second, organizational theorists and psychologists have long advocated that there are positive effects of motivation and incentives on employees’ satisfaction, commitment, organizational learning, and performance (Shrivastava, 1983; Cyr & Schneider, 1996; Colquitt & Simmering, 1998; Hays & Hill, 2001; Currie & Kerrin, 2003). In this respect, prescriptions for motivation include human resources management such as rewards, performance feedback, and promotion. In addition to the contents of motivation and incentives, how motivation is processed is also critical. It is important that learning organizations reward learning not only for achieving the desired objectives (i.e., reducing costs, improving quality, and meeting consumers’ needs), but also for innovation and significant improvements compared to past performance (Garvin, 1993). Despite considerable attention from psychologists and organizational theorists given to motivation, empirical studies on how contents and processes of motivation could affect learning at the organizational level are still inadequate and unsystematic.

2. OLMs from Structural Perspectives

Organizations that closely resemble Weber’s ideal-type bureaucracy have long been criticized as unable to adapt rapidly changing environments. As environments are getting more uncertain, the need for structural modifications that accommodate high frequency and informality in communication will increase (Gupta & Govindarajan, 1991). For example, Burns and Stalker (1961) proposed the organic form to fit in complex and dynamic industries. Mintzberg (1993) calls for an adhocracy configuration to adapt to complex and dynamic environments. Moreover, Mitki and colleagues (1997) advocate the positive effects of parallel structures on organizational learning. Despite their various
types, prescriptions that aim to soften and humanize the monolithic and rigid features of
ideal-type bureaucracy for organizational learning have the following foci: relaxation of
rules and regulation, decentralization, team learning, and enhancement of organizational
memory.

Relaxation of Rules and Regulations First, rules and regulations have often
been criticized as causing organizational inertia, red tape, unresponsiveness to new
stimuli and needs, and as barriers to innovation. To ameliorate the problems of
organizational rigidity and inertia, organizational theorists call for the relaxation of rules
and regulations that could inhibit organizational learning.

Empirical studies have supported this approach. Based on a study on 37
high-technology firms in the California’s Silicon Valley, Bahrami (1992) maintained that
when facing rapidly changing environments, organizations need to move away from a
rigid and monolithic structure and adopt a more flexible, diverse, and dynamic
organizational form so that people can be more encouraged to embrace novelty,
innovation, and change, more willing to share ideas, and more likely to learn from
different experiences. In addition, with a goal of examining whether rules proliferate
themselves, Schulz (1998) studied rule production in a U.S. research university. The
results suggested that bureaucratic, technical, or formal rules could inhibit organizations
from unlearning past experiences, block organizations from seeing new learning
opportunities, and cause organizations to be unresponsive to environmental changes.
Furthermore, Moynihan (2005) advocated managing for results (MFR) “as an
organizational learning mechanism and a deliberate structural effort to induce learning”
(p 203) and demonstrated the positive effects of MFR on organizational learning in the
corrections departments in both Vermont and Virginia where MFR was used not only as a tool to question existing goals but also to facilitate organizational learning through the change in the underlying justice philosophy.

**Decentralization** In addition, organizational theorists call for decentralized organizational structures to deal with unfamiliar problems, to facilitate acquisition and distribution of tacit skills and knowledge, and to encourage divergent thinking and innovation. For example, Blackler (2000) has called for ‘decentred’ collaboration to deal with problematic situations with which participants are not familiar. ‘Decentred’ collaboration relaxes the traditional hierarchical relationships and routines and actively involves people in contributing their skills and knowledge for new understanding of the context. Similarly, based on a U.S.-Japan comparison of industrial organization, Aoki (1986) argues that intangible skills and tacit knowledge could be better induced by horizontal information communication and coordination, less specialization of workers’ jobs, and more delegation of decision-making power. Moreover, Lam (2000) asserts that decentralized structures contribute to the acquisition and distribution of tacit knowledge. He further argues that the structure of an operating adhocracy, which stresses diverse backgrounds and experiences at multi-levels, contributes to divergent thinking, innovation, and creativity.

**Specialization** The merits of division of labor were articulated by Adam Smith (1776), when he stated that as “each individual becomes more expert in his own peculiar branch, more work is done upon the whole …” (p. 10). The widely accepted belief is that specialization can improve production/performance quality and quantity through accumulating more experience and knowledge of the activities involved (Shrivastava,
1983), through better understanding of the environments and situations (Levinthal & March, 1993), and through reducing time and costs.

Specialization, on the other hand, could exert negative effects on organization learning. First, specialization, either by territory or by locality, is likely to encourage employees to restrict or block information in order to guard their own mission, standards, and skills (Wilensky, 1973). The side products of specialization are inter-unit rivalry and parochialism, which are attributable to the “myopia of organizational learning” (Levinthal & March, 1993). Along with information blockages and distortions often come competency traps, technocracy, and ignorance of clients’ interests, all of which are responsible for organizations’ loss of the capability to learn and lack of responsiveness to stimuli and demands. To counteract those side effects, organizational theorists resort to systems thinking, job rotation, and team learning.

**Systems thinking**, according to Senge (1990), is the essence and the fifth discipline for learning organizations. By systems thinking, Senge (1990) means the examination of the dynamics, rather than a snapshot, of the problem. Systems thinking warns us that today’s problems often stem from yesterday’s solutions. Nonsystemic thinking, that is, seeing the tree without seeing the forest, could fuel negative compensating feedbacks and make the cure worse than the disease. Thus, Senge (1990) argues that learning organizations should avoid dichotomizing solutions and being blocked by structural boundaries. Systems thinking is important for organizations to think more comprehensively and systematically, to obtain a better and more complete picture of the situation, and to derive causality more accurately, and to find a better way to solve the problem.
Job rotation is viewed as one of the features of holistic organizations by Lindbeck and Snower (2000), and represents workers’ preferences for versatile work. Job rotation is also viewed by scholars as an integrative mechanism that helps remedy the disadvantages of specialization (Griffin & Hauser, 1996; Cosgel & Miceli, 1999; Jansen, van den Bosch, & Volberda, 2005). Job rotation has even been presented as a radical work-sharing initiative that helps spread good-practice, sustain employment, and promote lifelong learning (Etherington & Jones, 2004).

The positive effects of job rotation on productivity, innovation, and learning have been documented in a number of empirical studies. For example, with an interest in how companies have fostered product innovation, Harryson (1997) studied Canon’s and Sony’s R&D departments. The results of his case study suggested that successful production innovation is associated with four key mechanisms: “strategic training and job rotation for engineers, application-driven R&D, direct transfer of development teams from R&D to production and extensive networking with external centers of excellence and key suppliers” (p. 288). In addition, viewing job rotation as an organizational mechanism associated with coordination capabilities, Jansen, van den Bosch, and Volberda (2005) found that job rotation improved a unit’s potential absorptive capacity. Moreover, assuming that new knowledge generation is necessary for companies to remain competitive, Song, van der Bij, and Weggeman (2006) studied how managerial controllable variables would affect the level of knowledge generation in new product development. The results, based on data from 277 firms in high technology industries, suggested that job rotation was positively related to levels of knowledge generation.

Team Learning As a means to counteract side effects of specialization, team
learning could help to delegate decision-making power to team members, and to facilitate information distribution, especially distribution of tacit knowledge. Moreover, teamwork is also essential for individuals to learn from each other. Edmondson et al. (2003) maintain that when the improvement of organizational performance depends on a task that requires reciprocal coordination and the transfer of tacit knowledge, organizations could develop teams with stable membership to increase the chance for performance improvement. Similarly, Reagans et al. (2005) argue that cumulative working experiences in a team could contribute to a firm’s learning rate. Furthermore, Kayes (2004), analyzing qualitatively the deaths of eight climbers on Mt. Everest in 1996, asserts that team learning is a critical element for organizational survival especially when facing complex and rapidly changing environments.

Despite the popularity of team learning, merits of team learning do not hold in all cases (Romme, 1996, 1997). Team learning is preferable when organizational performance depends on producing and understanding novel information. Hierarchies, however, do not always face new situations and have to spend considerable time encoding, storing, and recalling already acquired information. Moreover, Tjosvold et al. (2004) assert that for team members to learn from each other and to learn from errors, organizations have to overcome barriers at the individual level by assuring psychological safety and encouraging shared mental models by developing a cooperative rather than competitive culture within the team.

Enhancement of Organizational Memory Last, but not least, barriers to productive learning, from perspectives focusing on organizational memory, stem from the problems of encoding, storing, and retrieving knowledge and skills. To improve both
knowledge encoding and sharing processes, organizations need to solve the problem of converting tacit knowledge (stored implicitly in human minds) into explicit knowledge (Nonaka & Takeuchi, 1985). As a means to overcome the limitations of human cognition and memory, scholars have resorted to computer-based information systems (Huber, 1991; Cross & Baird, 2000; D’Adderio, 2003) for information encoding, storage, and retrieval. For example, Huber (1991) asserts that computer-based information systems are superior to human memories with respect to completeness, precision, accessibility, and reliability.

Applications of information technology to health care, also known as health informatics, represent a form of institutionalized health and medical skills and knowledge for health care professionals to improve their health care performance. Effective use of health informatics has been found to improve health practices, reassurance, learning and confirmation (Pluye & Grad, 2004); to strengthen evidence-based medicine and clinical decision making (Haynes et al., 1995); and to improve patient care and outcomes (Wyatt, 1995). Nevertheless, Masino (1999) argues that the relationship between information technology (IT) and learning processes is rather complicated and cannot be easily determined.

Another important issue that is associated with organizational memory is membership attribution (turnover), which has been viewed by some scholars as having negative impacts on organizational learning capabilities (Levinthal & March, 1993). Other scholars, however, view turnover as an opportunity for organizations to discard outdated memory and a facilitator to innovation (Hedberg, 1981; Simon, 1991; Maier et al., 2001). The effects of turnover on learning and performance were argued by Carley
(1992) as depending on how organizational knowledge is institutionalized. In other words, as organizational knowledge is getting more institutionalized, the effects of turnover on learning and performance are getting less significant. Other factors that affect organizational memory include information distribution, information interpretation, and norms and methods for storing and retrieving information (Huber, 1991).

3. OLMs from Culture Perspectives

In addition to psychological perspectives, advocating learning at the individual level, and structural perspectives, stressing learning at the organizational level, cultural perspectives prescribe that productive learning also requires a receptive and sharing culture to facilitate learning between/among individuals. In learning organizations one can find not only that each individual possesses high learning capacities but also that individuals learn from each other. Moreover, what individuals have learned contributes to learning at the organizational level. Cultural prescriptions for organizational learning are centered around the following issues: shift of mental models, building shared vision, acceptance of failures and errors, receptive environments, and interpersonal skills.

Shift of Mental Models  Senge (1990) defines mental models as “deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action” (p. 8). Individuals are usually unaware of those mental models. This definition echoes what Schein (1985) defines as the essence of culture. In addition, Senge (1990) uses the word “metanoia” to illustrate the essence of a learning organization, meaning “a fundamental shift or movement of mind” (p. 13). Changes of mental models, however, should be reflected both inside each individual and
between individuals.

Changing mental models internally corresponds to one of Senge’s learning principles -- personal mastery, which, from Senge’s (1990) viewpoint, requires that learning individuals constantly refresh visions, develop patience, see reality objectively, and commit to lifelong learning. Personal mastery, from the viewpoint of Lipshitz et al. (2002), also means being persistent in investigation, being willing to accept uncertainty, questioning the status quo, and being reluctant to simplify. Moreover, aside from personal mastery, mental models should be challenged externally through the practice of surfacing individuals’ mental models and exposing them to rigorous scrutiny. The success of this practice lies in whether people can reflect their thinking process and express their thinking effectively and openly to each other.

**Building Shared Vision**  From Senge’s (1990) viewpoint, building a shared vision is the essence of leadership. Without the deeply shared goals, values, and missions, organizations cannot perform at their highest level. What is worse, the effectiveness of learning in the short term is likely to be substituted for learning in the long run and at a distance (Levinthal & March, 1993). To build up shared mental models, Kim (1993) calls for explicitly surfacing individual mental models. Moreover, systems thinking and archetypes are important in the process of incorporating individual mental models in order to build up shared meaning and coordinate individual actions (Kim, 1993). However, it is important to skillfully unearth “shared pictures of the future” rather than to focus on compliance so that genuine commitment and enrollment can emerge (Senge, 1990). Nevertheless, as Kim (1993) maintains, there is little empirical evidence to document the construction and effects of shared mental models.
**Attitudes Toward Failures and Success**  Focusing on both individual and organizational levels, organizational theorists have debated whether successes or failures are more likely to trigger learning. Some argue that organizations are risk adverse and learning mainly aims to avoid failures (Chapman et al., 1959; Lindblom, 1959; Cangelosi and Dill, 1965). Others assert that organizations are more likely to learn from successes and ignore failures (Hirschman & Lindblom, 1962; Levinthal & March, 1993). It would be easier for organizations to indulge themselves with the pleasures of success and try to apply successful responses to all other similar situations, thus running the risk of competency traps rather than trying to face, admit, and accept their failures. Garvin (1993) suggests that organizations “recognize the value of productive failure as contrasted with unproductive success” (pp. 85-86). Thus, both successes and failures could trigger organizational learning, depending on whether organizations recognize the learning opportunities.

In addition, organizational theorists have asserted that tolerance for errors is imperative to productive learning (Korten, 1980; Argyris & Schon, 1996; Mahler, 1997). In some industries such as nuclear energy, aviation, and healthcare, failure to meet performance criteria or errors could be catastrophic. How to cultivate a culture that helps organizations face errors, deal with errors, and learn from errors is not only essential to quality assurance but also crucial to organizations’ success and even survival.

**Receptive Environment**  Whether the environment is receptive is an important element of a learning organization. From Garvin’s (1993) viewpoint, learning can only occur in a receptive environment. There are several important components of a receptive environment, including openness to criticism, acceptance of conflicts, issue-orientation,
Receptive learning environments should first be open to criticism (Shrivastava, 1983; Garvin, 1993). As critical thinking is important to individual learning in generating new ideas and knowledge, so is it to learning organizations to stimulate innovation and improve performance. Thus, in order to acquire complete and accurate information as well as to induce innovative ideas, “managers cannot be defensive and must be open to criticism or bad news” (Garvin, 1993: 87).

In addition, conflicts in values and norms need not be fully eliminated in a receptive environment. Argyris (1991) found that the culture of hiding overt conflicts negatively affected the overall budget planning process in the White House during Reagan’s administration. Argyris and Schon (1996) further argue that ignoring, hiding, or treating the conflict as a fight, or solving it based on dominance or compromise should not be viewed as learning. To turn conflicts into learning opportunities, Argyris and Schon (1996) propose double-loop learning, meaning that learning leads not only to changes in strategies but also to changes in values and assumptions. Double-loop learning could solve conflicts by creating new understandings of the conflicting requirements and by resetting new priorities and emphasis on norms, strategies, and assumptions accordingly.

Moreover, people in a receptive environment are issue-oriented while coping with criticism and conflicts. Issue-orientation requires focusing on “the relevance of information to the issues regardless of the social standing or rank of the recipient or the source” (Lipshitz et al., 2002: 85). Similarly, Argyris and Schon (1996) also stress the importance of objectivity and resort to the use of technical theories to prevent defensive
routines from inhibiting learning.

Last, but not least, receptive environments should have the feature of diversity. By diversity, scholars have not only been interested in observable attributes, such as race, gender, and age, but also in implicit attributes, such as values, beliefs, skills, experiences, and education (Milliken & Martins, 1996). With respect to its effects on organizational performance, diversity is often viewed as negative and contradictory to desired bureaucratic features such as reliability, stability, and predictability. Structuralists often substitute diversity for unity to reach the commonly accepted values and mental models. Nevertheless, organizational theorists argue that diversity could be meritorious to organizational learning. For example, diversity was found essential by March (1991) in a simulation study not only to cope with nonroutine problems or tasks but also to the achievement of optimal performance. Fiol (1994), having conducted several linguistic analyses on the argument framing process among venture team members, further asserts that in order to facilitate collective learning, managers have to strive for a view that is both convergent enough for individuals to understand the situation and divergent enough for successful corporate innovation.

**Interpersonal Communication Skills** All in all, prescriptions and principles listed above will just be a castle in the air if one fails to recognize human nature and to apply good interpersonal communication skills. Conflicts in values or norms cannot be simply solved by explicitly exposing and critically examining each other’s mental models, as suggested by Argyris and Schon (1996), if people feel that their face, dignity, job security, and personal interests are threatened. Critical comments and information need to be shared in an acceptable way. Both theorists and practitioners need to understand that
mutual understanding, trust, respect, and openness depend on human personality and interpersonal skills.

Individuals are different not only in talent, experience, and values but also in personality. Managers and scholars should recognize that humans are both rational and emotional. Theory X management beliefs are cynical and unrealistic in their negative view of humans (McGregor, 1957). It is, however, naive to view human nature positively without recognizing the negative side. The more realistic and eclectic views would appreciate both positive and negative sides of human nature. Whether managers cultivate the good seeds of human nature and restrain the growing of evil seeds is the key to successful leadership. In addition, good interpersonal communication skills, such as attentive listening (Garvin, 1993) and patience, are also critical to collective learning. Interpersonal communication skills are themselves important to be learned. Personality, culture, and structure are all influential in this learning process.

4. OLMs from the Triangular Perspective

Given the above-mentioned discussions on the definition of organizational learning, factors that cause learning barriers, and prescriptions for productive learning, one should have a better understanding about how different perspectives give different descriptive definitions of organizational learning and normative prescriptions for improving organizational learning.

In essence, the focus of OLMs from a psychological perspective is how to remedy learning barriers either in the stimuli-response learning processes or in the vicarious learning processes. Structural OLMs mainly aim to counteract learning barriers stemming
from bureaucratic features such as formalization, centralization, and specialization, as well as learning barriers in the process of institutionalizing acquired knowledge and skills. Cultural OLMs stress how to cultivate shared beliefs, values, and assumptions that are critical to facilitate organizational learning at the higher level.

These OLMs, however, do not function individually and often interact with each other. A review of the current literature on organization learning reveals a paucity of research on these interactions. The present study is dedicated to filling in this gap. The triangular perspective presents a more systematic and comprehensive framework to examine how each OLM directly and indirectly affects learning and how each OLM could be mediated and moderated by other OLMs. In addition, the triangular perspective allows for the integration of important learning types such as direct learning vs. vicarious learning and single-loop learning vs. double-loop learning. For example, consumer needs, training and education, performance evaluation, and internal benchmarking are closely related to direct learning; whereas external benchmarking and grafting are more associated with vicarious learning. In addition, changes in SOPs and performance evaluation are more related to single-loop learning, whereas value conflicts, innovative ideas, tolerance for errors, and developing a receptive culture are closely related to double-loop learning.

Moreover, the proposed OLMs in the triangular framework are also closely associated with Huber’s (1991) learning process model, which proposes the four components in the learning process: information acquisition, information distribution, information interpretation, and organizational memory. Consumer needs, training and education, and external consultation are important to information acquisition processes.
Teamwork, apprenticeships, benchmarking, and structural attributes are critical to information distribution processes. Performance evaluation, diversity, participation, tolerance for errors, innovative ideas, openness/honesty, and trust/respect are pivotal to information interpretation processes. Lastly, IT, SOPs, staffing, and turnover are essential to organizational memory. Although not exclusively, the triangular framework could help categorize the proposed OLMs and examine how different types of learning as well as the learning processes could affect organizational performance.

C. Organizational Learning Mechanisms (OLMs) and Quality of Care (QC)

Despite the fact that dozens of OLMs have been prescribed to improve organizational learning and organizational performance, organizational theorists are still uncertain about how organizational learning helps improve performance. In addition, although health care scholars have applied some of the OLMs to improve quality of care, their applications are often isolated from other OLMs. As a result, it is still not clear how OLMs really affect quality of care. Moreover, it is not unusual to observe in the current health care literature that effects of some OLMs have produced mixed results and other OLMs are absent from this literature.

The purpose of this section is twofold. It endeavors to elaborate (1) how organizational learning and OLMs could help improve quality of care and (2) how the proposed triangular framework could be used to examine the relationship between organizational learning and quality of care. It will begin with a review of how the OLMs proposed by organizational theorists in each perspective are applied to the health care industry and whether they effectively improve quality of care. What composes the OLMs
in each of the OL dimensions and how the OLMs have been theoretically and empirically proposed to improve QC are summarized in Table III-2.

1. Psychological Prescriptions Applied to QC

As outlined in the previous sections, psychological prescriptions applied to quality of care could also be categorized into the three learning schools in psychology.

**Classical Conditioning Theory** The essence of classical conditioning theory is to quickly and accurately identify, organize, and select stimuli within a given environment. Prescriptions to improve organizations’ learning capabilities, following classical conditioning theory, thus focus on information acquisition of needs and challenges from both internal and external stakeholders.

**Patients’ Needs** Among the variety of stakeholders, it is especially important for health care organizations to understand patients’ needs, not only because consumer satisfaction has been viewed as one of the dimensions of health care performance but also because knowing their needs is critical both to their satisfaction and to the efficacy of medical regimes. To understand patients’ needs, health care organizations have long suggested involving patients and their family members in the quality improvement process. For example, with input from more than 3,000 members and 5 health care experts, the American Pain Society (APS) has recommended that all health care settings ensure the involvement of patients and families to improve the quality of acute and cancer pain management plans (Gordon et al., 2005).

The effects of patient participation and involvement on the improvement of quality of care have been supported in several empirical studies. Based on 20 follow-up
appointments on hypertensive patients at 4 health care units, Aminoff and Kjellgren (2001) concluded that active patient involvement and participation was critical to patients’ adherence to treatment. In addition, based on a literature study, Johansson et al. (2002) proposed that patient participation and involvement was one of 4 eight factors that affect patient satisfaction with nursing care. Similarly, Rantz et al. (1999) conducted 11 focus groups and identified family involvement as one of 7 dimensions of quality of care in nursing homes. Furthermore, it is important for health care professionals to know that patients and their family members could play an important role in learning. Numerous studies have shown that, in addition to their colleagues and books, nurses can also learn a great deal from patients and their family members (Twinn, 1995; Bennett & Baikie, 2003; Tuohy, 2003). Briefly, good relationships between nurses and patients not only have the potential to improve the quality of nursing care, they also could help these individuals learn from each other (Suikkala & Leino-Kilpi, 2005).  

The capability of knowing what patients need and how to meet their needs, however, does not come from the air and has to be learned. OLMs that aim to improve the learning capabilities of health care professionals are reflected in a variety of forms such as institutional staff training, workshops, seminars, and school education. Their effects on quality of care have been documented in a number of studies.

*Training, Education, Workshops*  Based on an experimental study to evaluate the training program in 22 New York City Bureau of Child Health Clinics, Evans et al. (1997) found training to be an effective intervention to improve continuing and preventive care for children with asthma. Similarly, Proctor et al. (1999) conducted a randomized controlled trial in 12 matched nursing and residential homes in the U.K and
found that a training and education program, requiring nursing staffs to attend seminars from the hospital outreach team, significantly improved residents’ cognitive impairment and depression in the intervention group. Kuhn et al. (1991) studied the association between hospital characteristics and the medical outcomes in 3,100 U.S. hospitals and suggested that training of medical personnel was positively related to hospital quality of care. Moreover, based on a comprehensive literature review using psychological databases, Bartels et al. (2002) concluded that preferred mental health services in nursing homes were attributable to interdisciplinary and multidimensional services and training and education that were based on consultation and feedback on clinical practices.

Nevertheless, the positive effects of training are not universal across all health care settings. Smyer et al. (1992) studied two interventions from the Penn State Nursing Home Intervention Project -- skills training and job redesign, both aimed at increasing nursing assistants’ knowledge and motivation. The results revealed that performance did not significantly improve. In addition, results of the literature review conducted by Aylward et al. (2003) also challenged the long-term effects of knowledge acquired from training on performance.

The effectiveness of training and education programs could be affected by a number of factors. First, the content and process of the training and education programs should aim to improve quality of care (Borgiel et al., 2003; Patel et al., 2005), with ongoing monitoring and feedback on their performance (Borgiel et al., 2003). Second, skills and knowledge acquired in the training at the individual level may not last long enough to affect job-related performance (Moniz-Cook et al., 1998; Aylward et al., 2003), may not be transferred into organizational knowledge immediately, and may not be
applied and distributed accurately and efficiently. Furthermore, effects of training on performance may be moderated by other organizational and system factors (Aylward et al., 2003). Successful implementation of training and educational programs to improve health care performance also requires necessary organizational changes (Adami & Kiger, 2005; Richards et al., 2005).

Consultation and Expert Opinions In addition to training and education, consultation and expert opinions are also viewed as important OLMs. For example, clinical laboratory consultants are viewed as a valuable means to provide credibly helpful advice on test selection and results interpretation (Burke, 2003). Empirical studies have suggested that computerized expert systems are effective for enhancing test ordering and interpretation of laboratory investigations (Smith & McNeely, 1999), as well as for increasing primary care physicians’ diagnostic and therapeutic accuracy. Furthermore, based on their study of 285 nursing facilities in the state of Missouri, Rantz et al. (2003) argued that NHQC can be facilitated by on-site expert technical assistance that helps nursing staffs interpret quality indicator (QI) reports and implement quality improvement programs.

Nevertheless, the effects of physicians’ use of information consultation on quality of care are strongly affected by their use of and beliefs about information consultation (Keating et al., 1998). For example, physicians may disagree with the role of curbside (informal) consultation and the quality of the information exchanged (Kuo et al., 1998). More research would be needed to examine how these cultural factors would affect the use and the effects of consultation and expert opinions on quality of care.

Operating Learning Theory In addition to being able to quickly and
accurately identify, organize, and select stimuli, health care organizations need to know how well they respond to the stimuli. Among the variety of quality improvement initiatives, organizational performance evaluation in the form of report cards has drawn tremendous attention from health care scholars and practitioners.

**Organizational Report Cards** Viewed as a powerful tool to improve quality of care in the health care industry, organizational report cards have been supported by health care advocates. Underlying this initiative are several important assumptions that public disclosure of quality of care in health care organizations (1) can help providers better improve their performance by making performance feedback available, (2) can help consumers choose better facilities by reducing the asymmetric information, and (3) can help regulators and payers better supervise their providers (Gormley & Weimer, 1999). Moreover, compared to mechanisms for improving quality of services, such as regulation, self-regulation, and subsidies, organizational report cards are viewed as stronger than self-regulation, less coercive than regulation, and less expensive than subsidies (Gormley & Weimer, 1999).

Empirical studies about the positive effects of report cards on quality of care are plentiful. Ito and Sugawara (2005) studied 547 of the 817 hospitals accredited in Japan and found that public disclosure was positively related to scores for patient focused care, efforts to meet community needs, and scores for management. In addition, based on literature reviews and decades of experiences, Mukamel and Spector (2003) concluded that nursing home quality reports helped consumers make better choices and providers improve quality of care. Those impacts, however, were limited and needed to be complemented with other quality improvement initiatives. Furthermore, Mukamel et al.
(2004) compared selection of surgeons in 1991 (pre-report publication) and 1992 (post-report publication) and found that the New York State Cardiac Surgery Reports had positive impacts on the selection of cardiac surgeons. More specifically, Montague (1996) documented how the CABG report card helped St. Peter’s hospital in Albany, New York to reduce mortality from 30% (out of 36 high-risk grafts) in 1991 and 1992 to 0% (out of 42 high-risk grafts) in 1993. Gormley and Weimer (1999) attributed the dramatic improvement to St. Peter’s proper responses to the report card, including: 1) identifying the source of its poor ranking, 2) reviewing its own procedures, 3) comparing them to those of better performers, 4) identifying more effective procedures, and 5) adopting and implementing them. The spirit of both classical learning theory and operating conditioning theory are again vividly revealed in these proper responses.

Nevertheless, instead of responding to report cards with functional responses, such as process involvement, input reallocation, managerial focusing, and mission enhancement, organizations often exhibit dysfunctional responses, such as self-selection, cream skimming, teaching to the test, deception, and blaming the messenger (Gormely & Weimer, 1999), indicating that some organizations either do not learn or learn unproductively. How organizations respond would depend on the strength of the incentives provided by the report card and the organization’s flexibility (Gormely & Weimer, 1999), which corresponds to psychological perspectives and structural perspectives of the learning theories.

Moreover, assumptions about the responses of consumers and other stakeholders may not hold up in practice. Report cards may mean nothing either to purchasers and providers (Berlowitz et al., 2005) or to consumers (Marshall et al., 2000). To learn from
the report card, they have to first trust it and then have the time and the capability to utilize the information. Furthermore, contextual factors such as market competition and governance relations would come into play (Vining & Weimer, 1990), meaning that, other things being equal, the more competitive the market, the more powerful consumers’ choice; and that, the more dependent the organization on government for resources, the more useful report cards are for regulators to monitor organizations’ performance. To disentangle the relationships, the present study will examine the effects of report cards on NHQC.

**Social Learning Theory** Although contributory to quality improvement, prescriptions simply from both classical and operant learning theories are inadequate. Health care organizations inevitably have to learn from others, especially from the best performers. For example, Plsek (1997) argued that clinical outcomes needed to be improved by collaborative efforts such as multiorganizational groups, expert panels, best-practice conferences, and benchmarking groups. Among the prescriptions for social learning, two are most stressed to improve quality of care: benchmarking as well as mentoring, apprenticeship, and role modeling.

**Benchmarking** Viewed as a tool for quality improvement, health care advocates have paid considerable attention to benchmarking (Weissman et al., 1999; Doebbeling et al., 2002; Walsh, 2003). Benchmarking was found effective in supporting pediatric units in 27 National Health Service Trusts in the north-west of England for continuous cycle of comparison and sharing of evidence-based care (Ellis, 2000). To make benchmarking techniques more objective and achievable, Kiefe et al. (1998) argued that benchmarks (1) should be based on a level of excellence, (2) should be demonstrably achievable, (3)
should use reliable data to select providers in a predefined way, and (4) should demonstrate that the selected providers all contribute to the benchmark level. To empirically evaluate the effectiveness of using achievable benchmarks of care, Kiefe et al. (2001) studied 70 community physicians and 2,978 Medicare patients with diabetes mellitus and concluded that benchmarking was positively related to enhanced physician performance in influenza vaccination, foot examination, glucose control, cholesterol control, and triglyceride control.

Nevertheless, other studies suggest that benchmarking could have limits and side effects on learning. For example, at the individual level, Hedberg (1981) warned that learners who learn only to imitate without understanding know-why would have little power over the environments. At the organizational level, benchmarking and vicarious learning would also be limited when environments are competitive or changing rapidly (Huber, 1991). To solve the puzzle, the present study will again examine the effects of benchmarking on quality of nursing care.

*Mentoring, Apprenticeship, and Role Modeling* are also important mechanisms for social learning. Chuk (1997) maintained that clinical nurse specialists were an important source of advanced nursing models. Their direct or indirect involvements in providing patient care were contributory to quality improvement. Jones (2002) argued that the presence of consultant nurses was pivotal to the delivery of health care. Their role could be contributory to quality of care in terms of identifying needs, deriving causality, and ensuring proper funding and training. Goldman et al. (2004) also suggested the positive modeling effects of nurse educators in their study of a two-year project to improve the quality of care in long-term care facilities. Furthermore, role modeling and
professionalism were suggested by Burke and Smith (2005) as a means to improve medical students’ exposure to home care.

**Human Resources Management (HRM)** Although literature on the effects of motivation or HRM on quality of care is legion, there are few studies in health research focusing on how employees can be motivated to learn and how the motivated learning can contribute to the quality of care. The positive effects of HRM on organizational performance is clearly demonstrated in other disciplines. For example, Hays and Hill (2001), based on a cross-sectional study, concluded that both employees’ motivation and organizational learning were positively associated with perceived service quality. In addition, Woiceshyn (2000) conducted a retrospective study on two large Canadian oil companies and examined the process of adopting new technology. They found that motivation was an important factor that affected the adopting process. Moreover, Storck & Hill (2000) studied the Transition Alliance initiated by Xerox and attributed the success to the motivation for learning and developing at the individual level.

In the process of motivating employees to learn, HRM plays an important role and its effects have also been evidenced in numerous studies. Cyr and Schneider (1996) studied joint ventures in Poland, Hungary and the Czech Republic and concluded that HRM activities helped organizations learn new values and behaviors. The positive associations between HRM practices and knowledge management were also found in Currie and Kerrin’s (2003) case study of Pharmco National, a pharmaceutical company in the U.K and in Minbaeva’s (2005) study of 92 subsidiaries of Danish multinational corporations in 11 countries. In a study of 99 small and medium-sized enterprises, Hayton (2003) also found a positive association between entrepreneurial performance and HRM
practices that facilitated employee autonomy, knowledge sharing, and organizational learning. Lastly, in a study of 18 automotive component plants in the U.S. and U.K., Barton and Delbridge (2004) identified a positive relationship between HRM practices and continuous quality improvement under the learning factory model.

Despite the positive relationships between HRM and learning as well as performance, there is apparently no empirical study that has examined whether these findings can be applied to health care organizations. More empirical studies are needed to examine how HRM could help improve health care organizations’ learning capability and how the enhanced learning capability contributes to quality improvement. The present study is dedicated to filling in this gap.

2. Structural Prescriptions Applied to QC

Structural viewpoints are centered on bureaucratic features such as centralization, formalization, and specialization. Along with their attention on efficiency, there are often detrimental effects on information flow and organizational learning. Appreciating those side effects of bureaucracy, health care scholars realize that rarely can a rigid, monolithic, and unresponsive health care organization survive in a rapidly changing environment. Moreover, quality of care could be diminished by information blockages and unlearning attitudes and behaviors.

In order to improve quality of care, health care scholars and advocates, following organizational theorists’ prescription, have proposed OLMs such as autonomy and empowerment, involvement and participation, job rotation, and teamwork to counteract the negative effects of bureaucratic features. In addition, clinical guidelines have been
viewed as an essential learning mechanism to institutionalize acquired knowledge and skills. Computerized decision-making systems and electronic medical records are further prescribed to enhance organizational memory. Moreover, health care scholars have also paid considerable attention to the effects of turnover on quality of care.

**Autonomy and Empowerment** In line with structural prescriptions, health care scholars have argued that quality of care can be improved by empowering nurses to exert their professional judgment and by holding them accountable for their practices (Laschinger & Wong, 1999; Laschinger et al., 2003). In addition, scholars have hypothesized nursing autonomy to be positively related to the perception of quality of care (Currie et al., 2005) and prevention of falls (Dempsey, 2004). Moreover, the positive relationship between nursing autonomy and perceived quality of care was empirically demonstrated by Rafferty and colleagues’ (2001) survey research on 10,022 staff nurses in 32 England hospitals, by Kramer and Schmalenberg’s (2003) interview study on 279 staff nurses in 14 magnet hospitals, and again by Laschinger and colleagues’ (2003) secondary analysis of data from 3 independent studies of nurses in the magnet hospitals.

Nursing autonomy and empowerment, however, may not affect quality of care directly. Laschinger et al. (2003) found that job satisfaction and professional practice could be the mediating variables. Manojlović (2005b) also found that effects of nursing empowerment and self-efficacy on nursing practice are moderated by strong unit-level nursing leadership. Furthermore, Manojlović (2005a) found that nursing autonomy and professional nursing practice cannot improve quality of care without the provision of environmental opportunities and power through resources, support, and information.

Despite the recognition of these moderating and mediating effects of nursing
autonomy and empowerment, little has been written about how/whether nursing empowerment and autonomy helps improve organizational learning as well as NHQC. The present study will be dedicated to investigating the relationship between nursing autonomy and empowerment and NHQC.

Involvement and Participation have long been proposed by organizational theorists as a means to fix defects of mechanistic organizations. To support this argument, there have been a number of studies focusing on the relationship between participation and performance.

The beneficial effects of participation were examined in Wagner’s (1994) comprehensive review of literature. This meta-analysis suggested that participation improved not only performance but also satisfaction. Additionally, Anderson and McDaniels (1998; 1999) studied 566 directors of nursing (DONs) of 566 nursing homes in Texas and found that greater RN participation in decision making significantly improved resident outcomes without increasing costs, which was attributed to more information flow, smoother connectivity of agents, and more diversity of information models. Moreover, viewing organizations as complex adaptive systems, Ashmos et al. (2002) argued that in addition to enhancing connectivity among organizational units, participation could make organizations more sensitive and adaptive to environmental changes by providing organizational members with more freedom and autonomy.

In addition to demonstrating the positive effects of participation, health care scholars have also dedicated their research to finding factors that affect participation. A number of empirical studies have shown that participation is associated with structural attributes such as size and ownership status (Connor, 1992; Kruzich, 1995, 2005).
Moreover, a large number of studies have found significant relationships between quality of care and ownership status, chain affiliation, and size (Zinn et al., 1993; Harrington et al., 2001; Zimmerman et al., 2002; Anderson et al., 2003; O’Neill et al., 2003; and Hillmer et al., 2005).

Nevertheless, whether/how these structural factors affect quality of care either directly or indirectly through their interactions with involvement and participation remains an enigma for scholars. The present study supports Glew and colleagues’ (1995) suggestion of avoiding viewing participation only with a narrow focus (such as only on participation patterns) and using a more inclusive framework to illustrate the effects of participation on NHQC.

Job Rotation As an OLM, job rotation is viewed as contributory to organizational learning through enhancing not only information flow and sharing but also job versatility (Etherington & Jones, 2004; Jansen, den Bosch, & Volberda, 2005), which would then lead to higher productivity and more innovative products (Harryson, 1997; Song, van der Bij, & Weggeman, 2006). Job rotation, however, does not come free and always work as intended. Collinson (2001), with wrinkles at the positive association between job rotation and innovation as suggested by Harryson (1997), argues that job rotation does not always do well and could cause R&D weaknesses. What organizational mechanisms are proper for R&D would depend on how firms make trade-offs between integrative and specialist capabilities. Similarly, based on a simulation study, Allwood and Lee (2004) concluded that job rotation did not improve problem-solving skills nor enhance productivity because specialization rather than job rotation better helped operators solve unique problems that did not occur uniformly at all places. Moreover,
Leenders and Wierenga (2002) studied 148 pharmaceutical companies and found no significant effects of job rotation on the speed and quality of the new product development process.

Despite the swirling debates on the effects of job rotation in the business and industrial literatures, there are few health care studies that document the effects of job rotation on health care professionals and quality of care. One exception is Kramer and colleagues’ retrospective study (2003) on the Dutch postgraduate training in general practice from 1992 to 1999 that examined whether postgraduate training in general practice contributed to clinical competence. Their study results revealed that job rotation that was required at the end of the training period did not help improve the acquisition of knowledge.

Given these mixed findings in the business and industrial literatures and the sparse literature in health care research, whether and how job rotation contributes to organizational learning and better quality of care still remains a mystery to health care advocates. To fill in these gaps, the present study will examine the effects of job rotation on organizational learning.

**Teamwork**  The importance of teamwork is getting more and more important in the 21st century, because multidisciplinary group practice is essential to the support of information systems, evidence-based medicine, and continuous quality improvement (Shine, 2002). In addition, scholars argue that poor quality of care could be attributed to problems in teamwork. From their viewpoint, teamwork problems could seriously diminish not only job satisfaction but also the quality of clinical care.

Positive effects of teamwork on patient satisfaction and quality of care have been
suggested in a number of studies. Teamwork was positively related with job satisfaction and nurse assessed quality of care in Rafferty, Ball, and Aiken’s (2001) survey study of 10,022 staff nurses in 32 hospitals in U.K., and was associated with reduced length of stay and increased hospital patients’ satisfaction in Meliones’s (2000) case study as well as in Friedman and Berger’s (2004) experimental study. Moreover, Shortell et al. (2004) found that perceived team effectiveness was positively associated with the number and depth of changes made to improve the quality of chronic care.

Nevertheless, it is effective teamwork, not merely the presence of teamwork, that helps improve quality of care. Teamwork cannot succeed without the cooperation of other factors. The question of how to make teams work effectively needs to be answered first. Wicke, Coppin, and Payne (2004), based on a focus group study on 12 qualified nursing home nurses in the U.K., pointed out that a hierarchical and profit-making culture was often a barrier to effective teamwork. Moreover, Alexander et al. (1996) studied 106 multidisciplinary teams in 29 Veterans Affairs hospitals and found that individuals in teams that were large in size and with heterogeneous backgrounds were less likely to perceive effective teamwork. How teamwork affect NHQC will be comprehensively examined in the present study.

Clinical Guidelines are a reflection of the institutionalized knowledge and skills in the health care industry. Their applications have been widely viewed as a means to translate new knowledge and skills into practice (Wollersheim et al., 2005), to reduce costs, to standardize care processes, to reduce variation, and to improve quality of care and health outcomes (Baker & Feder, 1997; Merritt et al., 1999; Carnett, 2002; Gross et al., 2003; McCarberg, 2004).
In spite of the widely hypothesized positive effects of clinical guidelines on quality of care (Huttin, 1997), there are only a few empirical studies that document these positive effects on the various aspects of medical care. Feder et al. (1995) conducted a randomized control trial in 24 inner city, non-training general practices in East London and found that clinical guidelines significantly improved care given to individuals with diabetes and asthma. Several studies, however, document weak or no association between clinical guidelines and quality of care. For example, Berlowitz et al. (2003), based on surveys from 1,065 nursing home staff at 35 nursing homes operated by the Department of Veterans Affairs (VA), examined the relationship between adherence to guideline recommendations and the rate of pressure ulcer development and surprisingly found no association. Moreover, in the area of neonatal care, Merritt et al. (1999) argued that there was minimal evidence to support the positive effects of clinical practice guidelines on neonatal outcomes. And they even cautioned against the adaptation of clinical guidelines that are mainly aimed at reducing costs or were poorly designed and implemented. The enigmatic relationship between clinical guidelines and quality of nursing care will be again examined in the present study.

**IT** With the current emphasis on evidence-based medicine, cost containment, reduction of diagnostic variation, and the prevention of medical errors, information technology has gained significance and popularity in the health care industry (Miller, 1994; Ball et al., 2003; Kalogeropoulos et al., 2003; Sequist et al., 2005). Scholars have paid tremendous attention to two aspects of information technology and their effects on quality of care: diagnostic decision support systems and electronic medical records.

**Diagnostic Decision Support Systems:** The positive effects of computer-based
diagnostic support systems (CDSSs) on physicians’ diagnostic performance on written clinical cases have been shown in several experimental studies (Berner et al., 1999; Friedman et al., 1999). In addition, Hunt et al. (1998), based on a comprehensive literature review of 65 controlled trials, concluded that 43 studies supported the positive effects of CDSSs on the improvement of prescription performance, preventive care, and other medical care.

However, CDSSs do not guarantee improved quality of medical care. Effects of CDSSs on quality of care depend on other factors. For example, Uckun (1994) suggested that, in addition to the quality of information and computer technology, the benefits of CDSSs also depend on factors such as proper collaboration between clinicians and computer specialists, easy access to clinical information, and emphasis on evaluation studies. Moreover, Kalogeropoulos et al. (2003) argued that it was essential to develop medical systems that supported not only the acquisition of clinical information and knowledge but also the development and evaluation of the decision support functions.

**Electronic Medical Records** In addition to CDSSs, electronic medical record (EMR) systems have also been viewed as an important means to reduce costs, to improve quality of care (Retchin & Wenzel, 1999), and to reduce medical errors (Doolan & Bates, 2002), because of EMR systems’ superiority with respect to readability, availability, and data quality (Roukema et al., 2006). Nevertheless, effects of EMR systems on quality of care are mixed in empirical studies. Several empirical studies have demonstrated that the use of EMR systems is positively associated with better metabolic control in diabetic care (O’Connor et al., 2005), with diagnosis of pharyngitis (Benin et al., 2005), and with quality improvement (Miller & Sim, 2004).
Other studies, however, suggest weak or no association between EMR and quality of care. For example, Karsh et al. (2004) conducted a cross-sectional survey of 1,482 family physicians and found that EMR systems did not directly impact quality of care. In addition, Sperl et al. (2005), based on 10 years of data from a large medical group with diabetic patients, found no association between EMR and glycemic control or lipid control. Furthermore, Weyer et al. (2005) reviewed 3,462 medical records in 79 primary care practices in Northeast Ohio and found that flow sheets were positively related to immunization, screening, and counseling, and that computerized records were still rarely used.

To improve the utilization of EMR systems and their impact on quality of care, scholars have identified several potential barriers to the use of EMR systems: technological problems of codifying and entering data, confidentiality, integration, providers’ collaboration, costs (Retchin & Wenzel, 1999) and staff buy-in (McLane, 2005). To remove those barriers, van Ginneken (2002) proposed several suggestions, including integration and flexibility in content and use, standardization, and adaptability.

**Turnover** Although turnover, from the organizational learning perspective, represents a discarding of organizational memory, which could have both positive and negative effects on organizational learning, health care literature almost unilaterally focuses on the negative effects of turnover on quality of care. Nursing turnover often represents nurses’ voting by foot to express their frustration, dissatisfaction, and disagreement with the work conditions and management. Thus, it is not surprising to see that negative effects of turnover have been documented in a variety of health care settings, for example, by Bame and Bettenhausen (1992) in dialysis care facilities, by Randolph et

Effects of turnover are especially important to the nursing home residents, given that they usually require a considerable amount of intensive nursing care. A number of empirical studies have documented the negative effects of turnover on NHQC. Castle (2001) studied 420 nursing facilities and found that nursing home administrators’ turnover was significantly associated with NHQC in terms of restraint use, catheter use, pressure ulcers, psychoactive drug use, and deficiencies. In addition, Castle and Engberg (2005) found that turnover rates of NAs, LPNs and RNs were negatively associated with quality of care in their study of 354 facilities in 4 states. Moreover, Zimmerman et al. (2002), with a stratified sample of 59 nursing homes across Maryland, also concluded that RN turnover was positively associated with both infection and hospitalization.

In order to minimize the negative effects of turnover, scholars have examined a number of precursors of turnover, which can be further categorized into organizational characteristics and psychological factors. In terms of organizational characteristics, turnover has been found to be positively related to full-time status, work tenure, education, training, staffing level, for-profit status, and size (Bame & Bettenhausen, 1992; Todd et al., 1996; Castel & Engberg, 2005). In addition, turnover is also associated with bureaucratic attributes such as clinical pathways (Williams et al., 1998) and participation and involvement (Bowers & Becker, 1992). With respect to psychological factors, turnover was found to be associated with work stress (Todd et al., 1996) and job satisfaction (Goodell & Coeling, 1994; Leveck & Jones, 1996), which could further be attributed to staff interactions (Shortell et al., 1994), support from family, friends, and
supervisors (Tai et al., 1998), preceptor programs (Shemansky, 1998), and process consultation (Weir et al., 1997).

Despite the convergence on the effects of turnover on quality of care in the literature, there have been few studies that examined the effects of turnover on quality of care from the organizational learning perspective. Moreover, there has been no study that examines causes and effects of turnover comprehensively from psychological, structural, and cultural perspectives. Filling in these gaps is also one of the objectives in the present study.

3. Cultural Prescriptions Applied to QC

Cultural changes have been viewed as one of the reform strategies to improve quality of care (Wiener, 2003), to reduce errors (Grzybicki, 2004), and to respond to changing health care needs and emerging technologies (McKee & Healy, 2000). Furthermore, cultural factors, such as openness to new ideas, individuals’ questioning and critical attitudes, and disciplined thinking, are also viewed as learning components to enhance performance and safety (Carroll et al., 2002). Empirical studies have uniformly pointed out the importance of cultural effects on organizational learning and quality of care.

Based on data from 17,440 patients in 42 ICUs, Shortell et al. (1994) found that culture, leadership, coordination, communication, and conflict management were significantly associated with lower length of stay, lower nurse turnover, and better fulfillment of family needs. In addition, to examine how the culture of medical group practices affects quality of care and patient safety, Kaissi et al. (2004) conducted a survey
The results suggested that the culture among clinicians strongly affected the adoption of quality programs, such as electronic data systems and formal programs, patient satisfaction surveys, benchmarking and physician profiling, and informal peer review. Focusing on population of 693 medical groups, Shortell et al. (2005) documented the associations between organizational learning capability, quality-centered culture, and group performance. Lastly, to examine the relationship between organizational culture and quality improvement implementation in nursing homes, Berlowitz et al. (2003) analyzed survey data from 1,065 nursing staff in 35 VA-operated nursing homes and concluded that an organizational culture that facilitated innovation and teamwork also contributed to successful quality improvement implementation.

Despite the importance of cultural effects on learning and performance, overcoming cultural barriers is often extremely difficult because it “requires a change in thinking, the hardest type of change to make or effect” (Grzybicki, 2004: p. 901). The present study argues that cultural prescriptions that aim to cultivate a receptive and learning culture should contain several important elements: acceptance of conflicting values, shared mental models, diversity, innovative ideas, tolerance for errors, and trust and respect.

**Acceptance of Conflicting Values** Among the values that are stressed most in the health care industry are quality, access, costs, and patient-centeredness. Given limitations on human cognitions and scarce medical resources, health care scholars and practitioners often have to wrestle with those values and make trade-offs. In addition, what they have to face is that focusing on one is not good enough but having them all is often impossible. As Port (2002) states, patient-centeredness is “essential but probably
not sufficient” (p. 387). What is more, the shift of value systems will “require transformation of systems as well as attitudes” (Port, 2002: p. 387). For example, structural attributes such as ownership status often considerably affects the views and values of health care professionals. Thus, it is important that organizational learning initiatives be proposed and examined not only from the cultural perspective but also from psychological and structural perspectives.

In addition to conflicts between the four values, value conflicts are also viewed as cultural conflicts between commercial and professional values (McArthur & Moore, 1997; Frankford & Konrad, 1998; Relman, 1998; Swick, 1998). Market or business values, such as profits, market share, and competition, are often contradictory to medical professional values, such as excellence, integrity, service, altruism, and advocacy. As a result, quality, access, and patient satisfaction are often sacrificed under the pursuit of cost reductions and profit seeking, which is often evidenced by studies revealing poorer quality of care in for-profit health care facilities.

To minimize the side effects of the value conflicts between commerce and professionalism and to imbue entrepreneurship into the health industry, a series of initiatives have been proposed from the cultural perspective. Some scholars have suggested articulating a vision that is distinct from market values and responds to lay values and community needs (Frankford & Konrad, 1998). Other scholars examined cultural conflicts between business managers and practitioners and recommended conducting “quality control” as a means to counteract the over-emphasis on price (McArthur & Moore, 1997). Swick (1998; 2000) even called for embedding humanistic values, such as honesty and integrity, caring and compassion, altruism and empathy,
respect for others, and trustworthiness, into the nature of the medical professions and their work, and having faculty in medical schools model those professional values.

**Shared Vision and Mental Models** Given the prevalence of value conflicts in health care organizations and the potential harm to quality of care, quality of care advocates have called for shared visions to enhance employees’ mutual expectations and commitments (Rouse et al., 1992; Grigsby et al., 2004), which is crucial not only to coordinate individual and organizational behaviors but also to align other cultural elements towards the agreed-upon missions and goals (Carroll & Edmondson, 2002).

Both organizational theorists and psychologists have argued for the importance of shared mental models in terms of team processes and team performance (Mohammed & Dumville, 2001; Austin, 2003; Brandon & Hollingshead, 2004; Salas et al., 2005). For example, Waller et al. (2004), based on a study of 14 crews working in a nuclear power control room, concluded that shared mental models helped improve the crew members’ adaptive behaviors, especially during nonroutine situations.

Applying Senge’s concept of shared mental models to the health care industry, Barnsley et al. (1998) argued that a shared vision, leadership, and communication could hold the key to promoting learning and increasing the flexibility of integrated health care delivery systems. To examine the effects of mental models regarding clinical practice guidelines, Hysong et al. (2005) conducted semi-structured interviews with 244 employees in 15 Veterans Health Administration (VHA) facilities in the U.S. The results suggested positive relationships between a clear shared mental model and the implementation of guidelines and quality of care.

To establish a shared vision, however, is not an easy job and often falls on the
shoulders of leaders (Grigsby et al., 2004). Rapport and Maggs (1997), based on an interview study of 43 health care professionals, asserted that there was little shared vision between staff and managers regarding each other’s responsibilities. To bridge this gap, scholars have proposed a variety of means such as the provision of resources, training, incentives, and rewards to help develop a shared vision (Barnsley et al., 1998).

Obviously, these prescriptions contain both psychological and structural elements, whose effects on the relationship between shared mental models and organizational learning, and quality of care, however, have been notably underexplored. The present study is dedicated to probing those effects.

**Diversity** The importance of diversity has been addressed by health care scholars from several perspectives. The foci are often twofold: its effects on performance and its effects on learning and innovation.

In terms of the first focus, scholars have maintained that diversity improves performance. Milliken and Martins (1996) argue that diversity would indirectly affect turnover and performance through its effect on “affective, cognitive, communication, and symbolic processes” (p. 402). Similarly, Dreachslin (1999) calls for health care executives to pay attention to diversity leadership and hypothesizes that performance indicators are associated with the diversity leadership processes. Furthermore, heterogeneous workforces are believed to enhance the competitive advantage of health services organizations (Muller & Haase, 1994).

As to its effects on learning and innovation, scholars have argued that diversity facilitates learning and innovation. Vicenzi and Adkins (2000) maintain that creativity and innovation cannot exist unless individual differences can be viewed as an important
source of new ideas, perspectives, and frames of reference. In addition, from a practical viewpoint, Janssen et al. (2004) argue that diversity among group members contributes to the benefits and costs associated with both individual and group innovation. Moreover, Salimbene (1999) maintains that diversity could affect quality of care considerably, since each culturally diverse group would view health and illness differently, which would dramatically affect quality of care through its mediating effects on health care delivery processes and patient satisfaction. How to identify and increase attention to those diverse values and meet those demands represents a learning challenge to health care organizations.

Numerous empirical studies have documented the effects of diversity at various levels. At the organizational level, Dansky et al. (2003) conducted a study of 203 hospitals and concluded that sensitivity to diversity affected strategic decision making and HRM practices. Similarly, Richard (2000), based on field research, argued that cultural diversity was positively related to firms’ competitive advantages. At the group level, Dreachslin et al. (2000) conducted a study using 14 focus groups in 2 hospitals and found that workforce diversity was significantly associated with the effectiveness of nursing care teams. At the level of top management teams, Smith et al. (1994) studied 53 high-technology firms and found a direct association between the top management teams’ diversity and performance. Lastly, at the individual level, De Vries and Pettigrew (1998) collected both qualitative and quantitative data from both police force and health care organizations in the Netherlands. The results suggested a positive effect of ethnic diversity on the quality of their work.

Nevertheless, not all empirical studies support the positive effects of diversity on
performance. Knight et al. (1999) studied 76 high-technology firms in the U.S. and Ireland and found that top management teams’ diversity had detrimental effects on the forming of strategic consensus. Vicenzi and Adkins’ statement (2000) is worthy noticing: “without a strong core value system and sense of purpose, extensive diversity tends to break down into unresolved disagreement and factionalism” (p. 101). In addition, effects of diversity on performance would depend on an open and receptive environment where people can feel comfortable enough to express their feelings and ideas and to question assumptions. Moreover, interpersonal and communication skills are also necessary to integrate the diverse and even contradictory ideas, knowledge, and skills. There are few empirical studies, however, that examine how these moderating and mediating variables affect the relationship between diversity and performance.

**Innovation** Plagued by problems of quality, access, and costs, health care scholars and practitioners have gradually recognized that innovation is the key to solving the gridlock. For example, Teisberg et al. (1994) resort to innovation triggered by competition as the last cure for health care in the U.S. Haley et al. (1998) stress the importance of innovation and adaptation in psychologists being able to find new opportunities in primary care settings. Moreover, Parker et al. (1999) view innovation as an important foundation for implementing quality improvement initiatives.

Nevertheless, studies have shown that internal climate and service innovations are still not frequent in the health care industry and that efficiency, standardization, and control rather than flexibility and innovation are still the dominant managerial concepts in the health care industry (West & Anderson, 1992). To help create an innovative environment, scholars have been trying to find factors and precursors that contribute to
innovation. Janssen et al. (2004) identified supervision, organizational contexts, culture, diversity, participation, and teamwork as the contributing factors for innovation. Pearce and Ensley (2004), based on a study sample of 71 product and process innovation teams, further pointed out and empirically demonstrated the reciprocal relationship between shared vision and innovation effectiveness. Similarly, Bower et al. (2003) studied primary care team members in 42 practices and found that shared perceptions of organizational practices were associated with better quality of care for patients with diabetes and with self-reported innovation and effectiveness.

Despite the generally recognized benefits of innovation, studies are inconsistent with respect to the contributory factors of innovation as well as with its effects on performance. For example, in terms of the effects of clinical guidelines on innovation, Tolson’s (1999) case study suggested the use of clinical guidelines to stimulate discussion and guide the perplexing methodological maze. Alternatively, Goodwin (2003) argued that guidelines may stifle innovative ideas. In addition, in terms of the effects of innovation on efficiency, Miron and Naveh (2004) studied 349 engineers and technicians in 21 units in a large R&D company in Israel and found that innovative ideas may need to be promoted at the cost of low performance quality in the beginning of the R&D process. Moreover, Ford and Sullivan (2004) argued that the effects of innovation on performance and frustration would depend on timing. The results of their study indicated that novel ideas should be proposed before or during the midpoint transition. After that, novel ideas would disrupt performance and induce frustration. To further clarify the inadequate and inconsistent findings in the literature, the present study will examine how innovation would affect NHQC.
**Tolerance for Errors**  Inarguably, high quality of care is incompatible with medical errors. Since the IOM’s report “To Err is Human” (Kohn et al., 1999), a variety of efforts and proposals have been launched to prevent and reduce the occurrence of medical errors. Among all those initiatives and recommendations, culture is always targeted. The key to successful prevention of medical errors lies in the “industry’s willingness to abandon historical and cultural precedents and beliefs” (Amalberti et al., 2005: p. 756). Miller (2005) also asserts that organizational culture is the key factor in adverse prenatal outcomes. A safety culture that contributes to a reduction in medical errors should not only stress the values of just, flexible, and collective responsibility but also encourage error reporting, learning, and open sharing (Penson et al., 2001; Ruchlin et al., 2004; Espin et al., 2006). Establishing a safety culture has been viewed as an indispensable component of patient safety reforms.

Unfortunately, the growth of a safety culture could be suppressed by a variety of cultural barriers, such as individualism (Espin et al., 2006), simplification (Amalberti et al., 2005), perfectibility (Giannetti, 2003), infallibility, fear of litigation (Manser & Staender, 2005), sense of guilt and shame (Penson et al., 2001), and a culture of blame and punishment (Penson et al., 2001; Giannetti, 2003). In addition, structural constraints such as shortage of staff, ownership status (Amalberti et al., 2005), a lack of training, and inadequate systems for error collection, discussion, and analysis (Manser & Staender, 2005) have also been identified as retarding the progress of a safety culture.

To overcome those structural and cultural barriers, health care scholars adopt prescriptions from organizational theorists in the hope that organizational learning can help cultivate a safety culture. For example, McCarter et al. (2003) argue that education,
safety systems and technology, and participative decision making can help reduce medical errors. Penson et al. (2001) advocate disclosing guidelines and changes in medical practices. Ruchlin et al. (2004) stress the need for error reporting systems and regular proactive checks. Lastly, Arah and Klazinga (2004) maintain that a safety culture should be embedded within structures and policies that promote effectiveness, patient-centeredness, and healthy innovation.

Despite the large number of studies suggesting cultural and structural prescriptions for creating a tolerant and safety culture, few empirical studies have been conducted on the effects of these prescriptions, mostly due to the difficulty of gathering medical error information. The present study will utilize the CMS’s NHQIs to explore the effects of those prescriptions and further examine the relationship between a tolerant culture and the quality of nursing care.

**Trust & Respect** Viewed as part of the safety culture, organizational theorists have long called for attention to the effects of trust and respect on quality of care not only because of their effects on employees’ psychological needs, such as job satisfaction and commitment, but also because of their effects on learning attitudes and behaviors, such as information sharing or reporting. For example, Checkland et al. (2004) argue that openness and sharing of information can help restore the trust exhibited by colleagues and patients in health care professionals, which would further help improve quality of care and nurture the moral motivation of professionals. Firth-Cozens (2004) also views trust as the keystone to increasing the reporting of and learning from errors, which is further assumed to affect quality of care.

To empirically test the effects of trust and respect, Laschinger et al. (2001)
surveyed 3,016 staff nurses from 135 hospitals in Ontario, Canada, and explored the antecedents of organizational trust and its consequences on quality of care. The results suggested that organizational characteristics such as autonomy, control, and collaboration had effects on organizational trust, which further affected nurse self-assessed quality of care. Laschinger (2004) later studied a random sample of 285 staff nurses in Ontario teaching hospitals and concluded that the higher the level of nurses’ feelings of respect, the more they have trust in management, the less they experienced emotional exhaustion, and the higher the level of nurse-assessed quality of care. Moreover, Williams (2005), based on a survey on 920 registered nurses in a regional community hospital, argued that organizational trust was positively associated with organizational policy, professional interactions, autonomy and professional status, and that organizational trust was crucial in affecting organizational competitiveness through its effects on effectiveness, adaptive ability, and innovation.

Despite considerable attention from health care advocates on the establishment of trust and respect in health care organizations, few attempts have been made to examine how trust and respect are cultivated in cooperation with other OLMs. To remedy this neglect, the present study will investigate the effects of respect and trust on NHQC.

4. An Integrated Perspective

Based on the triangular framework that depicts the three dimensions of OL, the OLMs that correspond to each dimension have been identified. A comprehensive examination of the health care literature indicates that the currently proposed QI initiatives could be comprehensively covered under the triangular framework and by the
OLMs in each dimension.

Even through both OL scholars and healthcare advocates may notice and call for attention to the effects of the OLMs on quality of care, the empirical studies often suggest that they are neither simple nor direct. The effects of OLMs on quality of care are often moderated by other OLMs. Moreover, in addition to their direct effects, OLMs could also indirectly affect quality of care via other OLMs. As a result, inconsistent findings regarding the effects of OLMs often confuse health care practitioners with respect to the merits of OLMs, reducing their ability to apply OLMs effectively to improve quality of care. Nevertheless, there are few studies that comprehensively investigate the effects of the OLMs.

It is believed that filling in these gaps is imperative both to theory building with respect to organizational learning and to quality assurance and quality improvement. The present study proposes the triangular framework that comprehensively examines the dimensions of OL and the proposed OLMs in each dimension. It will not only examine how each OLM affects quality of care directly and indirectly but also take into account how the OLMs interact with each other.
## Table III-1. The Three Dimensions and Definitions of Organizational Learning

<table>
<thead>
<tr>
<th>What learning is? (As a Metaphor)</th>
<th>Psychological</th>
<th>Structural</th>
<th>Cultural</th>
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<td></td>
<td><strong>Classical</strong></td>
<td><strong>Operant</strong></td>
<td><strong>Social</strong></td>
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<tr>
<td>S-R model: the process regarding how the learner responds to the stimuli consciously and unconsciously.</td>
<td>The process of intentionally deriving action-outcome relationships to obtain rewards and/or to avoid punishments.</td>
<td>A social process of observing and imitating other people's behaviors to obtain rewards and/or to avoid punishments.</td>
<td>What triggered learning? Intrinsic vs. External; Successes vs. Failures; A social and organizational process in which knowledge is developed and institutionalized into organizational memory.</td>
</tr>
<tr>
<td>Authors</td>
<td>Hedberg (1981); Weick (1991); Argyris &amp; Schon (1996); Garvin (1993);</td>
<td>Hedberg (1981); Argyris &amp; Schon (1996); Kim (1993);</td>
<td>Garvin (1993); <strong>Stress</strong>: Cangelosi &amp; Dill (1965); <strong>Problems</strong>: Hedberg (1981); Argyris &amp; Schon (1996); <strong>Grow &amp; survive</strong>: Fiol &amp; Lyles (1985); Stata (1989); <strong>Opportunities</strong>: Lumpkin (2005);</td>
</tr>
</tbody>
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The process that triggers an organization and/or individuals on behalf of the organization to acquire and distribute knowledge and skills either through directing learning or through imitation, which would then be institutionalized either formally in organizational routines or informally in shared beliefs, values, and assumptions.
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<th>Column</th>
<th>Psychological</th>
<th>Structural</th>
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<td></td>
<td>Classical</td>
<td>Operant</td>
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<tr>
<td>Level of Analysis</td>
<td>Individual</td>
<td>Individual</td>
<td>Group</td>
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<td>Group / Organizational</td>
<td>Individual / Group / Organizational</td>
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<td>Process vs. Product</td>
<td>Process &amp; Product</td>
<td>Product</td>
<td>Process</td>
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<td>OLMs</td>
<td>Journal subscriptions; conferences; seminars; workshops; consulting firms; site visits and tours</td>
<td>Experimentation; computer simulations; system thinking; performance evaluation; post-project review; case studies</td>
<td>Job rotation; mentoring and apprenticeship; internal teamwork; public forums; external benchmarking; grafting; consulting firms; help from academics</td>
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<td>relaxing of Rules/Regulations</td>
<td>Decentralization</td>
<td>Specialization</td>
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<tr>
<td>Structural</td>
<td>Computer-based Information System</td>
<td>Turnover</td>
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<tr>
<td>OLMs in QC</td>
<td>Benchmarking; Mentor/Apprenticeship/Role Modeling;</td>
<td>HRM Practices</td>
<td>Value Conflicts; Shared Vision/Mental Models; Diversity; Innovation; Tolerance for Errors; Trust/Respect</td>
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<tr>
<td>Empirical Studies</td>
<td>Customer needs</td>
<td>Customer needs</td>
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<tr>
<td>(t+) hypothesized to be positive</td>
<td>Autonomy/Empowerment; Involvement/Participation; Job Rotation Teamwork; Clinical Guidelines; IT (Decision Making Support Systems); IT (EMR); Turnover</td>
<td></td>
<td></td>
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<td>(e+) empirically</td>
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<td>(t+) Laschinger &amp; Wong (1999); Laschinger et al. (2003); Currie et al. (2005); Dempsey (2004);</td>
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<td>(e+) Gormley &amp; Weimer (1999); Mukamel &amp; Spector (2003)</td>
<td>(e+ OP) Hays &amp; Hill (2001); Woiceshyn (2000); Storck &amp; Hill (2000);</td>
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<td></td>
<td>(e-) Collinson (2001); Leenders &amp; Wierenga (2002); Kramer et al. (2003); Allwood &amp; Lee (2004);</td>
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<td>(o) Cosgel &amp; Miceli (1999); Eriksson &amp; Ortega (2006)</td>
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<td>Teamwork</td>
<td>(t+) Shine (2002);</td>
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<td>(e+) Rafferty, Ball, &amp; Aiken (2001); Meliones (2000); Friedman &amp; Berger (2004); Shortell et al. (2004);</td>
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<td>(e+) Mathieu et al. (2000); Waller et al. (2004); Hysong et al. (2005)</td>
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<td>Diversity</td>
<td>(t+) performance</td>
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<td>(e+) Berner et al. (1999); Friedman et al. (1999); Hunt et al. (1998)</td>
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<td>(o) Uckun (1994); Kalogeropoulos et al. (2003);</td>
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<td>Amalberti et al. (2005);</td>
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<td>O'Connor et al. (2005); Benin et al. (2005); Miller &amp; Sim (2004); Karsh et al. (2004); Sperl et al. (2005); Weyer et al. (2005); Retchin &amp; Wenzel (1999); van Ginneken (2002); McLane (2005)</td>
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<td>(e+) Stewart et al. (2005); Young et al. (2005)</td>
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<td>(e+) Penson et al. (2001); Ruchlin et al. (2004); Espin et al. (2006); McCarter et al. (2003); Penson et al. (2001); Ruchlin et al. (2004); Arah &amp; Klazinga (2004);</td>
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<td>(o) Espin et al. (2006); Amalberti et al. (2005); Giannetti (2003); Manser &amp; Staender (2005); Penson et al. (2001);</td>
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<td><strong>Trust/Respect</strong></td>
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IV. RESEARCH METHOD

The purpose of this chapter is to illustrate the research method designed to empirically collect data to examine the relationship between OL and NHQC. There are eight subsections in this chapter. The first subsection illustrates the conceptual model. The second subsection talks about the conceptualization and measurement of the dependent variables associated with NHQC. The third subsection presents the hypotheses to be tested and, for each hypothesis, addresses how the independent variables, OL attitudes and practices, are measured. The fourth subsection discusses the effects of controlling variables. Thereafter is the subsection discussing the issues of validity and reliability of the variables. Then, the chapter elaborates the data collection method. The last two subsections are dedicated to the data analytic method, SEM, and the important assumptions associated with this analytic method.

A. The Conceptual Model

The present study is inspired to a great extent by the current literature on organizational learning and quality of care. Given the fact that a huge debate still swirls over the definition of organizational learning, the present study proposes a triangular perspective that examines organizational learning from three perspectives: psychological, structural, and cultural. In addition, even though learning has been viewed positively by people in a variety of disciplines, such as zoologists, psychologists, educators, and so on, as a means to improve performance or as a cause that explains the improvement in performance, how and whether organizational learning could help improve quality of care
in the health care industry has not been systematically and sufficiently studied. Moreover, the literature review on organizational learning also reveals that prior studies on the currently proposed OLMs are lacking in discussion of how OLMs affect each other and how other OLMs could have moderating and/or mediating effects on the relationship between a given OLM and organizational performance. The triangular framework again is suggested to incorporate the currently proposed OLMs to provide a more comprehensive perspective.

The conceptual model proposed in the present study is shown in Figure IV-1. The model first presents the three dimensions of organizational learning as three latent variables, which are shown in the three oval boxes in the middle. The double-headed arrows between the three OL dimensions not only depict the interactions between the learning dimensions but also indicate the direct and indirect effects of each learning dimension on NHQC. Second, the conceptual model illustrates the OLMs that embody the essence of each learning dimensions. The seven psychological OLMs, the nine structural OLMs, and the seven cultural OLMs are shown in the smaller oval boxes surrounding the three OL dimensions. Moreover, the three dimensions of NHQC are shown in the rectangular boxes that surround the latent factor of NHQC. The 13 QIs are incorporated to form a composite QI indicator. The number of survey deficiencies and the number of complaints form the other two dimensions of NHQC.

In addition to the proposal of the conceptual model, the present study also aims to empirically examine whether organizations with good learning attitudes and behaviors have better performance. The study population to which the conceptual model will be applied is all the nursing homes in the State of New York. Organizational performance in
these nursing homes is examined in terms of the quality of nursing care they provide to the residents. The focus of the empirical testing, thus, is whether nursing homes with good organizational learning attitudes and behaviors also provide good quality of nursing care to their residents.

Furthermore, the present study echoes scholars’ long calling that both organizational learning and NHQC are multidimensional concepts. It is believed that findings that are converged from multiple perspectives could provide more comprehensive and convincing explanations of the relationship between organizational learning and NHQC.
Figure IV-1. The Conceptual Model

Psychological Factor

Performance Eval
Consultation
Training & Edu
Patient needs

Apprenticeship
Benchmarking
Motivation

Structural Factor

Tumour
SOPs
IT
Supervision
Participation
Empowerment
Job rotation
Teamwork
Staffing

Error Tolerance
Shared vision
Values & Assumptions
Innovation
Diversity
Open & Honest
Trust & Respect

Cultural Factor

NHOC

QIs
Complaints
Survey Deficiencies

QI1
QI2
QI3
QI4
QI5
QI6
QI7
QI8
QI9
QI10
QI11
QI12
QI13
QI14
QI15
B. Conceptualization and Measurement of Dependent Variables -- Nursing Home Quality of Care (NHQC)

Given that the purpose of the present study is to examine how and whether organizational learning could help improve NHQC, the dependent variable is thus NHQC, which is examined from the three dimensions: clinical quality indicators, number of survey deficiencies, and number of complaints. The measurement of these three dimensions of NHQC is based on the two databases that are available on the CMS’s website.

The first database is the Minimum Data Set (MDS) which contains over 400 items measuring the health, physical functioning, mental status, and general well-being of every resident in Medicare and Medicaid certified nursing homes. OBRA’87 stipulates that a MDS assessment be conducted at the time of admission, quarterly, and annually, as well as at times of significant change in status. Individual records are then aggregated to derive CMS’s nursing home quality indicators (NHQIs) at the facility level. It is based on the MDS that the NHQIs are calculated.

The NHQIs assess both the chronic and post-acute care services provided by nursing facilities. Chronic care refers to health care services provided to residents who are not capable of caring for themselves at home and tend to stay in the nursing homes at least several months and mostly likely until the end of their lives. Any resident with a full or quarterly MDS record in the specified quarter is included in the calculation of the chronic NHQIs. There are seven QIs for chronic care in terms of the percent of residents who (1) needed increased assistance with daily activities, (2) have moderate to severe pain, (3) were physically restrained, (4) spent most of their time in bed or in a chair, (5)
were getting unable to move about in and around their room, (6) had a urinary tract infection, and (7) were becoming more depressed or anxious. In addition, four QIs were recommended to be used as pairs: (1) percent of high-risk residents who have pressure sores, (2) percent of low-risk residents who have pressure sores, (3) percent of residents who have indwelling catheters, and (4) percent of low-risk residents who have incontinence.

Post-acute care is mostly provided to those who are referred by hospitals for high-intensity rehabilitation or clinically complex care. They usually stay in nursing homes for less than 30 days. Any resident with a 14-day MDS record in the last six months is included in the calculation of post-acute NHQIs. There are three QIs that aim to measure the post-acute care QIs: (1) percent of residents with delirium, (2) percent of residents with moderate to severe pain, and (3) percent of residents with pressure sores.

Basically, the NHQIs are ratios, whose numerators were created by counting nursing facility chronic care residents or post-acute care residents with conditions or problems of interest and summing over the number of these residents. The denominators are all residents of the facility who are at risk for conditions or problems of interest. Moreover, the NHQIs are also risk-adjusted to reflect the factors over which nursing facilities have/do not have control. Technical details are presented in Appendix A (Abt. Associates Inc., Appendix A).

The second database is CMS’s Online Survey, Certification, and Reporting database (OSCAR), which collects information about nursing home quality of care with respect to health deficiencies and nursing home characteristics. Health deficiencies come from two sources. The first source comes from the survey inspection results conducted by
the state survey agencies at least once during a 15-month period. The second source is the complaints reported to the state, which is required to conduct inspections about the complaints. The results are recorded to the OSCAR database should the inspections result in the citation of a health deficiency. Health deficiencies are categorized into eight types: (1) mistreatment deficiencies, (2) quality care deficiencies, (3) resident assessment deficiencies, (4) resident rights deficiencies, (5) nutrition and dietary deficiencies, (6) pharmacy service deficiencies, (7) environmental deficiencies, and (8) administration deficiencies. The severity of each deficiency is also classified into 12 levels, representing the combination of the scope and the level of harm.

C. Hypothesis Testing and Measurement of Independent Variables- Organizational Learning Attitudes and Behaviors

Given that NHQC is defined and measured from the three dimensions, good quality of care in nursing homes is defined as lower scores on the clinical quality indicators, fewer survey deficiencies, and fewer complaints. How to improve NHQC has been the focus of many health care advocates since the 1970s. Despite the fact that scholars and practitioners have tried to study and improve NHQC using a variety of means, there are still gaps and insufficiencies in these quality improvement initiatives. The present study argues that most of these initiatives could be incorporated under the organizational learning perspective. The independent variables thus are organizational learning attitudes and behaviors, which will be comprehensively examined from the triangular framework and from the OLMs that are associated with each OL dimension.

To empirically test whether and how organizational learning is associated with
This section will present a list of hypotheses that correspond to the essential OLMs in each of the three dimensions of organizational learning, followed by a discussion of how the organizational learning attitudes and behaviors will be measured. The operationalization of organizational learning attitudes and behaviors is presented in APPENDIX B.

1. The Psychological Dimension of OL

The essence of the psychological dimension of organizational learning is how to improve learners’ abilities to sense environmental challenges, to respond properly, and to learn from others. The OLMs that embody the psychological perspective include patient needs, training/education, consultations, organizational report cards, benchmarking, apprenticeship/role modeling, and motivation. It is hypothesized that these OLMs would affect not only the psychological dimension of organizational learning but also the quality of care. More specifically, the relationship between each OLM and the NHQC is hypothesized as follows:

**Patient Involvement** Despite the fact that scholars have noticed the merits of patient involvement and participation on quality of care through better adherence to treatment (Aminoff & Kjellgren, 2001), higher patient satisfaction (Johansson et al., 2002), and mutual learning (Twinn, 1995; Bennett & Baikie, 2003; Tuohy, 2003), there are few studies that document these effects. Thus, it is hypothesized that:

**H1: The more the nursing home involves patients and their family members, the better the quality of nursing care.**

To test this hypothesis, patient involvement is measured by whether the nursing
home makes efforts to acquire information about residents’ needs (PN1), provides communication channels for the residents (PN2), responds to their needs while making decisions (PN3), and customizes individual nursing plan (PN4).

Training and Education  Although training and education have been found to be positively related to preventive care, resident outcomes, and hospital quality of care (Kuhn et al., 1991; Evans et al., 1997; Proctor et al., 1999; Bartels et al., 2002), they were found not to be associated with performance (Smyer et al., 1992) and their long term effects have been questioned (Aylward et al., 2003). Moreover, other factors have been suggested as moderating or mediating the effects of training and education (Moniz-Cook et al., 1998; Borgiel et al., 1999; Aylward et al., 2003; Adami & Kiger, 2005; Patel et al., 2005; Richards et al., 2005). Examining how training and education affect organizational learning and quality of care would still be valuable to the literature. It is thus hypothesized that:

**H2: The more the nursing home stresses training and education, the better the quality of nursing care.**

To test this hypothesis, training and education are measured in terms of whether nursing staffs are trained or re-educated via on-the-job training (TR1), whether they are motivated to take external training opportunities, such as workshops and seminars (TR2) or are rewarded for further education (TR3), and whether they are kept updated with the latest nursing knowledge via journal articles (TR4).

Consultations  The effects of consultations have been found to be positively
related to laboratory testing performance (Burke, 2003) and physicians’ diagnostic and therapeutic accuracy (Smith & McNeely, 1999). Although Rantz et al. (2003) advocated the positive impacts of consultations on NHQC, there are still insufficient empirical studies to document how consultations affect organizational learning and NHQC, and how consultations could be affected by other cultural variables, as suggested by Keating et al. (1998) and Kuo et al. (1998). It is thus hypothesized that:

**H3: Use of outside consultations is positively associated with quality of care in nursing homes.**

To test this hypothesis, consultation is measured by three questions. OC1 measures whether the nursing home employs outside experts for quality improvement. OC2 measures the nursing home’s opinion about the effectiveness of outside consultation on quality improvement. OC3 measures whether the consulting services really impact the nursing home’s behavior.

**Performance Evaluation/Report Cards** Although health care advocates have called for organizational report cards as a means to improve quality of care (Gormley & Weimer, 1999; Mukamel & Spector, 2003) and provided empirical support for their contribution to improving consumers’ choices and providers’ control of quality (Montague, 1996; Mukamel et al., 2004; Ito & Sugawara, 2005), other scholars have also argued that report cards have no impact on either consumers (Marshall et al., 2000) or providers and purchasers (Berlowitz et al., 2005). The question of whether and how report cards affect quality of care will be examined again in the present study. It is thus hypothesized that:
**H4: The more emphasis the nursing home pays to its performance on report cards, the better the quality of nursing care.**

To test this hypothesis, performance evaluation is measured in three respects. The first respect examines how often meetings related to performance evaluation are held (PE1). The second respect explores whether the nursing home pays attention to CMS’s NHQIs (PE2), how it interprets the NHQIs (PE3), and whether it is satisfied with its ranking on the NHQIs (PE4). The third respect focuses on whether performance evaluation and feedback are conducted at the individual level (PE5) and whether nursing staff acknowledge performance feedback (PE6).

**Benchmarking**  Widely viewed as an important OLM in the health care industry, benchmarking was found to be positively related to comparison and sharing of evidence-based medicine (Ellis, 2000) and physicians’ performance (Kiefe et al., 2001). Benchmarking, however, could also have limited and side effects on learning (Hedberg, 1981; Huber, 1991). To further examine its effects, it is hypothesized that:

**H5: The more the nursing home pays attention to benchmarking, the better the quality of nursing care.**

To test this hypothesis, four items are designed to measure benchmarking. BM1 and BM2 are measures for external benchmarking in terms of whether the nursing home compares its performance with others and whether attention is paid to the best practices in other nursing homes. BM3 measures whether actions are taken after the benchmarking. BM4 is a measure for internal benchmarking.
**Apprenticeship/Role Modeling** In spite of the fact that experienced nursing models such as consultant nurses and clinical nurse specialists have been suggested by scholars to be positively related to quality of care (Chuk, 1997; Jones, 2002; Goldman et al., 2004), there are insufficient empirical studies to document the effects of apprenticeship or role modeling on quality of care in nursing homes. To enrich the literature, it is thus hypothesized that:

**H6: The greater the use of apprenticeship and role modeling in the nursing home, the better the quality of nursing care.**

To test this hypothesis, apprenticeship/role modeling is measured by three items with regard to the practices and one item as to the attitude. AP1 measures whether apprenticeship is practiced in the nursing home. AP2 measures how senior nursing staffs are involved in the apprenticeship program. AP3 explores the nursing home’s attitude about apprenticeship. AP4 measures to what extent apprenticeships are used in the nursing home.

**Motivation** Empirical studies have suggested the positive effects of motivation to learn on adaptability (Woiceshyn, 2000), perceived service quality (Hays & Hill, 2001), continuous quality improvement (Barton & Delbridge, 2004), and entrepreneurial performance (Hayton, 2003). Nevertheless, whether those positive effects are applicable to quality of care in nursing homes is still not fully understood by health care advocates. It is thus hypothesized that:

**H7: The more the nursing home motivates people to come up with new ideas, to try new ways of doing things and to share information, the better the quality of**
nursing care.

To test this hypothesis, motivation and incentives are measured by five items. MO1, MO2, and MO3 measure whether the nursing home recognizes or rewards for new ideas, for better ways of doing things, and for sharing information, respectively. Another two items measure whether rewarding and motivating occur when desirable performance requirements are met (MO4) or only when the best performance is achieved (MO5).

2. The Structural Dimension of OL

The focus of the structural dimension of organizational learning is on how to institutionalize the acquired knowledge and skills and make the information distribution processes work more smoothly. The OLMs that aim to accomplish this task and remove the bureaucratic barriers of organizational learning include autonomy/empowerment, involvement/participation, teamwork, clinical guidelines, IT, and turnover.

Empowerment and Supervision The positive influence of empowerment/autonomy on perceived quality of care has been suggested in several empirical studies (Rafferty et al., 2001; Kramer & Schmalenberg, 2003; Laschinger et al., 2003). Nevertheless, the measurement of perceived quality of care is rather subjective. Whether these effects are applicable to nursing homes is still a mystery to health care scholars. Moreover, the effects of empowerment/autonomy could be moderated or mediated by other variables such as job satisfaction and professional practice (Laschinger et al., 2003), nursing leadership (Manojlovich, 2005b), and environmental opportunities and power (Manojlovich, 2005a). Prior to the exploration of these moderating and
mediating effects, the present study will first examine whether empowerment/autonomy
is positively related to quality of care in nursing homes. It will also conversely examine
whether nursing supervision is positively related to NHQC. Thus, two hypotheses are
proposed as follows:

**H8:** The more empowerment/autonomy the nursing staffs have, the better the
quality of nursing care.

**H9:** The tighter the nursing supervision, the better the quality of nursing care.

To test this hypothesis, empowerment is measured by four items. EP1 and EP2
measure whether nursing staffs have a say in their daily work and whether they have
discretion in new situations, respectively. EP3 explores whether the nursing home values
nursing staffs’ individual decisions on quality improvement. EP4 measures how strictly
nursing staffs have to follow SOPs.

Nursing supervision is measured by three items. SU1 measures whether
supervision is based on position and experiences. SU2 measures whether supervision
dominates new nursing practices. SU3 measures attitudes about the relationship between
strict nursing supervision and quality of nursing care.

**Participation and Involvement** As means to boost performance, staff
participation and involvement have been found to be positively related to performance
and satisfaction (Wagner, 1994), resident outcomes (Anderson & McDaniel, 1998, 1999),
and organizations’ adaptability to environments. Nevertheless, their effects on
performance are also affected by other variables, especially structural variables such as
size, ownership, and chain affiliation (Zinn et al., 1993; Harrinton et al., 2001;
Prior to the examination of these moderating or mediating effects, the present study will re-examine the relationship between staff participation and quality of care in nursing homes. It is thus hypothesized that:

**H10: The more participative the nursing staffs in the decision-making process, the better the quality of nursing care.**

To test this hypothesis, participation is measured by five items. Two items are designed to measure whether nursing staffs at different levels participate in the quality-related meetings (PA1). PA2 measures whether nursing staffs like to participate in decision-making processes. Another two items aim to measure attitudes about the positive relationship between nursing involvement and quality of nursing care (PA3) as well as nursing satisfaction (PA4).

**Job Rotation** Although positive effects of job rotation on productivity, innovation, and learning have been documented in a number of empirical studies (Harryson, 1997; Jansen, ven den Bosch, & Volberda, 2005; Song, van der Bij, & Weggeman, 2006), job rotation is not always recommended by scholars and its negative effects on innovation have also been suggested (Collinson, 2001; Leenders & Wierenga, 2002; Kramer et al., 2003; Allwood & Lee, 2004). Moreover, scholars have suggested that there are prerequisites for successful implementation of job rotation and that job rotation might interact with other variables (Cosgel & Miceli, 1999; Eriksson & Ortega, 2006). Overall, however, the literature is barren in addressing how job rotation affects health care professionals. To remedy these insufficiencies, it is thus hypothesized that:
**H11: The more frequently job rotation happens in the nursing home, the better the quality of nursing care.**

To test this hypothesis, job rotation is measured by three items. JR1 measures the frequency of position changes in the nursing home. JR2 and JR3 respectively measure whether position changes happen horizontally or vertically. JR4 measures whether job rotation is one of the nursing home’s personnel policies. JR5 is an opinion item measuring the nursing home’s attitude about the benefits of job rotation on quality improvement.

**Teamwork** Widely viewed as an important OLM, teamwork has been found to be positively associated with quality of care (Meliones, 2000; Rafferty, Ball, & Aiken, 2001; Friedman & Berger, 2004; Shortell et al., 2004). Nevertheless, the effects of teamwork would depend on other structural and cultural factors (Alexander et al., 1996; Wicke, Coppin, & Payne, 2004). It is important to examine whether and how teamwork would also contribute to quality of care in nursing homes. To examine these effects, it is first hypothesized that:

**H12: The more the nursing home emphasizes teamwork, the better the quality of nursing care.**

To test this hypothesis, teamwork is measured by five items. TM1 measures whether the nursing home evaluates team performance. TM2 examines whether teammates evaluate each other. TM3 measures the nursing home’s attitude about the effectiveness of teamwork. TM4 measures the use of cross-functional teams in the nursing home. And TM5 measures to what extent teamwork occupies the nursing home’s
nursing care services.

**Standard Operating Procedures (SOPs)** Although viewed widely as a means to improve quality of care and health outcomes (Baker & Feder, 1997; Merritt et al., 1999; Carnett, 2002; Gross et al., 2003; McCarberg, 2004), there has only been minimal evidence supporting the positive effects of standard operating procedures in health care settings. For example, there have been studies that showed positive effects of SOPs on neonatal outcomes (Merritt et al., 1999) and on pressure ulcer development in nursing homes (Berlowitz et al., 2003). More empirical studies are needed to re-examine the effects of clinical guidelines. It is thus hypothesized that:

**H13: The more the nursing home stresses the use of standard operating procedures, the better the quality of nursing care.**

To test this hypothesis, SOPs are measured by six items. OP1 measures whether standard nursing care procedures are documented. OP2 further measures whether punishments are exerted for noncompliance with SOPs. OP3 and OP4 measure whether nursing staffs are required to document regular/routine work and special/new situations, respectively. OP5 and OP6 further measure how flexible the SOPs are and how frequently SOPs are updated, respectively.

**Staffing (Grafting)** In addition to acquiring and developing knowledge and skills internally, organizations could also extend their knowledge base by grafting, meaning recruiting experienced people from the external environment. Grafting is viewed as faster and more complete than direct learning and vicarious learning (Huber, 1991).
Despite the potential benefits of grafting, few health care studies have been conducted on whether nursing facilities practice grafting and whether grafting helps improve quality of nursing care. To examine its effects, the present study hypothesizes that:

**H14: The more frequently grafting happens in the nursing home, the better the quality of nursing care.**

To test this hypothesis, staffing is measured by five items. ST1 and ST2 both measure grafting in terms of the percent of nursing staffs working in other nursing facilities prior to the current employment and whether the nursing home has ever successfully recruited the best nursing staffs from other nursing facilities respectively. ST3-ST5 intend to measure seniority of the nursing staffs. ST3 measures the years of experience of current nursing staffs. ST4 and ST5 measure how many experienced and fresh nursing staffs the nursing home recruited in the past year.

**Turnover** The effects of turnover have been extensively documented in the health care literature. Despite its negative effects on quality of care (Bame & Bettenhausen, 1992; Todd & DeerySchmitt, 1996; William et al., 1998; Castle, 2001; Zimmerman et al., 2002; Castle & Engberg, 2005; Randolph et al., 2005), turnover has also been found to interact with many structural and psychological factors (Bame & Bettenhausen, 1992; Bowers & Becker, 1992; Goodell & Coeling, 1994; Leveck & Jones, 1996; Todd et al., 1996; Williams et al., 1998; Castel & Engberg, 2005). Nevertheless, systematic and comprehensive discussions of these effects of turnover are lacking in the literature. Prior to the probe of these effects, the present study will first examine whether the negative effects of turnover also exist in nursing homes in New York State. It is thus
hypothesized that:

**H15: The more efforts the nursing home makes to reduce the staff turnover rate, the better the quality of nursing care.**

To test this hypothesis, nursing turnover is measured by three items. TN1 measures whether the nursing home pays attention to the turnover problem. TN2 measures whether the nursing home tries to uncover the underlying reasons behind turnover. TN3 further measures whether the nursing home acts to reduce nursing turnover. TN4 directly asks for the percent of nursing turnover in the nursing facility.

**Information Technology (IT)**  Although health care scholars have long argued for the positive impact of IT on quality of care (Miller, 1994; Ball et al., 2003; Kalogeropoulos et al., 2003; Sequist et al., 2005), there is still insufficient empirical evidence to confirm its positive effects. In addition, other scholars have suggested that the effects of IT depends on other factors. For example, CDSSs need to be integrated with other OLMs to enhance quality of care (Uckun, 1994; Kalogeropoulos et al., 2003). EMR systems could also encounter several potential barriers (Retchin & Wenzel, 1999; McLane, 2005). With an interest in examining how IT affects quality of care in nursing homes, it is thus hypothesized that:

**H16: The more the nursing home stresses on IT, the better the quality of nursing care.**

To test this hypothesis, IT is measured by five items. IT1 measures the types of technology used in staff communication. IT2 further examines whether technology is utilized in information storage and distribution. IT3 and IT4 measure how technology is
used in the decision-making process and in storing residents’ records respectively. Lastly, IT5 measures the nursing home’s attitudes about the use of IT on quality of care.

3. The Cultural Dimension of OL

Organizational learning, from the cultural perspective, often holds the key to higher-level learning. It stresses not only the importance of building a shared vision and mental models but also the cultivation of a receptive and innovative learning culture. The OLMs that are proposed to achieve these goals target issues such as values and assumptions, shared vision/mental models, diversity, innovation, tolerance for errors, and trust/respect. Several hypotheses are also proposed to examine how these cultural OLMs affect the quality of care in nursing homes.

Value Conflicts Making trade-offs between quality, cost, access, and patient-centeredness is something that always confronts health care providers. Although health care scholars have noticed the side effects of value conflicts between commercial values and professional values (McArthur & Moore, 1997; Frankford & Konrad, 1998; Relman, 1998; Swick, 1998), how these value conflicts are handled is not well documented in the literature. In addition to the exploration of these value conflicts, the present study will first examine how value conflicts affect quality of care in nursing homes. It is thus hypothesized that:

**H17: The more flexible the nursing home is in changing its values and assumptions, the better the quality of nursing care.**

To test this hypothesis, value conflicts are measured by five items. VA1 measures
whether values and assumptions are challengeable in the nursing home. VA2 measures the flexibility of the nursing home with respect to changing the mission, goals, and objectives. VA3 and VA4 further ask whether the nursing home has ever changed the mission, goals, and objectives. VA5 lists a number of important values and asks how much the nursing home values each of them.

**Shared Vision & Mental Models** The importance of shared vision and mental models for enhancing performance and learning has been extensively documented. The building of shared vision and mental models, however, is not a simple task and requires the presence of other factors (Barnsley et al., 1998; Grigsby et al., 2004). Since little has been written about the effects of shared vision and mental models on quality of care, the present study will examine these effects, hypothesizing that:

**H18: The more shared the vision of nursing care among nursing staffs, the better the quality of nursing care.**

To test this hypothesis, shared vision and mental models are measured by four items. SV1 measures the degree of development, communication, and sharing of a vision of goals and futures. SV2 measures whether there is a clear mission statement in the nursing home. SV3 measures the existence of a shared vision and/or mission among the nursing staffs. SV4 further measures whether the shared vision and/or mission effectively affect(s) the nursing activities.

**Innovation** Health care advocates have viewed innovation as a means not only to solve value gridlocks (Teisberg et al., 1994) but also to improve quality of care (Parker
et al., 1999). Nevertheless, negative or questionable effects of innovation on performance have been found in empirical studies (Ford & Sullivan, 2004; Miron & Naveh, 2004). The effects of innovation have also been found to be dependent on other cultural variables (West & Anderson, 1992; Bower et al., 2003; Janssen et al., 2004; Pearce & Ensley, 2004). Empirically examining these effects is one of the interests of the present study. It is thus hypothesized that:

**H19: The more the nursing home stresses trying innovative ideas, the better the quality of nursing care.**

To test this hypothesis, innovation is measured by four items. ID1 and ID2 respectively measure whether the nursing home values more innovative ideas or the mastery of current nursing practices. Another two items measure the nursing home’s opinions on the importance of innovative ideas for quality improvement (ID3) and for market competition (ID4).

**Diversity** Although also widely viewed as a potential mechanism to improve performance (Milliken & Martins, 1996), learning (Vicenzi & Adkins, 2000), and quality of care (Salimbene, 1999; Dreachslin et al., 2000), diversity has been found to also have detrimental effects on performance (Knight et al., 1999). Again, testing whether diversity contributes to learning and performance requires the presence/interaction of other variables (Vicenzi & Adkin, 2000), which has been insufficiently documented in the literature. The present study will try to fill these gaps. It is thus hypothesized that:

**H20: The more diverse the nursing staffs are in terms of backgrounds, skills, and experiences, the better the quality of nursing care.**
To test this hypothesis, diversity is measured by five items. DV1 measures diversity in terms of background, skills, and experiences. DV2 measures whether the nursing home encourages the expression of different opinions and viewpoints. DV3 measures the acceptance of open debates in the nursing home. Another two items measure the nursing home’s attitude about the effects of diverse backgrounds, skills, and experiences on nursing management (DV4) and the effects of diverse opinions and viewpoints on nursing performance (DV5).

**Tolerance for Errors** The prevention of medical errors has been viewed as indispensable to quality assurance and improvement (Penson et al., 2001; Ruchlin et al., 2004; Amalberti et al., 2005; Miller, 2005; Espin et al., 2006). Nevertheless, cultivating a learning and safety culture is not an easy task and is often suppressed by other cultural and structural factors (Penson et al., 2001; Giannetti, 2003; Manser & Staender, 2005; Amalberti et al., 2005). To explore these interactions, the present study hypothesizes that:

**H21: The more a nursing home encourages error reporting and open discussion, the better the quality of nursing care.**

To test this hypothesis, tolerance for errors is measured by four items. ER1 measures whether the nursing home only views errors negatively. The other three items respectively measure whether errors are openly discussed (ER2), reported via formal procedures (ER3), and formally documented and analyzed (ER4).

**Openness, Trust, and Respect** A receptive learning and safety culture cannot be built from nothing. People need to have enough feelings of trust and respect so that they
are willing to share information and treat each other professionally (Checkland et al., 2004; Firth-Cozens, 2004). Feelings of trust, respect, and openness not only affect each other but also interact with other structural and cultural factors (Williams, 2005), which could further affect quality of care (Laschinger et al., 2001; Laschinger, 2004). To explore how these cultural elements affect each other and quality of care in nursing homes, two hypotheses are proposed:

**H22: The more open and honest the nursing staffs, the better the quality of nursing care.**

To test this hypothesis, open and honest culture is measured by three items. OH1 measures whether nursing staffs are open and honest with each other. OH2 measures whether nursing staffs feel free to express their viewpoints and opinions. OH3 further measures whether nursing staffs worry that being open and honest would cause trouble to themselves.

**H23: The more trust and respect among the nursing staffs, the better the quality of nursing care.**

To test this hypothesis, trust and respect are measured by five items. TS1 measures whether nursing staffs are required to treat each other respectfully. TS2 measures whether nursing staffs get along with each other well. TS3 measures whether trust exists among nursing staffs. TS4 and TS5 respectively measure how interpersonal skills are stressed in the recruitment process and in the training process.
D. Control Variables

While examining the relationships between organizational learning and NHQC, it is important to know how other variables may also affect NHQC and control the effects of these variables. Extracting the impacts of the control variables on the NHQC would help explain the relationship between organizational learning and NHQC more accurately. An examination of the quality of nursing care literature reveals that variables that are not closely related to organizational learning but have significant effects on NHQC include ownership status, chain affiliation, facility size, and occupancy.

As to ownership status and chain affiliation, scholars have suspected that quality of care will be traded off in NHs with a profit-driven mission. The underlying assumption is that quality and cost are irreconcilable; thus, in order to maximize profits, investor-owned and chain-affiliated nursing homes will sacrifice quality of care by cutting costs from every angle, both in the administrative processes and in the care delivery processes.

The negative relationship between for-profit status and NHQC has been documented in a number of empirical studies. Harrington and colleagues (2000) examined 1998 survey data for all 50 states and the District of Columbia, which contained 13,693 nursing facilities. The multivariate analysis suggested that controlling for case mix, facility characteristics and location, both investor-owned status and chain-owned status were positively associated with higher total deficiency rates. Based on a stratified random sample of 59 NHs and 2,285 residents in the Maryland long-term care project, Zimmerman and colleagues (2002) also found that for-profit status and chain affiliation were both positively associated with residents’ infection and hospitalization. In
addition, O’Neill and colleagues (2003) analyzed 1999 data on 1,098 free-standing nursing homes in California and concluded that proprietary status was significantly positively associated with total deficiencies. Furthermore, Hillmer and colleagues systematically reviewed 38 publications dated from January 1990 to October 2002 (Hillmer et al., 2005). Their study results suggested that regardless of the study design, lower quality of care was associated with for-profit nursing homes, compared with nonprofit nursing homes.

In addition to ownership and chain-affiliation, facility size has also been legitimately hypothesized to affect quality of care, and several empirical studies have documented its effects on quality of care. Rantz and colleagues (2004) studied the 443 nursing homes in Missouri to examine the relationship between facility characteristics and NHQC. The results suggested that small facilities with fewer than 60 certified beds were more likely to have good resident outcomes on 23 quality indicators. In addition, Johnson and colleagues (2004), based on a study of lawsuit data from 478 nursing homes in 30 Florida counties from 1997 to 2001, concluded that facility size and for-profit status were positively associated with the number of lawsuits.

In terms of occupancy, Rosko and colleagues (1995) studied the labor efficiency of 461 nursing homes located in Pennsylvania and found that ownership, occupancy rate, and size could explain the labor efficiency in NHs. With an interest in studying characteristics of nursing homes that did not physically restrain their residents, Castle and Fogel (1998) studied a national dataset that consisted of 15,074 nursing homes and found that restraints were less likely to be used in NHs that were nonprofit, smaller, less occupied, and not chain-affiliated. Moreover, Harrington and colleagues (2004) examined
state survey activities and types of intermediate sanctions in 1999 and found that state
enforcement actions were more likely to happen in NHs that were chain-affiliated and
had lower facility occupancy rates.

The measurement of these control variables is based again on the CMS’s OSCAR
database, which also collects information about nursing home characteristics. By law,
nursing homes are required to routinely report their ownership status, chain affiliation,
facility size, occupancy rate and so on at the beginning of the regular state inspection.

E. Validity and Reliability of the Variables

According to Brewer and Hunter (1989), “a valid measure is one that correlates
highly both with other equally face- and content-valid measures of its focal concept and
also with measures of that concept’s known or supposed correlates, while showing little
or no empirical association with measures of concepts unrelated to the focal concept” (p.
134). This is graphically presented in Figure IV-2. Reliability, on the other hand, refers to
consistent recordings of the instrument.

Figure IV-2. Validity of a Measure
1. OLMs

With respect to the measures designed for each OLM, three efforts have been made to improve both the validity and reliability of the survey instrument in the present study: comprehensive review of theoretical and empirical studies, use of multiple items, and the pilot study.

First, to increase the validity of the measures’ relevance (face validity) and magnitude (content validity), the proposed measures were based on both empirical and theoretical research as closely as possible. Moreover, the instrument was reviewed by several registered nurses with nursing home work experience to improve both the face validity and the content validity. Second, the researcher took into account that each of the proposed OLMs may not be a unified phenomenon and that subphenomena could be uncorrelated or even negatively correlated. In the process of developing the instrument, the traits of each OLM were identified on the basis of the literature review. Moreover, at least two measures were designed for each OLM. Some questions were deliberately designed from the reverse direction to detect whether subjects carefully answer the questions. Furthermore, the use of SEM can further inform the researcher about the extent to which measurement errors are attached to each measure. Construct, concurrent, predictive, and discriminant validities could be examined from the outputs of SEM. Last, but not the least, a pilot study was conducted to examine the reliability of the measures used in the present study. Open-ended questions were offered in the pilot study to allow for suggestions for improving the questionnaire.
2. NHQIs

Due to the fact that secondary datasets were used for the NHQIs, a comprehensive literature review was conducted to examine the validity and the reliability of measures in both the datasets and the QIs. As to the datasets, both the validity and reliability of the MDS have been demonstrated in a number of studies. Morris and colleagues spent decades studying the validity and reliability of the MDS. Their studies supported convergent validity of the MDS in areas of physical functioning, cognitive functioning, and activities of daily living (ADLs) (1994; 1999; 2004) and the reliability of Version 2.0 of the MDS (1997). Snowden and colleagues (1999) also assessed the criterion validity and responsiveness and demonstrated reasonable validity of the MDS in cognitive performance scale scores, behavior domain scores, and ADL functioning scores. Furthermore, to test the reliability of the MDS over time, Hawes et al. (1995) studied 13 nursing homes in 5 states and concluded that the MDS items had high reliability with intraclass correlation of .7 or higher in areas of cognition, ADLs, continence, and diagnoses. The reliability and validity of the MDS were also demonstrated specifically in other areas such as pain (Fries et al., 2001), and incontinence (Resnick et al., 1996).

The validity and the reliability of NHQIs based on the MDS have been comprehensively examined by Mor and colleagues (2003a; 2003b). Based on a sample of 209 nursing homes in 6 states, comprising 5,758 chronic and post-acute patients, their studies examined 45 existing MDS-based quality indicators (QIs) and concluded that many of the 45 QIs were appropriate for capturing nursing facility performance. As a result, they recommended their use by CMS and nursing facilities. Moreover, the NHQIs were also recommended for use to CMS by the National Quality Forum (NQF) in 2003.
F. Data Collection Method

Apart from the CMS’s databases that are used for the dependent variable, NHQC, data collection for the independent variables was conducted directly from the nursing homes. This subsection will address important data collection issues such as study population and samples, sampling method, units of analysis, survey delivery method, and the pilot study.

1. Study Population

The study population in the present study is the 660 nursing homes in the State of New York. This population is especially important in several respects. First, according to Health Care State Rankings (2002), New York had 120,558 beds, 7.9% of the total in the U.S.; and in Medicare and Medicaid certified nursing care facilities in 2002, ranked 1st in the nation. Second, New York State’s nursing home occupancy rate in 1999 was 94.8, ranked 1st in the nation. Third, New York State’s nursing home population 85 years old and older in 1999 was 112,000, 7.5% of the national total population, and was ranked 1st in the nation. Moreover, in 2007, approximately 132,000 New York State Medicaid beneficiaries, about 2.64% of the 5 million Medicaid beneficiaries, utilized services provided in skilled nursing facilities (nursing homes) with the expending of $6 billion, about 14.5% of the total $41.4 billion Medicaid expenditures. Along with the rising demands and spending of the services must come more attention to the quality of care in New York State nursing homes. It is believed that the findings in the present study will not only be important to a variety of stakeholders of the New York State nursing homes, but also relevant to those in other states.
2. Sample Size and Sampling Method

The sample size was determined by two factors: the analytic method and the response rate. The analytic method used in the present study is Structural Equation Modeling (SEM). The minimum sample size to generate efficient and unbiased parameter estimates for a structural equation model was suggested to be 150 or more by Anderson and Gerbing (1984) and to be 100 by Boomsma (1982) under Maximum Likelihood Estimate with normal data. Following these suggestions, the present study assumed that at least 200 nursing homes need to respond to the questionnaire. With a further assumption of 50% response rate, the sample size was set to be 400.

To generate the sample, the sampling frame was first generated by using the Nursing Home Compare database with the selection of only nursing homes in the State of New York. The simple random sampling method was applied to the sampling frame due to its simplicity and superiority in generating an unbiased and representative sample (Sproull, 1995). In so doing, each nursing home in the sampling frame was assigned a number in sequence and then a random table was used to select the 400 NHs in the sample.

3. Unit of Analysis and Unit of Observation

The selection of units of analysis is closely related to the research questions and the hypotheses. Given the fact that the research questions in the present study mainly focus on how to improve quality of care in nursing homes, the unit of analysis is at the organizational level. Accordingly, dependent, independent, and control variables are also measured at the organizational level.
The unit of observation in the present study is the directors of nursing (DONs) in
the sampled nursing homes. Each selected DON was surveyed with respect to the
learning attitudes and behaviors at the organizational level.

4. Pilot Test

The purpose of the pilot study was to detect and solve any potential or
unanticipated errors and problems in each data collection and analytic procedures before
the actual study was fully conducted. Given the fact that the present study is the first that
defines and measures organizational learning from the three perspectives utilizing an
untried questionnaire, it was important that a pilot study be conducted prior to the
full-scale study (Sproull, 1995). In the pilot study, the simple random sampling method
was used to select five nursing homes from the study population, which were then
excluded in the actual study, followed by the application of all the formal data collection
methods and analytic methods.

5. Delivery of the Questionnaire

Ethical Concerns Generally, the ethical issues involved in survey research are
less serious in the data collection processes, compared to experimental research (Kimmel,
1988). Nevertheless, issues of privacy and confidentiality were still highly stressed in the
cover letter and implemented throughout the research processes. Moreover, before
formally contacting any subject in the study population, the research proposal was sent to
the University at Albany’s Internal Review Board for approval.

The Cover Letter (Informed Consent) Along with each questionnaire, a cover
letter was sent to the selected nursing homes. The cover letter covered important ethical issues such as the purpose of the study, the selection methods, voluntary participation, confidentiality, and the use of the data or conclusions of the research.

**Delivery Method (by Mail/Fax)** Finally, the whole questionnaire package was initially mailed to the selected nursing homes in June 2007 based on the belief that paper questionnaires are a more formal and sincere way of contacting people than internet surveys as well as a more feasible and affordable way than interview surveys. The formal questionnaire that was sent to the nursing homes is included in APPENDIX C.

**Techniques to Increase Response Rate** In addition to the neat and well organized design of questionnaire, several techniques were applied to increase the response rate, including the assurance of confidentiality, a postage-paid envelope, an alternative way of faxing the questionnaire, the use of follow-up letters and follow-up phone calls, and the provision of research findings. After two follow-up letters, a total of 187 questionnaires were received, representing 46.75% response rate.

**G. Data Analytic Method**

Given that the primary purpose of the present study is to examine the relationship between organizational learning and NHQC, structural equation modeling (SEM) is the analytic method that could best achieve this objective. SEM incorporates, integrates, and in many instances even surpasses traditional multiple regression analysis, factor analysis, and path analysis. First, traditional path analysis works on models in which each variable has only one indicator and a path connecting the variables. By contrast, traditional factor analysis is usually applied to models in which each variable (latent factor) is assumed to
have multiple indicators and no direct path connecting the latent variables. One advantage of SEM is that it can analyze models in which (latent) variables are assumed to have multiple indicators and are correlated with specified paths. Second, unlike traditional multiple regression, which assumes no correlations between independent variables (multicollinearity), SEM can estimate not only the whole model in the face of multicollinearity but also the direction and strength of the correlations between the independent variables. Third, inheriting the advantage of traditional path analysis, SEM can estimate both direct and indirect effects, allowing the model to examine mediating variables. Hence, SEM is superior to traditional regression analysis in performing effect analysis by taking into account all possible ways that one variable could affect another variable both directly and indirectly. Fourth, unlike traditional analysis, SEM can test a model’s overall fit to the observed data rather than just individual coefficients. In so doing, SEM utilizes the observed variance or covariance matrix and tests whether the proposed model would generate the predicated variance or covariance that is as close as possible to the observed variance or covariance matrix. Last, but not least, unlike the traditional regression analysis, which ideally assumes no measurement error, SEM recognizes imperfect measures in the real world and takes into account this imperfection while estimating models. The statistical software AMOS16 was used to conduct the structural equation modeling mostly due to its superior graphical modeling interface.

**H. SEM Assumptions**

As with other statistical modeling methods, SEM has a number of assumptions that underlie its parameter estimating processes. Violating these assumptions not only
compromises accuracy, reliability, and efficiency of parameter estimates but also produces untrustworthy results. Nevertheless, many if not most SEM studies in the literature fail to report their compliance with SEM assumptions. The essential SEM assumptions that will be addressed in the following section are: sample size, missing values, multivariate normal distribution, and multicollinearity.

1. Sample Size

SEM parameter estimates are sensitive to sample size and to variability in covariance matrices. The smaller the sample size, the more unstable the parameter estimates and the less useful the significance tests. Scholars have warned that sample size under 100 is untenable and below the minimum (Kline, 1998; Schumacker and Lomax, 2004).

To meet this assumption, the present study conducted two follow-ups after the initial survey was collected. Given that 187 questionnaires were returned, the sample size in the present study is above the minimum sample size recommendations for SEM analysis.

2. Missing Values

In survey studies, due to fatigue, sensitivity, lack of knowledge, lack of time, or other reasons, respondents often leave items blank on the questionnaire, causing the problem of missing values. As a result, observations with missing values cannot be used in the analysis, leading to reduced sample size. What is worse, missing values could make the sample biased and unrepresentative of the population.
Faced with missing values, researchers often resort to two solutions. The first is to simply drop them from analysis using methods such as listwise deletion and pairwise deletion. The advantages of dropping cases with missing values is that it is a perfectly simple and reasonable solution when the proportion of such cases is less than 5% of the sample size (Roth, 1994; Schafer, 1997). In addition, by so doing, the results are comparable with univariate statistics. Nevertheless, dropping missing values from the analysis could result in several disadvantages such as reduced sample size, losing information, and causing bias in the parameter estimates.

The second solution is to impute/replace missing values with estimated values using single imputation methods (such as mean substitution, last value carried forward, and regression methods), likelihood-based methods (such as Expectation-Maximization approach, a.k.a. E-M approach), or multiple imputation methods (Bennett, 2001).

Given that sample size is an important issue in SEM, the present study used the multiple imputation method to avoid dropping cases from the sample, because “this method works well on both cross-sectional and longitudinal data and is robust to violations of non-normality of the variables used in the analysis” (Bennett, 2001: p. 466). The NORM package is the software used in the present study to accomplish this purpose.

3. Multivariate Normal Distribution

Multivariate normal distribution is defined as: “a p-dimensional random variable X is said to have a multivariate normal distribution if and only if every linear compound of X has a univariate normal distribution.” (Chatfield and Collins, 1980: p. 94). When multivariate variables are used in the model, the multivariate normal distribution is often
assumed in the analysis. Binary, multinomial and ordinal variables are less likely to meet the definition of multivariate normality.

When the assumption of multivariate normal distribution is not met, maximum likelihood estimate (MLE) will overestimate chi-square values, leading to Type I errors (falsely rejecting a good model). In addition, MLE estimation will moderately to severely underestimate standard errors, causing regression paths and factor/error covariances to be more highly statistically significant than they should be. Moreover, simulation studies suggest that severe non-normality of data would not affect SEM parameter estimates (i.e., path estimates) but would inflate the corresponding significance coefficients (Kline, 1998: p209).

A quick and simple way to examine the normality assumption is to look at the skewness and kurtosis scores in descriptive analyses. By convention, categorical variables could be assumed to be normal if the absolute values of their skewness and kurtosis scores are under 2.0 (Schumacker and Lomax, 2004: p. 69).

In spite of the popularity of MLE estimation, its normality assumption often limits its application. For example, when binary data is present, MLE is less efficient. A number of estimation methods have been suggested when the normality assumption is not met, such as the Bollen-Stine bootstrap and Satorra-Bentler adjusted chi-square, and weighted least squares (WLS).

Given that not all variables are normally distributed in the present study, the bootstrap method is specified to estimate the model parameters to avoid overestimating model-fit indices and underestimating standard errors. The number of bootstrap samples is set to be 200 in all model estimations.
4. Multicollinearity

Like traditional regression analysis, SEM assumes the absence of complete multicollinearity, which will result in singular covariance matrices and prevent a SEM solution. In addition, high multicollinearity will cause covariance matrices to be not positive definite and result in empirical model under-identification. As a result, the reliability of SEM estimates is compromised.

The source of high multicollinearity often comes from high correlations among the indicator variables ($r \geq .85$). The correlation coefficients will be analyzed in the present study to examine the extent to which variables are correlated with each other.

I. Summary

The primary purpose of the present study is to examine the relationship between OL and NHQC. It is hoped that the study results would contribute not only to the existing academic studies on organizational learning but also to the improvement of quality of care for nursing facility residents. To illustrate how the present study will accomplish this purpose, this chapter first presented the theoretical model that defines organizational learning from the three perspectives. It then addressed how NHQC is conceptualized and measured in the present study. In the third subsection, a list of hypotheses was also presented to examine and explore the relationship between organizational learning and NHQC, followed by a discussion of how a survey questionnaire was designed to measure nursing home learning attitudes and behaviors. Given the fact that factors other than OL could also affect NHQC, the chapter also examined the control variables in the study. Then, the discussion moved to the validity and reliability of the measures of the variables.
How the survey questionnaire was administrated and analyzed was also addressed in the end. Finally, the present study recognized the importance of the SEM assumptions and elaborated the essential SEM assumptions, how each of them could affect SEM parameter estimates, how compliance of each assumption could be examined, and how the remedies would be used in the present study.
V. STUDY RESULTS

Having examined the SEM assumptions and the importance of complying with those assumptions, this chapter begins with the data management and recoding methods to which the present study resorts in order to follow the SEM assumptions. Thereafter, the univariate statistics, the bivariate statistics, the SEM results, and the examination of each hypothesis will be presented.

A. Data Management and Data Recoding

In order to comply with the SEM assumptions, a series of data management and data analysis processes were performed in the present study. The purpose of this section is to elaborate the steps and results of the data management.

Before implementing any data management processes, descriptive analyses of the raw data values were conducted to examine the severity of missing values and normality in the study. Then, imputation and data recoding steps were performed to maximize the study’s compliance with SEM assumptions.

Moreover, given the fact that no study has comprehensively and empirically measured the three OL dimensions and their corresponding mechanisms, the present study developed an OL questionnaire to fill in this gap. To examine how reliable the measures used in this instrument are, in terms of measuring their intended OL dimensions and mechanisms, reliability analysis was also conducted. The results are also reported in this section.

Following the results of reliability analysis, 23 composite OL scores were
generated. Descriptive analyses were performed again to indicate how the composite OL scores help improve the study’s compliance with SEM assumptions.

Before conducting and recoding the variables, it is worth mentioning that, in addition to ordinal measures, the OL questionnaire also incorporates interval and dummy measures of OL learning attitudes and behaviors. The interval measures were used to explore more detailed information than the ordinal measures. Moreover, the dummy measures were used to examine whether OL practices existed in the nursing home. Therefore, their raw scores would be more meaningful than the recoded scores and will be presented first in the following section.

1. Descriptive Data Analysis on the Raw Data

According to the types of the variables, the descriptions of the analyses on the raw scores are divided into two sections: interval variables and dummy variables. In each section, the variables are discussed with respect to the three OL dimensions.

*Interval variables*

There is just one interval psychological measure (AP4). The mean of AP4 indicates that on average NYS nursing homes had only about 34% of the nursing staffs participating in on-the-job apprenticeship.

As to the structural measures, first, on average NYS nursing homes utilized at least 3 means to disseminate nursing practices (IT1). Second, in terms of nursing staff, about 66% of nursing staffs in NYS nursing homes had previous work experience in other nursing homes (ST1). The average year of experience of the nursing staffs in NYS
nursing homes was about 10 years (ST3). Moreover, on average each NYS nursing home hired more experienced LPNs (5.6) than fresh LPNs (3.4) and more experienced RNs (3.5) than fresh RNs (1.0) in a year. NAs, however, either experienced or inexperienced, were hired the most. About 14 NAs were hired by each NYS nursing home in a year. Obviously, NAs were the main workforce in NYS nursing homes. The average turnover rate in NYS nursing homes was about 27.5% (TN4). Last, about 34.5% of the work in NYS nursing homes had to be done in groups (TM5).
<table>
<thead>
<tr>
<th>ABB</th>
<th>1st Factor</th>
<th>QUESTION</th>
<th>Attrrib</th>
<th>MEAN1</th>
<th>% of Missing</th>
<th>MEAN2</th>
<th>STD</th>
<th>VARI</th>
<th>SKEW</th>
<th>KURTO</th>
<th>Reliability</th>
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<td>AP1</td>
<td>Apprenticeship</td>
<td>on-the-job apprenticeship for all nursing staffs</td>
<td>ordinal</td>
<td>0.00</td>
<td>4.8</td>
<td>1.28</td>
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<td>0.60 / 0.58</td>
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<td>AP2</td>
<td>requires senior nursing staff to mentor junior nursing staffs</td>
<td>ordinal</td>
<td>0.00</td>
<td>4.7</td>
<td>1.40</td>
<td>1.95</td>
<td>-0.99</td>
<td>0.25</td>
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<td>apprenticeship can effectively improve NHQC</td>
<td>ordinal</td>
<td>2.67</td>
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<td>0.86</td>
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<td>-1.12</td>
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<td>% of staffs participating in on-the-job apprenticeship</td>
<td>interval</td>
<td>34.00</td>
<td>14.44</td>
<td>2.7</td>
<td>2.00</td>
<td>4.01</td>
<td>0.68</td>
<td>-0.75</td>
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<td>Benchmarking</td>
<td>cares about QC ranking in comparison with other NHs</td>
<td>ordinal</td>
<td>0.00</td>
<td>5.5</td>
<td>0.82</td>
<td>0.67</td>
<td>-1.67</td>
<td>0.84</td>
<td>0.78 / 0.78</td>
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<td>NH talks about best practices in other NHs</td>
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<td>0.00</td>
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<td>1.20</td>
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<td>-0.34</td>
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<td>BM3</td>
<td>adopts good strategies, processes, and tech from other NHs</td>
<td>ordinal</td>
<td>0.00</td>
<td>4.4</td>
<td>1.21</td>
<td>1.46</td>
<td>-0.24</td>
<td>-0.81</td>
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<td>BM4</td>
<td>compare current QC against previous QC</td>
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<td>0.00</td>
<td>5.3</td>
<td>0.92</td>
<td>0.84</td>
<td>-1.49</td>
<td>2.16</td>
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<td>DV1</td>
<td>Diversity</td>
<td>values people with diff background, knowledge, &amp; skills</td>
<td>ordinal</td>
<td>1.07</td>
<td>5.4</td>
<td>0.79</td>
<td>0.63</td>
<td>-1.36</td>
<td>1.37</td>
<td>0.61 / 0.65</td>
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<td>DV2</td>
<td>encourages staffs to express diff viewpoints to improve QC</td>
<td>ordinal</td>
<td>0.00</td>
<td>5.1</td>
<td>0.90</td>
<td>0.82</td>
<td>-1.10</td>
<td>1.41</td>
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<td>encourages open debates in nursing care meetings</td>
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<td>0.53</td>
<td>5.0</td>
<td>1.10</td>
<td>1.21</td>
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<td>0.59</td>
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<td>DV4</td>
<td>diverse backgrounds, skills, &amp; experiences can be troublesome</td>
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<td>3.21</td>
<td>4.2</td>
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<td>DV5</td>
<td>diverse opinions and viewpoints can be harmful to performance</td>
<td>ordinal</td>
<td>2.14</td>
<td>4.6</td>
<td>1.20</td>
<td>1.43</td>
<td>-0.79</td>
<td>1.15</td>
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<td>EP1</td>
<td>Empowerment</td>
<td>staffs have a say in how they do their works</td>
<td>ordinal</td>
<td>0.53</td>
<td>4.7</td>
<td>0.95</td>
<td>0.89</td>
<td>-0.49</td>
<td>-0.04</td>
<td>0.73 / 0.72</td>
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<td>staffs can make individual decisions to handle new situations</td>
<td>ordinal</td>
<td>0.53</td>
<td>4.4</td>
<td>0.98</td>
<td>0.95</td>
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<td>0.36</td>
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<td>staffs can use their discretion to improve QC when proper</td>
<td>ordinal</td>
<td>0.53</td>
<td>4.6</td>
<td>1.00</td>
<td>1.00</td>
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<td>-0.15</td>
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<td>staffs are required to strictly follow SOPs</td>
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<td>0.85</td>
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<td>Tolerance for</td>
<td>errors can do no goods and should not be tolerated</td>
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<td>2.14</td>
<td>4.0</td>
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<td>-0.53</td>
<td>0.60 / 0.60</td>
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<td>open discussion of errors in nursing care meetings</td>
<td>ordinal</td>
<td>0.00</td>
<td>5.0</td>
<td>1.06</td>
<td>1.12</td>
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<td>has formal procedures to report errors</td>
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<td>ER4</td>
<td>formally documents &amp; analyzes each errors</td>
<td>ordinal</td>
<td>0.00</td>
<td>5.4</td>
<td>0.96</td>
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<td>ID1</td>
<td>encourages staffs to look for new &amp; fresh ways of doing things</td>
<td>ordinal</td>
<td>0.00</td>
<td>5.0</td>
<td>1.02</td>
<td>1.04</td>
<td>-0.88</td>
<td>0.15</td>
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<td>ID2</td>
<td>stresses the mastery of existing standard procedures</td>
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<td>0.00</td>
<td>2.0</td>
<td>0.99</td>
<td>0.98</td>
<td>1.16</td>
<td>1.88</td>
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<td>ID3</td>
<td>innovative ideas can effectively improve NHQC</td>
<td>ordinal</td>
<td>1.07</td>
<td>5.5</td>
<td>0.77</td>
<td>0.60</td>
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<td>4.07</td>
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<td>ID4</td>
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<td>0.79</td>
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<td>1.41</td>
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<td>IT1</td>
<td>means of sharing nursing practices</td>
<td>interval</td>
<td>3.40</td>
<td>1.07</td>
<td>3.4</td>
<td>1.49</td>
<td>2.22</td>
<td>0.68</td>
<td>0.16</td>
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<td>records and distributes best nursing practices</td>
<td>ordinal</td>
<td>0.53</td>
<td>4.3</td>
<td>1.27</td>
<td>1.60</td>
<td>-0.65</td>
<td>-0.04</td>
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<td>uses computer-based decision making systems to improve QC</td>
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<td>3.74</td>
<td>3.8</td>
<td>1.63</td>
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<td>-1.07</td>
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<td>medical records stored in computer</td>
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<td>0.500</td>
<td>0.53</td>
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<td>3.01</td>
<td>9.08</td>
<td>0.02</td>
<td>-2.04</td>
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<td>info tech can effectively improve NHQC</td>
<td>ordinal</td>
<td>2.14</td>
<td>5.1</td>
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<td>makes position changes frequently</td>
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<td>0.96</td>
<td>1.26</td>
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<td>rotates staffs horizontally</td>
<td>ordinal</td>
<td>1.07</td>
<td>3.4</td>
<td>1.16</td>
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<td>rotates staffs vertically</td>
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<td>2.8</td>
<td>1.18</td>
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<td>reward for new/creative ideas</td>
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<td>0.53</td>
<td>4.2</td>
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<td>1.28</td>
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<td>reward for sharing knowledge &amp; best practices</td>
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<td>0.53</td>
<td>4.4</td>
<td>1.29</td>
<td>1.67</td>
<td>-0.57</td>
<td>-0.27</td>
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<td>reward when meeting desirable performance</td>
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<td>0.53</td>
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<td>1.91</td>
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<td>consults outside experts for QI</td>
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<td>1.26</td>
<td>1.59</td>
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<td>0.03</td>
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**Notes:**
- ER: Errors
- ID: Innovation
- IT: IT
- JR: Job Rotation
- MO: Motivation
- OC: Outside Consultation
- Composite values represent the overall score or metric for each category.
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Type</th>
<th>1.07</th>
<th>4.4</th>
<th>1.48</th>
<th>2.19</th>
<th>-0.70</th>
<th>-0.29</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC3</td>
<td>endeavor to implement advices from OC</td>
<td>ordinal</td>
<td>1.07</td>
<td>4.4</td>
<td>1.48</td>
<td>2.19</td>
<td>-0.70</td>
<td>-0.29</td>
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<tr>
<td>OC</td>
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<td><strong>12.0</strong></td>
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<td><strong>-0.15</strong></td>
<td><strong>-0.62</strong></td>
<td><strong>0.80</strong></td>
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<tr>
<td>OH1</td>
<td>staffs are open and honest to each other</td>
<td>ordinal</td>
<td>1.07</td>
<td>4.4</td>
<td>0.92</td>
<td>0.85</td>
<td>-0.19</td>
<td>-0.38</td>
</tr>
<tr>
<td>OH2</td>
<td>staffs are free to express their viewpoints &amp; opinions</td>
<td>ordinal</td>
<td>1.07</td>
<td>4.7</td>
<td>0.93</td>
<td>0.87</td>
<td>-0.35</td>
<td>-0.69</td>
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<tr>
<td>OH3</td>
<td>being open &amp; honest can cause problems</td>
<td>ordinal</td>
<td>1.60</td>
<td>4.8</td>
<td>1.23</td>
<td>1.52</td>
<td>-1.05</td>
<td>1.01</td>
</tr>
<tr>
<td>OH</td>
<td>Composite</td>
<td>ordinal</td>
<td><strong>11.3</strong></td>
<td><strong>2.10</strong></td>
<td><strong>4.43</strong></td>
<td><strong>0.42</strong></td>
<td><strong>0.25</strong></td>
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<tr>
<td>OP1</td>
<td>has written documents to instruct staffs to follow SOPs</td>
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<td>0.982</td>
<td>1.07</td>
<td>1.0</td>
<td>0.13</td>
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<td>-7.35</td>
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<tr>
<td>OP2</td>
<td>punishes staffs for not following SOPs</td>
<td>ordinal</td>
<td>0.53</td>
<td>3.9</td>
<td>1.24</td>
<td>1.53</td>
<td>0.18</td>
<td>-0.76</td>
</tr>
<tr>
<td>OP3</td>
<td>staffs are required to write reports for their regular &amp; routine works</td>
<td>ordinal</td>
<td>2.14</td>
<td>4.0</td>
<td>1.57</td>
<td>2.45</td>
<td>-0.20</td>
<td>-1.08</td>
</tr>
<tr>
<td>OP4</td>
<td>staffs are required to document special &amp; new situations/prob</td>
<td>ordinal</td>
<td>1.07</td>
<td>5.4</td>
<td>0.90</td>
<td>0.81</td>
<td>-1.31</td>
<td>0.77</td>
</tr>
<tr>
<td>OP5</td>
<td>flexible in changing SOPs</td>
<td>ordinal</td>
<td>1.07</td>
<td>2.8</td>
<td>1.08</td>
<td>1.17</td>
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<td>-0.42</td>
</tr>
<tr>
<td>OP</td>
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<td><strong>16.5</strong></td>
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<td><strong>15.34</strong></td>
<td><strong>0.03</strong></td>
<td><strong>-0.45</strong></td>
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</tr>
<tr>
<td>PA1</td>
<td>are encouraged to participate in quality related meetings</td>
<td>ordinal</td>
<td>1.07</td>
<td>4.6</td>
<td>1.31</td>
<td>1.71</td>
<td>-0.75</td>
<td>-0.20</td>
</tr>
<tr>
<td>PA2</td>
<td>staffs like to participate in quality-related decision-making processes</td>
<td>ordinal</td>
<td>0.53</td>
<td>4.8</td>
<td>0.97</td>
<td>0.94</td>
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<td>-0.31</td>
</tr>
<tr>
<td>PA3</td>
<td>staff participation can effectively improve NHQC</td>
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<td>1.60</td>
<td>5.5</td>
<td>0.81</td>
<td>0.65</td>
<td>-1.40</td>
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<tr>
<td>PA4</td>
<td>staff participation helps increase their satisfaction</td>
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<td>2.14</td>
<td>5.1</td>
<td>1.02</td>
<td>1.05</td>
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<td>0.67</td>
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<tr>
<td>PA</td>
<td>Composite</td>
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<td><strong>-0.71</strong></td>
<td><strong>1.08</strong></td>
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<tr>
<td>PE1</td>
<td>freq of QI meetings</td>
<td>ordinal</td>
<td>0.00</td>
<td>4.6</td>
<td>1.23</td>
<td>1.50</td>
<td>-1.11</td>
<td>2.57</td>
</tr>
<tr>
<td>PE2</td>
<td>pays attention to the rank of NHQIs</td>
<td>ordinal</td>
<td>0.53</td>
<td>5.4</td>
<td>1.08</td>
<td>1.16</td>
<td>-1.92</td>
<td>3.47</td>
</tr>
<tr>
<td>PE3</td>
<td>NHQIs are good indicators of nursing perform</td>
<td>ordinal</td>
<td>2.14</td>
<td>4.4</td>
<td>1.30</td>
<td>1.69</td>
<td>-0.78</td>
<td>0.54</td>
</tr>
<tr>
<td>PE4</td>
<td>satisfied with the ranking of NHQIs</td>
<td>ordinal</td>
<td>1.60</td>
<td>4.2</td>
<td>1.13</td>
<td>1.28</td>
<td>-0.52</td>
<td>0.35</td>
</tr>
<tr>
<td>PE5</td>
<td>eval each nursing staff's performance regularly</td>
<td>ordinal</td>
<td>0.00</td>
<td>5.5</td>
<td>1.02</td>
<td>1.03</td>
<td>-2.19</td>
<td>4.81</td>
</tr>
<tr>
<td>PE6</td>
<td>ensure each staff acknowledges his/her perf feedback</td>
<td>ordinal</td>
<td>0.53</td>
<td>5.5</td>
<td>0.98</td>
<td>0.96</td>
<td>-2.40</td>
<td>6.35</td>
</tr>
<tr>
<td>PE</td>
<td>Composite</td>
<td>ordinal</td>
<td><strong>24.9</strong></td>
<td><strong>3.70</strong></td>
<td><strong>13.72</strong></td>
<td><strong>-1.50</strong></td>
<td><strong>3.68</strong></td>
<td></td>
</tr>
<tr>
<td>Patient Needs</td>
<td>Composite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>survey resident's satisfaction</td>
<td>ordinal</td>
<td>0.00</td>
<td>5.0</td>
<td>1.26</td>
<td>1.59</td>
<td>-1.36</td>
<td>1.42</td>
<td>0.61 / 0.63</td>
</tr>
<tr>
<td>has policies to express needs &amp; cmplnts</td>
<td>dummy</td>
<td>1.00</td>
<td>1.07</td>
<td>1.0</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>invites residents in QI meetings</td>
<td>ordinal</td>
<td>0.00</td>
<td>3.1</td>
<td>1.90</td>
<td>3.62</td>
<td>-0.41</td>
<td>-1.37</td>
<td></td>
</tr>
<tr>
<td>customizes each resident's nursing care plan</td>
<td>ordinal</td>
<td>0.00</td>
<td>5.7</td>
<td>0.57</td>
<td>0.32</td>
<td>-2.39</td>
<td>6.04</td>
<td></td>
</tr>
<tr>
<td>PN Composite</td>
<td>13.4</td>
<td>3.41</td>
<td>11.66</td>
<td>-0.69</td>
<td>0.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Staffing</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of staffs with previous work experiences in other NHs</td>
<td>interval</td>
</tr>
<tr>
<td>has ever hired the best nursing staffs from other NHs</td>
<td>ordinal</td>
</tr>
<tr>
<td>years of experiences of the nursing staffs</td>
<td>interval</td>
</tr>
<tr>
<td># of experienced LPNs hired</td>
<td>interval</td>
</tr>
<tr>
<td># of experienced NAs hired</td>
<td>interval</td>
</tr>
<tr>
<td># of experienced RNs hired</td>
<td>interval</td>
</tr>
<tr>
<td># of fresh LPNs hired</td>
<td>interval</td>
</tr>
<tr>
<td># of fresh NAs hired</td>
<td>interval</td>
</tr>
<tr>
<td># of fresh RNs hired</td>
<td>interval</td>
</tr>
<tr>
<td>ST Composite</td>
<td>15.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supervision</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>follow supervisors' guidance due to the position</td>
<td>ordinal</td>
</tr>
<tr>
<td>new practices to be approved by nursing supervisors</td>
<td>ordinal</td>
</tr>
<tr>
<td>strict nursing supervision can effectively improve NHQC</td>
<td>ordinal</td>
</tr>
<tr>
<td>SU Composite</td>
<td>14.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shared Vision</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>has a clear mission statement</td>
<td>dummy</td>
</tr>
<tr>
<td>NH has successfully created a shared vision</td>
<td>ordinal</td>
</tr>
<tr>
<td>shared vision successfully guides nursing activities</td>
<td>ordinal</td>
</tr>
<tr>
<td>SV Composite</td>
<td>14.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teamwork</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH evaluates teams' performance</td>
<td>ordinal</td>
</tr>
<tr>
<td>staffs are required to evaluate team members’ perf</td>
<td>ordinal</td>
</tr>
<tr>
<td>teamwork can effectively improve NHQC</td>
<td>ordinal</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>TM4</td>
<td>staffs have to cooperate with people other than nurses</td>
</tr>
<tr>
<td>TM5</td>
<td>% of work that has to be done in groups</td>
</tr>
<tr>
<td>TM</td>
<td>Composite</td>
</tr>
<tr>
<td>TN1</td>
<td>pays attention to the problem of nursing turnover</td>
</tr>
<tr>
<td>TN2</td>
<td>makes efforts to know reasons behind nursing turnover</td>
</tr>
<tr>
<td>TN3</td>
<td>has a policy to reduce nursing turnover</td>
</tr>
<tr>
<td>TN4</td>
<td>turnover rate</td>
</tr>
<tr>
<td>TN</td>
<td>Composite</td>
</tr>
<tr>
<td>TR1</td>
<td>regular on-the-job training to all staffs</td>
</tr>
<tr>
<td>TR2</td>
<td>incentives for training, workshop, and seminars</td>
</tr>
<tr>
<td>TR3</td>
<td>reimburses for nursing education</td>
</tr>
<tr>
<td>TR4</td>
<td>subscribes to nursing journals</td>
</tr>
<tr>
<td>TR</td>
<td>Composite</td>
</tr>
<tr>
<td>TS1</td>
<td>prohibited to use rude, impolite, &amp; violent languages</td>
</tr>
<tr>
<td>TS2</td>
<td>staffs get along well with each other</td>
</tr>
<tr>
<td>TS3</td>
<td>trust each other</td>
</tr>
<tr>
<td>TS4</td>
<td>good interpersonal skills in job descriptions</td>
</tr>
<tr>
<td>TS5</td>
<td>interpersonal skills in training sessions</td>
</tr>
<tr>
<td>TS</td>
<td>Composite</td>
</tr>
<tr>
<td>VA1</td>
<td>allows staffs to challenge assumptions and values</td>
</tr>
<tr>
<td>VA2</td>
<td>flexible in changing missions, goals, or objectives if in need</td>
</tr>
<tr>
<td>VA3</td>
<td>ever changed mission to fit changing environment</td>
</tr>
<tr>
<td>VA4</td>
<td>ever changed goals/objects to meet environment demands</td>
</tr>
<tr>
<td>VAS_eff</td>
<td>indicate how much your nursing home weighs efficiency</td>
</tr>
<tr>
<td>VAS_predic</td>
<td>indicate how much your nursing home weighs predictability</td>
</tr>
</tbody>
</table>
### Table V-1. Univariate Analysis and Reliability Analysis of the Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Type</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Max</th>
<th>Min</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAS_pr od</td>
<td>indicate how much your nursing home weighs productivity</td>
<td>ordinal</td>
<td>5.35</td>
<td>4.3</td>
<td>0.81</td>
<td>0.66</td>
<td>-0.66</td>
<td>-0.09</td>
</tr>
<tr>
<td>VAS_pr of</td>
<td>indicate how much your nursing home weighs profit</td>
<td>ordinal</td>
<td>5.35</td>
<td>3.7</td>
<td>1.19</td>
<td>1.41</td>
<td>-0.75</td>
<td>-0.05</td>
</tr>
<tr>
<td>VAS_qu ality</td>
<td>indicate how much your nursing home weighs quality</td>
<td>ordinal</td>
<td>6.42</td>
<td>4.8</td>
<td>0.65</td>
<td>0.43</td>
<td>-3.19</td>
<td>14.10</td>
</tr>
<tr>
<td>VAS_st ab</td>
<td>indicate how much your nursing home weighs stability</td>
<td>ordinal</td>
<td>6.42</td>
<td>4.4</td>
<td>1.01</td>
<td>1.02</td>
<td>-0.53</td>
<td>0.67</td>
</tr>
<tr>
<td>VAComposite</td>
<td>Composite</td>
<td></td>
<td>10.1</td>
<td>2.45</td>
<td>6.02</td>
<td>-0.46</td>
<td>-0.23</td>
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</tr>
<tr>
<td>chain</td>
<td>chain affiliation</td>
<td>dummy</td>
<td>0.1016</td>
<td>0.00</td>
<td>0.30</td>
<td>0.09</td>
<td>2.66</td>
<td>5.12</td>
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<tr>
<td>.cnahpr pd</td>
<td>CAN HPRPD</td>
<td>interval</td>
<td>2.3467</td>
<td>0.00</td>
<td>0.39</td>
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<td>-1.65</td>
<td>8.36</td>
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<tr>
<td>inhos</td>
<td>Hospital based</td>
<td>dummy</td>
<td>0.246</td>
<td>0.00</td>
<td>0.43</td>
<td>0.19</td>
<td>1.19</td>
<td>-0.59</td>
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<tr>
<td>lphinhrp pd</td>
<td>LPN HPRPD</td>
<td>interval</td>
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<td>0.00</td>
<td>0.29</td>
<td>0.09</td>
<td>0.15</td>
<td>-0.59</td>
</tr>
<tr>
<td>owner np</td>
<td>non-profit ownership</td>
<td>dummy</td>
<td>0.5134</td>
<td>0.00</td>
<td>0.50</td>
<td>0.25</td>
<td>-0.05</td>
<td>-2.02</td>
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<tr>
<td>pont_o cup_be d</td>
<td>Occupancy</td>
<td>interval</td>
<td>95.372</td>
<td>0.00</td>
<td>3.91</td>
<td>15.25</td>
<td>-1.59</td>
<td>2.65</td>
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<tr>
<td>mhhrp pd</td>
<td>RN HPRPD</td>
<td>interval</td>
<td>0.6825</td>
<td>0.00%</td>
<td>0.34</td>
<td>0.12</td>
<td>2.08</td>
<td>4.57</td>
</tr>
<tr>
<td>vall</td>
<td>Quality Indicators</td>
<td>interval</td>
<td>171.3</td>
<td>0.00</td>
<td>48.59</td>
<td>2361.</td>
<td>0</td>
<td>-1.27</td>
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<tr>
<td>count_cmplnt</td>
<td>Complaints</td>
<td>interval</td>
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<td>0.00</td>
<td>3.79</td>
<td>14.38</td>
<td>3.33</td>
<td>12.96</td>
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<tr>
<td>count_servdef</td>
<td>Survey Deficiencies</td>
<td>interval</td>
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<td>0.00</td>
<td>11.22</td>
<td>125.9</td>
<td>0.85</td>
<td>1.77</td>
</tr>
</tbody>
</table>


**Dummy variables**

First, in terms of the cultural dummy measures, all surveyed NYS nursing homes reported having formal procedures to report errors (ER3). About 93.6% of the surveyed NYS nursing homes had clear mission statement (SV2). Moreover, the surveyed NYS nursing homes were more likely to change goals/objectives to meet environmental demands (VA4, 78.7%) than to change missions to fit changing environments (VA3, 62%). Second, with respect to the structural dummy measures, almost all surveyed NYS nursing homes (98.2%) had written documents to instruct staffs to follow SOPs (OP1) but just half of the surveyed NYS nursing homes had medical errors stored in computer (IT4) and had a policy to reduce nursing turnover (TN3). Only 34.3% of the surveyed NYS nursing homes had policies to rotate staffs across different positions (JR4). Finally, all surveyed NYS nursing homes had formal procedures for residents to express their needs and complaints (PN2).

**2. Percent of Missing**

Given the understanding of the importance of sample size and the negative impacts of missing values, it is important to analyze the problem of missing values in the present study. As Table V-1 indicates, the problem of missing values is not serious in the present study, with the exception of staffing variables that measure the number of hired experienced and inexperienced nursing staffs (ST4 and ST5, from 13.4% to 25.1%). The variables that have missing values over 5% are: the percentage of staff participating in on-the-job apprenticeship (AP4, 14.4%), the percentage of staffs with previous work experience in other NHs (ST1, 5.4%), and the average years of experience of the nursing
staffs (ST3, 10.7%), the percentage of work that has to be done in groups (TM5, 23.5%),
and the turnover rate (TN4, 9.1%). In addition, the items that measure value conflicts
(VA5) also have missing values close to the 5% cut-off value.

3. Imputation

In order to maximally utilize the respondent surveys in the present study and avoid the negative impacts of dropping cases, the present study resorts to imputation to deal with the problem of missing values. Among a number of imputation methods, the present study adopts the method of multiple imputation (MI) where each missing value is replaced by \( m > 1 \) possible values derived from a multivariate normal distribution. MI then analyzes each of the simulated complete datasets by standard methods and combines the results to generate estimates and confidence intervals that incorporate missing-data uncertainty (Rubin, 1987). The imputing processes were conducted by using the software NORM (v2.03), which was developed by Schafer and his colleagues at Pennsylvania State University (Shafer and Graham, 2002), due to its easy accessibility and user-friendly interface.

4. Data Recoding

After missing values were replaced with multiple imputations, data recoding formats were applied to the variables that were designed to reverse OL attitudes and practices (DV4, DV5, EP4, ER1, ID2, OH3, OP5), to the percentage variables (AP4, ST1, TM5, TN4), to the dummy variables (ER3, IT4, JR4, PN2, SV2, TN3, VA3, VA4), and to the frequency variables (PE1, OP6). The purpose of recoding these variables is to convert
these variables into ordinal variables with a 6-point Likert scale so that composite OL scores could be generated later. In addition, before conducting Cronbach's alpha for the reliability analysis, it is also necessary that all variables be recoded in the same conceptual direction.

5. Descriptive Statistics on the Imputed Data

Having imputed and recoded the variables to maximize the compliance of the present study with SEM assumptions, descriptive statistical analysis on the imputed variables was conducted. It is worth noticing again that the 6-point Likert scale to measure organizational learning behaviors is: 6 (always), 5 (frequently), 4 (often), 3 (sometimes), 2 (rarely), and 1 (never).

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>never</td>
<td>rarely</td>
<td>sometimes</td>
<td>often</td>
<td>frequently</td>
<td>always</td>
</tr>
</tbody>
</table>

The 6-point Likert scale to measure organizational learning behaviors

And the 6-point Likert scale to measure organizational learning attitudes is: 6 (strongly agree), 5 (moderately agree), 4 (agree), 3 (disagree), 2 (moderately disagree), and 1 (strongly disagree). For each variable, the means calculated after imputation and data recoding are presented by MEAN2 in Table V-1.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>strongly disagree</td>
<td>moderately disagree</td>
<td>disagree</td>
<td>agree</td>
<td>moderately agree</td>
<td>strongly agree</td>
</tr>
</tbody>
</table>

The 6-point Likert scale to measure organizational learning attitudes

In NYS nursing homes, on-the-job nursing apprenticeships (AP1) and senior nursing staffs’ mentoring on junior nursing staffs (AP2) occurred rather frequently, 4.8 and 4.7, respectively. Similarly, respondents moderately agreed that apprenticeships can
effectively improve NHQC (AP3, 5.4).

Respondents indicated that their nursing homes cared more about their QC ranking in comparison with other NHs (BM1, 5.5) and compared their current QC against previous QC (BM4, 5.3). They, however, less frequently talked about the best practices in other NHs (BM2, 4.4) and less frequently adopted good strategies, processes, and technologies from other NHs (BM3, 4.4).

Respondents indicated that their nursing homes valued people with different backgrounds, knowledge, and skills (DV1, 5.4), encouraged staffs to express different viewpoints to improve QC (DV2, 5.1), and encouraged open debates in nursing care meetings (DV3, 5.0). They disagreed moderately that diverse backgrounds, skills, and experiences can be troublesome (DV4, 2.8, before recoding) and that diverse opinions and viewpoints can be harmful to performance (DV5, 2.4, before recoding).

Respondents indicated that their nursing homes were frequently required to strictly follow SOPs (EP4, 5.1, before recoding). Staffs often had a say in how they do their works (EP1, 4.7), could often use their discretion to improve QC when proper (EP3, 4.6), and could often make individual decisions to handle new situations (EP2, 4.4).

Generally, NYS nursing homes disagreed that errors can do no good and should not be tolerated (ER1, 3.0, before recoding) and had open discussion of errors in their nursing care meetings (ER2, 5.0). Moreover, they reported that they formally documented and analyzed each error (ER4, 5.4).

Respondents moderately agreed that innovative ideas can effectively improve NHQC (ID3, 5.5) and enhance their ability to compete in the market (ID4, 5.4) and frequently encouraged staffs to look for new and fresh ways of doing things (ID1, 5.0).
They, however, moderately stress the mastery of existing SOPs (ID2, 5.0, before recoding).

NYS nursing homes often record and distribute the best nursing practices (IT2, 4.3). In addition, they sometimes used computer-based decision making systems to improve QC (IT3, 3.8).

Generally, respondents did not agree that rotation can effectively improve QC (JR5, 3.6). NYS nursing homes rarely make position changes (JR1, 2.6) or vertical nursing rotations (JR3, 2.8), but sometimes make horizontal nursing rotation (JR2, 3.4).

NYS nursing homes often reward nursing staffs for new/creative ideas (MO1, 4.2), for better ways of doing things (MO2, 4.3), for sharing knowledge and the best practices (MO3, 4.4), and for meeting desirable performance (MO4, 4.5). In addition, respondents indicated that nursing staffs are not rewarded only when they achieve the best nursing performance (MO5, 3.5).

NYS nursing homes only sometimes consult outside experts for quality improvement (OC1, 3.6). However, respondents generally agree that outside consultation can effectively improve NHQC (OC2, 4.0) and would often endeavor to implement advice from outside consultants (OC3, 4.4).

Generally, nursing staffs in NYS nursing homes were open and honest to each other (OH1, 4.4) and were often free to express their viewpoints and opinions (OH2, 4.7). Respondents moderately disagreed that being open and honest could cause problems (OH3, 2.1, before recoding).

Respondents indicated that nursing staffs in their nursing homes were often punished for not following SOPs (OP2, 3.9), were often required to write reports for
regular/routine work (OP3, 4.0), but were frequently required to document special/new
situations and problems (OP4, 5.4). In addition, respondents indicated that they were
often flexible in changing SOPs (OP5, 4.2, before recoding).

Respondents moderately agreed that staff participation can effectively improve
NHQC (PA3, 5.5) and help increase staffs’ satisfaction (PA4, 5.1). Their nursing staffs
often liked to participate in quality-related decision-making processes (PA2, 4.8) and
were often encouraged to participate in quality-related meetings (PA1, 4.6).

Overall speaking, NYS nursing homes had quality-related meetings at least once a
month (PE1, 4.6). Although respondents only agreed that NHQIs are good indicators of
nursing performance (PE3, 4.4), they frequently paid attention to their rankings of NHQIs
(PE2, 5.4) and they agreed that they were satisfied with their rankings of NHQIs (PE4,
4.2). In addition, they frequently evaluated each nursing staff’s performance (PE5, 5.5)
and ensured that each nursing staff acknowledges his/her performance feedback (PE6,
5.5).

Respondents reported that their nursing homes frequently customized each
resident’s nursing care plan (PN4, 5.7) and frequently surveyed residents’ satisfaction
(PN1, 5.0). They, however, just sometimes invited residents in QI meetings (PN3, 3.1).
Moreover, NYS nursing homes reported that they often hired the best nursing staffs from
other nursing homes (ST2, 4.0).

NYS nursing homes frequently require nursing staffs to follow supervisor’s
guidance due to his/her position and experiences (SU1, 5.1) and frequently require that
new nursing practices be approved by nursing supervisors. Respondents generally agreed
that strict nursing supervision can effectively improve NHQC (SU3, 4.2).
Respondents reported that their nursing homes often successfully created shared visions (SV3, 4.5) and ensured that supervisors develop, communicate, and share visions among nursing staffs (SV1, 4.4). Respondents generally agreed that shared visions can successfully guide nursing activities (SV4, 4.8).

Generally, NYS nursing homes often evaluate teams’ performance (TM1, 4.7) and nursing staffs were sometimes required to evaluate team members’ performance (TM2, 3.7). Respondents moderately agreed that teamwork can effectively improve NHQC (TM3, 5.7) and that nursing staffs frequently had to cooperate with people other than nurses (TM4, 5.7).

NYS nursing homes frequently pay attention to the problem of nursing turnover (TN1, 5.2). In addition, they make efforts to know the reasons behind nursing turnover (TN2, 5.2).

NYS nursing homes frequently offer regular on-the-job training to all nursing staffs (TR1, 5.6) and often subscribe to nursing journals (TR4, 4.6). In addition, they often provide incentives for nursing staffs to attend training, workshops, and seminars (TR2, 4.3) and often provide reimbursements or rewards for nursing education (TR3, 4.4).

Respondents reported that staffs are frequently prohibited to use rude, impolite, and violent language (TS1, 5.8), that their nursing homes stress good interpersonal skills in job descriptions (TS4, 5.4), and include interpersonal skills in their training sessions (TS5, 5.2). Overall, staffs in NYS nursing homes often get along well with each other (TS2, 4.6) and trust each other (TS3, 4.5).

Respondents indicated that staffs are often allowed to challenge assumptions and
values (VA1, 4.7). In addition, if necessary, their missions, goals, or objectives were often flexible to be changed (VA2, 4.1). Finally, in terms of the values that NYS nursing homes valued the most (from 5 maximally valued to 1 minimally valued), quality gained the most attention (4.7), followed by stability (4.4), productivity (4.3), efficiency (4.3), profitability (3.7), and predictability (3.4).

6. Descriptive Statistics of the Control Variables and the Dependent Variables

Of the 187 NYS nursing homes that responded to the survey, the average percent of occupied bed was 95.37%. In addition, 51.34% of the nursing homes were non-profit; 10.16% of the nursing homes were chained affiliated and 24.6% were hospital-based. As to staffing variables, the average hour per resident per day was 0.6825 (approximately 41 minutes) for RN, 0.7859 (approximately 47 minutes) for LPN, and 2.3467 (approximately 2 hours and 21 minutes) for CNA.

With regard to the three dimensions of NHQC, the average number of survey deficiencies per year per nursing home was 5.7 and the average number of complaints per year per nursing home was 2.4. The mean of the total scores of the 15 quality indicators per year per nursing home was 171.30.

7. Reliability Analysis

Since the present study designed a questionnaire to measure the NYS nursing homes' OL attitudes and behaviors, it is important to examine the extent to which the instruments reliably and consistently measured the true scores. Reliability was examined by Cronbach’s alpha which is based on average correlation among items that aim to
measure the same concept.

Cronbach’s alpha ranges from 1 (indicating that there is no measurement error and that all items measure the true score) to 0 (indicating that the true score is not measured at all). Given that the OL questionnaire is exploratory in terms of measuring OL from the three dimensions and the corresponding 23 OLMs, the present study adopts a .60 cut-off point.

Table V-1 presents both the raw alpha scores and the standardized item alpha scores and how removing (an) item(s) could help improve the alpha scores. For BM (benchmarking), the two types of alphas are above the cut-off point with all the items retained (.78/.78). For EP (empowerment), the two alphas are good (.73/.72) with all the items included. The two alphas for all ID (innovation) items are .66 and .67. For JR (job rotation), using all the items produces a reliable measure (.70/.70). Using all five MO (motivation) items produces the best alpha scores (.89/.90). Using all three OC (outside consultation) items produces an acceptable score (.64/.64). All the other items with acceptable alpha scores are: the four items for PA (participation, .67/.69), the three items for SU (supervision, .62/.62), the four items for SV (shared vision, .74/.77), the four items for TR (training and education, .72/.73), the five items for TS (trust and respect, .65/.66), and the five items for VA (values and assumptions, .57/.64).

The measures whose two alpha scores would be improved with the exclusion of at least one item are: AP (apprenticeship) with the removal of AP4 (.60/.58), DV (diversity) with the removal of DV4 (.61/.65), ER (tolerance for errors) with the removal of ER3 (.61/.65), IT (information technology) with the removal of IT4 (.63/.63), OH (open and honest) with the removal of OH3 (.80/.80), OP (standard operating procedures) with the
removal of OP1 (.70/.70), PE (program evaluation) with the removal of PE1 (.71/.72), PN (patient needs) with the removal of PN2 (.61/.63), ST (staffing) with the removal of ST1 and ST2 (.62/.62), TM (teamwork) with the removal of TM5 (.64/.68), and TN (turnover) with the removal of TN4 (.72/.66).

It is worth noting that while there are disadvantages of recoding the variables in order to create the composite OL scores, the results of the reliability tests suggest that most of these recoded variables be excluded. As a result, the side effects of recoding will be largely offset in the composite OL scores.

**8. Composite OL Measures**

Following the results of the reliability analysis, the retained items were aggregated to create the composite OL scores to be entered into the SEM models. There are several reasons for so doing: 1) to achieve better normality; 2) to increase variances; and 3) to reduce multicollinearity.

As indicated in Table V-1, the absolute values of the skewness and kurtosis scores of the 23 OL composite scores are under 2, with the exception of PE (program evaluation) and TM (teamwork). The issue of multivariate normality could be dealt with by estimating methods that do not assume a multivariate normal distribution (i.e., bootstrap).

In addition, as is the case for ER3 and PN2, when a measure has no variation, it is not feasible to enter them into a SEM model. The 23 composite OL measures have larger variances and standard deviations than their composing items.

The correlations among the 23 composite OL measures are presented in Table V-2. First, no correlation coefficient is over .80, suggesting the problem of multicollinearity is
not serious in the present study. In addition, it is worth noting that ST (staffing) is negatively correlated with almost all of the composite OL measures (except diversity, tolerance for errors, participation/involvement, and teamwork). Further investigation of the items that compose the composite ST score suggests that the higher the score, the more mobile the nursing staffs in the nursing home. It then makes sense that recruitment would be negatively related to these variables.

In addition, several points are worth noting when further investigating the correlation coefficients that are over 0.60. First, the correlation coefficients between ID and EP (0.63) and between ID and VA (0.60) suggest that the more attention and practices toward innovation, the more attention and practices toward empowerment, as well as toward flexible values and assumptions. Second, SV is also moderately correlated with PA (0.60), PE (0.60), TM (0.60), TN (0.64), and TS (0.62), suggesting that as the attention toward and practices related to shared vision increases, so do attention toward and practices related to participation, performance evaluation, teamwork, turnover, and trust and respect.

In sum, despite the fact that aggregating individual items may to some extent distort the information, the aggregated/composite scores have the advantages of having greater normality, having less multicollinearity, being more parsimonious, and consuming fewer degrees of freedom. These features would be contributory to better model-fit indexes.
Table V-2. Correlation Coefficients
B. SEM Measurement Model

While conducting SEM, the present study basically follows Kline’s (1998) two-step modeling process. That is, first, the measurement models will be tested and then the structural models will be examined.

A pure measurement model in SEM is generally viewed as equivalent to the traditional confirmatory factory analysis (CFA), which aims to verify the theory-based underlying factor structure of a set of observed variables. SEM, however, is superior to CFA in that the latter usually relies on few statistics to determine model fit to the data but the former provides several statistical model fit indexes.

On the basis of organizational theories, the present study calls for the examination of organizational learning from three perspectives: psychological, structural, and cultural. The three dimensions could be viewed as the underlying factors of the 23 composite OL measures, as indicated in Figure V-1.

The fit of the model in Figure V-1 was evaluated with AMOS16 using the sample covariance matrix as input and maximum likelihood (ML) as the estimate method. The model is statistically over-identified. First, whether the data meet multivariate normality is revealed by Mardia’s test (Mardia, 1970, 1985). The nonsignificant $p$-value (5.65) fails to reject the null hypothesis of multivariate normality. In addition, a variety of model fit indices were evaluated.
Figure V-1. The Measurement Model
The relative Chi-square (CMIN/DF), one of the absolute fit indexes, was 1.63, under the threshold of 2. In addition, when comparing the proposed model with the independence model, which assumes uncorrelated latent factors. The comparative Fit Index (CFI) was 0.88, which is below the 0.9 cut-off point. Moreover, with respect to goodness-of-fit for lack of parsimony, the Root Mean Square Error of Approximation (RMSEA) was 0.07, suggesting adequate fit. Overall, the goodness-of-fit indices suggest that the measurement model in Figure V-1, which proposes the three dimensions as the latent factors underlying the concept of OL, is acceptable, although at the minimum level.

C. SEM Structural Model

In addition to the confirmatory analysis of the three OL dimensions, the present study also aims to examine the relationships between NHQC and the 23 proposed OL mechanisms. Figure V-2 depicts the structural model that examines the relationships between NHQC and OL.

The primary purpose of the model was to test the proposed hypotheses between OL and NHQC in NYS nursing homes. The model simultaneously covers the three dimensions of NHQC: the clinical quality indicators, the total number of complaints, and the total number of survey deficiencies. In addition, the model not only controls for five organizational characteristics (ownership, chain affiliation, hospital-based status, occupation, and nursing staff hours) but also reveals the total (direct + indirect) effects of each OL mechanism on the 15 clinical quality indicators.
Figure V-2. The Structural Model
To examine how each OL mechanism affects NHQC as well as to test the proposed hypotheses, the present study resorts to the unstandardized coefficient due to its simplicity and straightforward interpretation. The interpretation of the SEM coefficients and the testing of the hypotheses are presented with respect to the three dimensions of OL.

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Testing Hypothesis #</th>
<th>Quality Improvement (QIs)</th>
<th>Complaints</th>
<th>Deficiencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Psychological OLMs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BM (Benchmarking)</td>
<td>5</td>
<td>-0.0203</td>
<td>-0.0658</td>
<td>-1.2992**</td>
</tr>
<tr>
<td>MO (Motivation)</td>
<td>7</td>
<td>-0.0248</td>
<td>0.0556</td>
<td>-0.4409**</td>
</tr>
<tr>
<td>PN (Patient needs)</td>
<td>1</td>
<td>0.2118**</td>
<td>0.0841</td>
<td>-0.5538**</td>
</tr>
<tr>
<td>OC (Outside consultation)</td>
<td>3</td>
<td>0.0203</td>
<td>-0.2261**</td>
<td>0.1332</td>
</tr>
<tr>
<td>AP (Apprenticeship)</td>
<td>6</td>
<td>-0.0452</td>
<td>-0.1250*</td>
<td>0.0497</td>
</tr>
<tr>
<td>PE (Program evaluation)</td>
<td>4</td>
<td>0.0431</td>
<td>0.1402</td>
<td>0.1261</td>
</tr>
<tr>
<td>TR (Training &amp; Education)</td>
<td>2</td>
<td>0.1677**</td>
<td>0.0314</td>
<td>0.4978**</td>
</tr>
<tr>
<td><strong>Structural OLMs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EP (Empowerment)</td>
<td>8</td>
<td>-0.1453**</td>
<td>-0.1146</td>
<td>-0.1569</td>
</tr>
<tr>
<td>TN (Turnover)</td>
<td>15</td>
<td>-0.1746</td>
<td>0.2158</td>
<td>-2.3614**</td>
</tr>
<tr>
<td>PA (Participation)</td>
<td>10</td>
<td>-0.1691**</td>
<td>0.1546</td>
<td>0.9628**</td>
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<tr>
<td>OP (S.O.P.)</td>
<td>13</td>
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<td>0.1216</td>
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</tr>
<tr>
<td>IT (Information Technology)</td>
<td>16</td>
<td>-0.0205</td>
<td>-0.1034*</td>
<td>0.0004</td>
</tr>
<tr>
<td>ST (Staffing)</td>
<td>14</td>
<td>0.0083</td>
<td>-0.0293**</td>
<td>-0.0625**</td>
</tr>
<tr>
<td>SU (Supervision)</td>
<td>9</td>
<td>0.2115**</td>
<td>-0.2461**</td>
<td>-0.5379*</td>
</tr>
<tr>
<td>TM (Teamwork)</td>
<td>12</td>
<td>-0.0173</td>
<td>-0.0213</td>
<td>-0.4031*</td>
</tr>
<tr>
<td>JR (Job rotation)</td>
<td>11</td>
<td>0.0861*</td>
<td>-0.0819</td>
<td>0.0697</td>
</tr>
<tr>
<td><strong>Cultural OLMs</strong></td>
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<tr>
<td>TS (Trust &amp; Respect)</td>
<td>23</td>
<td>-0.1862**</td>
<td>-0.0047</td>
<td>0.4263*</td>
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<tr>
<td>SV (Shared vision)</td>
<td>18</td>
<td>-0.0366</td>
<td>-0.2252**</td>
<td>0.2526</td>
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<tr>
<td>ER (Tolerance for errors)</td>
<td>21</td>
<td>-0.0318</td>
<td>0.1216</td>
<td>0.1634</td>
</tr>
<tr>
<td>VA (Values &amp; Assumptions)</td>
<td>17</td>
<td>0.1144</td>
<td>-0.0610</td>
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</tr>
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<td>DV (Diversity)</td>
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<td>0.0007</td>
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<td>-0.2578</td>
</tr>
<tr>
<td>ID (Innovation)</td>
<td>19</td>
<td>0.0807</td>
<td>0.1465</td>
<td>0.9630**</td>
</tr>
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<td>OH (Open &amp; Honest)</td>
<td>22</td>
<td>-0.0939</td>
<td>0.1393</td>
<td>1.2852**</td>
</tr>
<tr>
<td><strong>Sum of All Sig. Coeff.</strong></td>
<td></td>
<td>-0.0925</td>
<td>-0.3270</td>
<td>-1.5237</td>
</tr>
</tbody>
</table>

Table V-3. Unstandardized Coefficients of the Independent Variables (n=187)

** p<.01
* p<.05
The Psychological Dimension of OL

As Table V-3 indicates, the SEM model provides modest support for the hypotheses that aim to examine the effects of the psychological OLMs on NHQC. The model suggests that four of the seven psychological OLMs are significantly associated with fewer deficiencies ($p < .01$). In the case of QIs and complaints, respectively, only two psychological OLMs achieve statistical significance at the .05 level or less.

More specifically, with respect to the impacts of the psychological OLMs on survey deficiencies, one unit increase in the attention and efforts toward BM (benchmarking) would result in a decrease of 1.30 survey deficiencies, controlling all the other variables. In addition, one unit increase in the attitudes and practices toward MO (motivating nursing staffs) for OL would decrease the total number of survey deficiencies by 0.44, controlling all the other variables. Moreover, one unit increase in the attitudes and behaviors toward PN (patient needs) would decrease the total number of deficiencies by 0.55 but would also increase QIs by 0.2 percent, controlling all the other variables. Hypothesis 5, 7, and 1 are supported in terms of reducing survey deficiencies.

Secondly, as to the impacts of psychological OLMs on complaints, the total number of complaints would decrease by 0.23 as the attitudes and practices toward OC (outside consultation) increase by one unit, controlling all the other variables. In addition, one unit increase in the attention and efforts toward AP (apprenticeship) would decrease the total number of complaints by 0.13, controlling all the other variables. Hypothesis 3 and 6 are supported in terms of reducing complaints.

Despite the positive impacts of the previous psychological OLMs on NHQC, PE (program evaluation) was found to have no statistically significant impacts on any of the
three dimensions of NHQC. Hypothesis 4 is thus not supported in the present study. Moreover, inconsistent with Hypothesis 2, one unit increase in the learning attitudes and behaviors toward TR (training and education) would increase QIs by 0.17 percent and the total number of deficiencies by 0.5.

Of the seven psychological OLMs, five are partially supported by the present study in the process of hypothesis testing that aims to examine their impacts on the three dimensions of NHQC. In terms of magnitude and significance, psychological OLMs would more significantly decrease the number of survey deficiencies than the number of complaints, and the percents of QIs. The two unsupported psychological OLMs are PE (performance evaluation) and TR (training and education), which could be attributed to several reasons. First, to know is one thing; to do is another. In spite of the fact that NYS NHs may recognize, appreciate, and pay attention to their OL performance, NHs may not transform their recognition, appreciation, and attention into efforts. Second, there may exist other variables that may moderate or mediate the effects of performance evaluation on NHQC. The present study may not capture these moderating and mediating effects. As a result, omitted variable biases may distort the study results. More measures of performance evaluation may be needed to further examine the relationship between performance evaluation and NHQC. Similarly, the effects of training and education may also be affected by factors not captured in the present study such as the content and the process of the training and education programs and the time lag between the programs and organizational performance (NHQC), and other moderating and mediating organizational and system factors.
**The Structural Dimension of OL**

As to the structural OLMs, their effects on NHQC are stronger and more significant compared to the psychological OLMs. Of the nine structural OLMs, six OLMs are significantly associated with QIs and complaints ($p < .05$) and five OLMs are significantly associated with deficiencies ($p < .05$). The cumulative significant effects are strongest on QIs, next on deficiencies.

More specifically, one unit increase in the attitudes and behaviors of EP (empowerment) would decrease QIs by 0.15 percent, controlling all the other variables, supporting Hypothesis 8 in terms of better performance on QIs. In addition, one unit increase in the efforts of reducing TN (turnover) would also decrease QIs by 0.17 percent and the total number of deficiencies by 2.36, controlling all the other variables. Hypothesis 15 is supported with respect to lowering the QIs scores and reducing the number of deficiencies. Moreover, controlling all the other variables, one unit increase in PA (participation and involvement) would decrease QIs by 0.17 percent, despite the fact that the total number of complaints and the total number of deficiencies would also be increased by 0.15 and by 0.96, respectively. Hypothesis 10 is thus supported in terms of decreasing QIs but not in terms of complaints and deficiencies. Furthermore, as the attitudes and behaviors of OP (standard operating procedures) increase by one unit, QIs would decrease by 0.09 but the total number of complaints would also significantly increase by 0.12. Hypothesis 13 is thus supported in terms of decreasing QIs but not supported in terms of decreasing the total number of complaints.

With respect to the impacts of structural OLMs on complaints and survey deficiencies, one unit increase in the attitudes and behaviors of IT (information
technology) would decrease the total number of complaints by 0.10, controlling all the other variables. Hypothesis 16 is supported in terms of reducing complaints. In addition, one unit increase in ST (staffing) would also decrease the total number of complaints by 0.03 and the total number of survey deficiencies by 0.06, controlling all the other variables. Moreover, one unit increase in SU (supervision) would also decrease the total number of complaints by 0.25 and the total number of deficiencies by 0.54, controlling all the other variables. QIs, however, would also significantly increase by 0.21 percent. Hypothesis 14 and Hypothesis 9 are supported in terms of reducing both complaints and survey deficiencies. Furthermore, as the attitudes and behaviors of TM (teamwork) go up by one unit, controlling all the other variables, the total number of survey deficiencies would decrease by 0.40. Hypothesis 12 is supported with respect to reducing survey deficiencies.

In spite of the positive impacts of the previous structural OLMs on NHQC, the present study found that one unit increase in attitudes and behaviors related to JR (job rotation) would increase QIs by 0.08 percent, controlling all the other variables. Hypothesis 11, thus, is not supported.

Overall, the study results suggest that all of the nine structural OLMs, except JR (job rotation), could help improve at least one of the three dimensions of NHQC. The structural OLMs tend to be more highly associated with QIs than with the number of complaints and the number of survey deficiencies. Nevertheless, NHs may need to pay attention to the side effects of SOPs (standard operating procedures) on the number of complaints and the side effects of PA (participation) on the number of complaints and the number of survey deficiencies, despite their positive impacts on the QIs, as well as the
side effects of SU (supervision) on the QIs, despite its positive impacts on the number of complaints and the number of survey deficiencies. Moreover, echoing Kramer and colleagues’ (2003) study, the effects of job rotation were not found to be associated with the number of complaints and the number of survey deficiencies. Inappropriate job rotation, such as rotating nursing staffs too quickly before the accumulated organizational knowledge could contribute to NHQC, may even have a negative impact on the level of QIs.

### The Cultural Dimension of OL

Table V-3 also indicates that the cultural OLMs are not associated with NHQC as strongly as the structural and psychological OLMs. One cultural OLM is significantly associated with QIs (p < .05); two cultural OLMs are significantly associated with complaints (p < .05); and three cultural OLMs are significantly associated with deficiencies (p < .05).

More specifically, with respect to QIs, TS (trust and respect) is the most influential. One unit increase in the attitudes and behaviors of TS (trust and respect) would decrease QIs by 0.19 percent, controlling all the other variables. Hypothesis 23 is supported in this regard.

As to complaints, one unit increase in the attitudes and behaviors of SV (shared vision) would decrease the total number of complaints by 0.23, controlling all the other variables. Hypothesis 18 is thus supported in terms of reducing the number of complaints.

Nevertheless, one unit increase in either ER (tolerance for errors) or VA (values and assumptions) would not significantly impact any of the three dimensions of NHQC.
Both Hypothesis 17 and 21 are not supported in the present study.

Furthermore, some cultural OLMs were found to have negative impacts on NHQC. For example, controlling all the other variables, one unit increase in the attitudes and behaviors of DV (diversity) would significantly increase the total number of complaints, which is inconsistent with Hypothesis 20. In addition, contradictory to Hypothesis 19, one unit increase in the attitudes and behaviors of ID (innovation) would increase the total number of deficiencies by 0.96, controlling all the other variables. The number of survey deficiencies would increase by 1.3 as OH (open and honest) increases by one unit, controlling all the other variables. Hypothesis 22 is also not supported in the present study.

Of the seven cultural OLMs, SV (shared vision) and TS (trust and respect) are both significantly associated with better NHQC. In addition, in agreement with Knight and colleagues’ (1999) study and Vicenzi AND Adkins’ (2000) statement, the effects of DV (diversity) on NHQC are not supported in the present study. Furthermore, the expected positive effects of ID (innovation) on NHQC were not observed either. In disagreement with Goodwin’s (2003) argument that guidelines may stifle innovative ideas, the present study suggests that SOPs would exert more positive impacts on NHQC than innovation in New York nursing homes. When and how novel and innovative ideas are implemented may have moderating effects on the relationship between innovation and NHQC. In sum, more studies with a larger sample size would be needed to help further examine the relationships between the cultural OLMs and NHQC.

In addition, Table V-3 also reveals the accumulative effects of OL mechanisms on NHQC. The sums of all the significant OL mechanisms influencing the three dimensions

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of NHQC indicate that OL mechanisms have more impacts on the total number of deficiencies, than on the total number of complaints, and the least impact on QIs.

The Controlling Variables

In terms of the impacts of controlling variables, their unstandardized coefficients are presented in Table V-4. Being a chain nursing home in NYS would increase QIs by 1.04 percent, the total number of complaints by 3.19, and the total number of deficiencies by 4.80. In addition, being a hospital-based nursing home in NYS would also increase QIs by 3.15 percent. Compared with for-profit nursing homes, nonprofit nursing homes in NYS had a lower percent of QIs by 1.18 percent and a lower total number of deficiencies by 4.25. In NYS, one unit increase in a nursing home’s occupancy would decrease the total number of complaints by 0.46 and the total number of deficiencies by 0.56.

<table>
<thead>
<tr>
<th>Controlling Variables</th>
<th>QIs</th>
<th></th>
<th>Complaints</th>
<th></th>
<th>Deficiencies</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>chain</td>
<td>1.0411</td>
<td>0.0536</td>
<td>3.1887</td>
<td>***</td>
<td>4.8023</td>
<td>0.0226</td>
</tr>
<tr>
<td>inhos</td>
<td>3.1548</td>
<td>***</td>
<td>0.5455</td>
<td>0.3171</td>
<td>2.2472</td>
<td>0.1783</td>
</tr>
<tr>
<td>owner_np</td>
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<td>0.008</td>
<td>-0.4510</td>
<td>0.3621</td>
<td>-4.2517</td>
<td>0.0050</td>
</tr>
<tr>
<td>pcnt_ocu</td>
<td>-0.0141</td>
<td>0.6960</td>
<td>-0.4569</td>
<td>***</td>
<td>-0.5639</td>
<td>***</td>
</tr>
<tr>
<td>cnahprpd</td>
<td>2.7208</td>
<td>***</td>
<td>0.2915</td>
<td>0.5760</td>
<td>3.7220</td>
<td>0.0197</td>
</tr>
<tr>
<td>lphprpd</td>
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<td>0.2486</td>
<td>0.0385</td>
<td>0.9565</td>
<td>8.4094</td>
<td>***</td>
</tr>
<tr>
<td>rnhprpd</td>
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<td>***</td>
<td>-2.3680</td>
<td>***</td>
<td>-4.2682</td>
<td>0.0284</td>
</tr>
</tbody>
</table>

Table V-4. Unstandardized Coefficients of the Controlling Variables

The impacts of staffing hours on NHQC are mixed in the present study. One unit increase in LPNHRPRPD (licensed practical nurses per resident per day) would increase the total number of deficiencies by 8.41. One unit increase in CNAHPRPD (certified nursing assistants per resident per day) would increase QIs by 2.72 percent and the total number of deficiencies by 3.72. However, one unit increase in RNHRPRPD (registered
nurses per resident per day) would decrease QIs by 3.35 percent, the total number of complaints by 2.37, and the total number of deficiencies by 4.27.

Similar to R-square in the traditional regression model, squared multiple correlation (SMC) is also reported for each endogenous variable in the model, representing the percent of variance explained by that variable. SMCs in the model are indicated in Table V-5. As shown, 75.05% of the variance in the composite QI score, 60.76% of the variance in the total number of deficiencies, and 55.14% of the variance in the total number of complaints could be explained by the model.

<table>
<thead>
<tr>
<th>Squared Multiple Correlations: (chained - Default model)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite QI Score</td>
<td>0.7505</td>
</tr>
<tr>
<td>Deficiencies</td>
<td>0.6076</td>
</tr>
<tr>
<td>Complaints</td>
<td>0.5514</td>
</tr>
<tr>
<td>ADL Decline</td>
<td>0.5168</td>
</tr>
<tr>
<td>Pain慢性</td>
<td>0.3086</td>
</tr>
<tr>
<td>Ulcer慢性高风险</td>
<td>0.2252</td>
</tr>
<tr>
<td>Ulcer慢性低风险</td>
<td>0.0774</td>
</tr>
<tr>
<td>Physical Restraints</td>
<td>0.0514</td>
</tr>
<tr>
<td>Depressed or Anxious</td>
<td>0.2174</td>
</tr>
<tr>
<td>Incontinence</td>
<td>0.3009</td>
</tr>
<tr>
<td>Indwelling Catheters</td>
<td>0.3061</td>
</tr>
<tr>
<td>Bedfast</td>
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<tr>
<td>Mobility Decline</td>
<td>0.5007</td>
</tr>
<tr>
<td>Urinary Tract Infections</td>
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</tr>
<tr>
<td>Weight Loss</td>
<td>0.2874</td>
</tr>
<tr>
<td>Delirium</td>
<td>0.1913</td>
</tr>
<tr>
<td>Pain慢性后急性</td>
<td>0.2082</td>
</tr>
<tr>
<td>Ulcer慢性后急性</td>
<td>0.0926</td>
</tr>
</tbody>
</table>

Table V-5. Squared Multiple Correlations

Table V-6 indicates the standardized regression weights that compare the relative importance of the independent variables. Aside from the control variables, the OL
mechanisms that have impacts on QIs by more than 0.1 percent are: trust and respect (TS, -0.1974), participation and involvement (PA, -0.1736), empowerment (EP, -0.1423), standard operating procedures (OP, -0.1247), and turnover (TN, -0.1164). With respect to the total number of complaints, the influential OL mechanisms are: outside consultation (OC, -0.1893), shared vision (SV, -0.1873), staffing (ST, -0.1752), supervision (SU, -0.1539), turnover (TN, -0.1069), and information technology (IT, -0.1021). Further, the total number of deficiencies was even more sensitive to such OL mechanisms as staffing (ST, -0.1139), supervision (SU, -0.1028), turnover (TN, -0.3515), benchmarking (BM, -0.3053), motivation (MO, -0.1806), and patient needs (PN, -0.1453).

<table>
<thead>
<tr>
<th></th>
<th>Estimate_Qis</th>
<th>Estimate_CM</th>
<th>Estimate_SD</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-0.0488</td>
</tr>
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<td>TS</td>
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<td>-0.0036</td>
<td>0.1009</td>
</tr>
<tr>
<td>SV</td>
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<td>0.0642</td>
</tr>
<tr>
<td>OH</td>
<td>-0.0694</td>
<td>0.0754</td>
<td>0.2123</td>
</tr>
<tr>
<td>ID</td>
<td>0.0641</td>
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<td>0.1707</td>
</tr>
<tr>
<td>ER</td>
<td>-0.0337</td>
<td>0.0941</td>
<td>0.0386</td>
</tr>
<tr>
<td>DV</td>
<td>0.0007</td>
<td>0.1029</td>
<td>-0.0594</td>
</tr>
<tr>
<td>EP</td>
<td>-0.1423</td>
<td>-0.0820</td>
<td>-0.0343</td>
</tr>
<tr>
<td>IT</td>
<td>-0.0277</td>
<td>-0.1021</td>
<td>0.0001</td>
</tr>
<tr>
<td>JR</td>
<td>0.1017</td>
<td>-0.0707</td>
<td>0.0184</td>
</tr>
<tr>
<td>OP</td>
<td>-0.1247</td>
<td>0.1175</td>
<td>-0.0547</td>
</tr>
<tr>
<td>PA</td>
<td>-0.1736</td>
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</tr>
<tr>
<td>ST</td>
<td>0.0676</td>
<td>-0.1752</td>
<td>-0.1139</td>
</tr>
<tr>
<td>SU</td>
<td>0.1810</td>
<td>-0.1539</td>
<td>-0.1028</td>
</tr>
<tr>
<td>TM</td>
<td>-0.0191</td>
<td>-0.0171</td>
<td>-0.0991</td>
</tr>
<tr>
<td>TN</td>
<td>-0.1164</td>
<td>-0.1069</td>
<td>-0.3515</td>
</tr>
<tr>
<td>AP</td>
<td>-0.0529</td>
<td>-0.1052</td>
<td>0.0130</td>
</tr>
<tr>
<td>BM</td>
<td>-0.0214</td>
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<td>-0.3053</td>
</tr>
<tr>
<td>MO</td>
<td>-0.0454</td>
<td>0.0746</td>
<td>-0.1806</td>
</tr>
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<td>OC</td>
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<td>0.0340</td>
</tr>
<tr>
<td>PE</td>
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<td>0.1150</td>
<td>0.0316</td>
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<tr>
<td>PN</td>
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<td>-0.1453</td>
</tr>
<tr>
<td>TR</td>
<td>0.2173</td>
<td>0.0297</td>
<td>0.1441</td>
</tr>
</tbody>
</table>
D. Summary

The primary purpose of this section is to address how OL survey data and NHQC online data were managed to meet the SEM model assumptions and to test the proposed hypotheses. This section started with an explanation of how the data were managed to meet these assumptions. Thereafter, reliability analysis was conducted and the 23 OL composite scores were created.

Next, the measurement model was presented and tested to examine the proposed three underlying OL dimensions. The SEM results suggest that the proposed three dimensions underlie the concept of OL. The SEM structural model was then presented to test the proposed hypotheses about the relationships between the OLMs and NHQC. The inspection of both unstandardized and standardized coefficients partially supports most of proposed hypotheses in that at least one dimension of NHQC is significantly influenced by each of the OLMs.

In addition to the exploration of the proposed three OL dimensions and the testing of the hypotheses, the present study also aims to improve NHQC from the OL perspectives. The implications of the proposed theoretical models and hypotheses testing for both OL students and healthcare advocates as well as LTC consumers will be presented in the next chapter.
IV. DISCUSSION

In this chapter, the study results based on the analytic models will be summarized for both OL students and health care advocates. The effects of each OLM on the three dimensions of NHQC will also be elaborated. Following the discussions, the limitations in the present study will be discussed in terms of the conceptualization and measurement of the NHQC, the limitations of the survey method, and statistical issues. Thereafter, the study’s theoretical implications and practical implications will be presented and suggestions for future research will be proposed.

A. Conclusions

The dual purpose of the present study is to contribute to our understanding of OL theories as well as to improve NHQC. In this study, OL is defined from the three dimensions and NHQC is measured by the clinical QIs, complaints, and survey deficiencies. Thus, the study results would be discussed first with respect to the three dimensions of OL and, for each dimension of OL, the effects of OLMs on NHQC will also be discussed.

The Psychological OLMs

For OL students interested in the psychological OLMs, the present study suggests that nursing homes that pay attention to patient needs (PN) could significantly decrease the number of survey deficiencies. However, it is also found that attention to patient needs would significantly increase the percentages of the QIs. To clarify the effects of PN
on QIs, OL students and healthcare advocates may need to further solicit patient needs that are closely related to the contents of QIs.

As an OLM, benchmarking (BM) would significantly decrease the number of survey deficiencies, which is consistent with the positive effects of benchmarking found in empirical studies conducted by Ellis (2000) and Kiefe et al. (1998, 2001). Nevertheless, it is worth keeping in mind OL scholars’ warning that benchmarking, imitating, or vicarious learning without understanding know-why would have limited power over the competitive and rapidly changing environments.

Apprenticeship (AP) was found to reduce the number of complaints significantly. Nursing staffs are well known to have a close relationship with each other, where junior staff served in apprentice roles. This finding is consistent with health care advocates’ emphasis on mentoring and role modeling to improve the quality of nursing care (Chuck, 1997; Jones, 2002, Goldman et al., 2004; Burke and Smith, 2005).

Outside consultation (OC), as a mechanism to learn from other people, was also found to significantly reduce the number of complaints, which is consistent with the empirical studies by Smith and McNeely (1999), Burke (2003), and Rantz et al. (2003). Nevertheless, its effects on QIs and deficiencies are nonsignificant, which would be attributable to whether NHs trusted and valued outside consultations in terms of accuracy and capability (Keating et al., 1998; Kuo et al., 1998), whether outside consultations were closely related to the contents of QIs and deficiencies, and whether NHs properly utilized the information.

Motivation (MO) could help NHs significantly reduce the number of complaints, which echoes the positive effects of MO found in other disciplines (Storch and Hill, 2000;
Woiceshyn, 2000; Hays and Hill, 2001) and would further contribute to the scarcity of the current health care literature regarding the effects of MO on NHQC. Nevertheless, NHQC would be further improved if nursing staffs are motivated more in terms of reducing complaints and the percentages of QIs.

On the other hand, the effects of training and education (TR) on the improvement of NHQC are not supported in the present study. Its negative impacts on QIs and deficiencies were even observed, which would be reasonable due to the wrongly spent time and money on training and education instead of on the improvement of NHQC. OL scholars should further investigate the contents of training and education as well as the factors that might moderate or mediate their effects on NHQC.

In addition, the effects of performance evaluation (PE) were not found to be significantly associated with any of the three dimensions of NHQC in the present study. The study results suggest that even though most of the surveyed NHs paid attention to their performance evaluation, it is not clear whether NHs acted accordingly based on the performance evaluation and whether dysfunctional responses, such as self-selection, cream skimming, teaching to the test, deception, and blaming the messenger (Gormely & Weimer, 1999), existed in those NHs.

Overall, the present study found that the psychological OLMs had more impacts on the reduction of complaints and deficiencies. The effects of other psychological OLMs, such as attention to patient needs (PN), training and education (TR), outside consultation (OC), performance evaluation (PE), benchmarking (BM), apprenticeship (AP), and motivation (MO), would need to be further investigated in terms of their association with the contents of QIs and other moderating and mediating factors.
The Effects of the Psychological OLMs on NHQC

First, as to the effects of the seven psychological OLMs on the QIs, the standardized regression weights in Table V-6 would suggest that health care advocates resort to apprenticeship (AP), benchmarking (BM), and motivation (MO) to reduce the percentages of QIs. Nevertheless, in terms of attention to patient needs (PN) and training and education (TR), their effects on the reduction of QIs are negative, suggesting that NHs may not expect training and education to improve QIs. Money and time could be wrongly spent if training and education do not efficiently and effectively target at the contents of the QIs. In addition, NHs would also need to solicit patient needs that are closely related to the contents of QIs.

Second, in contrast with their effects on the QIs, the psychological OLMs have more influential and significant effects on the reduction of complaints. NHs that pay attention to outside consultation (OC), apprenticeship (AP), and benchmarking (BM) are more likely to have fewer number of complaints.

Third, with respect to the reduction of deficiencies, the psychological OLMS have the strongest effects. Significant reductions in survey deficiencies were found to be associated with NHs that were more committed to benchmarking (BM), motivation (MO), and patient needs (PN).

The Structural OLMs

For OL students interested in the structural OLMs, the effects of empowerment (EP) on the three dimensions of NHQC are generally supported in the present study, especially with respect to effect on the percentages of QIs. This finding suggests that
empowerment, in addition to its positive relationship with perceived quality of care, as suggested by Rafferty et al. (2001), Kramer and Schmalenberg (2003), and Laschinger et al. (2003), could actually improve the observed/measured quality of care, especially with respect to QIs.

Similarly, the positive effect of teamwork (TM) was observed for all the three dimensions of NHQC, especially with respect to the number of survey deficiencies. This finding is consistent with the majority of the current OL empirical studies (Meliones, 2000; Rafferty, Ball, & Aiken, 2001; Friedman and Berger, 2004; Shortell et al., 2004).

Nevertheless, the study results also found that some structural OLMs had mixed effects on NHQC. For example, participation (PA) was found to significantly reduce the percentages of QIs as well as significantly increase in the number of complaints and the number of deficiencies. This finding not only echoes the results of scholars who have suggested finding the factors that affect the effects of participation (Connor, 1992; Kruzich, 1995, 2005) but also calls for attention to the content of participation, in other words, ‘participate for what?’.

Moreover, the effects of supervision (SU) on NHQC were also mixed. Although tighter nursing supervision would significantly reduce complaints and survey deficiencies, it could also increase the percentages of QIs. How to reduce the negative impacts of supervision on quality of care and learning should continue to be an important issue for both health care advocates and OL scholars.

In addition, the significant relationships between staffing (ST) and complaints and survey deficiencies suggest that recruiting more experienced nursing staffs would help reduce the number of complaints and the number of survey deficiencies. Furthermore, as
most health care advocates and scholars suggest, the study results indicate that the more efforts that NHs make to reduce the turnover rate (TN), the more likely it is that they reduce the percentages of QIs and the number of survey deficiencies. The three dimensions of NHQC would altogether be improved if NHs could keep their experienced workforce on the one hand and recruit more experienced nursing staffs on the other.

Consistent with the common praise of S.O.P. on quality of care, the study also found that standard operation procedures (OP) could significantly reduce the percentages of QIs, which is consistent with the majority of quality of care improvement studies (Baker & Feder, 1997; Merritt et al., 1999; Carnett, 2002; Gross et al., 2003; McCarberg, 2004; Wollersheim et al., 2005). Nevertheless, S.O.P. could also significantly increase the number of complaints. How to take the advantages of standardization associated with S.O.P. as well as to reduce complaints and deficiencies will also continue to be an important issue for both OL scholars and health care advocates.

Moreover, the study found that information technology (IT) has significant effects on the reduction of complaints, which is consistent with the majority of quality of care studies. Nevertheless, the effects of IT on QIs were nonsignificant, suggesting that the utilization of IT may be more associated with the contents of QIs.

Last, inconsistent with OL scholars’ expectation that job rotation would enhances information flow and sharing as well as job versatility (Etherington & Jones, 2004; Jansen, ven den Bosch, & Volberda, 2005), the present study found that job rotation (JR) significantly increased the percentages of QIs. This effect, along with the effect of staffing (ST), suggest that stable and experienced nursing staffs are more contributory to better NHQC.
The Effects of the Structural OLMs on NHQC

First, compared with the psychological OLMs, more structural OLMs exerted significant effects on the reduction of the percentages of QIs. Significantly lower percentages of QIs were found in NHs that put greater emphasis on the structural OLMs such as participation (PA), empowerment (EP), standard operating procedures (OP), turnover (TN), and teamwork (TM).

It is worth noting that the present study also found that job rotation (JR) and supervision (SU) increased the percentages of QIs, suggesting that job rotation that does not take into account the content of QIs and supervision that is too strict could have a negative impact on QIs.

Second, in terms of reducing the number of complaints, a significantly lower number of complaints were found in NHs that placed more emphasis on supervision (SU), information technology (IT) and staffing (ST). Nevertheless, a higher numbers of complaints were also found in NHs that placed more emphasis on standard operation procedures (OP), participation (PA), and turnover (TN), suggesting that NHs may not expect to reduce the number of complaints through these three OLMs and that while engaged in implementing the three OLMs, they should incorporate them with the content of complaints.

Third, supervision (SU) and staffing (ST), in addition to reducing the number of complaints, were also found to significantly reduce the number of deficiencies. In addition, besides decreasing the percentage of QIs, turnover (TN) and teamwork (TM) were also found to significantly reduce the number of deficiencies. Moreover, standard operation procedures (OP) and empowerment (EP), as shown in Table V-6, were also
found to reduce the number of deficiencies. Furthermore, as was the case with complaints, participation (PA) may not be an effective OLM in terms of reducing the number of deficiencies. While encouraging nursing staff to participate, NHs may need to incorporate staff participation with the contents of complaints and deficiencies.

The Cultural OLMs

For OL students interested in the cultural OLMs, a shared vision (SV), as expected, significantly helps reduce complaints, which would be of particular interest to OL scholars interested in OL at a higher level (Mohammed & Dumville, 2001; Austin, 2003; Brandon & Hollingshead, 2004; Salas et al., 2005). Nevertheless, its effects on the QIs and deficiencies is not significant and would demand more future studies.

In addition, the effects of trust and respect (TS) were found to be mixed. Although it significantly reduces the percentages of QIs, it also significantly increases the number of deficiencies. Likewise, the effect of openness and honesty (OH) was also found to be significantly associated with more deficiencies. More studies would be needed to explore whether there are other factors that moderate and mediate the effects of TS and OH on NHQC, whether more reliable and valid items would be needed to better measure the concepts, or whether other research methods such as interviews and case studies could help investigate their effects on NHQC.

Moreover, contradictory to OL scholars’ expectation, diversity (DV) was found to bring significantly more complaints, which is inconsistent with many empirical study results (Smith et al., 1994; De Vries and Pettigrew, 1998; Dreachslin et al., 2000; Richard, 2000; Dansky et al., 2003) but echoes Vicenzi and Adkins’ (2000) warning that diversity
could also bring disagreement and factionalism. As NHs try to diversify the workforce and/or seek different opinions and viewpoints, they may need to pay attention to the side effects of diversity. In addition, more focused studies would be needed to examine whether the effects of diversity on NHQC would be moderated and mediated by other factors.

Furthermore, innovation (ID) was also found to significantly increase the number of deficiencies, which echoes West and Andersons’ (1992) statement that efficiency, standardization, and control rather than flexibility and innovation would still be the dominant values in the health care industry. The importance of innovation might be different in different industries. For example, high technology companies would generally pay more attention to innovation than would nursing homes. It is not clear to what extent nursing homes need to be innovative and what the contributing factors are in order to improve NHQC. More focused studies on the effects of innovation would help shed light on this issue.

Last, although OL scholars have stressed the importance of values and assumptions (VA) and tolerance for errors (ER), their effects on NHQC were found to be nonsignificant, which could be attributable to several reasons. First, the two OLMs are more abstract, intangible, and vulnerable to social expectations. Second, their effects on NHQC may not be immediate and manifest. Third, their effects on NHQC could depend on other contributing factors. To further clarify the effects of VA and ER would require OL students to develop more measures and/or to use different research methods to further explore the causal relationships.
The Effects of the Cultural OLMs on NHQC

First, as to the reduction of the percentages of QIs, the most influential cultural OLM is trust and respect (TS), which was found to be significant. In addition, openness and honesty (OH), shared visions (SV), and tolerance for errors (ER) help reduce the percentages of QIs, as indicated by the standardized regression weights in Table V-6.

Second, shared visions (SV) was found to significantly reduce the number of complaints. In addition, standardized regression weights in Table V-6 also suggest that trust and respect (TS) and values and assumptions (VA) would contribute to the reduction of complaints. It is worth noting that diversity (DV) was found to significantly increase the number of complaints, suggesting that NHs may need to pay attention to the side effects of diversity and incorporate its content with efforts to reduce complaints while trying to diversify their workforce and the staffs’ opinions and viewpoints.

Last, with respect to deficiencies, innovation (ID) was found to significantly increase the number of deficiencies, suggesting that innovation may not be always contributory to NHQC. Moreover, openness and honesty (OH) and trust and respect (TS), despite their effect on the reduction of QIs, were found to significantly increase the number of deficiencies, suggesting that NHs need to incorporate these two OLMs with the reduction of deficiencies or that their effects be remote and/or not immediate.

B. Limitations

Due to the nature of social science research and also limited resource availability, there exists no perfect research design for studying human and organizational phenomena. Nevertheless, it is important for social science researchers to recognize and remedy as
much as possible the limitations while conducting their research and applying the results. The present study is not an exception and is limited in several aspects.

1. Conceptualization and Measurement of the NHQC

In the present study, NHQC is defined and examined from the three dimensions: NHQIs, survey deficiencies, and complaints. The three dimensions of NHQC are closely related to nursing home residents’ health status. Nevertheless, NHQC is not equal to organizational performance and does not cover other dimensions of organizational performance such as continuity of care, access and availability, consumer satisfaction and costs.

In addition, while interpreting NHQIs, it is also important to notice that they could be misleading, because what they are measuring is “quality of care” rather than “quality of life.” Quality of care refers to the technical competency of health care services. Quality of life, on the other hand, refers to such issues as consumer choice and autonomy, dignity, individuality, comfort, meaningful activity and relationships, sense of security, and spiritual well-being (Noelker and Harel, 2001).

Moreover, given that the 15 QIs cover a wide range of health outcomes and can be too complex to understand for the general public, the present study followed Scott and Elstein’s (2004) suggestion that “another approach is to formulate a composite or summary score for each facility to give a more global indication of quality” (p. III-15) and formulated a composite QI score by summing the 15 quality indicators. Prior to entering the composite score into the model, the correlation matrix of the 15 QIs was examined. No strong correlation (>=.8) was found and the composite score was found to
be even more strongly related to many of the QIs, suggesting the composite score would be used as a general indicator. Moreover, the result of exploratory factor analysis did not identify clear subdimensions of QIs, although it is likely that it is not a unidimensional variable. Nevertheless, it is important to recognize that the composite score is not able to reveal the detailed information each QI is able to provide. More studies would be needed to examine how each OLM would affect different dimensions of QIs or whether QIs should be examined as a set of factors.

2. Limitations of the Survey Method and Statistical Modeling

The selection of data collection methods in this study pivoted on how to achieve the study purpose in the most effective and feasible way. Given that the practical purpose of the present study is to examine whether NHQC is influenced by organizational learning attitudes and behaviors and to apply the study findings to improve NHQC in the state of New York, the survey method was chosen as the means to collect data about nursing homes’ learning attitudes and behaviors. It was believed that a survey could best achieve this purpose for two reasons. First, survey research is best known for its superiority with respect to external validity, which enables the researcher to have more confidence when generalizing the findings from the sample to the population (Brewer & Hunter, 1989). Second, surveys, as a method, can most efficiently and effectively achieve the research purpose not only because they result in lower data collection costs and lower coding and transforming costs but also because they enable the researcher to have better control over data collection processes.

Nevertheless, the present study has limited internal validity. First, the survey
questionnaire in the present study, like most of other survey questionnaires, could be affected by social expectations, meaning that respondents might answer questions in accordance with social expectations, which may not reflect reality. In addition, the pre-structured questionnaire may disregard respondents who have richer information. Among the various data collection methods, surveys generally are less capable of probing more deeply about causality than are interviews and experimentation. Moreover, survey research is usually limited in that it collects cross-sectional, rather than longitudinal, information. As a result, internal validity is often compromised. If time and resources are available, multimethod research could help avoid the weaknesses and take advantages of each research method.

Second, in terms of statistical limitations, both sample size and specification errors could exist in the present study. In fact, the measurement model was found to have only minimally acceptable goodness-of-fit indices. In addition, as a result of limited resources, the sample size in the present study only passes the minimum requirement of SEM. As a general rule, the larger the sample size, the more efficient the parameter estimates. Thus, a larger sample size would make the study results more efficient and consistent. In addition, despite the fact that the present study tried to include several theoretically appropriate control variables in the modeling processes, it may still be possible that some variables (for example, residents’ health status) were omitted or/and mis-specified in the models, which would exert substantial effects on the study results.

Third, with respect to measurement errors, even through the present study developed a questionnaire that comprehensively measures the three dimensions of organizational learning attitudes and behaviors, the validities of the questionnaire are
imperfect and measurement errors could exist in the present study. The minimum acceptable threshold (Cronbach’s alpha $\geq 0.6$) was adopted in the reliability analysis, and some OLMs had rather low alpha scores, suggesting that more reliable scales would be needed to appropriately measure their contents.

Last but not least, despite the superior external validity associated with survey research, it is arguable that the study results of the present study should only be generalized to the study population in the present study, that is, the entire nursing homes in the State of New York. Caution should be exerted when applying the findings beyond long-term care organizations. The researcher stresses the basic assumption of contingency theory and argues that how organizational learning attitudes and behaviors affect organizational performance is likely contingent on the type of the organization and the industry. In addition, the relationship between organizational learning and NHQC could be affected by inter-state differences, such as LTC regulatory policies. Thus, it is also suggested that applying the study results beyond the state of New York should take into account those inter-state differences that also affect NHQC.

C. Implications for Theory and Practice

Given that primary purpose of the present study is to contribute to academic studies on OL and to improve NHQC, the study first proposed the triangular framework of OL. It then identified the corresponding OLMs and further examined the effects of each OLM on the three dimensions of NHQC. The study results are meaningful and deserve attention in terms of providing theoretical implications for the three OL literatures as well as in terms of offering practical implications to health care advocates.
Theoretical Implications

First, the present study filled in many theoretical gaps that were not explored or comprehensively examined before. One of the most valuable advantages of the present study is the comprehensive and thorough examination of OL from the different psychological perspectives, structural perspectives, and cultural perspectives. The present study incorporated different viewpoints of OL, traced the root of thoughts and assumptions in each perspective, and compared the strengths and weaknesses of each perspective.

Given that the current OL literature still lacks a common definition/viewpoint of OL, the present study proposes the triangular framework of organizational learning and argues that it could serve not only as a theoretical prism for OL students to observe the different angles of OL but also as a roadmap to help them know the various dimensions of OL they observe, examine, and talk about.

In addition, following the triangular framework of OL, the present study also prescriptively proposed 23 OLMs and empirically examined the effects of each OLM on NHQC. The study results would provide OL students with some empirical support with respect to whether OL helps improve organizational performance, especially NHQC.

Practical Implications

Beginning in late 2006, CMS, in the hope that a performance-based reimbursement system can help improve NHQC, has launched the Nursing Home Quality-Based Purchasing (NHQBP) demonstration project, which offers financial incentives to participating nursing homes for providing/improving quality of nursing care.
The project measures nursing home performance with respect to the following four areas: (1) nursing home staffing (staffing level and staff turnover), (2) avoidable hospitalization, (3) the five quality indicators (ADL decline, mobility decline, pressure sores in high-risk residents, indwelling catheter, and physical restraint), and (4) survey inspections. Given that New York State is one of the host states for the project, the presented study results would help NYS nursing homes quickly identify the effective OLMs and efficiently prioritize resources to improve the different dimensions of NHQC.

In terms of improving NHQC through the organizational learning perspectives, the present study would also help broaden healthcare advocates’ viewpoints to quickly identify the important elements of OL and to incorporate the currently proposed QI initiatives into the OL framework so that when trying to propose QI initiatives, they could more soundly take into account important and different factors. Furthermore, the empirical results could assist healthcare advocates to prioritize attention, resources, and efforts with respect to the practice of OLMs and to avoid overly stressing some OLMs but ignoring the others.

In addition, as a means to empirically measure organizational performance in NHs, the present study attempted to incorporate as many dimensions of NHQC as possible so that effects of the OLMs on each dimension could be explicitly examined. Nevertheless, the study recognizes the fact that it is inadequate to measure NHQC using only clinical quality indicators, complaints, and survey deficiencies.

D. Suggestions for Future Research

The present study could be inspirational to students of organizational learning as
well as to health care advocates. Suggestions for future research could be illustrated in
the following categories: suggestions for research questions, suggestions for research
designs and methods, and suggestions for statistical modeling.

**Research Questions**

Despite the fact that the triangular framework of organizational learning proposed
in the present study identifies differences among individual learning, group learning, and
organizational learning, it does not further examine and illustrate the relationships among
the three different learning levels, which would deserve another set of research questions
and research designs. For example, contrary to the common viewpoint that training and
education would help improve NHQC, the study results did not provide evidence to
support this expectation. Future studies may provide more insights by further examining
how individual learning could be transformed into organizational learning that
contributes to organizational performance and whether there is a reciprocal relationship
between the two.

In addition, the triangular framework of organizational learning and the
corresponding OLMs could be further categorized into the different learning processes
proposed by Huber (1991). It would be interesting for future studies to examine further
the dynamics of how different learning processes interact with each other.

As to health care advocates, the practical purpose of the present study is to
examine the relationship between OL and NHQC. In spite of the fact that NHQC is
measured using clinical quality indicators, complaints, and survey deficiencies, quality of
life is not involved. Future studies might incorporate quality of life as one dimension of
organizational performance, especially when examining NHs that are dedicated to cultural OLMs, since their efficacies may not immediately emerge and may be more channeled to residents’ satisfaction.

**Research Designs and Methods**

Given the limitations of the survey methods used in the present study, it is suggested that future studies use multi-method research designs to take advantage of and avoid the disadvantages of different research methods. For example, case study approaches and interviews could help elicit more detailed information about factors that affect NHQC. Moreover, a longitudinal study could even address the limitations of cross-sectional study designs. The present study made risky assumptions that OL attitudes and behaviors do not change quickly and that the collected cross-sectional data would reveal a nursing home’s learning attitudes and behaviors over a period of time. Nevertheless, it would be preferable to study the effect of each OLM on NHQC over time so that the study results could reveal the reciprocal effects between each OLM and NHQC, for example, whether an OLM at Time 1 affects NHQC at Time 2 and whether NHQC at Time 2 in turn affects the OLM at Time 3.

In addition, given that the questionnaire used in the present study is the first attempt to incorporate the three dimensions of OL and the corresponding OLMs, there is certainly opportunity for improvement. Future studies could further explore and improve the reliabilities as well as the validities of the OLM measures.

Furthermore, in terms of statistical analysis, even though the present study noted the importance of sample size and made efforts to increase the response rate, the sample
size only met the minimum requirements. Future studies could improve the parameter estimates by increasing the sample size. Moreover, even through the present study attempted to explore the mediating and moderating effects between OLMs, the size of the models and the number of variables involved made it difficult to do so. Future studies could overcome these problems by using different modeling designs or statistical modeling techniques.

Last but not least, the study population in the present study is the NYS NHs, which is the population to which the study results could be generalized. Given that different industries face rather different environments, encounter different challenges, and possess different cultures, OL students or health care advocates interested in the effects of OL may choose different study populations (for example, hospitals or health plans) to examine whether the effects of OLMs are consistent across different study populations.

E. Summary

In this chapter, the study results were described for both OL students and healthcare advocates. The former would be more interested in the effects of OLM. The latter will be more concerned about how OLMs could help improve NHQC.

Overall, the study results suggest the positive effects of most OLMs on NHQC. Each OLM, however, exerted different effects on each dimension of NHQC. The structural OLMs had the most influential effects on QIs and the psychological OLMs would better reduce the number of complaints and survey deficiencies. The effects of the cultural OLMs were not as influential and there were not as many significant relationships as with the psychological and structural OLMs, probably due to its delayed
effects on NHQC.

The study results would be inspirational to both OL students and healthcare advocates. The triangular framework of OL normatively provides OL students with more comprehensive and thorough views of the different dimensions of OL. The examination of OLMs also prescriptively pointed to corresponding elements of each OL dimension. The empirical study results further offer health care advocates suggestions for how to prioritize their attention, resources, and efforts to improve NHQC via the OL perspectives.

Nevertheless, there are some limitations in the study due to the nature of the research design and resource availability. Multi-method research designs are encouraged to mitigate the disadvantages of the survey method used in the study. In addition, larger sample sizes and different modeling techniques could also improve the parameter estimates in the study. Moreover, NYS NHs are the targeted study population to which the study results can be generalized.

OL students may find interesting directions to devote their attention to in future studies in terms of the dynamics of the OL processes. Healthcare advocates may further examine the relationship between OL and quality of life in their future research. Moreover, future studies could further extend, refine, and test the results of the present study by targeting different study populations, utilizing multi-method research designs, and/or using different analytic techniques.
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APPENDIX A. Definitions of Nursing Home Quality Indicators

<table>
<thead>
<tr>
<th>Quality Measure</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Exclusions</th>
<th>Covariates</th>
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<tbody>
<tr>
<td><strong>Post Acute Care Quality Measures: MDSs from 6 month time window &amp; at least 20 cases to be reported</strong></td>
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<tr>
<td>Delirium</td>
<td>Any symptom of delirium: B5a through B5f=2</td>
<td>All residents with 14 day PPS MDS, except those with exclusions</td>
<td>1. Comatose (B1=1 or missing) 2. End-stage (J5c checked or missing) 3. hospice (P1ao checked or missing) 4. QM not triggered and missing data on any delirium item (B5a-B5f)</td>
<td>No prior residential history (AB5a-AB5e are not checked and AB5f is checked from admission assessment face sheet)</td>
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<tr>
<td>Pain (PAC)</td>
<td>Moderate pain at least daily (J2a=2 and J2b=2) OR excruciating pain at any frequency (J2b=3)</td>
<td>All residents with 14 day PPS MDS, except those with exclusions</td>
<td>1. missing or inconsistent data on J2a or J2b</td>
<td>NA</td>
</tr>
<tr>
<td>Pressure Sores</td>
<td>Residents who either a. Develop a PU: [M2a=0 on 5-days and M2a=1,2,3,or 4 on 14-day] OR b. Whose PU stays the same or worsens between their 5-day and 14-day PPS MDS: [M2a=1,2,3,or4 on 5-day AND M2a on 14-day &gt; or M2a on 5-day]</td>
<td>All residents with a 5-day and 14-day PPS MDS, except those with exclusions</td>
<td>1. Missing PU data (M2a)</td>
<td>1. Hx. of resolved PU (M3=1) 2. Limited or greater assistance with bed mobility [G1a(A)=2,3,4 or 8] 3. Bowel Incontinence (H1a=2,3,or4) 4. Diabetes or peripheral vascular dx. (I1a or I1j checked) 5. Low BMI on 50day (if &gt;=12 and &lt;=19)</td>
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<tr>
<td><strong>Chronic Care Quality Measures: MDSs from 3 month time window &amp; at least 20 cases to be reported</strong></td>
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<tr>
<td>ADL Decline</td>
<td>Residents with decline from prior to target MDS on ADLs when any two decline by at least or any one declines by 2 or more: 1. Bed Mob G1a(A)</td>
<td>All residents with target &amp; prior MDS except those with exclusions</td>
<td>1. All ADLs indicate total dependence (all=4 or8) 2. Comatose (B1=1 or missing) 3. End-stage</td>
<td>NA</td>
</tr>
<tr>
<td>Criterion</td>
<td>Description</td>
<td>Conditions</td>
<td>Notes</td>
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<tr>
<td>2. Transfer G1b(A) 3. Eating G1h(A) 4. Toileting G1i(A)</td>
<td>Note: values of 8 are recorded to 4.</td>
<td>disease (J5c checked or missing) 4. Hospice care (P1ao checked or missing) 5. QM not triggered and missing data on any of the four ADLs</td>
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<tr>
<td>Bedfast</td>
<td>Residents who are bedfast (G6a is checked)</td>
<td>All residents with target assessment, except those with exclusions</td>
<td>1. Admission assessments (AA8a=01) 2. Bedfast missing (G6a) 3. Comatose (B1=1 or missing)</td>
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<tr>
<td>Depressed or Anxious Worsening</td>
<td>Residents Mood Scale Score (MSS) increases from prior to target MDS assessment MSS counts the number of following 8 depression symptoms (scores range from 0 to 8): 1. Distress: E1a, 1c, 1e, 1f, 1g, or 1h&gt;0 2. Crying/tearfulness: E1m&gt;0 3. Motor agitation: E1n&gt;0 4. Leaves food uneaten: K4c checked 5. Repetitive health complaints: E1h&gt;0 6. Repetitive/recurrent verbalizations: E1a, 1c, or 1g&gt;0 7. Negative Statements: E1a, 1e, or 1f&gt;0 8. Mood symptoms not easily altered: E2=2</td>
<td>All residents with both target &amp; prior MDS, except those with exclusions</td>
<td>1. The Mood Scale Score is missing data 2. The Mood Scale at maximum (value 8) on prior assessment 3. Comatose (B1=1 or missing)</td>
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<tr>
<td>Incontinence (Low Risk)</td>
<td>Residents who are incontinent of bowel (H1a=3 or 4) or bladder (H1b=3 or 4)</td>
<td>All residents with target assessment and not qualifying as high risk, 1. High risk residents: a. Severe cognitive impairment (B4=3 &amp; B2a=1)</td>
<td>NA</td>
<td></td>
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</table>
| Indwelling Catheters | Residents with indwelling catheters (H3d is checked) | All residents with a target assessment, except those with exclusions | 1. Admission assessment (AA8a=01)  
2. Missing data on H3d | 1. Bowel incontinence on prior MDS (H1a=4)  
2. Pressure sores on prior MDS (M2a=3 or 4) |
|----------------------|-----------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Mobility Decline     | Residents locomotion self-performance declines from prior G1e(A) assessment to target assessment G1e(A) | All residents with a target & prior assessment, except those with exclusions | 1. Locomotion is totally dependent G1e(A)=4 or 8 on prior assessment  
2. Comatose (B1=1 or missing)  
3. End-stage disease (J5c checked or missing)  
4. Hospice care (P1ao checked or missing)  
5. Missing data on G1e(A) | 1. Recent falls (J4a or J4b checked)  
2. Eating assistance [G1h(A)=3, 4, or 8]  
3. Toileting assistance [G1i(A)=3, 4, or 8] |
<p>| Pain (CC)            | Residents with moderate daily pain (J2a=2 AND J2b=2) | All residents with target assessment | 1. Admission assessment (AA8a=01) | Independence or modified independence in |</p>
<table>
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<tr>
<th></th>
<th>OR excruciating pain at any frequency (J2b=3) except those with exclusions</th>
<th>2. Missing or inconsistent data for pain (J2a or J2b)</th>
<th>daily decision making on prior MDS B4=0 or 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Restraints</strong></td>
<td>Residents with daily physical restraints P4c, P4d, or P4e =2</td>
<td>All residents with target assessment except those with exclusions</td>
<td>1. Admission assessment (AA8a=01) 2. QM not triggered and missing data on any restraints item (P4c, P4d, or P4e missing)</td>
</tr>
<tr>
<td><strong>High Risk Pressure Sores</strong></td>
<td>Residents with pressure sores (Stage 1-4) [M2a&gt;0 or I3a-e=707.0]</td>
<td>All residents at high risk with target assessment, except those with exclusions</td>
<td>1. Admission assessment (AA8a=01) 2. QM not triggered and missing pressure ulcer data (M2a is missing) 3. Missing data for high risk stratification data a. Mobility or transfer [G1a(A) OR G1b(A) missing] b. Comatose (B1 missing)</td>
</tr>
<tr>
<td><strong>Low Risk Pressure Sores</strong></td>
<td>Residents with pressure sores (Stage 1-4) [M2a&gt;0 or I3a-e=707.0]</td>
<td>All residents with target assessment, who are NOT high risk and do not have any exclusions</td>
<td>1. Admission assessment (AA8a=01) 2. QM not triggered and missing pressure ulcer data (M2a is missing) 3. residents who are High Risk (i.e., have any of the following)</td>
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<tr>
<td><strong>Urinary Tract Infections</strong></td>
<td>Residents with urinary tract infection (I2j=checked)</td>
<td>All residents with a target assessment, except those with exclusions</td>
<td>1. Admission assessment (AA8a=01) 2. Missing data for UTI(I2j is missing)</td>
</tr>
<tr>
<td><strong>Weight Loss</strong></td>
<td>Residents who lose too much weight (K3a=1)</td>
<td>All residents with a target assessment, except those with exclusions</td>
<td>3. Admission assessment (AA8a=01) 4. Missing data for weight loss (K3a is missing) 5. Resident is receiving hospice care (P1ao=checked) or hospice status is unknown (P1ao is missing)</td>
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APPENDIX B. Survey Questions with Coding

### OLMs from the Psychological Perspective

#### Patient Needs

PN1). Our nursing home surveys or interviews our residents and/or their family members for their satisfaction of our nursing care.

PN2). There are formal procedures for residents to express their needs and complaints.

PN3). Our nursing home invites residents and/or their family members in the decision making process.

PN4). Each resident’s needs are customed in the nursing care plan.

#### Training and Education

TR1). Our nursing home provides on-the-job training regularly to nursing staffs.

TR2). Our nursing home provides incentives for nursing staffs to attend training, workshops, or seminars.

TR3). Our nursing staffs are actually reimbursed or rewarded for obtaining more nursing education.

TR4). Our nursing home regularly subscribes medical/nursing journals and they are accessible to all nursing staffs.

#### Outside Consultation

OC1). Our nursing home has ever consulted outside experts (either from schools or from commercial firms) for quality improvement.

OC2). Outside consultations are effective in helping our nursing home improve quality of care. (opinion)

OC3). Our nursing home endeavors to implement recommendations from consulting services.

#### Performance Evaluation

PE1). Staff meetings to improve nursing quality of care are held __ daily; __ weekly; __ monthly; __ quarterly; __ semi-annually; __ annually; __ other.

PE2). Our nursing home pays attention to our ranking on the CMS’s NHQI’s

PE3). The CMS NHQI’s are good indicators of nursing performance.

PE4). Our nursing home is satisfied with our current ranking in the CMS’s NHQI’s.

PE5). Our nursing home evaluates each nursing staff’s performance regularly
PE6). Our nursing home ensures that each nursing staff obtains his/her performance feedback.

**Benchmarking**

BM1). Our nursing home cares the ranking in nursing quality of care with other nursing homes.

BM2). In our nursing meetings, we talk about the best nursing practices in other nursing homes.

BM3). Our nursing home has ever adopted good strategies, clinical processes, and technologies from other nursing homes.

BM4). We routinely compare our current quality of care against our previous quality of care.

**Apprenticeship**

AP1). Our nursing home has on-the-job apprenticeship for nursing staffs.

AP2). Our nursing home requires senior nursing staffs to mentor the junior nursing staffs.

AP3). Apprenticeship is effective in improving quality of care in our nursing home.

AP4). About __% of our nursing staffs participate in the on-the-job apprenticeships.

**Motivation**

MO1). Our nursing home recognizes and/or rewards nursing staffs for innovative and creative ideas.

MO2). Our nursing home recognizes and/or rewards nursing staffs for trying new and better ways of doing things.

MO3). Our nursing home recognizes and/or rewards nursing staffs for sharing knowledge and best practices with each other.

MO4). Our nursing home recognizes and/or rewards nursing staffs when they meet desirable performance requirements.

MO5). Our nursing home recognizes and/or rewards nursing staffs only for the best performance.

**OLMs from the Structural Perspective**

**IT**

IT1). Our nursing staffs share nursing practices with each other via the following tools (internal publications, email, internet, intranet,

IT2). Our nursing home records and distributes the best nursing practices.

IT3). Computer-based decision making system is used in our nursing home.
| IT4). Our residents’ medical records are stored mainly in (__papers, __computers, __both). |
| IT5). Information technology is essential to improve quality of nursing care. |
| **Empowerment** |
| EP1). Our nursing staffs have a say in how they do their jobs. |
| EP2). Our nursing staffs are allowed to make individual decisions to handle new situations. |
| EP3). Our nursing staffs are allowed to use their discretion to improve quality of care when it is appropriate. |
| EP4). Our nursing staffs are required to follow standard operating procedures as closely as possible. |
| **Participation / Involvement** |
| PA1). Our nursing staffs at different levels are required to participate in quality related meetings. |
| PA2). Our nursing staffs like to participate in the decision making processes. |
| PA3). Our nursing home believes that involving nursing staffs at different levels helps improve quality of nursing care. |
| PA4). Our nursing home believes that involving nursing staffs at different levels increases nursing staffs’ satisfaction. |
| **Teamwork** |
| TM1). Our nursing home evaluates teams’ performance. |
| TM2). When working in group, our nursing staffs are required to evaluate each team member’s performance. |
| TM3). Teamwork is effective in our nursing home to deliver good quality of nursing care. |
| TM4). Our nursing staffs often have to cooperate with people other than nurses in the processes of delivering nursing care. |
| TM5). About __% of our nursing care services have to be done in group. |
| **Supervision/ Centralization** |
| SU1). Our nursing home requires nursing staffs to follow their supervisor's guidance due to his/her position and experiences. |
| SU2). Our nursing home requires new nursing practices to be approved by nursing supervisors. |
| SU3). Our nursing home believes that strict nursing supervision is essential to quality improvement. |
| **Job Rotation** |
JR1). Our nursing home makes position changes of our nursing staffs happen frequently in our nursing home.

JR2). Our nursing home rotates nursing staffs horizontally across different positions.

JR3). Our nursing home rotates nursing staffs vertically across different levels.

JR4). Our nursing home has policies to rotate nursing staffs across different positions.

JR5). Our nursing home believes that rotating nursing staffs in different positions help improve quality of nursing care.

**Standard Operating Procedures**

OP1). There are written documents to instruct nursing staffs how to follow standard nursing care procedures.

OP2). Our nursing home punishes nursing staffs for not following standard operating procedures.

OP3). Our nursing staffs are required to write reports for their regular and routine works.

OP4). Our nursing staffs are required to document special and new situations or problems.

OP5). Our nursing home is flexible in changing its standard operating procedures.


**Staffing (Grafting)**

ST1). On average, ____% of our nursing staffs has worked in other nursing care facilities prior to the recruitment.

ST2). Our nursing home has ever successfully hired the best nursing staffs from other nursing facilities.

ST3). On average, how many years of experiences do our nursing home staffs have? (___yrs)

ST4). How many experienced nursing staffs did our nursing home recruit in the past one year? (____RN, _____LPN, _____NA, None)

ST5). How many fresh nursing graduates did our nursing home recruit in the past one year? (____RN, _____LPN, _____NA, None)

**Staffing (Turnover)**

TN1). Our nursing home pays attention to the problem of turnover.

TN2). Our nursing home made efforts to know reasons behind nursing turnover.

TN3). Our nursing home has policies to reduce nursing turnover.

TN4). Nursing turnover in our facility is about _____%. 
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<thead>
<tr>
<th><strong>OLMs from the Cultural Perspective</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Values/ Assumptions</strong></td>
</tr>
<tr>
<td>VA1). Work assumptions and values can be challenged in our nursing home.</td>
</tr>
<tr>
<td>VA2). Our nursing home is flexible in changing its missions, goals, or objectives if necessary.</td>
</tr>
<tr>
<td>VA3). Our nursing home has ever changed the mission to fit the rapidly changing environment.</td>
</tr>
<tr>
<td>VA4). Our nursing home has ever changed our nursing goals and objectives to meet environmental demands.</td>
</tr>
<tr>
<td>VA5). Minimally valued (1)  -----------------Extensively valued (5)</td>
</tr>
<tr>
<td>Efficiency _____ ; Productivity _____ ; Profitability _____ ; Predictability _____ ; Stability, Unity, Order _____ ; Outcome Excellence, Quality ___</td>
</tr>
<tr>
<td><strong>Shared visions</strong></td>
</tr>
<tr>
<td>SV1). Our nursing supervisors endeavor to ensure that a vision of goals and futures is developed, communicated, and shared among nursing staffs.</td>
</tr>
<tr>
<td>SV2). Our nursing home has a clear mission statement.</td>
</tr>
<tr>
<td>SV3). A shared vision and/or mission exist(s) among our nursing staffs.</td>
</tr>
<tr>
<td>SV4). The shared vision and/or mission effectively guide(s) our nursing activities.</td>
</tr>
<tr>
<td><strong>Innovation / New Ideas</strong></td>
</tr>
<tr>
<td>ID1). Our nursing home encourages nursing staffs to look for new and fresh ways of doing things.</td>
</tr>
<tr>
<td>ID2). Our nursing home stresses the mastery of existing standard nursing care procedures.</td>
</tr>
<tr>
<td>ID3). Innovative ideas are important for our nursing home to improve quality of care.</td>
</tr>
<tr>
<td>ID4). Innovative ideas are important for our nursing home to compete with others.</td>
</tr>
<tr>
<td><strong>Diversity (viewpoints, backgrounds, skills)</strong></td>
</tr>
<tr>
<td>DV1). People with diverse backgrounds, knowledge, and skills are valued in our nursing home.</td>
</tr>
<tr>
<td>DV2). Our nursing home encourages nursing staffs to express different viewpoints and opinions to improve quality of care.</td>
</tr>
<tr>
<td>DV3). Our nursing home encourages open debates in the decision making process.</td>
</tr>
</tbody>
</table>
DV4). Diverse backgrounds, skills, and experiences could make nursing management complicated and troublesome.

DV5). Diverse opinions and viewpoints could be harmful to our nursing performance.

**Tolerance for errors**

ER1). Errors can do no good and should not be tolerated in our nursing home.

ER2). Our nursing home allows open discussion of errors and/or mistakes in our nursing care meetings.

ER3). We have formal procedures to report nursing care errors/mistakes.

ER4). Our nursing home formally documents and analyzes each error/mistake in our nursing records.

**Open and Honest**

OH1). Our nursing staffs are honest and open to each other.

OH2). Our nursing staffs feel free to express their viewpoints and opinions.

OH3). Our nursing staffs believe that being open and honest to each other could cause troubles to themselves.

**Respect / Trust**

TS1). Our nursing staffs are prohibited to use rude, impolite, and violent languages to each other.

TS2). Our nursing staffs get along with each other well.

TS3). Our nursing staffs trust each other.

TS4). Our nursing home includes good interpersonal skills in our job descriptions.

TS5). Our nursing home includes interpersonal skills in our training sessions.
**APPENDIX C. Formal Survey Questionnaire**

**Part I. Please circle a number to indicate the extent to which the following practices occur in your nursing home.**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Always</th>
<th>Frequently</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. surveys or interviews our residents and/or their family members for their satisfaction of nursing care;</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>b. invites residents and/or their family members in quality improvement meetings;</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>c. customizes each resident’s nursing care plan;</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>d. consults outside experts (either from schools or from commercial firms) for quality improvement;</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>e. endeavors to implement recommendations from consulting services.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

2). In terms of performance evaluation, our nursing home
   a. pays attention to our ranking on the CMS’s NHQIs; | 5      | 4          | 3     | 2         | 1      |
   b. evaluates each nursing staff’s performance regularly; | 5      | 4          | 3     | 2         | 1      |
   c. ensures each nursing staff obtains his/her performance feedback; | 5      | 4          | 3     | 2         | 1      |
   d. evaluates teams’ performance; | 5      | 4          | 3     | 2         | 1      |
   e. talks about the best nursing practices in other nursing homes; | 5      | 4          | 3     | 2         | 1      |
   f. adopts good strategies, clinical processes, and technologies from other nursing homes; | 5      | 4          | 3     | 2         | 1      |
   g. compares our current quality of care against our previous quality of care; | 5      | 4          | 3     | 2         | 1      |
   h. cares about our ranking in quality of care in comparison with other nursing homes; | 5      | 4          | 3     | 2         | 1      |
   i. uses computer-based decision making systems to improve quality of nursing care; | 5      | 4          | 3     | 2         | 1      |
   j. records and distributes the best nursing practices; | 5      | 4          | 3     | 2         | 1      |
   k. allows staffs to challenge work assumptions and values. | 5      | 4          | 3     | 2         | 1      |

3). In terms of training nursing staffs, our nursing home
   a. provides on-the-job training regularly to all nursing staffs; | 5      | 4          | 3     | 2         | 1      |
   b. provides incentives for nursing staffs to attend training, workshops, or seminars; | 5      | 4          | 3     | 2         | 1      |
   c. reimburses or rewards for nursing staffs’ nursing education; | 5      | 4          | 3     | 2         | 1      |
   d. subscribes to medical/nursing journals and keeps them accessible to all nursing staffs; | 5      | 4          | 3     | 2         | 1      |
   e. has on-the-job apprenticeship for all nursing staffs; | 5      | 4          | 3     | 2         | 1      |
   f. requires senior nursing staffs to mentor junior nursing staffs; | 5      | 4          | 3     | 2         | 1      |
   g. encourages nursing staffs to look for new and fresh ways of doing things; | 5      | 4          | 3     | 2         | 1      |
   h. stresses the mastery of existing standard nursing care procedures; | 5      | 4          | 3     | 2         | 1      |
### 4). In terms of motivating nursing staffs, our nursing home recognizes and rewards nursing staffs

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<tr>
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<tbody>
<tr>
<td>a.</td>
<td>for innovative and creative ideas;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>b.</td>
<td>for trying new and better ways of doing their works;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>c.</td>
<td>for sharing knowledge and best practices with each other;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>d.</td>
<td>when they meet desirable performance requirements;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>e.</td>
<td>only for the best nursing performance.</td>
<td>5</td>
<td>4</td>
<td>3</td>
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</table>

### 5). In terms of managing nursing staffs, our nursing home

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<tr>
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</thead>
<tbody>
<tr>
<td>a.</td>
<td>requires nursing staffs to follow their supervisor’s guidance due to his/her position and experiences;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>b.</td>
<td>punishes nursing staffs for not following standard operating procedures;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>c.</td>
<td>is flexible in changing its standard operating procedures;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>d.</td>
<td>requires new nursing practices to be approved by nursing supervisors;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>e.</td>
<td>rotates nursing staffs horizontally cross different positions;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>f.</td>
<td>rotates nursing staffs vertically cross different levels;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>g.</td>
<td>makes position changes of our nursing staffs happen frequently;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>h.</td>
<td>requires nursing supervisors to ensure that a vision of goals and futures is developed, communicated, and shared among nursing staffs;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>i.</td>
<td>is flexible in changing its missions, goals, or objectives if necessary.</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>j.</td>
<td>has successfully created a shared vision/mission among nursing staffs.</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

### 6). In terms of staffing, our nursing home

<p>| | | | | |</p>
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<tr>
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</thead>
<tbody>
<tr>
<td>a.</td>
<td>pays attention to the problem of nursing turnover;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>b.</td>
<td>makes efforts to know reasons behind nursing turnover;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>c.</td>
<td>has ever successfully hired the best nursing staffs from other nursing facilities;</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>d.</td>
<td>values people with diverse backgrounds, knowledge, and skills.</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

### 7). In the process of delivering nursing cares, our nursing staffs at different levels
a. have a say in how they do their jobs;  

b. can make individual decisions to handle new situations;  
c. can use their discretion to improve quality of care when it is appropriate;  
d. like to participate in the quality-related decision making processes;  
e. are required to follow standard operating procedures as closely as possible;  
f. are required to write reports for their regular and routine works;  
g. are required to document special and new situations or problems;  
h. are required to participate in quality related meetings;  
i. are required to evaluate each team member’s performance;  
j. have to cooperate with people other than nurses.  

8). In terms of personal interactions, our nursing staffs  
a. are honest and open to each other;  
b. feel free to express their viewpoints and opinions;  
c. are prohibited to use rude, impolite, and violent languages to each other;  
d. get along with each other well;  
e. trust each other.  

9). In terms of our nursing policies, our nursing home  
a. has formal procedures for residents to express their needs and complaints;  
b. has written documents to instruct nursing staffs how to follow standard nursing care procedures;  
c. has policies to reduce nursing turnover;  
d. has policies to rotate nursing staffs across different positions;  
e. has a clear mission statement;  
f. has formal procedures to report nursing care errors/mistakes;  
g. has ever changed the mission to fit the rapidly changing environment;  
h. has ever changed our nursing goals and objectives to meet environmental demands.  

Part II. Please circle a number to indicate your opinions on the following nursing practices.
1). In terms of nursing quality improvement and staffs' satisfaction, our nursing home believe that quality of nursing care could be effectively improved by
a. teamwork; 7 6 5 4 3 2 1
b. apprenticeship; 7 6 5 4 3 2 1
c. involving nursing staffs at different levels in quality improvement meetings; 7 6 5 4 3 2 1
d. outside consultations; 7 6 5 4 3 2 1
e. rotating nursing staffs in different positions; 7 6 5 4 3 2 1
f. strict nursing supervision; 7 6 5 4 3 2 1
g. innovative ideas; 7 6 5 4 3 2 1
h. information technology. 7 6 5 4 3 2 1

2). The CMS NHQIs are good indicators of nursing performance. 7 6 5 4 3 2 1

3). Our nursing home is satisfied with our current ranking on the CMS's NHQIs. 7 6 5 4 3 2 1

4). Involving nursing staffs at different levels in quality improvement meetings helps increase nursing staffs' satisfaction. 7 6 5 4 3 2 1

5). The shared vision and/or mission effectively guide(s) our nursing activities. 7 6 5 4 3 2 1

6). Innovative ideas are important for nursing market competition. 7 6 5 4 3 2 1

7). Diverse backgrounds, skills, and experiences could make nursing management complicated and troublesome. 7 6 5 4 3 2 1

8). Diverse opinions and viewpoints could be harmful to our nursing performance. 7 6 5 4 3 2 1

9). Errors can do no good and should not be tolerated in our nursing home. 7 6 5 4 3 2 1

10). Being open and honest to each other could cause troubles. 7 6 5 4 3 2 1

---

Part III. Other Questions

1). Staff meetings to improve nursing quality of care are held _____ daily; _____ weekly; _____ monthly; _____ quarterly; _____ semi-annually; _____ annually; _____ other.

2). Our nursing care procedures are updated _____ monthly; _____ quarterly; _____ semi-annually; _____ annually; _____ other.

3). Our nursing staffs share nursing practices with each other via the following tools: (multiple choices) _____ internal publications; _____ email; _____ internet; _____ intranet; _____ informal chatting; _____ others.

4). Our residents' medical records are stored mainly in _____ papers, _____ computers, or _____ both.

5). Please give a number (maximally values … minimally values) to indicate how much your nursing home weighs the following values: _____ Efficiency; _____ Productivity; _____ Profitability; _____ Predictability; _____ Stability/Continuity/Order; _____ Outcome excellence/Quality.

6). About _____% of our nursing care services have to be done in group.

7). About _____% of our nursing staffs participate in the on-the-job apprenticeships.

8). On average, _____% of our nursing staffs has worked in other nursing care facilities prior to the recruitment.
9). On average, how many years of experiences do our nursing home staffs have? (_____yrs)

10). How many experienced nursing staffs did our nursing home recruit in the past one year? (_____ RNs, _____ LPNs, _____ NAs, _____ None)

11). How many fresh nursing graduates did our nursing home recruit in the past one year? (_____ RNs, _____ LPNs, _____ NAs, _____ None)

12). Nursing turnover in our facility is about ____ %.

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**Part IV. A Little Bit about Yourself**

How long have you been a nursing staff? _______ years _______ months

How long have you been working in this nursing facility? _______ years _______ months

You are a _____ LPN/LVN, _____ NA, _____ RN, or _____ Other.