LEADERSHIP STYLES AND BRAIN DOMINANCE IN LEAD NURSES: AN EDUCATIONAL MANAGEMENT TOOL

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ABSTRACT

"Leadership Styles and Brain Dominance in Lead Nurses: An Educational Management Tool"

The purpose of the study: This study explores the relationships between personal brain dominance cognitive styles and leadership styles based on the idea that focusing on brain dominance one can have the ability of enforcing less dominant functions. This might be important in the development of nurse leadership, which will include brain functions influence nurses knowledge and dispositions for management styles. Knowledge gained may help to focus energies, improve processes and assist nurse managers in setting standards that are realistic, effective and efficient. Hopefully, in the future, results will be used as a tool, helping to focus on the positive factors recommended in purpose to increase staff satisfaction and organisational commitment. Increased insight into relationships may lead to improvements in nursing education.

Instrumentation:: The full range of leadership styles applying the Multifactor Leadership Questionnaire 5x (MLQ); transformational leadership, transactional leadership and outcomes and the Herrmann Brain Dominance Instrument (HBDI) as perceived by nurses – First Line Mangers. **Method:** The study was conducted at a major metropolitan teaching hospital in Israel affiliated to a major medical school with a long history of medical and nursing education. **Procedure:** The questionnaires were handed to 80 First Line Nurse Managers that filled them use self-rating technique.

Data analysis: Statistical analysis procedures were testing the hypothesis using descriptive statistics, t tests, analysis of variance, correlations and regressions.

Results: 1. The findings strengthen the correlation between Brain Dominance and leadership styles. 2. It may be possible to predict leadership styles and outcomes. 3. The study sample used part of the transactional leadership styles sub-scales which are the active styles among the transactional leadership style sub-scales and the transformational leadership styles. .4. .The study sample is characterised as identifying right brain population as being predominant than the left brain population. Checking the main leadership styles group and outcomes reveal that the right brain population, are using more transformational leadership style and attain greater amounts of outcome measures. 5. First line managers are highly dominant in quadrant B and C and close to those quadrants, most of the remainder are located in quadrant D. There quadrant sections and their significance will be analysed in Chapter IV.

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Dedication

This thesis is dedicated to the memories of
my father Yitzhak, my mother Zila, and my brother Uri.

List of Contents

List of tables

Appendices 301

Chapter I - Introduction

This thesis deals with the theories of brain dominance and leadership, and how these two theories apply towards improving nursing leadership in hospitals. It is organised into six chapters according to the following headings: Introduction, Literature review, Methods, Results, Discussion, and Conclusion. Chapter I (Introduction) presents the background and contextual information relating to this study. Five hypotheses in Chapter I are offered to determine the significant levels contributing to a leader's use of the full range of leadership styles. Chapter I and Chapter II (Literature Review) both in turn examine Leadership theory and Brain Dominance theory, and relate a history of the studies of these, leading up to the theories of transformational and transactional leadership. Chapter III (Methods) provides a detailed description of the established parameters and methods employed in this study. Chapter IV (Results) presents the findings, and this is followed, finally, by a comprehensive discussion in Chapter V and VI. including conclusions and the limitations of this study are reviewed, along with recommendations for further research.

1. Background

Nursing today is an exciting enterprise, and it is constantly changing. The nursing manager, elemental in all hospital setups, is at the forefront of this scene. The role of the nursing manager includes, among other things, the budgeting of resources and the establishment of the hierarchy of preferences. In the State of Israel today, managers coming from the Ministry of Health, are, in the main, currently not nurses, do not hold the knowledge nor the motivation required for correct performance. To be more precise, they see the needs of the health system from a different vantage point. They do not see in the same way the hierarchy of preferences at a time of shortage or budget cuts, nor do they recognise the importance, from the standpoint of the patients, of new and more effective technology and equipment. Hospitals working for the health of their constituents are constantly found in difficult negotiations for additional funding with the

Ministry of Health, as the Ministry's order of preferences is different from that of the hospitals and the nurses working therein. The rise of the nursing manager secures that the health and wellbeing of the patient remain the hospital's and health care's all-encompassing goal.

The nursing profession in a very clear and significant way has the responsibility of representing the patient and his or her family, and of being for all things relevant the 'patient advocator'. The profession does not serve as secondary to the doctor; the designation of its role is completely different. Nurses are not 'mini-doctors', but rather 'big nurses'. That this is true requires the nurse to be immersed in various disciplines to which the doctor is unfamiliar and which do not fall under the doctor's expertise. The nurse must therefore mould for her or himself a professional identity in line with this.

Many different types of nurses exist and the nurse hierarchy is overlapping, yet each role is unambiguous. First of all, there is the nurse responsible for a division (a first line manager) and the nurse executive. Then there are the nurses serving in subordinate positions, such as those in charge of quality control, staff development, research, and support. There are also nurses responsible for manpower. Finally, let us not forget those who manage the computer systems. These nurses make a serious impact on the ways by which all of the information of the patient is registered. This complex information includes entry data, follow-up, medical guidelines, and other things, all of which permit and assist in the concentration and streamlining of the actions required for the patient. According to this computerised concentration the preference hierarchy for treatment is set down. All these activities allow for the keeping of control over steps and treatments carried out for the patient, and furthermore for reassessments taken for the future, whether the treatment strategies should be changed and how to learn from them.

All of these facets, and more, influence our perception of what nursing ought to be, even fashioning it into a new profession. Government ministries of health are not able to comprehend, or are not interested in comprehending, these important facets of nursing, and they lack the ability to see the whole picture. All patients, and all family members and significant others, are different one from the other, and just like all people are different one from the other in health, so too are they when sick. It is for this reason that nurses must be professionals, who are familiar with and appreciate well all of the disciplines in as much depth as possible. In such a way nurses will be able to plan comprehensive treatments appropriate for the specific patient, in all that this entails.

Nurses constitute the greatest number of health workers within the health system, and they perform the most comprehensive tasks. They see the patient and his or her family as a whole, in terms of the patient's and the family's needs from the physical, emotional, and social standpoints. Therefore only they are able to respond to these needs and to prepare the patient and the family for the upcoming release. Upon release these two parties must know how to deal correctly with the continuation of treatment in the home, as the imparting of this knowledge is the responsibility of the nurse.

The nurse plays a role in the transmission of influence for the sake of persuading the managers of the health system on the governmental level of the importance of the aforesaid activities. The result is always geared for the budgeting of greater resources and for the establishment of a more beneficial hierarchy of preferences.

Nurses as defined here serve as, among other things, something of a doorkeeper for the sick person, and for this purpose they must be fortified with all of the knowledge required, at every level. The shift leader often is involved with the doctor in disagreements regarding treatments

needed by the patient, and this is even truer at higher levels of management. Leadership is important at every level, and this structured leadership is the means for dealing with situations of all kinds.

Regarding all that has been said of the activities that must be carried out by the nursing team as a whole, it is important that the leader – the first line manager – should succeed in explaining, persuading, criticising, and correcting, by means of organisational learning. The leader must be creative and original so as to cause the system not to ever come to a halt in time of overload, and to always be searching for means of improvement. This role of the nurse as leader is a new one, as is the conception of the nursing body as forming a forward-looking organisation in the health care system.

Thus, in an era of change and organisational uncertainty, organisations are required to function within an ever-changing reality (Daft, 1995). In health care delivery, leadership is the cornerstone for the management of this change and the key factor in coping with the turbulent environment it creates (Bonalumi and Fisher, 1999). As with Israel, so too throughout the world: A growing population of health care consumers, together with constantly diminishing resources, account for increasingly complex health care systems. Such human resources require skilful management (Byram, 2000). Furthermore, health care leaders must develop effective tools and strategies necessary for addressing the constantly changing health care arena. Effective leadership is becoming crucially important for both the organisations and their customers. Health care executives aspire to adapt their knowledge and skills to the evolving health care systems in an ever-changing environment. First line managers serve in a crucial and demanding position in this capacity, influencing the health care environment and, as such, playing a key role in the evolution of health care systems.

There is growing recognition of the importance of the nurses' role in reforming health care systems (Hayden, 1994), as individual nurse leaders are perceived as a significant force in these changes (Smith, 1995). In order to increase organisational effectiveness, they are required to deal with a complex blend of technological, social, economic, and cultural issues. Furthermore, adjusting to the constantly changing health care field requires ongoing education as well as development of skills and abilities (Booth, 1994). Effective first line managers need conceptual and technical skills to direct the health care system towards new pathways of change (Leddy and Pepper, 1998). Such conceptual skills include theoretical knowledge regarding the essence of leadership and the recognition of its styles. Technical skills, on the other hand, concern empowering one's abilities for the application of leadership to daily work. In essence, this means turning theory into practice.

Current organisational management theories seek new ways of coping with constant change. The nurturing of one's leadership style involves cognitive processes such as information processing, screening options, and decision making. Contemporary research emphasises brain functioning as determining these cognitive processes. Brain Dominance theory, which plays a significant role in explaining brain functioning, asserts that different parts of the brain process different kinds of information. Novel and creative thinking, an attribute required to manage change in our fast-paced era, may be the product of the integrative use of both hemispheres of the brain (Herrmann, 1995).

The current research aspires to explore leadership styles of lead nurses in light of the Brain Dominance theory. The existence of such correlations between leadership styles and this theory may, in the future, serve to create valuable educational management tools. This research will specify the relevant variables that affect leadership styles and brain dominance, and the connection between the two. A broader discussion on leadership and brain dominance follows

in the literature review. Finally, in dealing with the nursing profession it is always important to keep in mind the gender factor, and this issue will be briefly discussed in the next section, and taken up at greater length in, again, the literature review.

2. The role of leadership

The issue of organisational leadership is of concern to both theoreticians and practitioners. It is one of the most researched and analysed topics in the area of organisational development (Chapman, 1993). Leadership is the process in which a person exerts influence over individuals and groups through goal setting or activities (Gardner, 1990; Riches, 1994, 1997). It may be said to relate to the fulfilment of symbolic, inspirational, educational, and normative functions; management, on the other hand, deals with monitoring and controlling organisational activities, decision-making and resource allocation.

The first line managers not only have a variety of tasks to perform, but they also have to plan and arrange work activities (Tummers, van Merode and Landeweerd, 2002). The leadership function of emphasising the end goals serves to direct teachers to specific activities and clarify their contributions to the total organisational output, thus bettering the educational outcome (Goldring and Pasternak, 1994).

First line managers in health care institutions face challenges similar to those tackled by their colleagues in institutions, such as educational facilities. In this sub-field, much research has been carried out with regard to leadership, and this research may serve somewhat as an example for the field of health care leadership and management. For schools, the qualities of leadership and management are a crucial element in striving for effectiveness (Sammones, Thomas, Mortimore, Owen, Pennell and Hilman, 1994). As such, the ability to set clear organisational goals has been found to be a relevant variable linking leadership and school effectiveness.

Leaders in educational institutions are charged with a range of responsibilities, all of which have enormous implications for both the success, and future improvement, of their individual organisations. First line managers in health care institutions face similar challenges. Leadership styles in this field allow nurses to deal more effectively with the multifaceted and ever-changing environment. Diagnosing these styles provides valuable information for developing training programs for first line managers, such as nurses and health care educational managers (Herrmann, 1995).

Current reforms in nursing education are preparing students to assume leadership roles in health care organisations. Nurse educators should be at the forefront of health care change. It is central to nursing leadership that nurses' education includes a strong clinical component, in addition to administrative, business, and negotiation skills and an understanding of leadership attitudes (Fonville, Killian and Tranbarger, 1998; Koh, 1998). This will enable nurses to receive advanced clinical and management training, while the emphasis on nursing management, information systems, hospital-wide management and clinical education serve as core areas of focus in the new curriculum. Many hospitals have already expanded their nursing curricula to a four-year bachelor's degree.

3. The role of brain dominance

Extensive research has indicated that leadership in general should be studied following the lines set down by the study of brain hemisphericity and brain dominance (Owen, 1986; Kean, 1989; Soler, 1991). Analysis of cognitive processing styles, or brain hemisphericity, in relation to leadership styles, has been explored in the business sector to evaluate its usefulness as an indicator of administrative and goal-oriented success (Mintzberg, 1976; Agor, 1984; Spinola, 1988). Positive results have been found. Furthermore, the connection between brain dominance

and leadership styles has been analysed in studies of right brain and left brain thinking and administrative effectiveness (Kean, 1989; Soler, 1991).

The current study brings together an analysis of Brain Dominance theory with leadership styles among lead nurses, the first line managers of the heal care system. As such, some background is needed to understand the value of Brain Dominance theory. The left hemisphere of the brain is known as analytical, verbal, sequential, concrete, and rational; the right hemisphere as intuitive, spontaneous, holistic, visual, and symbolic (Wonder and Donovan, 1984). So far, research indicates that successful and innovative leadership involves integration of both left and right brain processing (Toth, 1997).

Understanding the brain's engineering and operation helps to best utilise its power, promote swift and creative thinking, and reduce stress and tension (Soler, 1991). Mind mapping allows leaders to develop mental fitness, especially in areas crucial for leadership, such as clarity of vision, energy, and persistence (Buzan, 1991). Whole-brain thinking, resulting from brain hemisphere integration training, produces excellent performance in leaders (Hooper, 1992). The simultaneous use of both hemispheric processing modes has been demonstrated in individuals taught how to successfully switch between the two (Boles, 1989). Identifying brain dominance among nurses is a first step towards developing integrative thinking, this being crucial for effective leadership. In this study, therefore, knowledge of brain processing and dominance is suggested as a new work tool to help nurses raise their expectations for themselves, and foster their achievements, so that, consequently, they perform better.

Importantly, research on brain functioning suggests some differences between the sexes. It is widely assumed that the two hemispheres are more asymmetrically organised for speech and spatial functions in men than in women. This idea has evolved from several sources. First, de

Lacoste and Holloway's (1982) controversial findings suggest that the back part of the corpus callosum, an area called the splenium, is larger in women than in men. The interest in the corpus callosum arises from the assumption that its size may indicate the number of fibres connecting the two hemispheres. Presence of a greater number of connecting fibres in a particular gender implies fuller communications between the hemispheres.

There have indeed been conducted a number of laboratory experiments on perceptual techniques indicating that in normal-functioning people, brain asymmetry is often to a lesser extent in women than in men. Finally, in experiments examining damage done to one brain hemisphere as opposed to the other, it has been found that there is less of an effect for women than a comparable injury for men. Overall, women prove more affected by damage to the anterior region of the right hemisphere than by posterior damage. Men tend to display the reverse pattern. Slight sex differences were also found in more abstract verbal tasks. For instance, vocabulary test scores were affected by damage to either hemisphere in women, but only by left-sided injury in men. This finding suggests that when reviewing the meanings of words, women use the hemispheres more equally than men (Kimura, 1992).

4. The role of gender issues

A word now is in order to explain briefly how gender issues and brain dominance affect the topic at hand in this study, namely, the empowerment of nurses. Put simply, the problem is such: Nursing is a female dominated profession, and so it is considered by nurses themselves, as well as by the management of health care institutions. It has been argued that there exists a particular type of leadership especially feminine, and this feminine leadership has been substantiated as equally effective to more masculine leadership styles. These differences stem from actual differences in brain dominance characteristics. Women's leadership turns out to be characterised by being people and collaborative work oriented. It tends to foster effective

organisational processes, as it encourages empowerment. However on the whole leadership is considered by society, unfortunately, a particularly masculine realm. This has had detrimental repercussions on the nursing profession, the majority of which are female, as it effectively robs practitioners as a health care force of their inherent ability to perform leadership and management activities. Nurses themselves do not see nursing as a leadership profession (Linn and Hyde 1989; Cleary 1992; Drach-Zahavy and Dagan, 2002).

Thus it will be argued in this thesis that for the betterment of the nursing profession, and thereby the betterment of the health care industry (on the side of the service providers and on the side of the customers), nurses should be taught how to access their leadership capabilities. They must be trained to practice whole-brained thinking, so as to claim their vital part in the leadership of the health care force. To integrate this part of the thesis into the rest, it may said that nurses have to work on leadership for two reasons. One, this is a changing time and nursing must take the lead in making health care more efficient. Two, nurses must break out of the mentality that nursing is a non-leadership profession, as leadership within the field will help to make the force a more streamlined and effective agency.

5. Managing health care

The current study takes place in a large tertiary hospital and examines leadership styles and brain dominance among first line managers. The following sections review the organisational and local context of the study.

An organisation's success and effectiveness increasingly depends on the knowledge, skills, participation, and motivation of its entire staff. Staff success depends on having opportunities to learn and practice new skills. To achieve this, organisations must invest in the development of their staff through education, training, and opportunities for continuing growth (Lock, 1993).

Organisations establish goals, create practices, provide guidance, suggest technical mechanisms, and set rules for establishing desirable actions through their policies, which in turn reflect their philosophies.

In the health care industry, organisational policies and practices need to focus on meeting the needs of patients. Moreover, they require the proper balance of the patients' needs for proper care, balanced against the human needs of health care providers. For the sake of practicality, quality service should be well defined. The following four categories define quality service:

1) Meeting patients' needs to achieve expected outcomes;
2) Providing individual, patient-oriented care;
3) Delivering care with clinical competence and expertise;
4) Providing knowledge to patients.

Failure to meet these goals may result in patients' reluctance to cooperate and lead them to use other organisational services or none at all (Herzlinger, 1997). Of course, creating and maintaining a successful health care organisation encompasses both ethical and economic concepts and reflects elements from a business world committed to targeting driven systems of control (Larrabee, 1996).

To create an environment that values and respects patient, both managers and employees need to engage in an ongoing process of individual and collective learning, evaluation, and improvement (Kaluzny, Zuckerman, Ricketts and Walton, 1995). First line managers must provide leadership by heightening their awareness of motivation, learning, and training. They are required to formalise structures for developing and implementing policies and procedures. This must be done by determining the path towards the most appropriate balance between the needs of the patients and their families and the needs of the workers, all the while remaining an

economical, efficient, and successful industry. Employee training practices and procedures become a large part of the determining process.

The current understanding of management theories suggests that it is the employees involved in front-line care that are responsible for the actual implementation of policies and procedures. This phenomenon creates a need for the employees to take an active part in the development of organisational policies.

Few, if any, health care organisations have developed an integrated approach to organisational management which addresses all the aspects mentioned above. Obstacles must be overcome in order to provide organisations with the incentives and motivation to adopt effective practices. Ensuring appropriate representation of the interests of all parties involved is a key to developing sound policy (Kanter, 1994). At the same time, the understanding that employee input into policy decisions increases the likelihood of their acceptance and effective implementation is in fact gaining popularity.

One result of this gain in employee input is that health care organisations have begun to adopt a range of formal policies to outline their goals with regard to maintaining patient well-being. Patient-centred policies, a hallmark of effective health care management, are intended to promote and enhance a stronger relationship between patients and providers. Adopting such policies will help to establish mutual understanding and trust towards the policies and the approaches used to develop them, improving employee compliance (Smith, 2002).

One influence upon leadership styles among employees are the organisation's policies, as a leader's ability to accomplish goals is often a consequence of the approach taken by the organisation. Hence organisations that value learning will enable employees to flourish and

encourage staff to accomplish goals and implement changes. In this vein, health care management occurs in a specific social, economic, and educational context. As social organisations placed in the public sector, they have to deal with legislative changes, while coping with rapid social adjustment (Griffiths, 2003). Therefore health care employees must be encouraged to learn how to take advantage and to work within the abovementioned contexts.

6. The national context: The health care system in Israel, 2004

Israel is a young country, comprised mostly of Jewish immigrants. The country's population has grown seven-fold in its fifty-six years of existence. At present, Jews comprise around 79% of the country's population, while the country's non-Jewish citizens, mostly Arabs, comprise the remaining amount. Israeli society is characterised by ethnic, religious, and cultural diversity. In Israel, as an immigrant country, the growth of the elderly patient population results mainly for two reasons. These are the general growth of the Israeli population, and the particular growth of the elderly population as a result of the Western extended life span.

This rapidly growing population requires an evolving health care system. Over the last two decades, the number of long-term care institutions has tripled. By the mid-1990s there were forty-seven general hospitals, twenty-eight psychiatric hospitals, two hundred long-term care institutions, and two rehabilitation centres in Israel. In addition, there were thirty day-care units not associated with hospitals: seventeen mental health units, six geriatric units, and seven dialysis units. By 1996, the rate of hospital days per one thousand people was 2,037 and there were 34,275 hospital beds available (Facts about Israel).

Most health care systems demonstrate a dramatic gap between the ideal and the actual function. In Israel, this gap is attributed to some extent to the health care delivery systems (Drach-Zahavy

and Dagan, 2002). Health care in Israel is a universal entitlement for residents, provided through a publicly-regulated system. Two types of institutions dominate the health care system: the Ministry of Health and the country's four health funds. The first is responsible for planning, controlling, and implementing health care-related legislation, as well as providing in-patient services. The latter provide nearly all of the nation's health insurance and deliver most of its primary care (Gross and Harrison, 2001).

During the late 1980s, a perceived crisis in financing and service delivery led to the creation of a national commission. Influenced by British and Dutch efforts (Gross and Harrison, 2001), the National Health Insurance Law took effect in 1995 in an attempt to manage competition among the nation's non-profit health funds and among hospitals (Light, 2001). Consequently, nurses operate today in a health care system that has shifted towards a more profit-orientated climate, emphasising professionalisation in delivering care (Nirel and Pariente, 1997).

With reference to structure, the health care system in Israel is characterised by separate chains of control and different payment systems for various professions. Thus, head nurses are in charge of their nursing staff and report to superiors within the nursing hierarchy (a head nurse reports to a nursing supervisor, who is part of the nursing management, and to the nurse manager).

7. Health care personnel

Some 27,000 Israeli physicians carry out their profession in hospitals and neighbourhood clinics, as well as in private practice. About half of the country's 47,000 nurses are registered (6% also hold a university degree), while the remainder are practical nurses. Training for the medical professions is provided at four medical schools, two schools of dentistry, one pharmacology school, and some twenty nursing schools, four of which grant academic degrees.

As well, several institutions offer courses for physiotherapists, occupational therapists, nutritionists, and x-ray and laboratory technicians.

There are four methods of educating nurse managers in Israel: in-service education, post-basic certificate education, management education provided as part of a four-year baccalaureate nursing or health administration program, and a graduate level university program. Several of the nursing schools teach leadership and managerial techniques for nursing. These present various approaches and theories, aiming to educate and strengthen the leadership capacity of nursing in all organisational and community contexts, and across every stage of a nurse's career. Integral to these programs are new directions in health care such as community-based practice, interdisciplinary collaboration, and the shifting emphasis from illness care to prevention and health promotion. Specific issues facing today's nursing administrators, such as organisation theory, leadership and management theories, health care economics, computerised information systems, total quality improvement, and the ethics of managed care are addressed. These topics taught in the schools are geared to improve professional competence in identifying and implementing nursing management theories and approaches, including teamwork and appropriate organisational models (Facts about Israel).

8. The local context of the study

The Chaim Sheba Medical Centre, also known as Tel Hashomer, is a truly multi-faceted institution. It is one of the premier medical facilities in Israel, combining treatment, education, and research with national and even international public service. It embodies all the disciplines of sophisticated modern medicine, geriatrics, and rehabilitation, while bringing physicians into closer contact with their patients.

The story of Tel Hashomer has been likened to the story of a village that grew into a town, and with the passage of the years, became a metropolis. The hospital was established in June 1948, one month after the founding of the State. It developed together with the nation, representing all that is best in this country's philosophy of health care and public service. The Medical Centre is involved in the academic training of four professions: physicians (catering to a third of the medical students at Tel Aviv University), registered nurses, physiotherapists, and speech disorder clinicians. Additionally, it trains radiographers (x-ray technicians). Today the hospital holds 1,862 beds with an annual patient flow of approximately 800,000 in its outpatient clinics and emergency rooms. Personnel (full time equivalent) include 4,500 employees, with 850 staff physicians and 1,550 nurses (About Chaim Sheba Medical Centre).

In research Tel Hashomer is committed to a number of fields, particularly cardiology, oncology, infertility, genetics, infectious diseases, and Alzheimer's disease. It additionally specialises in the research of rehabilitation, epidemiology, and health policy.

From the outset, the hospital's management developed a philosophy of combined treatment and rehabilitation. This tertiary medical centre offers cardiac transplantation, microsurgery, and very sophisticated cardiac and oncology departments (the acute section), together with orthopaedic, neurological, and cardiac rehabilitation departments. It also houses an extensive geriatric centre, and in- and outpatient psychiatric departments serving both adult and children.

9. The development of the nursing profession

As Reilly and Perrin (1999) have discussed, the nursing profession has undergone constant metamorphosis, as a response to contemporary changes of technological, educational and social forces in the world of medicine and healing. Nurse leaders in particular face the full impact of these collective changes. Nowadays, the early years of the twenty-first century, young nurses

and nursing students have difficulty imagining what nursing was like a hundred years ago. Our society has undergone enormous changes during the last century. Health services and even the concept of a nurse have been fundamentally transformed.

Florence Nightingale (1820 – 1910) is considered the most important initiator of nursing reform in modern times. According to Cohen (1984) and Audain (1998), she resoundingly meets the criteria of a leader under the Political-Historical Model, in which the accomplishments of the individual, his or her vision for and perception of leadership, are eminently correct for the purpose of improving the social conditions of the surroundings. Nightingale

> *is most remembered as a pioneer of nursing and a reformer of hospital sanitation methods. For most of her ninety years, [she] pushed for reform of the British military health-care system and with that the profession of nursing started to gain the respect it deserved.* (Audain, 1998, p 1)

Furthermore, as Huxley says, her achievements, especially her inimitable leadership skills, are all the more impressive upon reflection of the fact that she worked under the milieu of the male-dominated culture of Victorian Britain, with all that that entails (Huxley, 1975).

Nightingale's contribution to the evolution of nursing as a profession was invaluable. Her farsighted reforms in health care and nursing education have influenced the nature of modern health care, creating 'new social realities'. She was responsible for revising the image and status of nursing, and this brought her world-wide recognition. Her aim was no less than to revolutionise nursing (Palmer, 1983). Before she undertook her reforms, nurses were largely untrained personnel, who considered their job a menial chore. Through her efforts, nursing was raised to a medical profession with high standards of education and important responsibilities (Cohen, 1984).

It may be stated that on the basis of the social and political milieu of the 19th century, Nightingale came to be, more than a visionary and a transformational leader, a luminary in the method of leadership based on the situation. She became a bureaucratic-managerial leader with the responsibility to guarantee that nursing duties would be fulfilled, and would complement the reforms she instituted and agree with the needs of medical healing and the health care system as a whole. In her doing so, nursing education based itself mainly on managerial qualities of those days. These qualities cohered into an initiative of preparation and training the nursing leader for the demands of the future as Nightingale saw them. (Palmer, 1983).

Nightingale founded the Nightingale School and Home for Nurses at Saint Thomas's Hospital in London, her vision being to prepare her students to serve as the future nursing leaders. The opening of this school marked the beginning of professional nursing education. She became a bureaucratic-managerial leader, responsible for ensuring that nursing tasks were performed in compliance with her reforms, but more importantly, that they met medical and health care organisational requirements. This was achieved mainly through task orientated nursing training in a 'learning by doing' clinical situations. Nurses received a year's training, comprised of some lectures but concentrating mostly on practical ward work under the supervision of a ward sister. (Audain 1998)

However Nightingale's plans went somewhat awry, in that as things developed, it turned out that nurses were being taught more to meet the requirements of an organisational formula, but not to serve as the future nursing leaders. Nursing education became 'managed' by forces predominantly outside of nursing and took on the managerial characteristics of the time, learning by doing. This scenario of the early years of nursing education may be construed as highlighting the distributional dimensions of empowerment through education, while the constitutional dimensions were not taken up to empower the profession itself (Hayden, 1994).

Since Nightingale's time nursing roles have been expanding in all health care settings. Researchers describe the nurse's role as having come to incorporate tasks outside the traditional acute care setting, such as health promotion and community education (Wass and Backhouse, 1996; Lindsay, 1997). However in the foreseeable future most nurses will continue to practice in hospitals. Therefore, the task becomes one of looking for effective ways to improve nurse leaders (Aiken, 1990), while taking into account the above expansions of the nurse's role. In such a way it will be possible for those charged with the challenge of leading organisational change, to manage the journey more effectively (Knox and Irving, 1997; Koh, 1998; Willmot, 1998; Bonalumi and Fisher, 1999).

As in Nightingale's time, so too now, to a certain extent. It has been argued (Booth, 1994; Willmot, 1998) that the majority of the 'leaders' in nursing education are unprepared for their role. This deficiency is the result of the system of nursing education administration and the bureaucracy of the tertiary setting. Lacking the knowledge and skills needed to initiate effective change, nursing educators are left un-empowered to affect change for the next generation of practitioners.

Similarly, Carpenter (1993) has suggested that British nursing experienced three main professional phases in its development through to the present time, all of which have been characterised by the search for power and status. During the first phase, corresponding to the Nightingale era, the 'pre-feminist movement' aimed at expanding women's social position by creating an autonomous nursing structure. The second phase, marked by the work of Bedford Fenwick (Main, 1978), a British nurse of the early Twentieth century, concentrated on improving nursing skills by means of developing training. The third phase has evolved as a result and along with the educational reforms that characterised the 1980s. These reforms,

which caused the development of educational and training programs and adopted organisational changes (the two elements discussed in this study), are responsible for the current movement towards nursing empowerment.

10. Nursing roles and personality differences

Moreover, in appreciating the role of leadership in nursing, it is crucial to take into account the different characteristics of the population of nurses within their different environments of work. According to the literature there are differences in the complexity of care, such as characteristics of the patients and characteristic of the environment (Tummers, Landeweerd, and van Merode, 2002).

There are intensive care and non-intensive care nurses, and these follow the lines of acute departments and long term departments. Acute departments include intensive care units (ICU), surgical units, paediatric units, and emergency rooms (triage nursing). Long term departments, which are found to cope with less uncertainty than their acute counterparts, include geriatrics, psychiatrics, and rehabilitation departments. These are generally less organisationally complex. According to the literature, we find that there are differences between the characteristics of the nurses found in these different departments. These differences are to be found in the complexity of the care provided, based on the needs of the patients and characteristics of the environment (Riggio and Taylor, 2000; Cone and Murray, 2002).

Yura and Walsh (1988), and Zhang, Luk, Arthur and Wong (2001), identified three types of essential skills in nurses: the intellectual, the interpersonal, and the technical. Norman (1985) and Maatsch (1990) classified clinical competence into six components: clinical skills, knowledge and understanding, interpersonal attributes, problem-solving, clinical judgment, and technical skills. General competence includes intelligence, motivation, learning skills, a general

knowledge base, and personality. Alfaro-LeFevre (1994) has claimed that effective use of the nursing process requires manual, intellectual and interpersonal skills. Taylor (1995) also proposes that nurses have to display interpersonal, intellectual and technical competencies.

McPhail (2002) hypothesised that since people with similar personalities choose similar professions, then within the profession of nursing, nurses with like personality types gravitate towards similar specialisations within the world of nursing. This hypothesise is supported by several reasearch findings. Furlow (2002) found significant differences between personality characteristics of intensive care and non-intensive care nurses. Cone and Murray (2002) concluded that emergency room triage nurses are characterised in particular by intuition, assessment abilities, good communication, and critical thinking. Gambles, Wilkinson and Dissanayake (2003) revealed that cancer care nurses, who perform stressful activities, are more extravert, empathic, trusting, open, expressive, insightful, and group oriented than other nurses. Finally, Riggio and Taylor (2000) claimed that hospice nurses are destinguished by communicative and social competence, as well as several dimensions of empathy. To conclude, a sufficient body of evidence exists pointing to the fact that there are personality differences between nurses working in different types of department.

11. Summary

In summary of this introduction, we may start off by saying that nowadays organisations in general and health care organisations in particular, face an uncertain and unstable reality, as a result of a changing world, diminished resources, and an increase in the number of consumers. At this point in time a strong and skilful leadership is needed. Consequently, there is a need to adjust nurses' education, so as to develop appropriate leadership capable of coping with the current complex situations.

When focusing on health care organisations, it becomes clear that leaders must receive the appropriate tools to allow them to shape their leadership abilities so as to properly handle the turbulent situations they face. The role of nurses in this complex environment is significant, for it is they who actually uphold and maintain the health care organisations. At present, however, their involvement in the health care organisation's process of decision-making and their influence on shaping organisational policies are limited.

In order to increase nurses' impact on the health care organisations as a whole and to nurture the leadership demands of nurses, the following issues must be fully addressed: gender aspects, leadership styles, and cognitive processes. As was said, as the nurses' population is mainly female, the role of the nurse is considered weak, and has a relatively low standing in the organisations' hierarchy. Consequently, the nurses' impact upon the organisation is limited.

Developing leadership styles, mainly the transformational style to be spoken about in the next chapter, is linked to assessing the person's cognitive processes. Once this step is done, and brain dominance is determined according to both hemispheres (the four quadrants), diagnosing the potential leadership styles is enabled. Awareness of the individual's preferences creates a platform for developing the integrative use of all four quadrants. Integrating both hemispheres promises a more successful and innovative leadership, and eventually makes way for coming to creative solutions and flexible reactions to emerging situations, in a less tense environment.

The organisation policies have an impact on the leaders' leadership styles, and both successful and innovative leadership is vital to organisations' polices. Accordingly, more nursing education schools include leadership issues in their curriculum. Leadership influences the organisation's improvement as it has an impact on staff motivation and their professional skills. Leadership in health care organisations should develop an adequate system of guidance, so as to

induce personal and organisational learning, and guarantee care for patients' needs and their safety. It should also decide upon ethical and economic-business concerns, especially in times of diminishing resources.

In the Israeli context the health care organisation faces some similar environmental characteristics, such as a demand for quality treatment, caring for patients' safety, and diminishing resources. Therefore the question is one of expanding the role of the nursing leader, and preparing the nursing leader with more effective leadership skills, so as to better respond to these evolving demands.

12. Rationale

Changes in health service policy and the structure of nursing have made ward managers out of staff nurses. First Line nurse managers have gained the autonomy and the power to realise the true potential of this demanding and exciting position. As such they are expected to implement this change in the role of the nurse, a change that highlights the importance of effective change management, and holds the potential of benefiting the entire health care organisation. Hence, it is crucial to identify and analyse the first line nurse manager's general characteristics, so as to develop appropriate training programs and offer adequate knowledge and preparation for this new role.

In order to meet the criteria of a leader in a health care organisation, one has to understand the institution's medical and organisational needs. Nurse leaders should be at the forefront of change in health care institutions. This position requires time and energy to reflect and confer, and to act. Leadership perspectives addressing reflection on practices that challenge the status quo may result in increased autonomy and academic recognition. Nurse leaders should strive for

an educational system that will influence and lead the nursing profession, instead of being dependent on external management (Coyle, 1994; Skelton-Green, 1995).

Restructuring of hospital departments is a major focus in today's health care environment, requiring both change and planning. These crucial elements of moving toward innovative organisational strategies call for both left-processing logical and analytical skills, as well as right-processing conceptual, visionary abilities (Herrmann, 1988). Hospital administrators should be trained to identify individuals' mental styles and assign them to appropriate tasks and working environments.

Leaders, who function and think with an integrated hemisphere approach, bear the skills to encourage change for the sake of the health sector's educational management. As a leader the head nurse works with her group of nurses to set goals, materialising the vision the educational management has been advocating. The head nurse empowers the group, to identify with this vision and be its advocates as well. Policy formation and organisational change are both facets necessary to the implementation of programmes the purpose of which are to better prepare nursing leaders for the society of the next century. Knowledge, training, and awareness of the importance of hemisphere integration, leadership styles, and their impact on administrative effectiveness, all assist in achieving progress towards the accomplishment of this goal (Toth, 1997).

Thus, this study will argue that identifying a leader's cognitive processing and styles, and brain dominance, will help to guide the development of training programs and pinpoint the influence these programs have within health care institutions. Moreover, techniques for balancing brain functioning and leadership styles will advance the nursing manager's work competencies.

13. Research hypotheses

1. There will be a correlation between personal brain dominance cognitive style and leadership styles of first line managers' population.
2. Assuming that hypothesis number 1 is supported, it will be possible to predict leadership styles and their outcomes among the study population (in which the dependent variable is comprised of the leadership styles and the outcomes and the independent variable is comprised of the four quadrant profile scores).
3. First line managers will use mainly a transformational leadership style and may achieve better outcomes.
4. Leadership styles will be different among right brain and left brain participants of the study.
5. Lower mode (B & C) brain dominancy will be found among most of the First Line Managers' population.

14. Purpose of this study

This study explores the personal brain dominance, cognitive styles, and leadership styles of first line managers. Cognitive processing and leadership styles have been explored in the business sector, but little analysis has been undertaken in the field of health care and in other social positions. Extensive research (Norris, 1984; Owen, 1986; Kean, 1989; Soler, 1991) has indicated that leadership, especially at the top executive level, should be studied in connection with brain hemispheric dominance. This will benefit both the leadership styles of the first line managers and the organisations for which they work.

The current research studies the relationship between the factors of leadership styles and brain dominance among first line managers so as to utilise this connection as a managerial tool in nursing. The study seeks to advocate the possibility of reinforcing the less dominant functions

as part of developing nurses' leadership, and of including brain function development fundamentals in the nurse leaders' knowledge base.

15. Significance of the study

The previously cited factors of leadership and brain dominance should have the potential to aid in developing educational, administrative, practice modalities, and tools and strategies, for addressing the evolving health care system. In such a way the whole health care system, including management, staff, and the patients, will benefit. Furthermore, these factors will help focus energies, improve processes, and assist nurse managers in setting realistic, effective and efficient standards. The findings of such research may provide the information necessary for improving the educational preparation of first line managers, while increasing the understanding of managerial roles, facilitating better compatibility, and subsequently providing high quality patient care. Furthermore, it is hoped that the results of analysing the correlation between leadership styles and brain dominance will make it possible to focus on specific skill-building practices, leading to increased leadership effectiveness.

The ability to 'switch' hemispheres (to call upon the appropriate hemisphere at the appropriate moment) is a mark of balance or wholeness in an individual. Knowledge of this will facilitate the study of leadership styles of nurse managers within the organisational structure of the present hospital. Furthermore, by analysing these styles, it is hoped to identify the most effective style of nursing leadership, thus providing information to educate nurse managers, develop leadership skills and strategies for addressing the evolving health care issues, and create criteria for selecting the best head nurses in the future.

Hopefully, the results of this study will become a tool, to help focus on the positive factors, so as to increase staff satisfaction and organisational commitment, and to reach better insights for

the sake of improving nursing education. The end result shall be, of course, betterment of the nurse's experience in the hospital or health care facility, and of the patient's experience in his or her stay at these facilities.

Chapter II - Literature review

In this chapter, we will address and broaden the discussion about the two main topics of this research, leadership and brain dominance, and about the connection between them. The present discussion will culminate with an account of how brain dominancy bears on leadership, and how these in turn bear on the nursing profession. The two major theoretical tools corresponding to these two factors used in this study, the Full Range Leadership model and Herrmann's Brain Dominance Instrument (HBDI), will also be introduced (and discussed in depth in their appropriate place in Chapter III).

Leadership and brain dominance act as bookends to the further content of this chapter, those other factors bearing on leadership and nursing in today's turbulent world. An important topic to be dealt with along the way in this chapter is the learning organisation, in the framework of the functioning of organisations in a changing and dynamic environment, where the number of customers is on the rise and the amount of resources is diminishing. Furthermore we will discuss systemic thinking and how it contributes to the Learning organisation. Gender issues will be covered as well as their relation to the nursing profession. Only after reaching an in-depth understanding of these topics will we be able to move on to an exposition of the methods employed in this study. Moreover, in a significant way, this chapter serves as a model pedagogic exposition of the tenets of leadership theory and brain dominance theory, geared towards nurses in the health care field.

1. Leadership

This section elaborates on different aspects concerning leadership: the absence of agreed definitions; main characteristics; theories, approaches and models; and types and kinds of leadership. By way of introduction, it may be stated that leaders are not necessarily those who have the formal authoritative power to make decisions. Rather, leaders establish the framework

and set the context for the structural, informational and cultural environment as a whole (Pfeffer, 1994). Additionally, for the sake of precision leadership and management ought to be distinguished (even if throughout the majority of this paper the two terms are effectively interchangeable). As Kouzes and Posner (1991) have put it, the difference is between causing others to perform, and causing others to *want* to perform. This differentiation will be touched on at other junctions of this paper as well.

Modern times have witnessed seismic change in the Western philosophy of management, with the concept of the Learning organisation and an appreciation of the need to accommodate a global business environment becoming the main driving forces (Starkey, 1996). Health systems all over the world have had to adapt to this changing reality. Since the 1980s, health care has been perceived by consumers and experts as less and less efficient, and there have been urgent calls for reforms and vast organisational restructuring. As a result of such changes, health care staff has experienced increased stress in meeting the requirements.

A new age brings new responsibilities. Change, the path towards initiating and implementing change, must be guided by leaders with vision and inspiration, able to influence employees and health associations to find satisfactory ways of coping and surviving in a changing environment (Drucker, 1988; Booth, 1994; Gadman, 1997; Weaver and Farrell, 1997; Byram, 2000). Indeed, Drucker (1988) goes so far as to claim that in the future business organisations will emulate their health care counterparts; this sentiment is tribute to the vast changes and overhaul being carried out in the latter field.

Health care reforms originated during and as a result of difficult and repeated crises surrounding the health system. A public recognition, in many places and among different cultures, emerged of the need to alter current systems and find principles that would make it possible to

consolidate efficient health care (Beyers, 1995). The drive to supply high quality services on a backdrop of limited resources has forced a transformation of health care services and values, as well as of organisational norms, structures, patterns, and roles (Nichols, 1989; Cohen, 1992). Despite the variety of health care systems and their different natures, it is possible to locate similarities in the goals and principles of suggested and implemented reforms in different countries, including Israel (Phillips, Palfrey and Thomas, 1994).

The focus of many of these reforms is on health care service performance leadership. Such leadership usually focuses upon health care service, delivery, and performance, as well as on operational effectiveness. This requires a view of the future that includes not only the management of the health care market, but also how to compete and/or collaborate in that market. The thrust of these discussions upon health care leadership is on sustained performance, to perpetuate the reforms and revamp the system based on leadership and thorough guidance.

Therefore, this chapter begins with a discussion of theories relating to leadership. More specifically, we will discuss the Great Man theory, Trait Theory, Behavioural theory, Situational theory and Contingency theory, and transactional and transformative leadership. All these important theories lead up to the Full Range Leadership model. This model will be discussed, while the individual components of the model, including the leadership styles the outcomes of these, will be mentioned in Chapter III: Methods. The context of an examination of the changing nature of the nursing profession necessitates such a review upon the different leadership theories. Consequently, the next section will focus on leadership according to the different aforesaid theories and their perspectives.

The need for competent leaders in an increasingly complex world is self-evident. In this world the certainty/stability criterion of management and leadership performance becomes difficult to

maintain or sustain. Stability becomes a rarity, as fluctuations in market needs and resource allocation more frequently and more dizzyingly occur. The goal becomes one of moving towards stability in the face of hopeless setbacks. How does one then prepare for building up the capability for stability and certainty, and at the same time remaining open to opportunities for change and innovation? Assuaging the dilemma between certainty and ambiguity becomes the greatest challenge for organisations engaged in capability building. The emerging belief is that leadership is that force, critically important, whose *raison d'etre* is to deal with this dilemma. It constitutes the prime force behind any successful organisation, be it a school, a government, an office, or a company (Bolman, and Deal; 1991; Richards, 1996).

Leadership is one of the most researched topics in the field of organisational development. After decades of theory and research, leadership still fascinates theoreticians and professionals. One reason for this perpetuated interest is that there does not exist for leadership a successful, and universally applicable, paradigm. The concept continues to be something that everyone knows exists, but that no one can define (Bennis, 1980). Likewise there is no universal agreement about key attributes and elements of leadership, or a dissemination of leadership knowledge.

The literature on the topic of leadership has been described as a piecemeal collection of documentation, evidence, and theory, pertaining to its various aspects, but for which no general, integrative, or universally accepted theory has emerged (Peters and Austin, 1985; Gray, 1987, 1993). Decades of academic analysis had provided by 1980 more than 350 definitions of leadership (Bennis, 1980). More recently, this figure was revised (Bennis and Nanus, 2003), to the effect that now academic analysis has generated over 850 definitions of leadership.

Leadership has been defined in terms of the relevant traits, forms of intelligence, and behaviours; its influence over others and a way of thinking about others; administrative

positions; and control, supervision, power, and authority (Yuki, 1989). Leadership has also been defined through description of a leader's personality and its influence (Bass, 1990), the art of directing, the amount of influence and distinguished functioning for achieving goals (Bass, 1985; Atik, 1994). The leader has been defined by Kotter (1985) as the initiator of team change and as the one who influences team processes. Bass (1990) attempted an all-inclusive definition by stating that many processes are the infrastructure of leadership. Leadership is an aggregation and combination of processes such as applying personality along with particular behaviour, exercising influence, and inducing compliance. Persuasion also plays a part, as do issues of power relation, goal achievement tools, interaction effects, differentiated roles, and the structured initiation.

The modern conception of leadership as management-related, can be studied under other, different lights; therefore we may discuss it according to trait or behavioural terms, situationally, or contingency-based. There are other possible approaches for how to conceive of leadership, such as skill-based approaches, and self-management or shared leadership. However, all these formations can be seen as sharing some common qualities – and we can approach them all as variations of the 'classical' model of leadership.

Peters, Waterman, and Philips (1980) glorified the so-called 'visionary leader'. At a time when entrepreneurs were changing the fundamental nature of the business world, they wrote that one of the key elements that characterise great leadership is the development of a vision. The vision should be simple, compelling and lucid, in order to be adopted and lived by vigorously. Likewise, Bennis (1980) suggested that the definition of leadership should stress the capability to develop a vision that is compelling, and which can be converted into action and sustained.

Goleman (1995) asserted that it is not just the vision, but the emotional intelligence and the

social skills that make a great leader. He emphasised the importance of relationship-building skills, such as social awareness, empathy, reading the social currents of organisational life, influencing skills, communication skills, building social bonds, facilitating teamwork and collaborating. Throughout all this, relationship-building skills are very important.

Bossidy, Charan and Burck (2002) claimed that despite the importance of the vision and relationship-building skills on making a great leader, the culture and the environment in which the leader lives have a crucial impact as well; these two elements are deeply valued by everyone and therefore impact on the leader's style. Clearly, consideration of these mentioned elements is crucial for leadership.

Some great leaders are visionaries. Others are relationship builders, and more still are managers of implementation. While each one might be successful, that leader will tend to focus on a specific aspect of leadership. Each will have natural strengths and weaknesses. Most organisations need all a combination of all three types of leaders for success (Farley, 1994).

Early versus new genres of leadership theory

It is beyond the scope of this work to discuss all of the numerous available leadership philosophies, theories, and theory roots that have developed during this century. Nor would that be necessary. Following is a representative catalogue of these perspectives, those that are most important for the elucidation of this study's methodology.

First, a basic history of leadership theories is presented. The earliest perspective to emerge in the last century was that of Trait theory. This was itself an evolution of the Great Man theory (Kirkpatrick and Locke, 1991), and it espoused that the desirable traits and qualities of a leader are his/her innate gifts. The leader merely draws on the inherent traits when the need arises, and

the call goes out to lead. It is nevertheless accepted according to the theory that leadership qualities can also be developed, albeit in men and women with great reserves of capability. However, it is essential to keep in mind that the Great Man theory, and additionally Trait theory, stressed the view that leaders are born, not made (Bird, 1940). Leaders were thought to be endowed with superior qualities, which caused them to be different from their followers and gave them license to lead (Cowley, 1928). These two theories stressed the personal qualities of leaders and attempted to identify the traits that allowed leaders to be successful (Yukl, 1989). Bird in 1940 identified seventy-nine individual traits.

However, by the late 1940s the pure trait model lost favour, as Stogdill (1948) argued that no traits were universally associated with effective leadership. Quite the opposite; the new theories asserted that people can be changed and made into good leaders. This innovation offered the possibility of developing leaders, and there grew increased interest in the situational components contributing towards building effective leaders. This work gradually led to the emergence of the Contingency theory in the Seventies, and served as the building blocks of Transformational Leadership and the Full Range theory in the Eighties to the present day.

Now each of the above-posited theories shall be explicated at somewhat greater length.

The Great Man theory: Early research studied leadership by investigating the personal qualities of leaders. Two schools of thought emerged, as philosophers debated the importance of the Great Man versus the situations in which these super-men found themselves in their times of leadership.

The seeds for our modern-day contest of theories can be traced back to the Scottish scholar Thomas Carlyle (1795-1881), the prominent philosopher who coined the idea of the ’great

man'. According to Carlyle, some people are born with more leadership ability than others. These men and women possess great or heroic traits and as such, should rightly hold positions of leadership in social organisations. This type of leader is thought of as a charismatic, caring autocrat.

Trait theory: The Trait theory of leadership, although similar to the Great Man theory, focuses on the personality, the intellectual and physical traits that distinguish leaders from non-leaders. Early research on leadership was based on the psychological focus of the day, which was that people inherit their characteristic traits. Attention was thus placed on discovering the traits of leaders, often by studying real-life successful leaders. The underlying assumption was that if other people could also be found with these traits, then they too could become great leaders (Stogdill, 1948). Studies of such traits have shown only minor orientation differences between leaders and followers. Research has shown that leaders tend to be somewhat larger, brighter, and better adjusted than their followers (Stogdill, 1948). The word 'somewhat', however, should be emphasised, for leaders who are drastically different from their followers are usually not as effective.

Following is a list of various researchers' lists of major leadership traits and characteristics:

1. Stogdill (1957, 1974): Masculinity, adjustment, dominance, and extroversion; nervous and physical energy, a sense of purpose and direction, enthusiasm, friendliness, integrity, technical mastery, decisiveness, intelligence, teaching skills, and faith.
2. Mann (1959): Alertness, insight, responsibility, initiative, persistence, self-confidence, and sociability; an above average education, activity in social organisations, and high moral and ethical standards.
3. Lord, DeVader and Alliger (1986): Persistence, insight, initiative, and self-confidence.

4. Bass (1990): Good physique, technical skill, perception, knowledge, memory, imagination, determination, persistence, endurance, and courage.
5. Kirkpatrick and Lock (1991): Persistence, insight, initiative, self-confidence, masculinity, dominance, motivation, integrity, and confidence.

Clearly, the basic problem with the Trait theory of leadership is that theorists do not agree and have never agreed as to which traits are essentially attributable to effective leadership. While the above qualities seem to be desirable in an effective leader, no one trait seems to be absolutely necessary. Therefore, the weakness of this theory lies in the absence of a single agreed-upon list. Furthermore, it does not take into account the situations in which leadership arises, does not point out which are the most important, and is not useful for training new leaders (Stogdill, 1948; Kirkpatrick and Locke, 1991; Fairholm, 1991).

Stogdill, (1974) a major theorist and proponent of Trait theory, has come to agree that different situations do in fact need different kinds of leadership; this realisation paved the way for later behavioural and situational approaches. These approaches are presently taken up.

Behavioural theory: Kurt Lewin was a German-American psychologist; he is commonly regarded as one of the founders of modern social psychology, and is considered responsible for the Behavioural theory of leadership. He focused on the observable behaviour that makes a leader effective. It was hoped that the behavioural theories would provide more definitive answers, and make it possible to train people not otherwise endowed to be leaders, and to make existing leaders better leaders (Lewin, Lippitt, and White 1939).

Lewin focused his attention on the behaviour of individuals in leadership positions for groups and organisations. His position was very different from that of proponents of the Great Man and

Trait theories. Behavioural theories of leadership thus do not seek inborn traits or capabilities. Rather, they look at what leaders actually do. Behavioural theory is a big leap from Trait theory, in that it assumes that not only may a leadership capability be inherent in a person, it can also be learned.

Behavioural theorists identify determinants of leadership so that people can be trained as leaders. They have developed training programs to change managers' leadership behaviours and work with the assumption that the best styles of leadership can be learned. The programs with this rationale have fomented a movement towards leadership development; it clearly contrasts the simple psychometric assessments that sort those with leadership potential from those who will never have the chance. The rationale may be stated that if success can be defined in terms of describable actions, then it should be relatively easy for other people to act in the same way. Thus leadership is easier to teach and learn along these lines than according to the more ephemeral 'traits' or 'capabilities'. This theory emphasised the behaviour of the leader, focusing on what a leader does and how he/she acts (Fleishman, 1973).

In the classic research of Lewin et al. (1939) at the University of Iowa, three leadership behaviours, or styles, were examined: the autocratic, the democratic, and the laissez-faire. It was found that the autocratic style tends to centralise authority and dictate work methods, while the democratic style tends to involve employees in decision making, delegate authority, encourage participation, and use feedback to coach employees. Of the three, the laissez-faire style was found to be ineffective in every performance criterion.

This original research of Lewin's greatly influenced other studies conducted after World War II. The most significant of these studies were performed by the Ohio State Group (Shartle, 1949, 1950; Fleishman, 1953; Halpin and Winer, 1957; Hemphill and Coons, 1957), as well as took

place at the University of Michigan (Katz, Maccoby and Morse, 1950; Katz, Maccoby, Gurin and Floor, 1951; Katz and Kahn, 1952). All these studies found that leadership displaying concern for people produced better results than that displaying concern for production.

The Ohio State Group formulated dimensions of consideration and initiating structure. The first of these signifies the extent that the working relationships a leader has with subordinates is characterised by mutual trust and respect for group members' ideas and feelings. The latter signifies the extent that a leader is likely to define and structure her/his role and the roles of group members for the sake of seeking goal attainment. The Michigan studies spoke of employee orientation and production orientation. The former emphasises the extant that a leader values interpersonal relationships and accepts individual differences among subordinates; this is associated with high group productivity. The second emphasises the extent to which a leader values the technical or task aspects of the job and is concerned with accomplishing the group's tasks; this is associated with low group productivity and low job satisfaction.

Other behavioural researchers found that leadership is comprised of two different kinds of behaviours: task behaviours and relationship behaviours (Hemphill and Coons, 1957; Blake and Mouton, 1964; Fiedler and Chemers, 1974; Stogdill, 1974). The idea of the most relevant studies regarding these two types of behaviours concentrates, therefore, on the Managerial Grid. This is a two-dimensional view of leadership styles; developed by Blake and Mouton (1964), it examines on two axes different types of leadership behaviour:

1. Concern for Production – a manager who has high concern for production is task-oriented and focuses on getting results and accomplishing the task at hand.
2. Concern for People – a manager who has high concern for people avoids conflicts and strives for friendly relations with subordinates.

On the vertical axis is the concern for people, while on the horisontal axis is the concern for production. Management deficient in both of these traits is called Impoverished management. Management deficient of a concern for production but sufficient in the concern for people is called Country Club management, characterised by a friendly atmosphere but with not much emphasis on getting the job done. Management sufficient of the concern for production but deficient of a concern for people is called Authority-compliance management, in which people are not much taken into account while emphasis is laid on keeping to schedule and quality control. That management in which the extents of both these axes are found somewhere in the middle, is aptly called Middle of the Road management, in which boundaries are not pushed to get the most out of people or production. Finally, the most effective management according to Blake and Mouton's scheme is Team management, in which the twin concerns for people and production are both held paramount, and leader and subordinates remain dedicated to getting the job done to the best of their abilities (Blake and Mouton, 1964, 1978; Reddin, 1967, 1970, 1973, 1987; Barge, 1994).

The Managerial Grid has its advantages and disadvantages. It focuses on observable actions of leaders in order to determine whether the leader's main concern is for production or for people or both. This provides a more reliable method for studying leadership than Trait theory. Trait theory is purely descriptive, while the Managerial Grid attempts to break down and analyse the actual components of leadership for the sake of a tool to diagnose and improve leadership in real-life situations. The Managerial Grid, however, adopts the universal approach. Thus it aims to identify the most effective leadership style regardless of situations; an approach lacking this element cannot be supported by evidence in real organisations. Fleishman (1973) supports this approach, reporting that task behaviour or initiating structure involves acts that organise and define the people's tasks and work, while relationship behaviour, or consideration, addresses behaviour that builds trust and respect, and strengthens the bonds between leaders and

followers. Nonetheless, it is evident that the two dimensions used in this model, concern for production and concern for people, are important for examining leadership behaviour and characteristics. We will see them again, often with different names, in many other leadership theories. They are important and relevant factors in this study.

Behavioural leadership theories have lead to several positive conclusions, they have been important in introducing the concept that leadership can be taught, and their theories of how to teach this have also met with success. However, deficiencies must be noted. First, behavioural researchers have had very little success in identifying consistent relationships between patterns of leadership behaviour and outcomes of successful performance. Moreover, and more importantly for our purposes, they have not properly considered the importance and influence of situational factors. Theories integrating these factors are now to be taken up.

Situational theories: Situational theories examine leadership in terms of its relationships with environmental factors such as superiors, subordinates, and peers (Tannenbaum and Schmidt, 1958; Fiedler, 1964, 1967; Reddin, 1967, 1970; Hersey and Blanchard, 1977).

Tannenbaum and Schmidt (1958) identified three forces that led to a leader's action: the forces in the situation, the forces in the followers, and also the forces in the leader. This proposal recognises that the leader's style with regard to the criteria of the aforementioned sections is highly important, but it also posits that displacement activities can lead to a more aggressive stance than usual in an at-work dispute. (Basically, a displacement activity is one in which a person 'takes out' on another, emotions built up from a prior encounter with others. Therefore even such distant events as a family argument can lead to a hotter temper on the job.) If displacement activities can disrupt the implementation of leadership on the level of the leader, it

is not difficult to see how disruptions can occur on the levels of the superiors, subordinates, and peers.

Another comprehensive Situational theory for leadership is the Fiedler model (1964, 1967). Fiedler agreed with the proposition that since a leader's style of leadership is relatively stable and a feature of his/her personality, how this person will act in given situations can be predicted. He offered a continuum ranging from task-focused to people-focused leadership. The Fiedler model assumes that the effectiveness of a leader is a result of the interrelationship between his personality and traits and a given situation. In other words, effective group performance depends on a proper match between the leader's style of interaction and the degree to which the situation gives the leader control and influence. Fiedler claimed that it is necessary to match the leader with the situation based on three criteria; upon these criteria even the most effective leadership style depends:

1. Leader-member relations – the degree of confidence, trust, and respect subordinates have for their leader;
2. Task structure – the degree to which the job assignments of subordinates are structured or unstructured; and
3. Position power – the degree of influence a leader has over power variables, such as hiring, firing, discipline, promotions and salary increases.

The advantage of Fiedler's model is in its attempt to isolate situations, relate personality measures to situational classification, and then predict leadership effectiveness. However, one critique of the Fiedler model contests its 'least-preferred co-worker (LPC) questionnaire', which Fiedler developed as an instrument for measuring a leader's behavioural orientation, as being either task- or relationship-oriented. The primary disadvantage of the Fiedler model is in the argument that a leadership style is innate to a person. Accordingly, a person cannot change his

style, and therefore different situations demand different leaders. Whereas Fiedler's theory regards that leaders hold one leadership style, other, Contingency theories (which we will get to momentarily) emphasise rather leaders' flexibility and ability to adapt their leadership style to new and actual situations, as to increase effectiveness.

Similar to Fiedler's, Reddin's three-dimensional model known as 3-D Management (1967, 1970) also assumes that there is no ideal leadership style and a leader's effectiveness is connected to the interactions between the characteristics of the leader, the characteristics of the followers, and the situation. Reddin, however, added to the people oriented and the task oriented behaviour dimensions a third dimension called the effectiveness dimension. The previous two dimensions emphasised the situational constraints alone, i.e. what type of relationship the manager has with the employees, respecting their opinions and building on trust, and to what extent the manager directs the employees' efforts toward completion of the task at hand. This third dimension takes into account the effectiveness of the manager qua manager in the task at hand, whether the manager's style is effective.

The first two dimensions create four basic leadership styles: the integrated, the related, the dedicated, and the separated. Adding the third dimension, each of these styles can further be either effective or ineffective, according to the situation. Therefore, the integrated includes both the high task-oriented and the high people-oriented in its effective version. This 'activated style' describes leaders who have the ability to integrate the subordinates' goals with those of the organisation. In its ineffective version however, we get the 'compromiser', a leader who surrenders under pressure and shares his ambiguities with others more than he can afford to as a leader. Likewise, the related manager in an effective situation is a developer, in an ineffective situation is a missionary; the dedicated manager in an effective situation is a benevolent autocrat but ineffectively a power-hungry autocrat; and the separated manager in an effective

situation is a bureaucrat, but in an ineffective situation is a deserter. The meanings and implications of these terms in general follow their common usage (Reddin, 1987; Hurst, 1991).

Another attribute of the leader that the literature often speaks of is flexibility. There is general consensus that leaders must be flexible. Reddin in his later studies (e.g., 1987) offered four personality characteristics that a flexible manager should possess:

1. High ambiguity tolerance (comfortable in unstructured situations);
2. Power insensitivity (not control-oriented);
3. Open-belief system; and
4. Other-directed (interested in others).

Other situational theorists, Hersey and Blanchard (1977) in particular, have found that successful leaders adapt their behaviours to meet the demands of a particular situation along the lines of the follower's development style or 'maturity'. This latter term signifies the amount of readiness and willingness the follower has (that is, his or her competence and motivation) to perform the required tasks. According to this theory, in order to be successful, a leader needs to utilise different styles of leadership based on the task readiness of the follower. Here the necessary dimensions are task behaviour and relational behaviour. Task behaviour focuses on defining roles and responsibilities whereas relational behaviour is more about providing support and encouragement. The extent to which either is used depends on the follower's job maturity and psychological security.

Hersey and Blanchard (1977), and Hersey (2000), therefore laid down that the level of the follower's maturity styles determines the rate of directive and supportive behaviours taken up by the manager. The manager concentrates his/her faculties upon either telling, selling, participating, and delegating, depending on the extent to which the follower is able or willing to

carry out the task at hand. When the follower is neither able nor willing, the manager *tells* the follower how to do the task, employing task behaviours. When the follower is unable but willing, the manager must *sell* the task to follower, and thus employs relational and task behaviours. If the follower is able but unwilling, the manager takes a participatory role, and concentrates on relational behaviours. Finally, when the follower is both able and willing, the manager may *delegate*, without using much task or relational behaviours. Thus, the leader is obliged to put greater or less emphasis on the task in question and on the relationship between him/her and the follower, depending on the development, or the maturity level, of the follower (Hersey and Blanchard, 1977).

Vroom and Yetton (1973), as discussed by David Straker (2006),

> *accepted the earlier generalised situational theories and models that assume that the best action of the leader depends on a range of situational factors. They found that situational factors cause almost unpredictable leader behaviour; yet they succeeded in reducing the behaviours possible to a more limited set. The model they created, based on this set, is most likely to work when there exist clear and accessible opinions about the decision quality importance and decision acceptance factors. However these are not always known with any significant confidence.* (p. 3)

The situational model is most likely to work when there are clear and accessible opinions about the decision quality importance and decision acceptance factors. However these are not always known with any significant confidence. Factors, as we have seen, that impact upon situational decisions include the motivation and capability of followers. This, in turn, is affected by factors within the particular situation. The relationship between followers and the leader may be another factor that affects leader behaviour as much as it does follower behaviour.

Contingency theories: Situational theories examine, as we have seen, leadership in terms of its relationships with environmental factors. Of course, it is the leaders' perception of the followers and the situation that affects what they do rather than the truth of the situation. The leader's perception of them and other factors such as stress and mood will also modify his or her behaviour. When this realisation developed, of the role of perception by the leader, the consequence was that researchers came to perceive that situational factors affect leadership only insofar as they are taken in and interpreted by the leader. This gave rise to the contingency approach of leadership. The central idea of these theories is that effective leadership is dependent on a mixture of factors.

It must be stressed that the designation 'Contingency theory' is used from time to time in place of Behavioural leadership theories and Situational theories, and vice versa. The main difference is that Situational theory focuses more on the behaviours which the leader should use and given situational factors, while Contingency theory takes a broader view which includes contingent factors about leader capability, but also includes other variables within the situations. Contingency theories basically argue that the 'right' or effective leadership style varies according to the context. As McNamara (2006) puts it:

> *[B]asically, a Contingency theory asserts that when managers make a decision, they must take into account all aspects of the current situation and act on those aspects that are relevant and pertain to the situation at hand. The approach may be summed up with the expression, 'it depends'. For example, the continuing effort to identify the best leadership or management style might now conclude that the best style depends on the situation. If one is leading a hospital or university, a more participative and facilitative leadership style is probably best. If one is leading a football team, better to be more authoritarian and discipline-oriented.* (p. 1)

Contingency theory is a class of behavioural theory that claims that there is no universal style working in all situations, and that leadership effectiveness is best evaluated by the unit's success in achieving its objectives.

Lawrence and Lorsch, in 1967, coined the label 'Contingency theory' to capture the notion that different environmental contexts place different requirements on organisations. Contingency theory is like Situational theories in that there is an assumption that no simple way that is always right. The main difference between the two is that Situational theory focuses more on the behaviours which the leader should use with given situational factors, while contingency theory takes a broader view. This view considers variables regarding the situation, but also other contingent factors about leader capability.

Burton and Obel (2003), as described in Ibrahim and Nissen (2006) view a contingency theory as

> *when workflow and organisational structure dynamic characteristics are set up in conformance with the key organisational design propositions. Such propositions include that a high complexity, high uncertainty, and high equivocality organisation tends to have low formalisation, low organisational complexity, and low centralisation.* (p.4)

Contingency theory has also mutual elements/ideas with systems theory, in that both view the effectiveness of an action as being dependent on the relationship between the action in question, and other elements of the system, especially the environment with which the system interacts (Shafritz and Ott, 1992). This idea will be expanded at other junctures within this thesis. Contingency theory recognises that solutions are situational rather than absolute, and that they may become inappropriate under different environmental conditions. A key application of

contingency theory is the longstanding recognition of the importance of matching information processing to environmental variety (Thompson, 1967; Galbraith, 1973; Pfeffer and Salanick, 1978).

Carley and Lin (1997), in their research on the superiority of Contingency theory to other leadership theories, show that task environmental characteristics have more effect on performance than information distortion and the organisational design. Galbraith (1973) furthermore states that in Contingency theory there is no one best way to organise but that not all ways of organising are equally effective. This displays the flexibility of Contingency theory.

One important Contingency theory is the path-goal theory developed by House (1997), which looks at what leaders must do to motivate people to perform well and be satisfied from work. The path-goal theory extracts key elements from the Ohio State leadership research (discussed above, Shartle, 1949, 1950; Fleishman, 1953; Halpin and Winer, 1957; and Hemphill and Coons, 1957) and the expectancy theory of motivation. The expectancy theory of motivation draws four leadership styles: supportive, directive, participative and achievement oriented. It is used to help us understand how individuals make decisions regarding various behavioural alternatives. This model deals with the directional aspect of motivation, that is, once behaviour is energised, what behavioural alternatives individuals are likely to pursue (Maslow, 1943, 1954; Skinner, 1953; Herzberg, Mausner and Snyderman, 1959; Vroom, 1964; Adams, 1965).

The essence of the path-goal theory is that a leader's role is to assist followers in attaining their goals and to ensure that their goals are compatible with the overall objectives of the group or organisation. A leader's behaviour is acceptable to employees to the degree that they view it as an immediate source of satisfaction or as a means for future satisfaction. Moreover, a leader's

behaviour is motivational to the degree that it makes the satisfaction of employees contingent on effective performance. For an employee's effective performance the leader provides the necessary coaching, guidance, and rewards (House, 1997).

It has been noted that according to Fiedler's model, a leadership style is innate to a person. In contrast to Fiedler, House assumes that leaders are flexible. The path-goal theory implies that the same leader may display any or all leadership styles, depending on what the situation requires.

Transformational and Transactional Leadership

In the last twenty years a new and better understanding of the concept of leadership has emerged. The focus has moved on to a new kind of leadership, this being transformational leadership. This group of theories is based on extraordinary leaders, who possess the abilities to influence their subordinates and social organisations in unusual ways. It has been claimed that this kind of leadership influences subordinates in different manners. Leaders of this kind differ from their theoretic forerunners in their qualities and their ability to influence (Shamir, House and Arthur, 1993).

Finally, as Lewis (2001) explains:

> *All leadership, whether by example, command, instruction, or some other means, can be classed as either transactional or transformational. Transactional leadership occurs when one person takes the initiative in making contact with others for the purpose of an exchange of valued things, whether economic, psychological, or political. Transformational leadership occurs when leaders and followers raise one another to a higher moral plane.* (p. 1)

The transactional leader: Burns (2003) claimed that transactional leadership is comprised of the attempts, made by a leader, to fulfil the needs of followers by reinforcing the importance of exchange. Such a leader recognises what the subordinates want to get from work and tries to ensure that they get it if their performance merits it. Here, there is an exchange of rewards and promises for effort. The leader is responsive to the employees' immediate self-interests if they can be met by getting the work done. The exchange nature of transactional leadership involves a promise of rewards for good performance or threats and discipline for poor performance (Egan, Sarros and Santora**,** 1995).

Transactional leadership can explain only one aspect of leadership effectiveness. This aspect is the equal transaction of interests for interests, where each party looks out to make sure its interests most perfectly match the interests of the other with which it has entered into a relationship. However this model of leadership does not explain why certain subordinates are ready to sacrifice their own interests for the sake of the transactional leader, their colleagues, or the organisation. Moreover, it does not explain how leaders can design values and raise the amount of the subordinates' obligation and their level of involvement without promising further rewards. Another area of interest to theorists which transactional leadership cannot answer is an explanation of how workers develop and utilise their potential. As a result, transformational leadership is said to be necessary, because of the more sophisticated demands made upon leaders and followers or subordinates.

The transformational leader: Transformational leadership was conceptualised by Downton in 1973 and Burns in 1978; the deficiencies of the old transitional models stimulated interest in the creation of a new paradigm. This paradigm would, and in retrospect does, explain how to understand leadership processes which take people beyond self interest, and which raise motivation and moral commitment.

According to Bass (1985), Avolio and Bass (1998), and Hater and Bass (1988), transactional leadership theory is derived from the expectancy theory of leadership (Vroom, 1964) and the path-goal theory of leadership (House, 1971). According to Seltzer and Bass (1990):

> *The concepts of consideration and initiating structure in the behavioural approach were insufficient to explain the full range of leadership behaviours commonly associated with the best and also the worst leaders.* (p. 695)

Burns, therefore, made the distinction between the two types of leadership, transactional and transformational. Burns's Transformational Leadership theory (1978, 2003) has been influential in forming current thinking regarding leadership.

According to Burns (2003), the transformational leader motivates others to do more than they originally expected to do. In the former approach, that of transactional leadership, leaders direct their followers with an eye on trading one thing for another. The transformational leader is a visionary, who seeks to appeal to followers' better nature and move them towards higher and more universal needs and purposes (Bolman and Deal, 1997). In other words, the leader is seen as an agent of change.

This style of leadership has also been analysed by Bennis and Nanus (1985), and they claim that it is transformative in the sense it is has an empowering effect on others, enabling them to translate intentions into reality. A transformative leadership style is described as one that motivates through identification with the leader's vision, pulling rather than pushing others on. Bennis and Nanus (2003) make the following distinction, for the purposes at hand, between managers and leaders:

> *Managers are people who do things right and leaders are people who do the right things. The differences may be summarised as activities of vision and judgment-effectiveness versus activities of mastering routine-efficiency.* (p. 20)

Bennis and Nanus (1985) go to pains to establish the thread of thought traversing theories of leadership starting from the Great Man theories down to the Contingency theories of more modern times. The implication here is that the Great Man theories is a direct descendant of their Transformational theory, in that the Great Man is one who traditionally inspires the people to do more than they originally intended, for the same amount in return. It was originally supposed that great men were born; now, Bennis and Nanus explain that it is great events that make great leaders of otherwise ordinary people. They also argue that

> *from statements of policy that have minimum impact, to revising recruiting aims and methods, training [should be] explicitly geared to modify behaviour in support of new organisational values, and not least, adapting to and modifying shared symbols that signal and reinforce the new vision.* (1985, p. 143)

Bennis and Nanus (1985) further maintained,

> *Effective leadership can move organisations from current to future states, create visions of potential opportunities for organisations, to install within employees commitment to change and install new cultures and strategies in organisations that mobilise and focus energy and resources. These leaders are not born. They emerge when organisations face new problems and complexities that cannot be solved by unguided evolution. They assume responsibilities for reshaping organisational practices to adapt to environmental changes. They direct organisational changes that build confidence and empower their employees to seek new ways of doing things.*

> *They overcome resistance to change by creating visions of the future that evoke confidence in and mastery of new organisational practices.* (p. 17)

The transformational leader raises subordinates' levels of awareness and consciousness about the significance and value of designated outcomes and ways of reaching them. In this context, the leader brings them to transcend their own self-interest for the sake of the team, organisation, or the society, altering their needs level (as per Maslow, 1954) and expanding their range of wants and needs (based on Bass, 1985; Wright, 1996).

According to Burns (2003), the Maslow Hierarchy of Needs is the basis for the transformational process. Maslow (1954), in his landmark theory, suggested the following hierarchy: First a human seeks to fulfil physiological needs; once these are taken care of the human turns to security needs; then to the need for communication with others or social needs, such as the sense of belonging or love; then to the need for recognition, status, and self-esteem. Finally, once all the lesser needs are satisfied, the human turns to fulfilling self-actualisation needs. An individual cannot progress to a higher level of needs, until the previous needs have been satisfied. This motivates a person to constantly be striving to succeed to a higher degree of needs; the fulfilling of the final need of self-actualisation is endless.

Burns (2003) claims that the result of transformational leadership is the relationship of mutual stimulation and mutual advancement. This relationship transforms subordinates into leaders and leaders into moral agents. Therefore, Maslow's Hierarchy of Needs comes into play as the ladder up which leaders raise their charges, and charges are able to raise their leaders.

Bass, in his book *Leadership and Performance Beyond Expectations* (1985), discusses Maslow's Hierarchy as well. He offers the possibility that travellers along the hierarchy

experience a broadening of needs as well as the ascent suggested by Maslow. Regarding leadership, he suggests that the transformational theory explains the leadership influence process. Transactional leadership is presented as a necessary but insufficient leadership style. On the other hand, the superior transformational leadership style characterises highly developed organisations.

Bass analysed several factors of Maslow's hierarchy as it relates to leadership differently than did Burns. Bass (1985) was concerned that Burns (1978) considered transforming and transactional leadership to be the extreme ends on a continuum of leadership behaviour. In contrast, Bass (1985) stated that these leadership paradigms, the transformational and the transactional, are complementary, in that transformational leadership builds upon the exchange functions of transactional leadership. He suggested that we should look for ways to draw upon and transform the transactional forms. Furthermore, Burns tends to see only the positive use of transformational leadership. Bass, on the other hand, claims that transformational leaders are often tempted to make unconstructive use of their influence, and enforce the moral downfall of subordinates by means of terror and coercion; obvious examples of these misuses of power are the regimes of Hitler and Stalin.

The Full Range Leadership model

Bass, together with Avolio, developed a model of the full range of leadership behaviours, the Full Range Leadership model, in 1985 (also in 1990; and with Jung, 1996). This model depicts the relations of transactional leadership, transformational leadership, non-transactional or laissez-faire leadership, and the outcomes of the person's leadership profile. This laissez-faire style indicates an absence of leadership or the avoidance of intervention, or both (Hater and Bass, 1988).

After scouring for the ideas of organisation employees in a subordinate position regarding ideal leaders, Bass and Avolio (1990) were able to narrow the focus onto several leading characteristics of transformational leadership. Transformational leadership, they presented, is identified by the extent of change occurring in an organisation. It stands out in situations in which the race for technological development, reforms, and dynamic organisational changes, have forced organisations to develop an atmosphere where people not only react to change but serve as change agents. Transformational leadership achieves performance beyond expectations. Its advantage lies in the subordinates' willingness to broaden their scope of duty and develop self-motivation, independent of external remuneration. Furthermore, subordinates under a transformational leader develop even at the price of self-sacrifice, an elevated degree of obligation to their work and colleagues.

In like manner, in a follow-up study Avolio and Bass (1998) portrayed transformational leaders as earning credits with followers by considering the followers' needs over their own personal needs. In contrast, transactional leaders practise contingent reward, where reward-performance relations are specified.

The Full Range Leadership model was developed together with the Multifactor Leadership Questionnaire (MLQ), which measures and assesses a broad range of leadership types. The Multifactor Leadership Questionnaire (MLQ) with its many variations, the latest being the MLQ(5X), has been used in many studies to measure the components of the Full Range Leadership Model. The conceptualisation of transactional and transformational leadership presented by Bass include twelve components: attributed charismatic leadership, behavioural charismatic leadership, inspirational motivation, intellectual stimulation, individualised consideration, contingent reward, active management by exception, passive management by exception, non-transactional or laissez-faire leadership, and finally the three outcomes to these

elements (Downton, 1973; Bass, 1985). These ideas will all be dealt with in greater depth and detail in Chapter III: Methods.

All transformational leadership studies have used different versions of the MLQ questionnaire. The variables index has been found to be reliable and valid, even though the factorial structure has been different in different studies (Bass and Avolio, 1993). The studies that commenced after Bass's original publication (1985) contributed to the development of the Full Range Leadership model, on the basis of a division between transformational leadership, transactional leadership, and the outcomes of using a specific leadership style (see Chapter III).

The Full Range Leadership model is a synthesis of all the preceding leadership theories, and it asserts that every leader displays each behaviour to some extent. A person with the optimal profile infrequently displays laissez-faire (LF) leadership. This individual displays successively lower frequencies of transactional leadership styles of behaviours such as Contingent Reward (CR) and Management-By-Exception – Active (MBE-A) and Passive (MBE-P), and uses transformational components most frequently. In contrast, a poorly performing person tends towards inactivity and ineffectiveness, exhibiting LF Laissez-Faire behaviours most frequently and transformational components least frequently.

Many research studies employing the MLQ survey instrument derived from the Avolio and Bass model, have been completed in business and industry, government, the military, educational institutions, and non-profit organisations. All of them demonstrate that transformational leaders as measured by the MLQ are more effective and satisfying as leaders than transactional leaders. The best leaders, it has further been demonstrated, frequently do some of the latter, but more of the former. Follow-up investigations have shown that developing

transformational leadership through training in its components can enhance effectiveness and satisfaction of a leader (Bass, 1998).

Summary

To begin with in summary of this review of genres of leadership theories and models, it may be said that speculation and interest in leadership has been a road much travelled by scholarship in the past century through to today. It is a topic of constant study and discussion, and theories of it have become, it is right to say, more and more accurate. The fact that after so many years of research there is no agreed-upon definition of leadership is testimony to the enduring complexity of the issue. More recent-day definitions and study have focused on leadership and change, vision building and empowering others.

The field of leadership study has been shown to be a dynamic one and an area of dispute. The theories up until that of transactional and transformational leadership presented three different emphases, these being:

1. A leader's personal characteristics, which are supposed to predict success – the Great Man theory and Trait theory;
2. A leader's behaviour, regarding their actual actions for accomplishing missions – asking whether they are task oriented or human oriented;
3. A leader's contextual awareness, which emphasises concern for people, while measuring achievement of actual objectives – the Contingency theory, with complementary variations such as the Path-Goal theory.

This newest perspective is based on a distinction between two kinds of leadership: transactional and transformational leadership. Transactional leadership may cause organisational change, but does not really change or empower the people; transformational leadership empowers the

people and generates deeper organisational changes. The advantage of transformational leadership lies in its ability to bring people to identify with the leader's vision.

2. The learning organisation and systemic thinking

The present section examines the importance of the learning organisation approach and systemic thinking. The understanding of these issues has been considered key for the advancement of organisations as a whole and specifically for the subject of the current research, health organisations. The two are intended to be used as tools for directing leaders to function along the path to excellence, by means of leadership development, staff working and vision. These are all crucial for functioning in a changing environment. By means of these the organisations will observe within itself an improvement of work results, a heightened level of efficiency, a better and more productive atmosphere, and a surge in motivation.

The learning organisation

Organisations are given to a dynamic of fast changes in the last millennium; thus it has become manifest that the only certainty is uncertainty (Nonaka 1996). As Timpson puts it:

> *Modern life is characterised by change, against the backdrop of this continual turmoil, organisational learning has emerged as a dominant theme within contemporary management theory, with many commentators increasingly locating the capacity of an aspiring organisation to accommodate the ethos of learning organisation, as the vital component in ensuring enduring efficiency, innovation and competitiveness. However, the utility of such learning needs to be scrutinised and evaluated in terms of service need and expectation.* (Timpson, 1998, p. 1)

The 'learning organisation' approach has become one of the major approaches in persevering with the vicissitudes of change (Argyris, 1977; Senge, 1990). Argyris (1977) argues that the

learning organisation is a process of detecting and correcting error. Managers regard the learning organisation as an influential instrument for the improving of an organisation's performance. Thus, not only the scholars of organisation studies show a deep interest in this phenomenon, but also the practitioners regard it as significant, and advance the importance of the learning organisation's aspects.

The traditional model to management was that 'the top thinks and the local acts', in other words that management was in charge of planning and problem solving, and the workers merely acted, carried out and followed directions. On this lower level there was no room for creative or contingent thinking. The learning organisation, on the other hand, may be defined as follows: All the elements of the organisation are responsible for the creative and contingency thinking and planning for the level at which they are found. Learning is encouraged at every level, so as to tap the creative genius of the employees. An indicative and helpful comment comes from Richard Karash: 'A learning organisation is one in which people at all levels, individual and collectively, are continually increasing their capacity to produce results they really care about' (Karash, 1996, p.1).

Generally, two different processes of organisational change are associated with the learning organisation:

- Adaptive learning, i.e. re-active organisational changes, as a response to new environmental conditions.
- Proactive learning, i.e. toward organisational changes, which originates in ideological motivation and represents serious intentions and responsibilities to the change processes (Nystrom, Hedberg and Starbuck, 1976; Starbuck 1983).

Hedberg and Holmqvist (2001), argue that operating proactive learning process are more efficacious than adaptive and reactive learning processes, and are perhaps even required for survival in fast changing and unpredictable environments. An organisation culture is a combination of the values and beliefs of the people in an organisation. Thus Hedberg and Holmqvist claim that the culture of a learning organisation encourages organisations to develop an ongoing state of experimentation. Additionally, they assert that a culture such as this contributes to the development of a variety of design features and flexibility.

In general, it is supposed that adaptive learning brings about a lower degree of organisational change. This is because adaptive learning is seen as a process of incremental changes. Adaptive learning is also conceived of as more automatic and less cognitively induced than proactive learning. The inferiorities of adaptive learning, compared to proactive learning, are also expressed by the different labels used to describe these two types of learning organisation: 'loop versus double-loop learning' (Argyris and Schön, 1978), 'lower level versus higher level learning' (Fiol and Lyles, 1985), 'tactical versus strategic learning' (Dodgson, 1991), 'adaptive versus generative learning' (Senge, 1990).

Learning organisations develop credos and visions for renewal and innovativeness, which inspires the whole organisations' progress. Not surprisingly, learning organisations demonstrate a continuous desire to improve their performance and to be more efficient. Starkey (1996) said: 'The "learning organisation" is a metaphor, with its roots in the vision of and the search for a strategy to promote individual self-development within a continuously self-transforming organisation' (p. 2).

Starkey (1996) also stated:

> *The key to lasting success is to bridge the gap between working on the continuous improvement of what the firm currently does well and innovating for the future. Innovation frequently challenges our existing mind-sets. This joint challenge – efficiency and innovation – requires unceasing learning.* (p.1)

Learning organisations tend to develop collaborative management teams in order to inspire and validate climates that encourage creative thinking for conducting affairs through conditions of uncertainty. This inevitably involves broadening the power base of decision-making. It also foments a change of organisational cultures so that imagination and motivation are given as much significance as planning, action and evaluation (Starkey, 1996). Learning organisations tend to a rearrangement of the existing work environment, in which there is an active change of beliefs concerning efficient ways for achieving best productions. Consequently, learning organisations need to operate alternative processes, which represent multiple perspectives for managing the organisations in the current business oriented environment (Starkey, 1996).

Senge, in his seminal book *The Fifth Discipline* (1990) on learning organisations, identified five areas that constitute the learning organisation's core. These consist of personal expertise (mastery), mental models of thinking styles, a common goal (shared vision), systemic orientation (thinking), and team learning. A combination of these five 'disciplines' presented here enabled Organisational Development.

Senge (ibid.) further has emphasised that personal expertise cannot be spread in organisations unless they develop supporting conditions, which encourage members of the organisations to study and develop. 'No one can increase someone else's mastery. We can only set up conditions which encourage and support people who want to increase their own' (ibid., p. 193).

Timpson (1998) adds:

> *The learning process in organisations requires the creative destruction of barriers of learning and the broadening of access to new sources of knowledge and experience. In any* [sic] *companies this requires a new culture of learning. People have to feel free to ask questions. They must not feel threatened by their ignorance. In some companies the three words 'I don't know' are anathemas. They can ruin careers. But the fear of this form of expression stifles growth. If we are not comfortable revealing our ignorance we cannot overcome it.* (p. 273)

In a fashion similar to that of Senge (1990), Argyris and Schon (1978) and Timpson (1998) have written about people's and organisations' ability to change and become more efficient. They noticed that such changes can be generated only in communicative environment, which facilitates staff empowerment, and in an open collaborative culture. These features characterise learning organisations.

In his work, Senge demonstrates the advantages of

> *organisations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together.* (1990, p.3)

The rationale that underlies such organisations, states that in situations of rapid change only the flexible, adaptive and efficient organisations will survive and succeed. Organisations that strive to guarantee their success must 'discover how to tap people's commitment and capacity to learn at all levels' (ibid, p. 4).

One central tenet that organisations must constantly be keeping in mind is the requirement to be responsible for the future. The organisation must generate significant changes in the staff's ways of thinking, by supplying professional tools and ideas for deep thought. This need for an outlook of change takes effect even in cases in which the staff is very capable; a staff nowadays must understand constantly be on the lookout for a change in the situations they face, if they want to improve their productivity.

Systemic thinking: Basis for organisational learning, from theory to practice

The five 'disciplines' raised up by Peter Senge, mentioned in the preceding section, distinguish the learning organisation from other more traditional organisational setups. These areas must be adopted and mastered in order to reap the benefits the learning organisation promises. This fifth and last is aptly called 'the Fifth Discipline', and it is the subject of Senge's book of the same title (1990). As it is the axis around which all the others function, we will now proceed to discuss it as the main theme of this sub-chapter.

Systemic thinking is a field in itself that, in addition to management theory, relates also to computing, engineering, and the environment. In general, when studying an object or idea systemic thinking may be thought of as relating not so much to reductionist techniques, but rather to holistic techniques. It attempts to break the object of thought into components, to focus on the elements of which it is comprised, and then to systematise how these elements are related to one another. In dealing with an organisation, systemic thinking will concentrate on coordinating all the various and disparate elements making up the whole and providing an environment in which they all work in tandem and in harmony. Thinking in such a way helps in avoiding the silo effect, in which a lack of communication between the elements causes a change in one area beneficially affected to adversely affect elements in another area of the organisation (Senge, 1990, 1995).

According to Senge (1990), systemic thinking is critical to learning organisations because it actualises new insights into persons and their world. At the heart of a learning organisation is a shift of mind – from seeing ourselves as separate from the world to connected to the world, from seeing problems as caused by someone or something 'out there' to seeing how our own actions create the problems we experience. Senge (1995) defines a learning organisation as 'a place where people are continually discovering how they create their reality and how they can change it' (p. 12).

Senge (1990) emphasises that translation of theories into practice that does not refer to organisations as whole entities, and focuses rather on parts and not on the whole, brings about too simplified a framework for change to be affected, and too reductionist to carry out the change that is. He regards systemic thinking as a key for attaining a better conceptual framework, as systemic thinking creates a comprehensive basis for holistic organisational learning. Systemic thinking combines multiple ideas and concepts, and it thus enables observance and systemic understanding of organisations. It enables turning these multiple ideas and concepts into a clear and coherent body of knowledge, and it facilitates turning theory into practice. Systemic theories also facilitate examination of the mutual relations between the different factors that encourage and facilitate integrative thinking.

Systemic thinking enables considering all the key components taking part in systems, as well as their mutual relations. It allows, when needed, focusing on specific components, without forgetting the whole system's needs. Non-professional use of systemic thinking might enhance a dynamic of blame between the different components that compound systems – as there is always another component that can be blamed for 'bad' results (ibid.).

Senge (1990) further argues: 'We learn best from our experience, but we never directly experience the consequences of many of our most important decisions' (p. 23). In this vein, Senge discusses how systemic thinking prevents emergence of simple classic solutions, based on direct links between causes and results, as if causes are closed to results. This kind of management does not offer long lasting and complex answers. Additionally, short term solutions tend to be narrow and drastic, and to cause damage for the long run. Eventually, they end up being more expensive than long run solutions.

Organisational decisions are sometimes based on partial or misleading feedback that addresses the need for small layer changes based one upon the other.

> *Whatever movement occurs is amplified, producing more movement in the same direction. A small action snowballs, with more and more and still more of the same, resembling compound interest.* (ibid., p. 81)

For example, in the short term, a gradual cut in the publications budget of an organisation, in the interest of cutting costs, does not immediately affect the clients. The reduction of client numbers will not be noticed. But such a process will have a significant impact on the reactions of customers in the long run, as they will come to eventually ignore the organisation's services. An organisation in such a strait would face an existential threat. Systemic balanced feedback, therefore, plays a vital role in collecting relevant data for better understanding actual situations. Such feedback helps to keep organisations balanced. Bringing home this point, Senge (1990) concludes:

> *The systems viewpoint is generally oriented toward the long-term view. That's why delays and feedback loops are so important. In the short term, you can often ignore them; they're inconsequential. They only come back to haunt you in the long term.* (p. 92)

Van Maurik (2001) for the most part agrees with Senge (ibid.), and adds that organisations that do not change their routine organisational traditions do not succeed, and later down the road they tend to regret their former unwillingness or inability to modify and improve their basic organisational assumptions and beliefs. Still, Van Maurik (2001) questions the benefits organisations gain out of belief toward development processes, as there are limited concrete proofs that actually recommend following such processes. Nevertheless Van Maurik emphasises that construction of an organisational statement of belief highlighting staff development and personal development for expertise, facilitates the flourishing of the staff including leaders and managers more than other sophisticated mental models. It additionally encourages their creativity and increases their satisfaction.

Sennett (1998) argues that organisations should develop their narrative, the central idea around which all else comes to fruition. The purpose of the narrative is to get adjusted to the current rapid environmental changes, in such a way as to consider the worker's work-life, needs, and expectations. This will, eventually, help the worker to better understand the organisation's new directions. Furthermore, the organisation should invest in its workers, and update them, rather than expect them to develop by themselves, as a result of their own enterprise, and in their own private time. Instead they should enable workers, and even encourage them, to opt out of the organisation should they show signs of burnout.

Ferlie and Shortell (2001) reinforce Sennett's analysis (1998) regarding health organisations. They argue that the health organisations in the UK and the USA are aware of the problematic picture and the low level of investment in improving the organisations' quality. Thus, these countries have initiated some processes that would improve the quality of their service and the results. They emphasise that unless the organisations consider and adopt a systemic approach for changes, the steps taken will not succeed. Taking a systemic approach entails considering

workers' needs as individuals, working groups' interests and needs, the whole system's needs and expectations, issues of leadership and management, the current and desired organisational culture, staff development, development of information and technology systems.

The learning organisation, systemic thinking, and leadership

Senge (1996) has discussed three essential types of leaders in the building and development of learning the learning organisation in actual practice; these are local line leaders, executive leaders, and internal networkers or community builders. The local line leader works at the level of the organisational unit, and is able to work independently of the organisational community as a whole as an agent for change, implementing innovations in line with the tenets of systemic thinking. This type of leader deals with initiating practical experiments and carrying out change by example.

The executive leader may be called the local line leader's 'protector, mentor, and thinking partner' (ibid., p. 4); he or she connects and networks between innovative leaders on the local level and plays a mentoring role for them, helping them understand internecine politics and how to communicate their ideas to like-minded others. The role of the executive in this scheme is much more behind the scenes, much more of a steward than of the captain of the ship. It is the task of the executive 'to see the company as a living system and to see it as a system within the context of the larger system of which it is a part' (ibid., p. 5).

Finally, the internal networkers or community builders live by the maxim that 'no power is power' (ibid., p. 5). While the executives' and local line leaders' projects and initiatives may backfire on account of approaching change from a top-down perspective, these lesser leaders benefit from no power responsibilies. They are thus able to move effortlessly between units, unnoticed, unthreatening, searching out people willing to work on learning, and enhancing

efficiency. It is as if these leaders share responsibilities with the executives, yet start on the opposite side of the spectrum to achieve complementary results.

Senge's vision of leadership, bifurcated as it is into three branches, is interesting for taking on a situation, and describing the types of leaders important in dealing with it. The learning organisation and acting in accordance with systemic thinking are an ideal; however it is nonetheless a situation, and therefore his tripartite theory may be best classified with the Situational theories of leadership. Yet the difference between it and the Situational theories is that the latter talk about leaders for different situations should they arise, while the former talks about the need for three types of leaders concurrently for three different types of situations.

Summary

In summary, the organisation's level of performance must be improved, and for this sake learning is needed. Systemic thinking must be the basis for implementing change. For most organisations, like health organisations and others, there is no clear route that guarantees success. It is clear that high level performance is critical, as this increases both the workers' and the customers' satisfaction, as well as the workers' sense of fulfilment. High-level performances occur in learning organisations, as these offer width-wise collaborative learning and a link between theory and practice. Learning organisations embed the learning into the staff's beliefs and the organisation's structure, and the organisation's policy and culture. Learning that takes place in such an atmosphere is a dynamic process, and it creates the basis for constructing the organisational common knowledge.

To effectively employ their members, the organisation must continuously educate leaders, managers, and personnel, so as to ensure the growth of its environments and its successful existence. Developing change in line with systemic thinking is a requirement. Otherwise, the

level of performance will decrease, and organisation will collapse. Furthermore, nowadays, in the current turbulent times, systemic development of organisations demands innovation, based on environmental needs and possibilities. Individual workers must understand their responsibility to work for the good of the organisation, as their deep understanding and involvement in the organisation's narrative eases the process of change. Good communication between policy makers and workers, at all levels, based on positive feedback, strengthens the organisation's systemic thinking. Still, organisations should support individuals, groups, and not only the general interests, so as to increase synergy.

The health organisation in many ways is similar to other organisations, but it is more complex, as it faces dilemmas and the problems of life and death on a daily and often hourly basis. The obligation to meet these dilemmas sets a real challenge for improving the organisation's level of performance and its level of services, in times of resource reduction.

3. Gender

This section broadens the scope to encompass gender aspects. It refers to the most fundamental differences between males and females, thus illumining their personal preferences. It reviews gender theories regarding biological gender differences, psychological differences that appear as cognitive styles, the cultural impacts on gender differences, and sociological explanations for male and female behaviours. It also reviews the different ways in which the genders communicate.

Gender refers to the socially and culturally constructed roles, behaviours, activities, attitudes, values, beliefs, and attributes that a given culture considers appropriate and fitting for men and women. These components of gender, based on but not limited to sex differences, may vary from culture to culture. Gender is therefore not defined by physical sexual characteristics, but

rather by a repertoire of sometimes contrasting behaviours (Peters and Austin, 1985; Gray, 1987, 1993).

The phenomenon of categorising human beings in terms of gender (men and women) is most common and even automatic among humans. It is almost impossible to suppress the tendency to split the world's population into half, using gender as the great divider. This grouping results from men's and women's differing behavioural patterns, which has struck the human eye and led to further examinations upon their divided nature.

The term gender is used as a social-cultural translation for the battery of sexual tendencies displayed in males on the one hand and females on the other. It explains and even determines the ways males and females behave in different societal settings. Margaret Mead in 1935 was already arguing that gender differences in different cultures vary, as human beings' behaviours are produced and reproduces through socialisation processes, and are contextual and culture-situated. Thus, men are expected to follow accepted social codes, or stereotyped characteristics, such as being assertive and colder than women emotionally, while women are expected to behave less assertively – and more emotionally – than men (Mead, 1961).

Gender refers to two different kinds of factors, each of which vastly influence human behaviours. On the one hand are culture's and society's expectations for males and females; on the other are the basic biological differences. The latter stems from the male's and the female's distinctive physiological characteristics (anatomy and chromosomes), and from their genetic differences (such as brain hemispheric functioning, neurological and hormonal processes). Both of these kinds of factors, the cultural and social on the one hand, and the biological on the other, have a powerful effect on children's emotional development and their behaviours, and they eventually, therefore, influence adults' behaviours and preferences as well (Brody, 1985).

It is quite clear that gender characteristics are influenced by cultural factors; they do not necessarily and directly result from biological differentiations only. These characteristics rather originate in human beings' translation or interpretation of the biological differentiations into cultural-sociological dimensions. The translation and interpretation of the biological differences between the sexes determines the values given to the genders' typical behaviours, and inevitably the social status humans of either gender are destined to reach. Not surprisingly, human expectations have a massive role in creating and designing cultural-social processes. These processes foster hierarchical pattern in favour of men, and systematically evaluate and validate man's superiority over woman (Bem, 1993).

Bem (1993) takes the view that the differences between males and females cover up the similarities between them. Consequently men are conceived alike, thus are grouped and are identically typified, and women are conceived alike, and are grouped and likewise identically typified. This grouping represents, according to Bem, a psychological cognitive process that seems nearly inevitable.

Bem (1993) touches upon some important aspects of gender thought. She argues that the male, masculine way of doing things, has been traditionally regarded as the correct way. She relates to 'biological essentialism', and argues there are natural and biological differences influences on cultural and sociological settings, and these play a crucial role in how men and women manage their lives. In this vein, the fact that the male way of doing things has often been considered proper, is the great instigator of inequality between the genders. Male is regarded as powerful, and the male ways of doing things is supported by the social structure; whereas women are regarded as powerless. Both men and women are socialised in to this perception of reality,

follow and reinforce the traditional culture and the existing discriminatory social structure, and thus reproduce it.

Gender theorists such as Koestner and Aube (1995) have forged a theory of gender identity to explain the diversity and the complexity of women's and men's displayed social roles. This examination has discussed biological perspectives, neuro-chemical structures, and hormonal processes shaped by the course of evolution. They have also taken up the sociological perspectives which have influenced males' and females' roles and functioning in different societal settings.

The division of human beings into two distinctive groups by its nature has caused gender stereotypes. These have had, and continue to have, a tremendous impact on the human's life. In fact, gender stereotypes, the particular way in which males and females are conceived by people and organisations, influence personal and societal considerations and decision-making processes, and determine, to a large extent, males' and females' careers (Operario and Fiske, 2001).

This division, as it has played out in history, has encouraged humanity to conceive all males as similar to one another, and all females as similar to one another. It highlights areas of difference between male and female, rather then areas of commonality, even though in reality women's and men's characteristics have much in common and greatly tend to overlap. Yet despite these similarities gender polarisation remains a significant force even in modernity, and has often created an artificial gap between women and men (Bem, 1993).

One branch of research focuses on gender-unique styles of behaviour and investigates differences between male and female leadership characteristics. Concurrently, it queries as to

the difference in potential between the sexes, in their present ability to successfully cope with different settings of reality, and in their potential ability to so successfully cope with possible future settings. This research is specifically interested in women's leadership styles in different leadership positions (military and civilian). It is interested in investigating how women may adapt for the sake of practicing traditionally male leadership roles, while at the same time revealing unique behaviours, customarily considered as more feminine, such as creativity though sensitivity. These innovations may improve leaders' abilities to analyse current and future needs, and successfully operate them (Hackman, Furniss, Hills and Paterson, 1992; Leiter, Clark and Durup, 1994).

Other researchers have concentrated particularly on the biochemical plane in exploring the differences between males and females, mainly researching hormonal influences. This research focuses on identifying differences in the development of the male/female brain, as well as on the impact of these differences on various human behaviours, including aspects of communication (Blum, 1997).

The crux of this second branch of research is that gender dissimilarities are generated and evident even before birth, and established throughout childhood. The basic differences do not disappear in the course of growth, they rather become firmer and clearer. The fact that these biochemical differences exist, poses something of a challenge for female/male progress despite the differences, and for the dialogue between them (Rories and Spelsberg, 1989; Flinn, Quinlan, Decker, Turner and England, 1996; Blum, 1997).

Social and emotional interpersonal abilities of the genders

As noted above, gender roles are rooted in social assumptions and in cultural traditions. They do not represent pure biological considerations (Sayers, 1982). However on the other hand

biological explanations usually support social-cultural explanations (Blum, 1997). A result of this is that it is relatively rare for one to find research that provides a social-cultural explanation that contradicts a biological one. In this context, gender research brings to light some differences between men's and women's social and emotional interpersonal abilities. This research reveals an interesting and strong pattern of gender differences. For example, Condry and Condry's classic study (1976) focused on the adult's interpretations of an infant's behaviour. Their research showed that when presented with unclear negative reactions of infant boys' behaviour, this was interpreted as more masculine and thus as reflecting anger. However similar infant girls' behaviour was interpreted rather as more feminine, and thus as displaying fear, and not anger.

Riggio (1986) examined people's abilities to communicate through nonverbal channels, assuming that these abilities are an integral component of the interpersonal emotional range. The results revealed that women were far more skilled at encoding and decoding nonverbal messages than men. Furthermore, there was demonstrated substantial evidence that women were more nonverbally expressive than men, as they showed superior ability to express emotions with their faces and displayed greater frequency of smiling and facial animation. In terms of nonverbal decoding skills, women moreover presented a greater attention to visual cues, particularly facial cues.

Some researchers, such as Spence (1993), Feingold (1994) and Koestner and Aube (1995) have demonstrated results that reveal some distinctive dominant categories in which males differ from females. In these studies, the following were found:

1. Males appeared more assertive, and they showed a slightly higher level of self-esteem than females.
2. Males demonstrated better spatial abilities than females.

3. Males performed better at tasks and measures involving mathematics.
4. Males were more verbally and physically aggressive, and took charge more readily in small groups.
5. Females showed higher measures of extraversion, anxiety and trust than males.
6. Females were especially high in measures characterised as sensitivity.
7. Females exhibited higher verbal abilities, larger vocabularies and better reading skills than males.
8. Females expressed themselves better than males at nonverbal communication. They appeared as more sensitive to nonverbal cues, and more nonverbally expressive.

This research did not expose noteworthy gender differences in the fields of social anxiety, impulsiveness, activity, ideas, locus of control, and orderliness**.** George (2000) describes how aspects of emotional intelligence, including the appraisal and expression of emotion, knowledge about emotions, and management of emotions, were better represented among women than among men.

In short, there is ample empirical evidence to suggest that there indeed exist gender differences with respect to social and emotional considerations (Conger & Kanungo, 1994).

Gender communication styles

The literature shows there to be significant attempts at explaining gender differences concerning communication, while considering both heredity and environmental factors as the reasons for these differences. Therefore, it has been revealed that some elements of language differences originated in human genetic formation, whereas other elements are learned. Whether gender differences are genetic or learned, they appear as communication patterns, which go along with human beings through their lives (Glass, 1993).

Basic communication between men and women is conducted, of course, using the same words and the same grammar system as any communication within the genders. Still, there are numerous general differences that characterise gender communication. Gray (1992), for example, in his popular book, *Men are From Mars, Women are From Venus*, goes so far as to suggest that the differences in communication styles and patterns between them are so pronounced that men and women seem to have come to earth from different planets. At least, the differences between the sexes can be considered as cross-cultural, as men and women communicate despite the different cultures they seem to belong to, and in spite of the different languages and dialects they sometimes seem to speak.

Tannen (1990), in her book, *You Just Don't Understand*, asserts that as much as boys and girls may grow up together, the worlds in which they do so are very different. In terms of ways of talking, differences first emerge in young children at the age of three, at a time when their vocabulary and language abilities are rapidly developing. For example, little girls' way of talking reveals their eagerness to be liked; little boys' way of talking often demonstrates their need to boast. Little girls tend to request, and little boys tend more to demand. Additionally, the perception is that little girls speak to create harmony, whereas little boys produce conflicts. If little girls tend to talk somewhat indirectly, little boys talk more directly. Finally, little girls express themselves better in words while little boys express themselves better in actions. As seen, boys and girls communicate differently as to guarantee the achievement of their typical gender desires. Boys' and girls' styles of communication characterises their styles of communication as adults.

The tendency of these gender communication styles is to maximise communication, insights and understandings within that gender. These interpersonal verbal relationships validate and

maintain the dual communication styles in which they have developed; they thereby perpetuate the significant differences between men's and women's styles of communication (Rosener, 1990).

Studies indicate that women, to a larger extent than men, are sensitive to between the lines meanings when exchanging interpersonal messages with their mates. Similarly, with regard to societal expectations women often feel responsible for regulating intimacy, and controlling the extent of closeness they allow. It has been argued that women are more aware of underlying meanings concerning intimacy than men. Men on the other hand, to a larger extent than women, are more sensitive to between the lines meanings concerning status matters. In this way, regarding societal expectations men feel obligated to negotiate hierarchy, and are bothered with the question – who is the leader and who is the subordinate (Tannen, 1990; Wood, 2001).

Tannen (1990) explains the difference between men's and women's styles of communication in the terms men's tendency to 'report talk', and women's tendency to 'rapport talk'. Men interpret their duty to give a 'report' to others as to enhance their own power. Women prefer sharing information and knowledge they hold in order to guarantee 'rapport' with others, to help others and encourage equalisation. Whereas men in their 'report talk' are impatient, and tend frequently to interrupt and compete for getting more talk-time, women are more patient, and they tend to wait for their turn to speak.

Till now the discussion has focused on the differences between men and women. Yet gender aspects also exert powerful influence on facets of human communication; this raises many profound social issues. How does gender affect people in their everyday interactions? Are people treated differently on account of their gender? Does a listener's gender influence the way

the speaker chooses to verbally express an ideas? These questions will be dealt with in the next few sections.

The Myers-Briggs Type Indicator (MBTI) and gender

Gender differences can be identified by the use of indicators that elucidate personality differences. The Myers-Briggs Type Indicator (MBTI), among other tools, provides a useful instrument for identifying personality differences and analysing them, and for enhancing understandings regarding patterns of communication among people. The MBTI is a questionnaire used to identify preferences and temperaments, which can then be correlated with psychological types. More specifically, this questionnaire measures people's perceptions, their judgments, interests, values, needs and motivational preferences (Terrence and McCarthey, 1987; Terence, 1992; Myers, 1998).

The MBTI questionnaire is currently used in many settings in order to facilitate understanding of communication styles, and consequently for enhancing people's efficiency in operating in different settings of communication. Psychologists use the MBTI to quantify the above mentioned individual preferences, in four preference scales: Extroversion (E)/Introversion (I), Sensing (S)/Intuition (I), Thinking (T)/Feeling (F), and Judgment (J)/Perception (P).

The scale is designed to reflect mental functioning, such as whether a person is extrovert or introvert. It questions whether people primarily rely on familiar processes of sensing, or whether they primarily chose less obvious processes of intuition. The scale is also designed to reflect how persons choose their preferences between two opposite ways of judging. Furthermore, it enables indication of whether a person primarily relies upon thinking or upon feeling. It determines whether a person chooses primarily by perceiving or by judging, and indicates the person's dominant inclination when reacting to reality (Myers, 1998).

Put differently, the MBTI measures people's preferences in the following way (Myers et al., 1998):

- The way one prefers to relate to others: Extroversion (E) - Introversion (I).
- The way one prefers to attend and gather data: Sensing (S) - Intuition (N).
- The way one prefers to process data and make decisions: Thinking (T) – Feeling (F).
- The way one prefers to decide between choices: Judgement (J) - Perception (P).

Sixteen combinations or personality types emerge from these optional preferences, and each combination or style has unique traits and behavioural preferences. Each of these has implications and definite tendencies, which may predispose certain behaviours. Dulewicz and Higgs (2000) suggest that the Myers-Briggs Type Indicator (MBTI) can be used to gather a more complete picture of a person's emotional intelligence in an organisational context. The MBTI is often utilised to conceptualise personality differences (Myers, McCauley, Quenk and Hammer, 1998).

As a matter of fact, very little has actually been published regarding gender differences as demonstrated by the MBTI. That which has come to light includes the fact that females' preferences tend to be feeling oriented, characterised as F, and males' preferences tend to be thinking oriented, and characterised as T (Knowlton and McGee, 1994),

Additionally, some studies have identified a slightly higher percentage of extroversion in female populations. Further, it is worthy of interest that women do not score higher than they do on the N scale (intuition), as 'women's intuition' is an attribute frequently assumed, and frequently discussed in management and leadership literature (Stogdill, 1974; Terrence and McCarthey, 1987; Terence, 1992; Myers, 1980; Myers et al., 1998). This data may point to the possibility

that successful women in male-dominated career fields tend to adapt their functioning styles to better guarantee their survival as career women. With regard to nursing practitioners, a review of their MBTI types indicates that they score as either ESTJ (Extroversion, Sensing, Thinking, and Judgment) or ISTJ (Introversion, Sensing, Thinking, and Judgment). They tend to be more nurturing (F) and intuitive (N), characteristics that are found with other health care professions (Myers, 1980).

Cognitive styles and gender

For years, both psychologists and the general public have been fascinated by the notion that there indeed exist gender differences in cognitive abilities. Nevertheless, meta-analyses do not suggest particularly large or significant differences in cognitive ability between males and females; this after there having been an increasing amount of research on cognitive processes. Regarding these differences that do exist, men are more abstract learners, while women are more anxious about study success; men are more analytical, while women are more intuitive; women more organised, while men more undirected (Fausto-Sterling, 1985; Herrmann and Crawford, 1992; Freidman, 1995; Blum, 1998; Kimura, 2000).

In the same vein, some literature suggests that learning styles probably differ by gender; however research results vary, and there is no one accepted answer as to this phenomenon's extent (Belenky et al., 1986; Philbin, Meier, Huffman and Boverie, 1995; Sadler-Smith, 1999). For example, feelings about science, due to sex-role stereotyping, reveal a decrease in confidence and academic risk-taking as girls get older (Kahle and Rennie, 1993; Orenstein, 1995). As to the correlation between gender and problem-solving questions, researchers have throughout the years found higher problem-solving achievements among males than among females (Sweeny, 1953; Adigwe, 1992; Casey, 2001). These findings point to there being a difference in learning styles, on the whole however research has often demonstrated an

inconclusive picture in how gender affects learning. Yet it is quite clear that in some ways it is true that men and women may learn differently.

Cann (1993) found different ways in which gender stereotypes are related to cognitive processes, and described different expectations for female's and male's behaviours. Other, similar research focuses on gender differences in verbal, mathematical, spatial and scientific abilities. Results of this research suggest that gender differences may have recently lessened (Geary, 1989, 1992, 1994, 1995).

The literature on sex differences concerning cognitive abilities returns inconsistent findings, contradictory theories, and emotional claims unsupported by the research. There are real, and in some cases sisable, sex differences with respect to some cognitive abilities. Representative of these studies, investigators have found a higher density of neurons in the orbital area of the female brain (Haug, 1984), and a consistently greater amount of right-left asymmetry in the planum temporale of male controls (Wada, Clarke and Hamm, 1975). The corpus callosum - the major fibre tract connecting the two hemispheres – has also been found to display sexually different dimorphism. Post-mortem studies have found that the total area of the absolute sise of the corpus callosum is larger in females, and that women have a more rounded and bulbous splenium of the corpus callosum (Holloway, Anderson, Defendini and Harper, 1993).

Other biological research has been equally captivating and fruitful – specifically the hormone research identifying differences in male/female brain development and impact upon behaviour and communication (Dörner, 1979, 1980), 1981; Kaplan, 1980; Campbell, 1989, 1990). The bottom line is that while socialisation practices are undoubtedly important, there is also good evidence that biological sex differences play an important role in the establishment and the perpetuation of cognitive sex differences.

The issue of gender differences and their bearing on ability is a salient factor in today's world. Science grapples with the issue of resolving the complexity of these differences, figuring out what the extent of biological differences are, how these biological differences affect cognitive differences, and how malleable these cognitive differences might be. It seems that men find it much easier to visualise and deal with spaces, the position of objects, relative heights and dimensions (McGuinness, 1993; Silver, 1996). To what extent are differences in spatial ability, verbal skills, or academic achievement traceable to biological differences? Thus gender differences are a big issue in scholarship today; and this fact plays a significant role in the study of brain dominancy and leadership, as we shall see.

Leadership and gender

The theory and practice of leadership in organisations has developed as a male realm. Schmuck (1996) claims that leadership theories focus mainly on male and disregard the female experience. Those theories make an implied statement regarding the role of gender in organisations. Morgan, Hall and Mackay (1983) assert that gender stereotypes in leadership and management are common. Male dominated high-level organisational positions may perpetuate a situation in which males are promoted on the basis of their gender and presumed management styles. Similarly, Gane and Morgan (1992) found in their study that there was a presumption that leadership is based on male characteristics, such as equanimity in problematic situations, physical and mental strength. This reinforces the common stereotype that leadership is an inherent male characteristic.

Schein's research (1994) showed that the existence of the stereotype identifying leaders as male is supported by research. Research has conceded that 'there is a cross-cultural persistent

stereotype associating management with being male' (Shein, 1994, p. 47). Schein's research (ibid) demonstrated that:

> *Both men and women tended to see the key characteristics of good managers as being: leadership ability, Responsibility, business skills and analytical ability. These characteristics were perceived by both men and women as masculine rather than feminine. There is a stereotype of a tough, possibly aggressive, leader who is preoccupied with tasks rather than relationships. In contrast, the female manager is being identified with the 'softer' aspects of management, for example, those aspects related to pastoral care with the management of people.* (p.48)

Indeed, current research indicates gender differences in leadership styles, but not however in line with the stereotypes. Anecdotal, survey, and experimental evidence all point to the greater tendency of women in leadership positions to be somewhat more transformational and to display less managing by exception than their male counterparts. Concomitantly, they are seen by their subordinates and colleagues as slightly, but significantly, more effective and satisfying as leaders (Eagly, Johannesen-Schmidt and van Engen, 2003).

Evidence for this difference between male and female leadership styles may be found in Coleman's empirical work (2000) on female principals and other female senior managers. This work, conducted within the educational management arena of England and Wales, indicates that women display a tendency toward a collaborative and transformational managerial style. Findings showed that most (about 85%) of the secondary head teachers defined their managerial style as being collaborative and people-centred. Furthermore, Bush and Coleman (2000) distinctly conclude that there is a tendency for women leaders to apply transformational and educational managerial styles. These styles may be known as a feminine leadership style strongly linked to notions of effectiveness.

A study undertaken in Hong Kong and China by Chow and Lul (1996) elaborates this theme reinforcing a female management style characterised by a particularly people-centred style. The study questioned business women about key motivators at work. The findings indicate the significance of recognition of good performances and the human relationship with peers and superiors. Similar findings were reported in international studies conducted by Blackmore (1989) and Hall (1996). Jirasinghe and Lyons (1996) claimed that a co-operative managerial style is favoured by female managers, promoting colleague empowerment and team collaboration.

Significantly, Multifactor Leadership Questionnaire (MLQ) (form 5x) -procured data from four separate studies conducted between 1986 and 1992, supporting the conclusion that women display more transformational and less transactional leadership (Bass, Avolio and Atwater, 1996). In one such study reported upon by Bass (1998), 154 female and 131 male focal leaders were drawn from non-profit groups such as small health care and other social services, government, and other local agencies as well as small businesses. These focal leaders selected their own 532 female and 381 male raters, following which they participated in a leadership training program. The conclusions: In all four of these studies the women leaders attained higher scores on all four components of leadership: charisma, inspirational motivation, intellectual stimulation, and individualised consideration. The same was true for contingent reward, although generally the effects were not statistically significant in the separate studies.

An explanation for the male-female differences in transformational leadership may be due to the female's well-known, documented tendency to be more nurturing (Eagly, 1991).

Gender and nursing

An important example of a profession dominated by one of the sexes, either for social or biological reasons, or both, is nursing. Nursing is dominated by the female gender, and women are the main human resource, functioning as nurses and social workers in health care institutions. Furthermore, it has been claimed (Farley, 1994) that consumers of health care facilities generally perceive nursing as a non-powerful profession. Thus the state of nursing as a female profession is further perpetuated by social perceptions. Farley reasoned that this is the product of nursing leadership, which is characterised as directive and authoritarian. Golding and Chen (1994) found in their study that the female gender dominates, numerically, the teaching profession in the United Kingdom and elsewhere. However, it is rare to find women in authoritative positions in higher education institutions and educational administration roles (although this is not entirely true for schools in Israel). Finally, more women study science and earn advanced degrees than in the past. But only few women reach high employment positions.

Therefore the question becomes how to rectify this situation in the nursing profession. Gender theories are relevant on these grounds for two reasons. The first reason is that understanding and considering gender aspects are vital for elucidating basic problems that female nurses, who reach leader's tasks and status, face. Doing so may enable executives to be aware of leader nurses' unique characteristics on the one hand, and of the unique support they need to properly fulfil their tasks on the other hand. Therefore knowledge of gender aspects might be helpful in preparing the nurses for their complicated leading tasks. The inclusion of gender aspects in the preparation program would increase the effectiveness and the professionalism of the nurses' work as leaders. Additionally, it would guarantee their ability to cope better in the complex current reality, and to adjust to its rapid and demanding changes.

The second reason gender theories are relevant is this: As most of the top executives of health care organisations are males, and a great deal of the nurse's work team (physicians) are also males, the inclusion of gender aspects in the nurses' preparation for leader tasks would provide 'helping tools' for improving their use of strategies and tactics for coping with the male members in their staffs.

Summary

In summary, there clearly exists a gender gap, as men outperform women in a host of cognitive functions and women outperform men in a host of others. Yet biological differences between males and females are not the only reason for this gap. A large amount has to do with cultural traditions and social expectations. The combination of biological differences and cultural-sociological conditionings generates stereotypes and approaches, which influence males' and females' education, from very early in childhood. Differences proven to be grounded in the biological, such as males' superiority on spatial tasks and females' superiority on the technicalities of speech, have given way to a narrowing of differences on the ground. It is unforeseeable whether, but improbable that, these differences will be altogether nullified; however the fact of their existence at all does not serve as reasoning for a preference of male involvement in engineering and the sciences over female.

The gender gap is to a great extent a product of the socialisation processes. Therefore preference of males over females in technical employment capacities is impracticable. Nowadays business organisations are run according to the rules of teamwork, and people should be socialised to this new reality, which considers women's engagement in high job positions. Consequently, women now face a real challenge. This reality necessitates women to strengthen some important characteristics needed for leading roles. They must develop hierarchical and goal-focused

orientations. Men, on the other hand, should strengthen flat and process-focused orientations. A combination of male and female styles of leadership fosters organisational success.

4. Transformational leadership style and the nursing profession

As discussed, rapid change in the business and organisational world has brought about the need for new ways of thinking. The current organisational development philosophy emphasises the function of learning. The new aspiration is the learning organisation. Thus, management's new paradigm combines the 'art', the subjective approach, and the 'science', the more objective approach, of the organisational endeavour (Peters and Waterman, 1996). The focus of leadership within this construct is to ensure that people reflect upon, and discover, what they do best and then work at it better and more frequently (Kanter, 1994). Hence, there are many researchers who regard leadership skills as the first step towards achieving a learning organisation (Senge, 1996).

The recent world-wide crisis in health care systems has brought nursing, as part of the entire health care industry, to search for new solutions. The key answer concentrates attention on leadership. Sullivan (1993), Drache and Sullivan (1999), and Sullivan and Decker (2001), describe the alternatives in their field: health care reform and massive changes in the management of hospitals, home health agencies, and physician office practices. The whole industry has become more business-like. Such structural changes require adaptations in the workforce.

The management of a state's health system may benefit from the new paradigm's optimism, especially by liberating human potential and facilitating creative collaboration (Mullins, 1993). The provision of clinical supervision for nurses working within the National Health System (NHS) may well have already begun to affirm management's hopes in the potential

contributions of nursing, and to achieve the as-of-yet unrealised potential of patient care and advanced nursing practices (Starkey, 1996).

The attributes of nursing leadership

In conveying the lessons learned in nearly a century of leadership scholarship to the field of healthcare and nursing on a practical level, it must be made sufficiently clear that the two fields of business leadership and healthcare leadership are compatible. While in an abstract sense the tenets of leadership should be valid regardless of the area of application - indeed for a theory to be successful it must withstand various cross-field applications - nevertheless there are inevitable dissimilarities between the two areas. That these differences do not necessarily weaken the overall ability to carry over, shall be taken up upon their explication.

It is inescapable that in a business atmosphere there is much more room for trial and error than in that of healthcare. Indeed, a basis for innovation in the corporate world is that experimentation is welcome since learning is possible even in the event of failure. While experiments can be sanctioned in nursing, these must be facilitated with much more care. Healthcare, and likewise the oft-compared field of the armed forces, deals with life and death, where there is less room for mistakes.

Furthermore, overarching aim in the business is to perpetuate itself and make money. This should not be interpreted as a cynical reading but rather as a positive truth. On the other hand, while doctors' and nurses' personal reasons for doing their jobs might be similar to the above, the overarching aim of the hospital is to serve the public good. Being successful contributes to serving the public good, while in the private business sector serving the public good serves its non-cynical overarching aims.

A final difference between healthcare and the business world is that in the former there are more competing interests than in the latter. Healthcare provides for the community an integrated service, of which nursing plays a part (Sofarelli, 1998; Beyers, 1995). In the business all employees from the top on down work their own personal betterment and for that of the business. In the hospital it is closer to the truth to say that administration has its management, doctors have their own management, and nurses have their own management.

Despite all these differences, the element of saving human life, the element of serving the public good, and the element of competing interests, leadership formulas between the two fields are nevertheless compatible. With regard to all three element, the innovation charged by effective leadership by the head nurse must go into seeking out new ways to master efficiency and care for her charges. Meaning, instead of making decisions to experiment along the lines of life and death, those decisions should be along the lines of making the caretaking more efficient and beneficial. Also, all experiments should be crafted in such a way as to promote and further the patients' wellbeing. Efficiency for the sake of treating more patients and charging more money should not come at the expense of seeking for the best care possible.

Finally, the nursing leader must flesh out the particular role of the nurse all the clearer for her subordinates. The nursing sector of the hospital, as its own entity, must search for its own paradigm of the role of the nurse. Leadership in this form grants the subordinate nurse a better idea of her mission, and allows the other sectors participating in the hospital conglomerate to better fulfil their roles.

According to Porter-O'Grady (1997) and Valentine (2002), the seeds of leadership in the nursing profession flourish in the following circumstances: Nurses must decide when a doctor is needed, choose and arrange sufficient care plans, and carry out effective interventions. The

nurse who for the duration of an entire shift is on call for the improvement of the patient, is in command of a large amount of decision-making, and is at the front line of this process.

Nursing leadership does in fact differ from that in a business setting, in that businesses do not generally deal with life and death while nursing does, businesses exist solely for the benefit of their employees while nursing exists for the benefit of the public good, and businesses are more streamlined in a common goal while the interests of nursing sometimes run at odds with those of other sectors in the hospital. Nevertheless, these differences do not constitute enough of a reason to disassociate nursing leadership from business leadership. Furthermore, as nurses serve at the front line of much decision-making on the level of arranging care plans and interventions, the profession constitutes fertile ground for the development of leadership. Both types must employ the tenets of transformational leadership in order to derive the best results, while the means of employing them might be somewhat different. Nurses too must focus on the ability to successfully affect change in the organization, and not strive solely for rote predictability (Fedoruk and Pincombe, 2000).

Significance of leadership in the nursing profession

There is a theoretical and practical consensus regarding the significance of leadership in the nursing profession. Barrett, Gessner and Phelps (1975) claim that strong nursing leadership is needed for the development of a renewal of professionalism in modern nursing. Only clear leadership is capable of providing the quality of care needed and expected by clients and to explore new and better ways to achieve its purposes. Moreover, nursing literature has been tracking management literature in identifying the importance of decentralising power and responsibility. In this vein there is now considerable evidence that the hierarchical management of nursing teams has declined (Springer, 2003).

Sullivan (1993), Drache and Sullivan (1999), Sullivan and Decker (2001), argue that modern employees expect to be empowered, flexible, motivated, and responsible. They claim that an interdependent workforce requires a manager with skills very different from the more traditional authoritarian and paternalistic manager. They therefore note the importance of the democratic and 'permissive' leadership style for ward nurses. This trend has become dominant in some hospitals, where leadership is not limited to selected positions in the ward. Clifford and Horvath (1990) argue that the function of leadership should be an inherent component of all professional nursing roles. All nurses need to be given an opportunity to influence their work environment, define their own practices, and make available their expertise throughout the organisation.

Though the significance of leadership is evident, the search for the most effective leadership style is still in progress. Chambers (2002) and Vance (2004), have recently suggested that the qualities required by the individuals leading health care in today's context are those of a transformational leader. The development of nursing competencies that incorporate concentration on technology, scientific methods, critical thinking, and technical skills have become a primary focus and this transition must be affected by strong transformational leadership. This focus on the development of critical thinking and a collaborative, empowering, and transformational approach has drawn attention to the need for new and efficient leadership skills (Leddy and Pepper, 1998).

Present and future nurse leaders must have professional attributes that enable them to see the 'big picture' in health care and the place of the unique contribution of nursing within that milieu. They need to have personal qualities, enabling them to articulate this vision and win the hearts and the minds of their teams in a commitment to driving and shaping the changing agenda in partnership with, and for the benefit of, patients and clients. However, at the same

time, they must be able to draw upon a repertoire of practical skills (both managerial and clinical) so as to take the lead in turning the rhetoric into reality (Chambers, 2002; Vance, 2004).

According to Davidhisar (1993), transformational leaders possess charisma. They demonstrate confidence, an exceptional enthusiasm towards their personal commitments, and an ability to relate to others. To attain the vision, leaders must also provide the structure and process. Finally, transformational leaders are able to see situations from a perspective that questions basic assumptions (Dunham and Klafehn, 1990). Considering these qualities – the ability to identify and communicate a vision for the future, the ability to articulate and gain commitment to shared values, and the ability to empower colleagues to work towards achieving organisational goals – the model of transformational leadership appears to be precisely what is needed for today's nursing profession (Dunham-Taylor, 2000).

During the last decade, transformational leadership styles have been used as a foundation for extensive studies of nursing. These studies have examined the theory of transformational leadership, its components and links, and investigated the connection between theory and result factors. Prominent result factors were leader efficiency according to team perception, the degree of staff and nurse job satisfaction, and staff and nurse retention rate. The population of most of these studies consisted of nurse executives, which is the highest function on the nursing hierarchy in hospitals. Only a small part of the studies were conducted with mid-level nurse administrators.

McDaniel and Wolf (1992) tested the transformational leadership theory and found its comprising factors to be similar to leadership qualities described in magnet hospitals. They agreed with the sentiment that this leadership strategy, which helps move workers toward self-

actualisation, is exemplified by visionary leadership, and thus has the great potential to help address the current crisis in health care. In 1995, another study was conducted by the same investigators on a larger population, and identical results were yielded. Interestingly, both nurse executives and mid-level nurse administrators scored higher on measures of transformational than transactional leadership.

Medley and Larochelle (1995) found a relationship between head nurses exhibiting transformational leadership style and the job satisfaction of their staff nurses. Their study indicated that transformational leadership styles promote retention and prevent turnover in the ward, an important economic implication for hospitals. These investigators were persuaded to the proposition that exploration of transformational and transactional leadership styles in leadership courses and workshops for nurses and administrators would be a beneficial development. The exploration, they believed, could lead to a better understanding of the components of effective nursing leadership.

Dunham (2000) studied management practices of top nursing officials in hospitals across the United States. Nearly four hundred nurse executives in all fifty states were surveyed. Findings indicated that leaders who use the transformational style usually encourage creative problem-solving and decision-making at various levels within the organisation. These leaders empowered their employees to assume greater responsibility for developing innovations and improving performance. Moreover, the employees under nurse executives employing transformational leadership practices had much higher job satisfaction. Finally, the nurse executives' superiors, who were also questioned in the study, reported significantly higher overall work group effectiveness among transformational leaders than among their transactional counterparts.

Dunham (2000) specified the main benefits of transformational leadership in the setting of the hospital ward. First, satisfaction among nurses often results in positive behaviour, better interaction, and volunteered retention. Secondly, empowering employees is integral to transformational leadership and results in effective performance. Finally, involving employees in the decision-making process has positive results. The rationale of transformational leadership suggests that the more power is given, the more power is possessed.

Overall, Dunham's study (2000a) found that nurse executives who held higher degrees were more likely to be transformational, suggesting that advanced education may enhance such characteristics. Dunham (2000b) also noted that larger hospitals tend to have more transformational leaders and that employees usually look for job opportunities in hospitals that allow them to continue with the same leadership style. Support for these findings is found also in studies by McDaniel and Wolf (1992), Dunham and Klafehn (1994), and Morrison, Jones and Fuller (1997).

Recently, many authors (Manfredi, 1996; Cliford, 1998; Fox, Fox and Wells, 1999; Agich and Foster, 2000) have highlighted the leadership function of the head nurse. These investigators contend that in order to make a significant impact on performance and goal achievement, especially while pursuing new reforms and strategies, head nurses must be able to inspire, challenge, motivate and unite staff in a common purpose. However, very few, if any, empirical studies have tested the extent of head nurses' engagement in leadership in their day-to-day work.

Leadership is in fact the most important aspect of a head nurses' activity (e.g. Mintzberg, 1994; Sanchez, Siler and Houston, 1995; Manfredi, 1996; Fox et al., 1999). For example, Fox et al. (1999) examined the impact of the head nurses' time devoted to leadership on the unit's

personnel productivity. Findings indicated that of all activities the head nurse might be occupied with, executing leadership contributed most substantially to unit productivity.

Despite the importance of executing leadership found in Fox et al.'s study and those of others, the reality of the situation presents a different picture. Drach-Zahavy and Dagan (2002) studied the job of the head nurse as it plays out in real life. Specifically, they strove to depict the essence of what head nurses do and how they perform their managerial tasks. The work behaviour of 48 head nurses was examined with a semi-structured observation technique of six hours each. The results of the study highlighted several important aspects of the head nurse's role. First, it was found that head nurses engage extensively in clinical practice. Second, they exhibit an inter-unit orientation, focusing more on the internal aspects of their job (managing care) than on the external ones (promoting the unit's interests by presenting them to the management). Third, although leadership is considered the head nurse's most important role, findings demonstrated that leadership occupied only 10% of their time. These findings concur with conclusions come to by Mintzberg (1994), that head nurses, in actuality, exhibit a management style oriented to maintenance rather than to re-creation, focusing more on the 'doing' and the 'here and now' aspects of the job than on leading, planning, and proactive problem solving (Mintzberg, 1994).

The findings of Drach-Zahavy and Dagan (2002) and of Mintzberg are consistent with other, prior studies. Mackay (1989), for example, found that the most valued attribute of a nurse in charge was 'being approachable'. Smith (1992) reported that the 'ideal' nurse has a 'caring side'. Furthermore, many authors insist that as head nurses emerge from patient care into management, they often attempt to manage people as they have managed patient care. Thus

they neglect the leadership role, for not all patients are 'led' (Duffield, 1994; Agich and Foster 2000; Laurent, 2000).

While some theoreticians see the two functions of caring and leading as conflicting, others view them as coinciding. Head nurses may consider leadership in nursing as a caring kind of work, for example caring for their nurses as they have cared for their patients (Mintzberg, 1994). We have seen theories espousing similar views on the nurturing role of the leader (e.g. especially the transformational theories of leadership).

Finally, other authors have highlighted the linking function in the head nurse's role. For example, McCloskey, Bulechek, Moorhead and Daly (1996), discerned an important function of nursing in its 'glue function'; namely that it is nurses who maintain the holistic overview of the care given to the patient by all members of the health care team. The linking function is perceived as closer to caring and hence as 'natural' to nursing. In our research context, nurturing is integral to the nursing profession. Feeding, sustaining, supporting, and caring are all 'feminine' activities, central to nursing. Therefore we may conclude that despite the fact that head nurses do not currently execute proactive leadership, they being wrapped up in caring and nurturing, it is nonetheless precisely this caring and nurturing that can be used as a springboard to more effective, transformational, techniques of leadership.

Summary

In summary, business leadership and nursing leadership are compatible, and can be spoken of as working along the same lines. While the areas of leadership may be different, in other words where leadership shows its face and plays a part, the substance of leadership stays the same - regardless of whether one deals with life or death situations and one does not, or whether the goal of one is self-perpetuation and the earning of money and that of the other is to serve the

public good. The sphere of leadership in nursing is in the responsibility of involving the doctor, and arranging and implementing care plans and interventions.

Most of the studies investigating the connection between transformational leadership and nursing have indicated a positive correlation between transformational leadership and organisational outcomes. The retention rates as well as team satisfaction and overall work group effectiveness, as assessed by nurse executives' superiors, has been found to be much higher among transformational leaders. Currently head nurses do not employ effective leadership techniques, as they arrive in their leadership positions straight from nursing. Nursing fills a nurturing and holistic role, and when nurses reach management positions they have not had substantial experience in leadership. However, studies have indicated that women in general employ more transformational techniques in leadership, and that these are themselves greatly related to a holistic and nurturing approach. Therefore there is room to assume that with some training nurses may find themselves employing better leadership techniques, thus improving results and creating a more positive and proactive atmosphere.

To be a successful leader requires many diverse skills. Nobody has all of them. In fact, nobody needs them all at the same time and in every situation. There are many types of successful leaders and many ways to do the one great thing. There is surely a style of leadership that suits each person's unique characteristics, and other people with complementary qualities and strengths, with whom each leader can partner. In the same way, we may say there is surely a style of leadership appropriate for each profession and walk of life. The transformational approach to leadership, in this case, seems to be the most suitable approach for nursing leaders, especially at this time of upheaval and change in the health care world. The reasons for this assessment are that the head nurse takes with her the nurturing she employed while as a staff nurse, and nurturing plays a large part in this type of leadership; and that in a time of change

and reform in the health care system, transformational techniques are most effective at getting the job done. This thesis would like to expand this way of thinking by illustrating why, and in which direction, the nursing curriculum can enable nursing leaders or potential leaders to use each of the precise leadership styles that is right for them at the right time.

The current thinking in organisational management looks for new ways of coping with constant change. However another aspect of leadership styles are the cognitive processes involved in them. As contemporary research emphasises, these cognitive processes, which include information processing, screening options, decision making, and others, are determined by brain functioning. The cognitive processes involved in brain functioning have very much to do with Brain Dominance theory, which asserts that different sides of the brain process different kinds of information, and control the vast array of cognitive processes. This research study scheme on the topic of leadership would be deeply lacking without an in-depth discussion on (and later on an application of) brain dominance. Novel and creative thinking, required for managing change, are the product of an integrative use of both hemispheres of the brain. This managing of change is the underpinning of leadership in general and transformational leadership especially. It therefore constitutes the link to the argument on the importance of considering brain dominance; brain dominance will now be taken up as the topic of discussion.

5. Brain dominance

The brain is the ultimate source of all human behaviour. Our individually unique brains are physically created by a combination of both our genetic resources and our socialisation (Hart, 1983; Ornstein and Thompson, 1984). The human brain, in its present form, evolved in three distinct stages: first developed the reptilian brain, then the limbic system, and finally developed the modern part of the brain, the cerebral cortex. In humans, the cerebral cortex constitutes about 80% of the brain's mass (MacLean, 1978).

The limbic and cerebral brain systems are each divided into interconnected hemispheres. The corpus callosum connects the two halves of the cerebral cortex, and the hippocampal commissure interconnects the two halves of the limbic system. The dual structure of the brain, known from the ancient times, has always triggered thoughts concerning how it functions. Hence, the concept that one side of the brain might sometimes be dominant over the other side, was first introduced by the Greek physician Hippocrates (Herrmann, 1988). The double structure of the brain was interpreted as dual functioning. It was Galen, who around 200 CE asserted that the left hemisphere controls verbal processes, while the right hemisphere controls nonverbal processes (Ornstein and Thompson, 1984).

Thousands of years later, modern scholars have founded and discussed left brain/right brain cognitive theory. In a series of landmark studies in the 1960's (1961, 1964, and 1968), neurosurgeon Michael Sperry demonstrated the disparity of the brain's hemispheres. This line of research presents at least two modes of thinking that the human being may employ. These modes are popularly called right brained thinking, in which the right hemisphere of the brain is dominant, and left brained thinking, in which the left hemisphere is dominant (Power and Lundstern, 1997). Consequently, these hypotheses have been validated and confirmed by modern research until by now they are considered established fact (Mintzberg, 1976; Ornstein, 1977; Doktor, 1978; Robey and Taggart, 1981; Agor, 1984; Taggart, Robey and Kroeck, 1985; Waber, 1989; Sonnier, 1990; Allinson and Hayes, 1996).

Much of our understanding of localised brain functions stems from Sperry's original research. Studies time and again have shown a correlation between the loss of specific capabilities, such as past memory loss, loss of speech capabilities or motor skills, with head injuries in different areas. In his research, Sperry conducted studies on epileptic patients who had undergone

severance of their corpus callosum. His deduction was that in severe cases, the left and right hemispheres had been split into two independently acting cognitive processing units. In agreement with Gallen's observations of old, he found that verbal processes were regulated by the left side and nonverbal ones by the right side (Sperry, 1961, 1964, 1968). Furthermore, each hemisphere only received the tactile and perceptual experiences of the body's opposite side. The left brain, in other words, received the tactile and perceptual experiences of only the body's right side, and vice versa. Others of Sperry's experiments (1964) showed that the disparity between the split hemispheres was not limited to matters of perception and memory, but also included emotion and arousal.

Sperry's ground-breaking work and that of others, have established the connection between neuro-physiology and cognitive psychology. According to this disciplinary fusion, there exist at least two major methods for arriving at decisions in the human brain, these being right brained thinking and left brained thinking. This means that inter-human differences in cognitive style may be due to differences between them in how their brains have accomplished left and right hemispheric specialisations (Sperry, 1964; Luria, 1966; Gazzaniga 1967, 1970; Bogen, 1975; Riding, Glass and Douglas 1993; Power and Lundstern, 1997).

Many researchers later expanded Sperry's findings, such as Luria (1966), Gazzaniga, (1967, 1970, 1975), Bogen (1969), Levy and Trevarthen (1976), Wonder and Donovan (1984), Mintzberg, (1976), Ornstein (1977), Doktor (1978), Robey and Taggart (1981), Agor (1984), Taggart et al. (1985), Waber, (1989), Sonnier (1991), and Allinson and Hayes (1996). While some in recent years have regarded this split-brain formulation as an oversimplification (Rao, Jacob, Lin, Robey and Huber, 1992), others, for example Languis (1998) and Languis and Miller (1992), continue to report patterns of brain mapping research which are consistent with Luria's (1980) theory of brain functioning.

Other studies along the same lines include, but are not limited to, Warren (2003), Collins and Cooke (2005), Landis (2006), Kang (2005), Miller, Miller, Bloom, Hynd, and Craggs (2006), and Singh (2006).

These studies, which span from the 1960's to the present decade, have fully demonstrated the difference between the two hemispheres, and the set of facts showing that the left hemisphere operates on a more analytical level, while the right hemisphere uses a more holistic, spatial approach. Each hemisphere has its specific mental abilities that are lateralised and coordinated. The left side is analytical, abstract, verbal, logical, sequential, concrete and rational; the right brain is intuitive, non verbal, concrete, spontaneous, integrative, holistic, visual and symbolic.

Moreover, electroencephalographic (EEG) surface measurements of brain electrical activity also demonstrate that various tasks elicit measurable differences in mental activity levels in different parts of the brain (Herrmann, 1988, 1995; Ornstein and Thompson, 1984). This research yet again drives home the difference in cognitive functioning between the left hemisphere and the right. However, notwithstanding all this significant research, one point is important to keep in mind: Irrespective of whether the left brain/right brain analogy is proven scientifically correct, it does nevertheless serve as a useful metaphor for describing and classifying actual cognitive differences of this nature.

Findings attributing verbal and non-verbal information processing to different hemispheres have led to the characterisation and reification of these two thinking styles. Verbalisation encourages a thinking style that is much more category-oriented, sequential, and prone to logical reasoning. This is the left hemisphere. The second cognitive/ thinking style, more associated with the right hemisphere, is more flexible in its ways of acquiring information, manipulating information

through patterns rather than sequential strings and arriving at conclusions when patterns become evident rather than through linear sequences (Power and Lundstern, 1997).

More recent research takes the existence of hemispheres and the fact of their differentiation for granted. These studies simply assume these to be true, or set out to once again prove them true in yet another area of research. An example of the former type of study is that of Turk, Heatherton, Macrae, Kelley, and Gazzaniga (2003), an examination of the nature of the self. They argue that even in the disconnected brain of the split-brained patient, there exists a left hemisphere 'interpreter', which holds the task of generating a sense of consciousness. This study takes as a given the different roles of the two hemispheres, and seeks to further map out their various roles and functions.

An example of a study that seeks to prove the existence of the hemispheres and their different roles in a new setting is that of Adamson and Hellige (2006). In this study, the two authors examine Urdu-English bilinguals and conclude that fewer errors occur in the reading comprehension of words presented to the right visual field/left hemisphere than vice versa. This present study seeks to prove the fact established by Sperry (1961, 1964, 1968), that verbal processes are regulated primarily by the left hemisphere.

Another type of study regarding hemisphericity takes an existing psychological or perceptual problem or question and supposes that the solution can be found in an examination of the neural phenomenon. An example of such a study is that of Bourne and Todd (2004), in which they consider the bias women and girls show to hold infants to the left side of their own body. They posit that this is the case since the left visual field connects to the right hemisphere, which among other things is concerned with the perception of facial emotional expression. In this they seek an explanation to a known observable fact in the study of hemisphericity.

Brain dominance theory is based on research showing the aforesaid different specialties of the two hemispheres. Herrmann, a major researcher and theorist in the field, revealed differences of this sort. People, he found, use different sides of the brain to process different kinds of information. However, he further made the very important and decisive point that while all humans use both sides of the brain, most prefer learning strategies that are associated with one side or the other. Thus, some people are considered to be left brain dominant, while others are right brain dominant. Still others, Herrmann found, have more balanced preferences and may be considered to have bilateral dominance (Herrmann, 1988).

As previously noted, the limbic and cerebral brain systems are each divided into interconnected hemispheres. According to Herrmann's partitioning, these four physical areas (left cerebral, left limbic, right limbic, right cerebral) form the basis for a quadrant model of the human brain. These four physical areas parallel four thinking styles or four quadrant preferences. The quadrants according to Herrmann are: quadrant A - the upper-left cerebral area, quadrant B - lower-left limbic area, quadrant C - lower-right limbic area, and quadrant D - upper-right cerebral area (1995). This brain-based quadrant model is aligned with and supported by considerable research on the localisation of brain functions (Power and Lundstern, 1997). It has developed, as was mentioned above, into a very useful metaphor, however this does not take away from its scientific virtuosity.

As such:

- Cerebral left thinking (quadrant A) is characterised as logical, factual, critical, rational, analytical, quantitative, authoritarian and mathematical. It represents preferences for analysing, solving problems, and obtaining facts.

- Limbic left thinking (quadrant B) is described as technical, data collecting, conservative, controlled, sequential, articulate, dominant and detailed. It indicates preferences for arranging and organising, being procedural, precise, and control-seeking.
- Limbic right thinking (quadrant C) is characterised as musical, spiritual, talkative, symbolic, emotional, intuitive regarding people, and prone to reading at a personal level. It signifies emotional, spiritual and intuitive preferences (Herrmann, 1988).
- Cerebral right thinking (quadrant D) is described as creative, innovative, intuitive regarding solutions, simultaneous, synthesising, holistic, artistic and spatial. It represents preferences for risk-taking, imagination exercises, and new experiences ((Peschanel, 1988; Watson, (1998).

Hermann innovated that most people display preferences among the hemispheres and quadrants, that some people will prefer one hemisphere over another or a quadrant or quadrants over the others. One person might be right-brained, meaning he or she prefers to use the right hemisphere over the left; another might prefer limbic right thinking and cerebral left thinking, while another cerebral right thinking - at the expense of the others. An important caveat to emphasize in this classification of humanity is that no preference is ever at the total expense of the others. It should not be inferred that this one who prefers cerebral right thinking, and therefore loves being creative and holistic and artistic, will never employ her limbic left quadrant and pick up her room. No one never uses the non-preferred hemisphere or quadrants. Rather, they use their preferred quadrant perhaps 75% of the time, and their other three quadrants to varying extents and in varying circumstances the other 25% of the time.

Finally, whole brain thinking must now be explained. This type of thinking relates to processing information by both hemispheres, all four quadrants, and thus likewise incorporating them. Integrated processing functions in a complementary manner, views the whole picture, and

considers a variety of circumstances. A working partnership between the two hemispheres indicates that one or the other is dominant depending on the activity (Peters and Waterman, 1982). This integrated thinking exceeds hemispheric dominant thinking (Carthey, 1993). Global cognitive style is characterised by a tendency to synthesise parts to form a whole (Woltz, 1978).

Brain dominance and gender

Gender is perhaps the most significant variable in the differentiation of brain dominance. In all the cited research studies, consistent differences were found between males and females with regard to brain dominance. On the whole, men are more left brain oriented, whereas women are more right brain oriented (Wallace, 1992; Craycraft, 1999) Thus, gender has proved to be a significant predictor of brain dominance (de LaCoste and Holloway, 1982)

Research on brain functioning suggests some gender differences. It is widely assumed that the two hemispheres are more asymmetrically organised for speech and spatial functions in men than in women. This idea has evolved from several sources. First, the controversial findings of de Lacoste and Holloway (1982) suggest that the back part of the corpus callosum, an area called the splenium, is larger in women than in men. The interest in the corpus callosum arises from the assumption that its size may indicate the number of fibres connecting the two hemispheres. Presence of a greater number of connecting fibres in a particular gender implies fuller communications between the hemispheres, or in other words, whole brain thinking.

With the fact of the corpus callosum being larger in women, it may now be understood how other studies may indicate that while men are left brained thinkers, women are more balanced, whole brain thinkers. Studying leadership among educational administrators, Norris (1984) suggested that women were more characteristically whole-brained than men. Soler (1991) also found female school superintendents to reveal a more holistic brain dominance profile.

These two conclusions are buttressed by findings from laboratory experiments performed by Kimura (1992). The studies focused on perceptual techniques, and they indicate that in normal-functioning people brain asymmetry is sometimes less in women than in men. Moreover, damage to one brain hemisphere sometimes has a lesser effect in women than a comparable injury in men. Overall, women prove more affected by damage to the anterior region of the right hemisphere than by posterior damage. Men tend to display the reverse pattern. Slight gender differences were also found in more abstract verbal tasks. For instance, vocabulary test scores were affected by damage to either hemisphere in women, but only by left-sided injury in men. This finding suggests that when reviewing the meanings of words, woman use the hemispheres more equally than men.

Brain dominance and learning style

Research on learning style has its origins in educational research, and Keefe (1979) substantially differentiates it from cognitive style. He does so by referring to cognitive style as consistent patterns in the manner in which people perceive process, store, and use information.

Learning style, on the other hand, is considered according to Herrmann's typology, as an explanation for individual differences in learning styles information processing, and decision-making. Moreover, Keefe (ibid.) argues that cognitive style consists of broad terms such as including cognitive, emotional and physiological preferences. Campbell (1991) notes that even as the two terms mean different things, they are nonetheless used synonymously in the professional literature, even while this leads to significant confusion.

That said, Herrmann's typology, suggesting an explanation for individual differences in learning styles, information processing, and decision-making, has been in fact eagerly adopted

by educators and learning psychologists. Many studies have aimed to link the quadrant model to learning styles. From the 1970's there has been a growing interest in applying the concept of cognitive/learning styles to educational settings, particularly to methods of teaching and learning (Dunn and Dunn, 1979; Dunn, DeBello, Brennan, Krimsky and Murrain, 1981; Newstead, 1992; Kang, 2005). This has led to the formation of strategies designed to enhance the learning process.

Other studies explored the relationship between brain dominance and the characteristics of education professionals. Wallace (1992) studied brain dominance and work perceptions of educational administrators. Findings showed that subjects were remarkably balanced in brain dominance, displaying a slight preference for left hemispheric thinking. The controlling, administrative B quadrant was generally the most preferred. The emotional, interpersonal C quadrant was the least preferred. Sonnier, (1991) explored brain dominance profiles of teachers. Teachers in gifted education had a significantly higher preference than teachers in regular education for D-quadrant and right brain functions. Teachers in regular education showed a significant difference in A-quadrant, B-quadrant, and left brain functions.

Summary

Summing up, brain studies have been a great boon for advances in cognitive psychology. Starting with research performed in the early Sixties, it has been learned that the brain may be split up into four distinct quadrants, and that each of these quadrants control certain aspects of human behaviour. Quadrant A, the left half of the cerebral cortex, is responsible for analytic activities; quadrant B, the left half of the limbic system, is similarly responsible for organisational activities; quadrant C, the right half of the limbic system, is responsible for emotional activities; and quadrant D, the right half of the cerebral cortex, is responsible for a

human's imagination. In addition to this quadratic division being scientifically valid, it stands on its own as an important and useful cognitive postulate.

Furthermore, it has been shown in numerous studies how the brains of people can, and do, tend towards a certain domination of one or more of the above quadrants. Therefore it is helpful to describe a person's styles of cognitive processing as either the quadrant A style, the quadrant B style, and so on. Owing to the similarity of the two left quadrants to one another and the two on the right to one another, common nomenclature is to call a person 'right-brained', if that person is right-brain dominant, or 'left-brained', if that person is left-brain dominant.

It has been seen how there exist gender differences with regard to brain dominance. On the one hand studies have shown that men are more left-brained and women are more right-brained. However, research has discovered that the female's corpus callosum is larger than that of the male's, and this brings about more communication between the two. This heightening of communication causes women often to be more whole-brained.

Research has lead to the discovery of relationships between brain dominance and individual learning styles. This research gave way to looking into how brain dominance impacts on educational administration.

6. Brain Dominance and leadership

Research points to a relationship between brain dominance and individual learning styles and teaching styles (Campbell, 1989; McCarthy, 1987, 2000; Sonnier, 1991). Whilst most studies have been confined to the area of educational psychology, it has also been recognised as a concept that has the potential to make an important contribution to management practice

(Streufert and Nogami, 1989; Hayes and Allinson, 1994), cognitive styles (Woltz, 1978; McCarthy, 1987, 2000; Campbell, 1989; Shoemaker, 1991) and creativity (Gowan, 1979).

With the development of the cognitive theory of brain dominance, there emerged the suggestion that hemispheric dominance dictates not only thinking styles but also behaviour patterns (Power and Lundstern, 1997). A major topic explored in the area of organisational development is leadership. Lately, this topic has begun to be studied in the context of brain dominance. Some studies have taken place in educational institutions. Leadership styles and brain dominance were studied among selected school superintendents in Texas. Findings showed that educational leadership was predominantly left brained, utilising leadership skills of organising, administrating, planning, and controlling (Soler, 1991).

Educational leaders were compared to corporate leaders regarding brain dominance and training style preferences. Findings revealed significant differences between brain dominance mean scores of educational and corporate leaders, with preferences shown for right and left hemispheres, respectively. On the other hand, both groups demonstrated a strong preference for right brain training program formats (Cicchetti, 1991).

Creative leadership and brain dominance were studied among selected educational administrators. The sample comprised superintendents, principals, and supervisors. Positive relationships were found between two management skills and specific areas of brain dominance (conceptual = right brain; technical = left brain). Superintendents were strongly oriented towards a left-hemispheric style and exhibited more developed technical than conceptual skills. Principals exhibited a balance in left or right brain dominance and a high level of perceived innovation. As a group, principals were ranked highest in conceptual skills. Supervisors, the most balanced of the three groups studied, ranked highest in human skills (Norris, 1984).

Thus, research indicates that brain dominance may suggest indications of a person's leadership style. Some studies portray how individuals who prefer left-hemispheric processing are task-oriented and those who prefer right hemispheric processing are people-oriented (Piatt 1983; Agor, 1984; Herrmann, 1988). Another differentiation divides leadership styles into either initiating structure styles or considerate styles (Halpin, 1959; Stogdill, 1974).

Toth (1997) studied cognitive and leadership styles of school superintendents. The results showed that 53% of the subjects preferred left-hemispheric processing, 30% preferred right-hemispheric-processing, and 17% preferred integrated hemisphericity. Superintendents who preferred right-hemispheric processing (conceptual, synthesising, interpersonal and holistic) usually demonstrated a preference for a considerate leadership style and were people-oriented. However, the majority of superintendents, preferring left-hemispheric processing, did not demonstrate a preference for initiating a structured (task-oriented) leadership style.

These findings regarding superintendents were also supported by Craycraft (1999), who asserted that a changing environment requires conceptualisation skills that enable leaders to cope with the necessity to take risks and accept changes. School superintendents own a more authoritative leadership style suited to the use of the left hemisphere, which prefers the controlled, organised and more logical processes.

Craycraft (1999) found significant differences in brain dominance patterns between male and female leaders, with males again showing stronger preference for left hemisphere (technical) and females for right hemisphere (conceptual) skills. Studying brain dominance and work perceptions of educational administrators, Wallace (1992) attributed the most significant variance to gender. Males were found to be more left hemispheric, A-quadrant dominant, while

females were more right hemispheric, C-quadrant dominant. In spite of significant differences in thinking styles, an interesting congruence was shown by Wallace in the rating of work dimensions, with leadership rated first by both genders.

Similar findings to Wallace's (1992) and Craycraft's (1999) have been shown by Cicchetti (1991), whose focus of study was educational and corporate leaders. Significant differences were found between brain dominance mean scores of male and female leaders, with groups showing a stronger preference for left and right hemispheres respectively. Interestingly, fewer differences were found between corporate males and females than between males and females in educational administration roles. While there were no significant differences between education administrative and corporate males, moderate differences were found between education administrative and corporate females.

Organisations, health care, and whole-brained thinking

Organisations are purposeful, rational, and structured entities, in this way just like people. Research suggests applying Herrmann's typology of the four quadrants to an organisational setting. Accordingly, it has been found that currently, the nature of organisational functions and routines heavily favour left hemispheric processing. As a result, right brain processing, which has been found to correlate positively with creativity (Gowan, 1979) is usually left out (Agor, 1985; Mintzberg, 1976). Recently, some researchers have pointed out that one of the missing leadership characteristics is, in fact, creativity (Wonder and Donovan, 1984; Martinsen and Kaufmann, 1991; Agor, 1991; Toth, 1991; Martinsen, 1993; Martinsen, 1994; Martinsen, 1995; Herrmann, 1995; Martinsen, 1997). The literature is full of references arguing that future leaders must be comfortable with using both hemispheres of the brain as they manage organisations and employees (Mintzberg, 1976; Agor, 1985; Taggart et al., 1985). Hence, it has

been recommended time and again by these above authors that right brain functioning attributes be included in management training programmes.

Besides creativity, innovation is another critical element of organisational realities. Both are mysterious, uncontrollable forces, and for this reason leaders, in their quest for order and clockwork, have shunned them. However it is the very challenge of leadership to create a climate that encourages both creativity and innovation as well as order and productivity (Klemm, 2000).

Successful innovative leadership has been found to relate to integrative brain processes. Leaders espousing innovative willingness are better adjusted to changing reality and are more mentally and emotionally balanced (Kean, Leary and Toth, 1993). Research indicates that at the top management levels, right brain and integrative brain skills characterise effective leaders (Johnson and Daumer, 1993; Spinola, 1988). Likewise, the competitive imperative for virtually all businesses today is 'innovate or become extinct' (Leonard and Straus, 1997).

Similarly, Blodgett (1988) found that organisations achieving higher rates of growth have more right brain dominant presidents. These executive leaders tend to build executive teams with divergent thinking style preferences that complement one another and compensate for areas in which the managers have low preference. Interestingly, and significantly, the composite thinking styles of successful management teams were characterised as balanced across the whole-brain.

Leadership and management development programs abound in the market. Educational institutions, management training institutes/centres, and consulting firms offer a variety of programmes and services that cater to competency needs of leaders, executives, managers and

supervisors from business corporations, service organisations and institutions. The training programmes consist of different plans for various functional skills, personality types/styles, and types of training-learning configurations. Most of these are designed and developed around frameworks, themes and processes reflective of a particular theory or paradigm. Moreover, utility of types in training for interpersonal and interaction skills (and for personal growth) is needed beyond doubt (Herrmann, 1988, 1995; Aiken, 1990; McClure and Werther, 1993; Hequet, 1995)

People differ in their preferences. Yet we have seen the preferability of leaders and even management teams for being whole-brained. In order to increase the effectiveness of management in its current manifestations, it would be desirable to develop its capabilities in styles for which preferences are low. Diagnosing leaders' brain dominance styles has made it possible to apply simple and effective techniques for increasing mental performances. Applying rational and strategic thinking process should enable people to handle issues and opportunities (Herrmann, 1988).

Herrmann's Brain Dominance Instrument (HBDI) is such a means to diagnose brain dominance style. It is used by many organisations for individual, team-work, and organisational purposes. An individual can identify his or her own style and gain insight into the ways in which such preferences unconsciously shape leadership style and communication patterns. Teams can benefit from a whole-brained approach. They should not concentrate on one particular cognitive style. They may have a wide repertoire for decision making and problem solving. Thus, using just the right brain or the left brain is not enough; it is best to use the whole brain (Leonard and Straus, 1997).

Creativity is not the exclusive province of one side or the other. Innovation is the product of differences in opinions, attitudes, and cognitive styles. A cognitively diverse environment generates innovation (Leonard and Straus, 1997).

Some organisations, such as General Electric, the U.S. Navy Procurement Command, Procter and Gamble, and National Semiconductors have applied Herrmann's typology, putting the institution's 'whole brain' to work using the HBDI. Although every organisation did so in a different way, in all companies mental processes affected business results. In all cases, the intervention success was measured differentially, based on financial results, timely project completion, the development of outstanding customer relationships, or the unleashing of an organisation's creative potential (Herrmann, 1985).

Innovation in such a context of unleashing potential is a major challenge for the health care system. Kerfoot (1998) suggests that leadership in the health care sector should be concerned with successfully carrying out creative and innovative change. For this to be achieved whole brain thinking is required. As Kerfoot puts it,

> *The challenge for us is to constantly transform and rewire our brains through the creativity process and to rewire the processes of the places where we work. We know that we can cultivate and energise our organisations through the interplay of serial, parallel, and quantum thinking processes. But we can't wait. Health care and the world of nursing are changing rapidly. We need the creative processes to build the change needed for the future for the care of our patients.* (p. 98)

Kerfoot (1998) goes on by saying,

> *Leadership is the leading of creativity that leads to creative change. To innovate or die is the question that faces our health care future. It is no longer enough for us to*

> *operate with just our serial, mathematical thinking. We must also be concerned about the spirit and the heart and how we integrate this into whole brain thinking.* (pp. 98-99)

In sum, the field of nursing is in need of renewal in the form of a more dynamic leadership, and it is precisely a firm grasp of the architectonics of leadership with the strategy of the integration of whole-brained thinking into leadership that has been proposed to serve in filling this need. If the basis of transformative leadership is transactional leadership, and if transactional leadership centres in the left hemisphere of the brain while transformative leadership centres in the right hemisphere, then it would be well to locate the core of this renewal in nursing leadership in a combination of the use of the two hemispheres.

7. Summary Chapter II

The scheme of this chapter was to first describe leadership, and from there to describe the other topics of this research, the learning organisation and systemic thinking, gender, and finally brain dominance. Interspersed throughout, as chapters in their own right and as appended sub-chapters, we have attempted to consistently explicate the connections of the various other topics upon leadership as described firstly, and upon the field of nursing, sufficiently described in Chapter I.

This scheme was selected on the grounds that leadership and nursing are the main foci of this research; we attempted throughout to answer the current need of improving the quality of the nursing leadership for the sake of the entire nursing profession. Therefore, the thinking goes, it was incumbent upon us to account for all various other factors bearing on these two arch-categories. The most important of these has been, of course, the study of brain dominance, in how the two disparate hemispheres of the cerebral and limbic system can work together to

produce the best results in leadership of other human being. In other words, how knowledge of a person's brain dominance profile can help in predicting that person's aptitude for leadership.

Henceforth are presented summaries of the field of leadership as described above, along with of the aforesaid other topics in their own right and in how they relate to leadership and modern nursing.

Leadership

This thesis serves to better the leadership within the modern nursing profession by seeking a synthesis of the most up-to-date research upon brain dominance and the best of the theories pertaining to leadership. These theories described in this paper regarding leadership, as we have seen form a hierarchy based on time and complexity. In other words, those mentioned first, not only were formulated before those mentioned afterwards, but also owing to their coming later in time are more complex. The factor of complexity covers two distinct directions: The first of these is a description of the effective leader for the sake of classifying potential leaders; the second, which developed later in time, attempts also to implement effective leadership techniques upon current leaders.

Thus the first three leadership theories were the Great Man theory, Trait theory, and Behavioural theory. Each one adds an element to the construct. The Great Man theory stressed that leaders are born, not made, and therefore the task of identifying a leader is simply comprised of noticing his or her achievements. Trait theory focuses more on the traits of a leader, enabling selection based on prior characteristics and not retrospective achievements. The Behavioural theory of leadership spurns talk of traits as these are too difficult to identify, ephemeral perhaps, rather preferring to identify leaders based on their behaviour in actual circumstances.

Situational theories of leadership move beyond the Behavioural theories by including in what makes effective leadership the situation in which the leader is found. The innovation of these theories is that not only does the leader act upon the environment, the environment also acts upon the leader. Contingency theories, on the other hand, add that it is not only the situation that acts upon the leader, but rather a vast array of contingencies. The upshot of these is that there is no one right kind of leader, as there might be according to situational theories and all their predecessors; instead the appropriate leader is required for one appropriate task and another leader is appropriate for another.

Finally, the most up-to-date research on leadership is concerned with the distinction between transactional leadership and transformative leadership. The distinction between the two was conceptualised by Burns (1978) and utilised most by Bass and Avolio starting in 1985. Transactional leadership concentrates on reinforcing the importance of exchange. The worker fulfils his charge and the leader duly rewards him. Transformational leadership, on the other hand, motivates others to do more than they originally expected to do, not for any tangible reward. The leader is seen as an agent of change, not only for the sake of an end product, but for all those involved.

Bass and Avolio formulated their research upon leadership into one encompassing theory: The Full Range of Leadership model. This model includes transactional and transformational leadership along with laissez-faire leadership, a dysfunctional style lacking even the transactional quality. Along with these styles they include a theorisation of the outcomes in real life that they engender, and composed the MLQ, a survey instrument that measures leaders upon a scale of transaction and transformation.

The learning organisation and systemic thinking

The learning organisation comes as opposed to the traditional model to management, in which only the higher echelons of the organisation plan and create, while the lower levels carry out the plans and show no creativity of their own. In this more innovative model, each element of the organisation is responsible for the planning and problem solving for the level at which it is found. According to the scheme learning takes place at every level; the implication being, it may be said, that the amount of total learning and contingency planning is greatly increased. As should be clear, this increase of creative forces is seen as a tremendous boon for the organisation's competitive edge and total productivity.

The type of learning going on in a learning organisation has been characterised as proactive learning, which is not merely responsive but more so ideologically motivated (Starbuck, 1983). It is in the organisation's best interest to encourage this type of learning amongst its constituents, setting up conditions for this sake, and inculcating among the constituents a shared vision and the skills to work well as a team (Senge, 1990). The learning organisation has on this basis come to the forefront of approaches for perseverance against the vicissitudes of change (Argyris, 1977; Senge, 1990).

Systemic thinking, as per Senge (1990), is the comprehensive basis for effective and holistic organisational learning. It basically stipulates that in order to learn effectively, two levels of activity must work together. First, on the micro level, each part of an organisation must be delineated, marked off from its surroundings, and reified into a functional and theoretically self-sufficient organism. Second, each one of these organisms must be systematised and secured into the organisation. This means that all parts must be concretised to work in tandem.

For lack of systemic thinking, the organisation will suffer from outbreaks of the silo effect, in which one problem solved in one area leads to the failure of an element in another area. Systemic thinking rectifies this deficiency by ensuring that all parts have clear and disambiguated goals, and that there is no overlap between them. Furthermore, all links are continually sending feedback to their respective next-higher link on the hierarchy. The relations of the levels of this hierarchy to one another are regulated according to the system. These regulations contribute to the organisation's narrative, the central idea according to which all the doings of the organisation may be summarised (Sennett, 1998). By means of this narrative, and the systemic thinking that underpins it, all of the parts of the organism work in tandem and harmony, learning as they go and applying what they learn.

The health care system, for example, is in need of applying the tenets of the learning organisation and systemic thinking, for their ability to accommodate change and restore an ethos of a common goal. Once the health team is able to identify and arrive at its individual learning pattern, it may experiment with new learning methods and expose itself to new sources of knowledge. It constitutes a means to examine and challenge the strongly-held beliefs and opinions held, and the existing working procedures carried out, by the learning team and the entire learning health organisation. Only by challenging these, by means of employing the lessons of the learning organisation and systemic thinking, will the modern health organisation thrive.

Gender

In this paper, the subject of gender is discussed upon the level of social and emotional interpersonal abilities, communication styles, and cognitive styles. At the heart of any discussion of gender lies the basic conclusion that what moulds the modern perception of the matter is a combination of cultural and biological factors. As Bem (1993) puts it, gender

characteristics originate in the interpretation by human beings of the biological differences between the sexes. For our purposes Koestner and Aube (1995) substantially agree with this conception. While none of the differences according to the aforesaid categories between the genders are so large or positively unbridgeable, it is nonetheless a fact that humanity has an almost ingrained need to classify all persons according to their respective sex.

Researchers have found provocative evidence of the social and emotional differences between the sexes. It has been found that in general women are more capable at interpreting the encoding and decoding of nonverbal messages than men (Riggio). On the flipside, people interpret the same sign differently according to whether the signifier is male or female (Condry and Condry, 1976). Regarding emotional particulars, women have been demonstrated to be more sensitive, extraverted and anxious than men. Men, on the other hand, have been shown to be more aggressive, assertive and power-seeking.

It has been seen how the subject matters of communication differ along gender lines. Starting out with those of children, young females express more often a desire to be liked, while their male counterparts have more of a need to boast. Along these lines many differences have been found (Tannen, 1990). However the thread that runs through these observations is traceable in adults as well, as men seek underlying meanings in others' communication upon matters of status, while women seek these meanings upon matters of intimacy (Wood, 2001).

Many cognitive differences have been found between men and women. Here being analytical and disorganised for men counters for women being intuitive and organised (Kimura, 2000). While these types of differences are sometimes difficult to attribute to the separate causes of environment versus biology (Sadler-Smith, 1999), these differences nonetheless are remarkable. For instance, men do better with problems of spatial relations and mathematics.

Many of these cognitive differences have recently been attributed to real physical differences between the male and female brains. The most significant of these is that among women the corpus callosum is larger than among men. This part of the brain is the major connector between the two hemispheres of the cerebral cortex. Other research has found significant results regarding hormones.

Finally, it must be reiterated how and why gender has a very important role to play in the present research. It has been found that women and men approach leadership in different ways, men usually being more transactional and women more transformative. On the face of it this differentiation bodes well for the nursing profession, as it has been composed historically and up to the present day as female-dominated. However, the hurdle that must be cleared in order for these women to take the lead in nursing leadership is that nurses have generally approached leadership as they have their job, in other words, as nurturers and not as initiators. Therefore the cure for this deficiency is for nursing leaders to be encouraged to perform leadership under the demands of whole-brained thinking. They must be encouraged to approach leadership as the head of any other organisation would, as creative and reliable initiators, albeit with perhaps an added emphasis on nurturing, this being the hallmark of nursing historically and today.

In summary of Chapter II, from the standpoint of gender, we have presented analyses of the two main topics of this research, leadership and brain dominance, and how they bear on the peculiar profession of nursing, female-dominated and nurturing based. This research now takes the turn, in Chapter III: Methods, of describing in depth the various and important elements of Bass and Avolio's Full Range of Leadership model, as well as of Herrmann's Brain Dominance Instrument (HBDI), and of then describing fully how we have applied them for the sake of

identifying nurses with great potential for leadership, and identifying for nurses how to improve their leadership.

CHAPTER III - Methodology

This chapter begins by restating the key arguments, purposes and aims of the present study. Afterwards, it refers to the chosen methodology tradition and the research method. The chapter explains the development and refinement of the measurement instruments used to measure leadership styles and brain dominance. Included are descriptions of the nurse participants (first line managers) and instrumentation, of the design and statistical analysis, and of procedures for hypothesis testing. Issues concerning the data collection and the analysis process are also raised. Also discussed are the procedures taken as to ensure trustworthiness. The chapter also refers to the study's ethical concerns. A selection of other studies that have run along the lines of similar methodology is also included.

This study was conducted at the Chaim Sheba Medical Centre, a central metropolitan teaching hospital in Israel, affiliated with a major medical school with a long history of medical and nursing education. See detailed description in the Introduction.

The present study is designed to determine brain dominance characteristics and leadership styles of first line managers and to examine the correlations between preferred brain hemispheric processing of first line managers, as established by the Herrmann Brain Dominance Instrument (HBDI) and their preferred leadership styles, as measured by the Multiple Leadership Style Questionnaire (MLQ) 5x.

The current study hypotheses

1. There will be a correlation between personal brain dominance cognitive styles and leadership styles of first line managers.
2. Assuming that Hypothesis 1 is supported, it may be possible to predict leadership styles and outcomes among the study population (with leadership styles and

outcomes as the dependent variable and the four quadrant profile scores as the independent variable).

3. First line managers will use mainly the transformational leadership style and may achieve better outcomes.
4. Leadership styles will be different among right and left brained participants of the study.
5. Lower mode (B and C) brain dominance will be found among most of the first line managers' population.

1. The chosen methodology tradition and research method

Health services research applies a variety of methods (Jenkinson, Coulter and Bruster, 2002). The following review describes very briefly examples in the context of the nursing realm.

Most studies examining primary nursing focus on outcome variables such as enhanced patient-staff satisfaction with care and perceived autonomy and quality of care, whereas only limited research has examined processes of development (Drach-Zahavy, 2004). This research method focuses on studies exploring the job of the expert and/or the first line nurse manager.

Benner (1984) studied the process of becoming a nurse. In her analysis of observations reported by nurses in actual practice, she applied a model of skill acquisition. Her study compared clinical performance and situational performance of beginning and expert nurses. Paired interviews were conducted with beginning nurses and nurses recognised for their expertise. These nurses (21 pairs) were selected from three hospitals. A series of four two-hours, small-group interviews were held with four to eight experienced nurses from different patient care units within the same hospital. Individual interviews were conducted with 51 experienced

nurses and participant observations were made on 26 of these. The interviews were conducted by experts, they were tape recorded, and verbatim transcripts were made for textual analysis.

Drach-Zahavy and Dagan (2002) explored the context of leadership among first line nurse managers. More specifically, they studied how first line nurse managers perform their managerial role. In this study, the work behaviour of 48 first line nurse managers were examined by a semi-structured observation technique of six hours each. Participants in the study were 48 first line nurse managers of departments in various hospitals in Israel. Research methods used were those of semi-structured observation.

In another study, Drach-Zahavy (2004) explored the impact of primary nursing care delivery models on the performance of nurses. Three hundreds and sixty eight nurses from a variety of wards completed questionnaires that assessed the degree of primary nursing on their unit, the support practices of their direct supervisor and their perceptions of the cost of seeking support from the supervisor. In addition, the direct supervisor evaluated the nurse's performance in the unit. Results showed that the interaction of primary nursing with the supervisor support was most predictive of performance.

Gedsana (2002) studied the role performance as expert clinician among professional nurses. The subjects were 85 first line nurse managers and 223 staff nurses practicing in all nursing sections with experience of more than five years. The research instruments used for data collection were the Biographic Data Questionnaire and valuing and role performance as expert clinician. Results showed that first line nurse managers scored a high to highest role valuing in regard to specific domains, management of change, administrating therapeutic interventions, quality assurance and organisational and work role competencies, and helping, teaching, and diagnosis.

Riba and Reches (2002) explored the performance of professional nurses under the threat of daily terror. In their article they described discussions that took place with four focus groups consisting of emergency room nurses who had recently cared for victims of terror. The task of gathering the groups together was arranged through first line nurse managers – the latter chose the members and the mixture of focus groups (emergency rooms, intensive care units, etc.).

2. The current research approach

The survey approach

The social survey is a method of social research in which investigators attempt to gain a representative sample of a given population, or indeed may sample the entire population and gain data from self report. A survey is an investigation in which information is systematically collected, but in which the experimental method is not used (Abramson, 1990).

The aim of the survey activity is eliciting equivalent information from an identified population. The kind of information sought by a survey may be straightforward 'facts', attitudes or opinions, at the time of the survey approach. A survey is regarded as a mean by which one can document, analyse and interpret past and present attitudes and behaviour patterns.

The purpose of a survey is to give a research basis for collated description or comparison. Among the strengths of the survey approach are: the breadth of coverage (the possibility of approaching a large number of respondents); generalisability and/or comparability (depends on sampling) and the descriptive power (the rich factual information). The weaknesses of this approach are the shallow coverage, the indifference for 'sensitive' issues and the scope for bias in the cases of flawed samples. In some way then generalising from the survey findings can produce seriously biased statements (i.e. it is not in fact a true representation of the 'identified population') (DeVaus, 2002).

Correlational research

Human behaviour at both the individual and social level is characterised by great complexity. One approach to a fuller understanding of human behaviour is to begin by testing out simple relationships between those factors and elements deemed to have some bearing on the phenomena in question. Correlational techniques are generally intended to answer three questions about two variables: Is there a relationship between the two variables? If yes, what is the direction of the relationship? And finally, what is the magnitude/strength of the relationship?

Relationship in this context refers to any tendency for two variables to vary consistently. Correlational studies may be broadly classified as either 'relational studies' or as 'prediction studies'. In the case of the first of these two categories, correlational research is mainly concerned with achieving a fuller understanding of the complexity of phenomena or, in the matter of behavioural and educational research, of behavioural patterns, by studying the relationship between the variables which the researcher hypothesises as being related.

In contrast to exploratory relationship studies, prediction studies are usually undertaken in areas having a firmer and more secure knowledge base. Prediction through the use of correlational techniques is based on the assumption that at least some of the factors that will lead to behaviour to be predicted are present and measurable at the time the prediction is made (Borg and Gall, 1983).

Questionnaires

The essence of the questionnaire, as research tool, is that it is in the hands of the respondent and is completed by him or her. The effective use of a questionnaire as a research tool is gained

through the following: ensuring that the questionnaire will be clear and comprehensible to the desired respondent; getting the questionnaire into the hands of the appropriate respondent; motivating the respondent to complete and return the questionnaire; and making effective administrative arrangements for the return of the questionnaire's to the present researcher reference (Presser, Rothgeb, Couper, Lessler and Singer, 2004).

3. Participants

The population of this study consisted of eighty unit nurse managers, working as head nurses at the Sheba Medical Centre. They were recruited from all hospital departments. Most of them were female (five males). The average age was 44.38 years old (SD = 9.48). The length of nursing practice averaged 21.49 years (SD =10.12) while average length of experience as head nurse reached 9.59 (SD = 8.87). All nurses were registered, with educational levels ranging from non-academic (registered nursing school is not considered academic) to MA degrees (high school = 13 participants; BA degree = 37 participants, and MA degree = 30 participants).

4. Ethics

The study faces several ethical concerns: personal informed consent, confidentiality, anonymity, non-traceability, personal risk, and credibility.

Personal informed consent – Participants were personally requested to participate in the study. They were personally informed about the study's nature and purposes; and they personally and voluntarily gave their consent to participate in the study. All participants could withdraw at any stage.

Maximising personal confidentiality – The study guaranteed confidentiality by avoiding access or transference of data, and by paying attention to keeping the data secure.

Guaranteeing anonymity and non-traceability – Steps for guaranteeing anonymity and non-traceability were taken. Guaranteeing anonymity and non-traceability were critically important for two reasons. 1. The scope of participants was limited 2. All participants were well known in their professional milieu. Names of participants, and colleges and other functionaries, are therefore symbolised.

Minimising participants' risks – The study was mainly interested in factual information, concerning private information and beliefs. All participants were appointed to their roles, and their beliefs and personal attitudes were well known, so they were not in a risky situation, and their position was not under threat.

Credibility – There was a diminished problem of credibility as all participants approved of their participation, the analysis and the interpretations, as suggested by Simons (1989) claiming that

> *Key individuals will always be identifiable, at least to those within the case. This may be just as threatening or more . . . than being identifiable to those outside the case to whom the study might be disseminated.* (p. 117)

In the present study, not only was informed consent guaranteed, but also the research process did not betray confidentiality (Morse, 1994; Cohen, Manion and Morrison, 2000).

5. Instrumentation

Three self-assessment instruments were used in this research: the HBDI for measuring brain dominance, the Multifactor Leadership Questionnaire (5x-short) for measuring transformational and transactional leadership styles and outcomes (Bass and Avolio, 1995), and a demographics questionnaire.

The present study is presumably the first to employ both the HBDI and the MLQ concurrently. Were this enough; the use of other data-gathering methods, such as interviews, and integrative

and qualitative methods, was decided against, for the reason that such a load would be over and above the resources of just one researcher. Nevertheless, the present researcher decided to use a large number of subjects specifically to offset this lack of additional methods, and also to offset other nursing studies that question a smaller number of subjects. The fact that the Chaim Sheba Medical Centre at Tel HaShomer is in fact that largest medical centre in the Middle East and is affiliated to the State universities, allowed us the resources to test eighty subjects without having to resort to requesting information from other medical centres. The present study's population reflects the mid-level nurses, a very important population in the doings of hospitals.

These instruments partially appear in the appendices as follows:

1. The Herrmann Brain Dominance Instrument (HBDI) (Herrmann, 1982) (Appendix 1)
2. The Multifactor Leadership Questionnaire MLQ (Form 5X- short) (Avolio and Bass, 1995) (Appendix 2)
3. Demographic questionnaire (Appendix 3)

These instruments will now be examined and detailed.

The Herrmann Brain Dominance Instrument (HBDI) (Herrmann, 1982)

The HBDI is a 120-item questionnaire comprising a variety of questions concerning individual performance on work elements and self-description of best and worst areas, hobbies, energy levels, motivation, sickness, handedness, and personal preferences (Herrmann, 1982). The responses to such questions were weighted in the scoring of the instrument.

During the 1960s, research on the corpus callosum caused scientists to postulate a view of the relative capabilities of the two halves of the human brain. Both hemispheres are involved in higher cognitive functioning, with each half specialising in complementary fashion for different

modes and different types of thinking, both highly complex. The main emerging theme suggests two modes of thinking, verbal and nonverbal, represented by the left and right hemispheres respectively (Sperry, 1973).

Newer evidence found by Levy (1983) shows that the mode of processing used by the right brain is rapid, complex, whole-patterned, spatial, and perceptual, and therefore are not only different from, but complementary to, the complexity of the left brain's verbal, analytic mode. It was also found that the two modes of processing interact with each other, preventing maximal performance. Further evidence showed that the left hemisphere mode is verbal and analytic, while the right hemisphere mode is nonverbal and global. As Restak (2001) states, the bipartite brain is organised to process emotions alongside logic. The HBDI, it may therefore be said, measures how a person uses each of his or her hemispheres, and how in that case emotions interact with logic.

Reliability and validity - The HBDI is considered to be a valid, reliable measure of human mental preferences (Bunderson, 1995). The instrument was found reliable and the overall pattern of HBDI scores appears to be fairly stable. Empirical data on test-retest stability were collected by Ho (1988). In this thesis, 78 repeated measures of the same people were taken in a large data set. Test-retest reliabilities were calculated. Reliabilities were found to be high. They were as follows: left - .96; right - .96; A quadrant - .86; B quadrant - .93; C quadrant - .94; D quadrant - .97; cerebral - .93; limbic - .91.

The HBDI was developed in the early 1980s and a series of studies validated it. However, it has to be noticed that none of these were studies in the health sector. Three factor analyses were performed for establishing the external construct validity of the instrument. The first used an early version of the instrument and two scores: overall left and overall right (Bunderson and

Olsen, 1980). The second factor analysis used the same version as the first, but employed a new scoring procedure (Bunderson, Olsen and Herrmann, 1982). The third factor analysis (used in this study) uses a new instrument, a battery of cognitive ability tests, several instruments measuring personality dimensions, as well as learning and thinking styles and strategies (Olsen and Bunderson, 1980).

Two preliminary studies established internal construct validity. The first involved item factor analysis of 439 cases in which Herrmann's holistic scores were found valid. Through this study, a new instrument, and a new scoring procedure were developed (Bunderson and Olsen, 1980). In the second study, eight thousand HBDI Instruments were item-factor analysed. The results substantiated the internal validation results of the earlier studies and showed that all new items functioned properly (Ho, 1988).

Since the early 1980s, a variety of studies and several dozen dissertations at a number of universities have used the HBDI. Senior investigators have employed it in studies, providing evidence for external validity related to other behaviourally measured constructs. In addition, some studies have been conducted to validate inferences about actual brain processing in persons with different HBDI profiles (Bunderson, 1995).

Construct validity - Two decades of validation research have provided much support for and confidence in HBDI use. For the purposes of internal construct validation, four distinct clusters of preference and avoidance are measured by the HBDI. These four clusters are consistent with the descriptions of the quadrant model of brain processing. The instrument's scores are reliable. The internal factor structure consists of two bipolar second order factors and a single bipolar third order factor.

When it comes to external construct validation it is known that the left vs. right score and the four quadrant scores correlate in a pervasive and predictable way with the mental processes involved in measures of other constructs: personality types, Myer's-Briggs Type Indicator (MBTI), cognitive style, cognitive abilities, and learning styles (Bunderson, Olsen and Herrmann, 1982).

The bipolar factors internal to the HBDI are also found in first, second, and third-order factors in batteries of instruments that cut across these different instrument types. The quadrant constructs thus have explanatory and predictive powers well beyond the HBDI item types.

While HBDI scores share predictable variance with speeded cognitive ability factors, introversion/extroversion, and the tendency to use different learning strategies, these separate as distinct factors in properly constructed test batteries. By contrast, the Myers-Briggs Type Indicator and other high-order measures of pervasive personal styles load on the same bipolar factors as HBDI scores. They appear to be different rotations of item clusters which, while developed based on different theoretical models, may ultimately be explainable by a common set of constructs.

Limitations - Along with the ubiquitous limitations that come with using a questionnaire, the HBDI is subject to several limitations that must be aired:

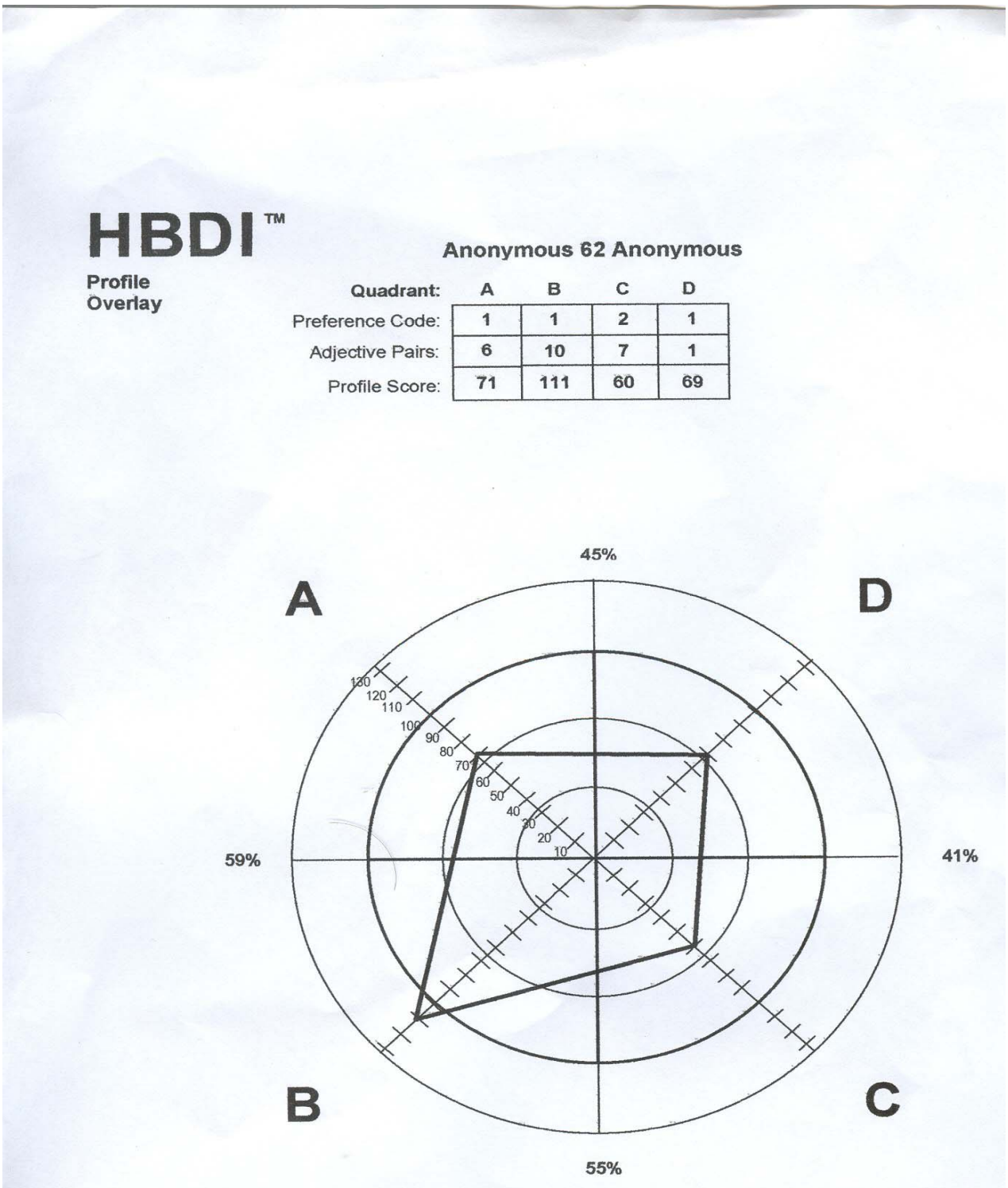
- The HBDI absents itself from assessing conative orientations, concentrating solely or primarily on cognitive orientations. This means that while it evaluates a subject's cognitive abilities, it does not evaluate the subject's will to act or change. This point is raised in Bentley (2001).

- There does not seem to be an accurate means of scaling the four quadrant scores so as to compare the scores of a patient (Bunderson, 1995). The validity of the Herrmann Brain Dominance Instrument) (HBDI).
- Researchers applying the HBDI are not given access to the item weightings for any portion of the questionnaire. While it is understandable that this should be proprietary information, it is also unfortunate, as the weightings' disclosure would permit greater accuracy with regard to generating scores for the individual quadrants.

Scoring: The Brain Dominance Instrument (HBDI) measures - The main independent constructs of the HBDI are the four quadrant scores. Yet there are nine main scores derived from the HBDI: left and right dominance, the four quadrant scores, cerebral and limbic preferences, and introversion/ extroversion. There are also several minor scores useful in making certain inferences, as well as the sought-after construct of balance referred to as being 'whole-brained' (Bunderson, 1995).

Some studies use only four scores, one of each possible thinking style. The scores are converted into rankings for easy recall and use: 1 = prefer, 2 = use, and 3 = avoid. An individual's HBDI profile is reported in numbers and graphics. See Illustration 1 for an example of an individual scoring of the present study using this ranking.

Illustration 1: HBDI Profile Overlay – Anonymous 62



Three kinds of scores are calculated for each quadrant.

1. The Preference Code consists of four numbers placed in the order of the quadrants, ABCD. Primary – 1 = prefer, (score of 67 or above) in a given quadrant, indicates a

distinct preference for the types of activities relevant to that quadrant. Every profile has at least one primary score, but could have as many as four. A result above 100 represents a very strong preference, often easily recognised by other people. Secondary – 2 = use (scores of 34-66 inclusive) indicates thinking modes that are comfortable and available, when necessary in relative cases. This is still a preference, but clearly secondary to the primary. Tertiary – 3 = avoid (scores under 34) indicates a lack of interest in the mode of thinking, and for some even an avoidance of that mode of thinking. This means that this mode of tertiary quadrant, although available, will be the least likely to be used. In a profile, a tertiary reinforces the preferences of the primary situated diagonally opposite it. In short, the scores are converted into a ranking for easy recall and use. An individual's HBDI profile is reported in numbers and graphics. For example, a person's profile might be a 1-1-2-3 or 1-2-1-2 with quadrants always listed in the following order: cerebral left, limbic left, limbic right, cerebral right (Power and Lundstern, 1997).

2. Adjective Pairs are a result of 24 forced choice pairings on the HBDI, where a person has to select one of two adjectives as best describing him or her (0-24). The highest numbers of these four scores often indicates where thinking shifts in pressured situations.
3. Profile score of 10 to 150 calculated for each of the four quadrants. These are indicated as the profile score. The higher the score, the stronger the preference for that quadrant. All such quadrant values are read in the ABCD order starting in the upper left.

Brain dominance quadrant characteristics

Quadrant A: Logical, Analyser, Technical, Mathematical, Problem Solver

Quadrant B: Organisational, Administrative, Conservative, Controlled, Planner

Quadrant C: Interpersonal, Emotional, Musical, Spiritual, Talker

Quadrant D: Artistic, Holistic, Imaginative, Synthesiser, Conceptualised

Illustration 2: Quadrants profiles

Quadrant A	**Quadrant D**
Logical	**Artistic**
Analyser	**Holistic**
Technical	**Imaginative**
Mathematical	**Synthesiser**
Problem Solver	**Conceptualised**

Quadrant B	**Quadrant C**
Organisational	**Interpersonal**
Administrative	**Emotional**
Conservative	**Musical**
Controlled	**Spiritual**
Planner	**Talker**

Important: The following are not actual profiles. Although they rarely occur in nature, they help gain a sense of each quadrant's influence and the relative preference compatibilities and incompatibles.

Right brain D+C – Interpersonal, Emotional, Musical, Spiritual, Talker, Artistic, Holistic, Imaginative, Synthesiser, Conceptualised

Right-mode

Right-mode is the left-handed, right-hemisphere mode. This mode is curvy, flexible, and more playful in its unexpected twists and turns, more complex and fanciful. Those leaders who prefer right brain processing are process oriented, view problems as opportunities, consider feelings first, may have difficulty following through on tasks, need quiet time and personal space, promote brainstorming and group decision-making, and take risks (Mintzberg, 1976). For

example, Honey & Mumford (1992) found that writers, artists, musicians, nurses, and entrepreneurs tend to be predominantly right brained.

Illustration 3: Right brain

Quadrant A

Quadrant B

Quadrant C + Quadrant D
Artistic
Holistic
Imaginative
Synthesiser
Conceptualised
Interpersonal
Emotional
Musical
Spiritual
Talker
Feeling-based

Left brain A+B – Logical, Analyser, Technical, Mathematical, Problem Solver, Organisational, Administrative, Conservative, Controlled, Planner

Illustration 4: Left brain

Quadrant A + Quadrant B	**Quadrant D**
Logical	
Analyser	
Technical	
Mathematical	
Problem Solver	
Organisational	
Administrative	
Conservative	**Quadrant C**
Controlled	
Planner	
Fact-based	
Quantitative	
Detailed	
Sequential	

Left-mode is the right-handed, left-hemisphere mode. This mode is square, upright, sensible, direct, true, hard-edged, and forceful. People with left or right brain dominance (preference) are more 'comfortable' with that sort of thinking than the other. For example, Honey & Mumford (1992) found that lawyers, engineers, bankers, and bureaucrats tend to be predominantly left brained.

Upper mode = A+D – Logical, Analyser, Technical, Mathematical, Problem Solver, Artistic, Holistic, Imaginative, Synthesiser, Conceptualised

Based on Herrmann's model, those whose thinking is dominated by the upper left brain tend to be logicians most concerned with the question 'What?'. Upper right-sided thinkers are the visionaries who ask 'What if?'.

Illustration 5: Upper mode - Cognitive

Quadrant A + Quadrant D

Logical, Analyser, Technical, Mathematical, Problem Solver

Artistic, Holistic, Imaginative, Synthesiser, Conceptualised

Quadrant B **Quadrant C**

Lower mode = B+ C - Organisational, Administrative, Conservative, Controlled, Planner, Interpersonal, Emotional, Musical, Spiritual, Talker

Lower right-sided thinkers deal with the question of 'Why?' and are perhaps best defined as collaborators. Lower left brained people are implementers or organisers, who address the question 'How?'

Illustration 6: Grounded - Limbic

Quadrant A **Quadrant D**

Quadrant B + Quadrant C

Organisational, Administrative, Conservative, Controlled, Planner

Interpersonal, Emotional, Musical, Spiritual, Talker

The Multifactor Leadership Questionnaire (Avolio and Bass, 1991, 1995)

The Multifactor Leadership Questionnaire (5x-short) (MLQ) is a 45-item, 5-point Likert-type scale. The MLQ is used to evaluate how frequently, or to what degree, first line managers believe that their behaviours are. The MLQ survey is a comprehensive, 360-degree report, completed by the leader/manager, measuring a full range of leadership styles. The leadership types, here factors, include laissez-faire leaders, leaders giving contingent rewards to followers, and leaders transforming followers into leaders. While there are other measures for the measurement of the Full Range Leadership model, the MLQ is the most prevalent.

The MLQ consists of twelve sub-scales (Avolio and Bass, 1995). Nine sub-scales are used to measure components of style, while the other three sub-scales are outcome measures for leadership style evaluation (outcomes). These factors will be detailed below. The self-scoring MLQ (Form 5X) uses 45 items to measure twelve sub-scales. These items are rated using a 5-point Likert scale with anchors labelled as 0 = not at all, 1 = once in a while, 2 = sometimes, 3 = fairly often, 4 = frequently, if not always.

As identified above, three factors, transformational leadership sub-scales, transactional leadership sub-scales, and outcome sub-scales, are examined in this study. The Multifactor Leadership Questionnaire (5x-short) (Bass and Avolio, 1995) is used to obtain leadership scores. Descriptions of transformational and transactional leadership sub-scale items are presented. Response options for the MLQ range from 0 (not at all) to 4 (frequently, if not always).

Reliability and Validity - The MLQ is widely accepted as a valid and reliable questionnaire. Reliabilities are reported in the 1995 MLQ Technical Report, based on the initial set of nine

samples of participants (n=2154). Reliabilities for the total items and for each leadership factor scale ranged from .74 to .94. All of the scales' reliabilities were generally high. Reliabilities within each data set have indicated that the instrument (MLQ Form 5X) measures each of the leadership factors across the initial nine data sets reliably (Bass and Avolio, 1997).

Since Burns's groundbreaking publication (1978) on transformational leadership, there have been extensive further research, development, and practical applications of the subject. More than two decades of work have yielded a comprehensive tool, which contains influencing behaviours characterised as leadership types (Avolio, Bass and Jung, 1999). The MLQ has been used extensively worldwide. It has been shown to be valid across cultures, for different organisational types, and at different organisational levels (Bass and Avolio, 2000).

The MLQ was developed through painstaking and extensive research (Whitelaw, 2001). The instrument provides a high level of testability by containing performance measures of staff satisfaction, performance, and extra effort. Replicability is confirmed by the consistency of results across a wide variety of organisations and institutions. Extensive use across organisations and countries has assured precision of findings and generalisability (findings are consistent across different settings) of the MLQ. The debate about the MLQ confirms that the instrument has been scrutinised and validated by objective, disinterested parties (Whitelaw, 2001).

Den Hartog, Muijen, and Koopman (1997) found that 'reliability (alphas) for the sub-scales of Transformational Leadership ranged from a = .72 to a = .93, Transactional Leadership ranged from a = .58 to a = .78, and laissez-faire was a = .49' (p. 27). Correlations for transformational and transactional sub-scales were all significant at $p < .01$. Laissez-faire and passive management-by-exception correlated positively with each other, but negatively with all other

dimensions, including active management-by-exception. Den Hartog et al. also wrote that, consistent with other findings, correlations among the Transformational Leadership scales were somewhat strong (r = .67 to r = .75). However, in this instance, contingent reward correlated almost as high as active management-by-exception (r = .39) as it did with the Transformational Leadership sub-scales (r = .40 to r = .50). These studies have shown that upon reassessment of the same people, results are the same; thus making the MLQ a reliable instrument.

Howell and Hall-Marenda (1999) tested the reliability and validity of the MLQ when they undertook a study to determine the impact that leader-follower relationships had on performance. The authors used all MLQ sub-scales, except laissez-faire. They also noted that the aggregated reliability for the Transformational Leadership sub-scales was a = .93. Reliabilities for the following sub-scales were: contingent reward, a = .95; active management-by-exception, a = .86; and passive management-by-exception, a = .90.

Factor structure – Here the factor structure of the MLQ is explicated. The current version of the MLQ presents a full range of assessment of leadership behaviours, from transformational to transactional and passive/avoidant. Recent studies revealed a factor structure made up of nine MLQ dimensions, sufficient for covering the richness of the full range of leadership issues (Whitelaw, 2001).

In a recent work, Bass and Avolio (1997) analysed the factor structure of the latest MLQ version (Form 5X). A total of 3,786 respondents in fourteen independent samples, ranging in sise from 45 to 549 in U.S. and foreign firms and agencies, completed the questionnaire. Based on prior literature, nine models, representing different factor structures, were compared to determine the best fit for the MLQ survey. This turned out to be represented by six lower-order factors and three higher-order factors.

Those factors proposed in Bass's (1985) model and their operational definitions are provided below.

Two correlated factors:

Transformational leadership – charisma - IIA and IIB, inspirational, individualised consideration and intellectually stimulating leadership

Developmental/Transactional – contingent reward

Third un-correlated factor:

Corrective Avoidant – management-by-exception and laissez-faire leadership

Questions about the MLQ have primarily involved correlations among the transformational leadership sub-scales and the transactional sub-scale of contingent reward. Bass (1985) as well as Bass and Avolio (1995) have argued for retaining this sub-scale within the transactional leadership grouping. This position stems from Bass's contention that leaders can be both transformational and transactional. They offered the following explanation for the high correlations. First, both transactional leadership and transformational leadership represent active, positive forms of leadership. Second, leaders have been shown in repeated investigations to be both transactional and transformational. Third, as Shamir (1995) argues, the consistent honouring of transactional agreements builds trust, dependability, and perceptions of consistency with leaders by followers, which are each a basis for Transformational Leadership.

Intercorrelations among each of the higher order factors also provide further evidence for discriminate validity. Transformational leadership with developmental/transactional was .39 and with passive corrective leadership was -.73. Developmental/transactional leadership was .05 with passive corrective leadership.

In summary, the Confirmatory Factor Analysis (CFA) was used to determine whether the data from the initial and replication sample sets confirmed the proposed six-factor model of leadership. Findings showed that the factor structure of the MLQ was best represented by six lower order factors and three higher order factors.

Construct validity – The Full Range Leadership Model was developed to broaden the range of leadership styles typically investigated in the field. The recent form of the MLQ displays a full range of assessment of leadership behaviours (Bass and Avolio, 1995). For content validity, the nine MLQ dimensions are sufficient for covering the span of the full range of leadership topics, but not so extensive as to become incomprehensible and unmanageable (Whitelaw, 2001).

The Full Range Leadership model on which the MLQ is based, relates influencing behaviours to desired outcomes, these being extra effort, efficiency, satisfaction, and productivity (Avolio and Bass, 2002).

The current and revised version of the MLQ (Form 5X) has been studied extensively (see factor structure for results). Based on these findings, it seems that the new instrument covers the actual range of leadership styles and may provide a means for leadership assessment, training and development (Avolio and Bass, 2002).

Nearly two decades of research have proved the MLQ as predictive of preferred organisational outcomes, mainly of effectiveness. The hierarchical ordering of leadership constructs with respect to their relationship with performance, reported by Bass (1985) and further developed by Avolio and Bass (1991) argue that transformational leadership may be strongly correlated with effectiveness, followed by transactional and non-transactional styles.

In terms of performance, three recent meta-analyses of the military and broader organisational psychology literature have confirmed that the relationships between transformational leadership and rated, objectively measured performance were stronger and more positive than in transactional styles of leadership and the less active non-transactional laissez-faire leadership (Gaspar, 1992; Patterson, Fuller, Kester and Stringer, 1995; Lowe, Kroeck and Sivasubramaniam, 1996).

Limitations of the MLQ - The main complaint running through a large amount of studies using the MLQ is that the self-perception of the leaders answering the questionnaire may be different from the judgement of the leaders' subordinates regarding them. There is not included in the testing of the MLQ a mechanism to address this concern. The fact is, as would be expected, subordinates estimations of their leaders' qualities fall lower than those of the leaders' themselves (Miller, Miller, Bloom, Hynd and Craggs, 2006).

In two studies (Avolio, Bass, and Jung, 1999; Lievens, Van Geit and Coetsier, 1997), the possibility that MLQ scores are biased by social desirability, that leaders will rate themselves as leaders based on what they perceive the more desirable answers to be, is looked into. The conclusions reached in these studies are to the negative, that social desirability does not much bias scores; nonetheless, it is still a concern for testers.

Furthermore, the fact that the MLQ is based solely on questionnaires at all, and not on some other, more objective measure, can be considered a deficiency. In the specific case of the present study, the patients' satisfaction might have played a part in determining the leaders' quality of leadership.

This lack of a more sound system of objectivity, in the present sample, does not threaten the study's internal validity; however it might threaten the study's external validity or generalisability to other samples and populations (Lievens, et al 1997).

Scoring – Scoring of the MLQ was carried out by the leaders themselves, answering on each item using a frequency scale that ranged from 0 = not at all to 4 = frequently, if not always.

The MLQ score for each sub-scale, is the average score for all the items salient to that sub-scale. The score is derived by summing the items and dividing by the number that make up the sub-scale. All leadership style scales have four items, Extra Effort has three items, Effectiveness has four items, and Satisfaction has two items.

Sub-scales – The sub-scales, as divided into the three factors of Transformational leadership, Transactional leadership, and Outcomes, will now be explained. The item numbers corresponding to each particular sub-scale are listed as well.

Transformational leadership

The measures of the transformational leadership dimensions exhibit favourable psychometric properties.

1a + 1b. Charismatic Leadership CL or **Idealised Influence II(A)** and **II(B)** refers to the extent to which a leader's attitudes and behaviours translate into admiration, trust, and cooperation from subordinates. The two terms CL and II are used interchangeably in the literature, while II is in fact slightly more prevalent. A leader displaying II provides followers with a clear sense of purpose that is energising, is a role model for ethical conduct, and foments identification with his or her articulated vision. II involves getting followers to understand the leader's values, standards and goals. Transformational leaders behave in ways which turn them into role models for their followers. Followers identify with the leaders and want to emulate

them, while leaders are willing to take risks and are consistent rather than arbitrary. Idealised influence (attributed), or II(A), is behind items 10, 18, 21, 25; Idealised influence (behaviour), or II(B), is behind items 6, 14, 23, 34.

2. Inspirational Motivation IM. Transformational leaders behave in ways that motivate and inspire those around them, by providing meaning and challenge to their followers' work. Charismatic leadership and inspirational motivation usually form a combined single factor of charismatic-inspirational leadership. Inspirational motivation focuses on how leaders provide their subordinates with a sense of purpose that includes and transcends their own immediate self-interests. Inspirational motivation aims to help all team members achieve their individual and common goals. Inspirational leaders are generally charismatic. Inspirational motivation, or IM, is behind items 9, 13, 26, and 36.

3. Intellectual stimulation IS gets followers to question the tried and true ways of solving problems and encourages them to question the methods they use, so as to improve upon them. Intellectual stimulation is concerned with how leaders challenge their subordinates to resolve problems creatively and effectively refine their problem-solving methods. Intellectual stimulation, or IS, is behind items 2, 8, 30, 32.

4. Individualised Consideration IC focuses on understanding the needs of each follower and works continuously to get the followers to develop their full potential. Transformational leaders pay special attention to each individual follower's needs for achievement and growth by acting as coaches or mentors. Followers and colleagues are guided to successively higher levels of potential. Individualised consideration, or IC, is behind items 15, 19, 29, 31.

<u>Transactional leadership</u>

The three transactional leadership sub-scales are:

1. Contingent reward CR. This constructive transaction clarifies what is expected from followers and what they will receive in return for meeting expected levels of performance. It has been found to be reasonably effective, though not as effective as any of the transformational components, in motivating others to achieve higher levels of development and performance. Contingent Reward, or CR, is behind items 1, 11, 16, 35.

2a + 2b. Management-by-Exception MBE tends to be less effective than contingent reward or the components of transformational leadership. The corrective transaction may be 2a - active MBE(A) or passive 2b - MBE(P). In active MBE(A), the leader arranges to monitor deviances from standards, mistakes, and errors in the follower's assignments actively and to take corrective action as necessary. Management-by-Exception (Active), or MBE(A), is behind items 4, 22, 24, 27. Passive/Avoidant Management-by-Exception (Passive) MBE(P) implies waiting passively for deviances, mistakes, and errors to occur and then taking corrective action. Oftentimes, the person displaying this leadership sub-scale will avoid making any decisions at all. Management-by-Exception (Passive), or MBE(P), is behind items 3, 12, 17, 20.

3. Laissez-faire (LF) The most ineffective and passive leadership factor. Laissez-faire leaders avoid leading and let followers do what they want. They are 'loose' and permissive. Followers quarrel among themselves over authority. The leader is not perceived as an authority resource and the subordinates take their leader's place. Followers demonstrate indifference and lack of concern, in order to focus on achieving their personal goals, even if they contrast organisational objectives. Laissez-faire, or LF, is behind items 5, 7, 28, 33.

In addition, the MLQ also measures organisational outcomes to the leadership sub-scales; the willingness of followers to expend extra effort, effective leader representation of follower needs to higher-level leaders, unit effectiveness, job effectiveness, organisational effectiveness, and job satisfaction. In other words these outcomes act as predictors to the leadership sub-scales.

<u>Outcomes of Leadership</u>

Extra effort (EE) Getting others to do more than they expected to do, try harder and desire to succeed (items 39, 42, 44).

Effectiveness (E) Meeting job-related needs and leading an effective group (items 37, 40, 43, 45).

Satisfaction (SAT) Working with others in a satisfying way (items 38, 41).

The Full Range Leadership Model on which the MLQ is based, includes the factors of **transformational leadership style and transactional leadership style** and relates influencing behaviours to desired **outcomes**, such as **Extra effort EE, Effectiveness E, and Satisfaction S** (Avolio, Bass and Jung, 1999; Avolio and Bass, 2002).

In this research, the range of the MLQ questionnaire sub-scales reliability is between 0.56 – 0.79. Some of them are lower than those described in literature (0.74 - 0.94) (Bass and Avolio, 1995), but sufficiently satisfactory, since fewer items are included in the scales. Furthermore, item analysis shows that all items are correlated to the factor. Lower reliabilities were found regarding scales IC (0.46), LF0.48), and SAT (0.43).

The reliability of these factors is as follows: **transformational leadership style 0.83, transactional leadership style 0.53 (the reliability is higher = 0.66, if we do not count item 1, which was found as non-correlated to the factor). (Transactional leadership - Contingent reward CR* - (items 1, 11, 16, 35). The outcomes reliability is 0.80.** (See Table 1.)

Table 1: Reliabilities of sub-factors for transformational, transactional and outcomes in this research

	Entire sample
Transformational leadership style	
II(A) Idealised Influence (A = Attributed)	0.56
II(B) Idealised Influence (B =Behaviour)	0.57
IM Inspirational Motivation	0.66
IS Intellectual Stimulation	0.72
IC Individualised Consideration	0.46
Transactional leadership style	
CR Contingent Reward	0.60*
MBE(A) Management-By-Exception (A = Active)	0.68
MBE(P) Management-By-Exception(P = Passive)	0.62
LF Laissez-Faire	0.48
Outcomes	
EE Extra Effort	0.79
E Effectiveness	0.56
SAT Satisfaction	0.43
Main styles	
Transformational leadership style	0.83
Transactional leadership style	0.64
Outcomes	0.80

* As CR reliability was low (0.08 for the entire sample), it was decided to analyse the items. The findings showed that item 1 ('I provide others with assistance in exchange for their efforts'), decreased reliability significantly. Therefore, the item was removed from the CR

factor and the factor average was calculated without this item. The transactional (as a whole) factor average was calculated the same way as well.

Demographic questionnaire

Demographic variables of the respondent leaders were as follows:

1. Gender
2. Age
3. Length of service as a nurse
4. Length of service in current position
5. Highest degree achieved.

Demographic information was gathered in order to gather information regarding gender, age, educational level, and experience in nursing and administrative capacities (as a head nurse).

6. Procedure

Questionnaires were distributed to eighty unit nurse managers. Participants were first informed of the purpose and the procedure of this study. The unit nurse managers received written (Appendix 4) and oral explanations of the study's aims and the importance of their cooperation. Then, they were asked to sign the informed consent form in order to signify their approval of participating in this study. Participants were told that the questionnaires would be anonymous and were assured of secrecy and anonymity. The confidentiality of their questionnaire results was guaranteed. Each nurse received the questionnaire privately. The time necessary for filling out the questionnaire was between forty to fifty minutes. Questionnaires were collected in sealed envelopes within two weeks. Unit nurse managers not filling out the questionnaires received an additional explanation and were encouraged to do so. Questionnaires were filled out by unit nurse managers, using self-rating technique. All data was carefully maintained in the

researcher's closed cabinet and was used for academic purposes only. The questionnaires were coded so that the ward and associated data could be identified. After all the data was collected, it was analysed as follows.

7. Data analysis

The research data was analysed using descriptive statistics, t-tests, analysis of variance, correlations, and regressions. The correlations between the research variables, and these other measures of analysis, will be assessed in Chapter IV: Results.

8. Research variables

The independent variables are the brain dominance measures and the dependent variables are the leadership styles (Transformational leadership style, the Transactional leadership style and the Outcomes). In other words, we will be testing the correlation between the nurse's specific brain dominance make-up according to the HBDI, and her leadership style according to the MLQ. The basic hypothesis is that certain brain dominance patterns can predict certain leadership styles. It is important to bear in mind our contention, that one's brain dominance style bears on leadership style; this leads to the very helpful conclusion that a firm grasp of one's brain dominance style potential and capabilities can better direct a potential or actual leader to better leadership skills.

Chapter IV: Results/Findings

Prior to the hypothesis findings, the following data was examined among the current research sample.

HBDI - The profile score was calculated on the basis of two other scores, described in the methodology chapter: 1 = prefer, 2 = use, and 3 = avoid. An individual's HBDI profile was reported in numbers and graphically. (See above for an example of individual scoring using this ranking) which have within mathematical combination (Each item on the survey was part of a total profile score. The weightings cannot be disclosed for any portion of the questionnaire, as this is proprietary information).

Indeed, high correlations within the quadrants were found between the quadrant profile scores (Spearman correlation of 0.46 - 0.90) and the extent of use of a certain quadrant (Spearman correlation 0.45 - 0.80). As a result, it was decided that in order to perform data analysis, only the Profile score would be used, instead of the Preference Code and the Adjective Pairs.

Table 2: Intercorrelations between brain quadrants profiles scores

	4	3	2	1
Quadrant A(1)	**-0.55***	**-0.71***	**0.16**	**-**
Quadrant B(2)	**-0.61***	**-0.19**	**-**	
Quadrant C(3)	**0.12**	**-**		
Quadrant D(4)	**-**			

***p<0.001 two tailed**

Table 2 describes the intercorrelations between brain quadrants profiles scores. It shows that quadrant A is negatively correlated with quadrants D and C, while quadrant B is negatively

correlated only with quadrant D. In addition, the extent of use of different modes was measured for the right mode (quadrants C and D) and the left mode (quadrants A and B), the lower mode (quadrants B and C), and the upper mode (quadrants A and D).These scores were calculated as a specific percentage of the use of each mode in comparison to the opposing mode. This way, the measure of each mode ranged between 0 - 100 and the value was complementary to the opposite mode. Therefore, only two modes are presented, the right (as a complementary to the left mode) and the upper mode (as a complementary to the lower mode).

Research Hypotheses

The goal of this research was to examine the relationship of brain dominance and leadership styles of first line nurses and to test predictive information using two sets of predictors: self-rating measures of first line nurses' transactional leadership style, transformational leadership style, and outcomes (the full range Leadership styles and outcomes as one set of predictors); and their brain dominance (thinking styles).

The goal was achieved by investigating the following five hypotheses:

1. There will be a correlation between personal brain dominance cognitive styles and leadership styles of first line managers.
2. Assuming that Hypothesis 1 is supported, it will be possible to predict leadership styles and outcomes among the study population (with leadership styles and outcomes as a dependent variable and the four quadrant profile scores as an independent variable).
3. First line managers will use mainly transformational leadership style and gain better outcomes.
4. Leadership styles will be different among right and left brained study participants.

5. Lower mode (B and C) brain dominance will be found among most of the first line managers.

This research utilised two concepts, the leadership theory (transformational leadership, transactional leadership, and the outcomes) and the brain dominance theory (thinking styles), to analyse the relationship between these two variables.

The researcher selected two instruments, the full range leadership styles questionnaire, the MLQ for measuring transformational leadership, transactional leadership styles, and the outcomes, and the brain dominance instrument. Selected instruments were analysed and correlated with each other within eighty different first line department managers in a medical centre health care organisation.

1. Hypothesis 1

Hypothesis 1 stated that, 'There will be a correlation between personal brain dominance cognitive styles and leadership styles of first line managers'. Based on the findings (Illustration 7), Hypothesis 1 was supported and data suggests correlations between these variables.

First of all, the correlations were examined using the Pearson coefficient correlation among the four brain quadrants, the upper mode (A+D), and the right brain (C+D) on one hand and leadership styles and outcomes on the other. The findings showed that the correlations were found between quadrant B and II (B) ($r=.23$, $p<0.05$)B < ---------- > II (B) (Idealised Influence II (B)) (B =Behaviour) (Transformational); and quadrant C and IS ($r=-.29$, $p<0.01$).

B and C High scores were also found to be correlated with stronger II (A) and IS leadership styles; (r=0.23, p<0.05, r=0.37, p<0.01 respectively). High B and C scores < ---------- > II (A) and IS (Transformational)

Illustration 7: A visual description of the leadership style and quadrants correlations

A	**D**
Higher Quadrant B **↑** **correlation** **↓** **stronger Idealised Influence behaviour II(B), stronger II(A) Idealised influence (attributed) and IS Intellectual stimulation** **↑** **↑ (transformational)**	**Higher Quadrant C** **↑** **negative correlation** **↓** **less IS Intellectual Stimulation and less II(A Idealised influence (attributed) (transformational)**

Moreover, table 10 displays the descriptive statistics of quadrant profile scores (mean and standard deviation). It seems that on average, profile B has the highest score, followed by C, D, and A.(t-tests for dependent variables have shown significant differences among these 4 measures (quadrants A, B, C, and D):(t(79)'s < -10.3, p < 0.01. (t values are between -2.66 and -10.30, p<0.01). Current research suggests that most nurses utilise the lower mode - Limbic (quadrants B and C):

Summary

In conclusion, the findings show that the research population (first line managers) is highly dominant in quadrants B and C.

Conclusion 1: The current research findings strengthen the correlation between brain dominance and leadership. Thus for example, quadrant B is more characteristic of leadership and managerial orientation than quadrant C. It is worthy of note that although the current research population consists of nurses, which usually show quadrant C characteristics, nurses serving as leaders (first line managers) exhibited scores matching quadrants C and B.

I further explore this issue when testing hypothesis 5, which states, 'Lower mode (B and C) brain dominance will be found among most of the first line managers'.

2. Hypothesis 2

Support for Hypothesis 1 enabled us to examine hypothesis 2, which stated that, 'Assuming that Hypothesis 1 is supported, it will be possible to predict leadership styles and outcomes among the study population (with leadership styles and outcomes as a dependent variable and the four quadrant profile scores as an independent variable)'.

Based on the findings (illustrations 8, 9, 10**;** tables 3, 4, and 5), Hypothesis 2 was also supported.

In order to predict leadership styles, several statistical manipulations were performed:

1. Multiple regression analysis (stepwise) - Illustration 8
2. Multiple regression analysis (enter) - Illustration 9

3. F-measures for MANOVA and Univariate tests - Table 3; Illustration 10
4. Leadership styles average and standard deviation (descriptive statistics) - Table 4
5. ANOVA (4 ways) F-measures - table 5 for 4-way analysis of variance in main leadership styles and outcomes.

The serial multiple regression analysis (stepwise), with leadership styles and outcomes as the dependent variable and the four quadrant profile scores as the independent variable, was conducted. The only predictive finding was for II (B) and IS. As to II (B), B quadrant get in on the first step ($F(1, 78)= 4.21$, $p<0.05$, $R^2=0.05$, $\beta =0.23$) and in the second step quadrant D showed ($F(2, 77)= 4.71$, $p<0.05$, $R^2=0.11$, $\beta =0.30$), meaning that higher B and D scores (more dominant) correlated with more frequent II(B) leadership style.

As to IS, the analysis was completed after only one step and quadrant C was found as the only predictive variable $F(1, 78)= 7.18$, $p<0.01$, $R^2=0.08$, $\beta =-0.29$), meaning that higher quadrant C quadrant scores correlated with less frequent use of IS leadership style.

Illustration 8: Multiple regression analysis (stepwise)
Diagonal Quadrant - Prediction of leadership styles threw the quadrants

A	**As much as D Quadrant is Higher** **II(B) will be Stronger** ***Idealised Influence* behaviour (transformational)**
As much as B Quadrant is higher **II(B) will be Stronger** **Idealised Influence behaviour (transformational)**	**As much as C Quadrant is higher the use of IS leadership style is lower. IS ↓**

To sup up, B and D quadrants are able to predict transformational leadership style whilst the C quadrant has the opposite trend (also predicting).

Another serial of multiple regression analysis (enter) was performed in order to predict leadership styles or outcomes as the dependent variable and the 4 quadrant profile scores as the independent variable.

The predictive findings were as follows: II (B) (Idealised Influence behaviour) [$F(4, 75)=3.06$, $R^{2=}$ 0.14, $p<0.05$], IS (Individual Stimulation) [$F(4, 75)=4.39$, $R^{2=}$ 0.19, $p<0.01$], CR (Contingent Reward) [$F(4, 75)=2.54$, $R^{2=}$ 0.12, $p<0.05$].

For CR (Contingent Reward) and II (B) (Idealised Influence behaviour), the predictive findings were B (β 0.43 and 0.56 respectively) and D ($\beta = 0.56$ and $\beta = 0.58$ respectively). For IS (Individual Stimulation), A ($\beta = 0.58$) and D ($\beta = 0.62$) are the predictive quadrant.

The multiple regression analysis (enter method) for predicting the transformational leadership style, showed such prediction possible for quadrants A [β =0.59], B [β =0.43], and D [β =0.74] [$F (4, 75) =4.00$, $R^{2=}$ 0.18, $p<0.01$]. (see illustration 9)

Illustration 9: Multiple regression analysis (enter) findings

A **Predictive of transformational leadership style**	**D** **Predictive of transformational leadership style**
B **Predictive of transformational leadership style**	**C**

In addition, a string of multivariate analysis of variance (MANOVA) was manipulated. To this end, a dichotomy of the variable according to median cross-section was created for each of the four quadrants (the subject received 0 for profile scores below the median, and 1 for profile scores above the median).

Each one of the leadership styles and outcomes was included as a dependent variable in each analysis of variance. The four quadrant dichotomy values were included as independent variables. As no significant interactions were found between the quadrants, the models were used without interactions.

Significant main effect was found for quadrant D and the transformational leadership style. Univariate tests showed the effect source in transformational leadership styles, excluded IC. In other words, participants with high quadrant D scores used transformational leadership styles more often than participants with low quadrant D scores.

As to the main leadership styles (transformational, transactional, and the outcomes), participants with high B and D scores were characterised by frequent use of the transformational leadership style, attaining the three outcome measures more often than participants with low scores in these quadrants. Participants with low quadrant C scores used transformational leadership styles and attained the outcomes more frequently than high quadrant C scorers.

Table 3: F-values for MANOVA and Univariate tests

	A	B	C	.D
F(5, 75)	1.32	2.22	0.89	4.57**
Transformational leadership styles				
	F(1, 75)	F(1, 75)	F(1,75)	F(1, 75)
II(A) Idealised Influence (A = Attributed)	1.12	0.31	0.93	6.27*
II(B) Idealised Influence (B =Behaviour)	0.46	6.61*	0.03	5.89*
IM Inspirational Motivation	0.19	4.22*	0.00	4.83*
IS Intellectual Stimulation	5.8*	7.37*	0.89	22.47***
IC Individualised Consideration	0.06	3.02	1.78	1.99
Transactional leadership styles				
F(4, 76)	1.4	2.76*	0.58	2.57*
	F(1, 75)	F(1, 75)	F(1,75)	F(1, 75)
CR Contingent Reward	1.14	9.37**	0.57	10.29**
MBE(A) Management-By-Exception (A = Active)	0.08	0.38	0.03	0.02
MBE(P) Management-By-Exception (P = Passive)	3.15	0.08	0.67	0.19
LF Laissez-Faire	0.00	4.23*	0.58	1.30
Outcomes				
F(3, 73)	0.18	1.27	0.58	2.34
	F(1, 75)	F(1, 75)	F(1,75)	F(1, 75)
EE Extra Effort	0.37	2.58	0.04	5.28*
E Effectiveness	0.27	1.14	0.08	5.07*
SAT Satisfaction	0.01	2.79	1.69	3.61

*p<0.05 **p<0.01 ***p<0.001

Quadrants B and D are not significantly transformational, even though for the most part transformational leadership style sub-scales do show significant results. In other words, the main factor (the linear combination of sub-scales) is not significant, and therefore it was no point in checking the main groups separately.

Illustration 10 (displays the findings in table 3): F-values for MANOVA and Univariate tests.

Diagonal Quadrants

A	**High quadrant D profile scores** **Significantly more frequent use of transformational leadership style (except for IC) (Individualised Consideration) (transformational)**
High Quadrant B profile scores **Significantly more frequent use of** **II(B) Idealised Influence behaviour** **IM Inspirational Motivation** **IS Intellectual Stimulation** **(transformational)**	**C**

Table 4: Leadership style average and standard deviation

Variables	A		B		C		D	
	low (n=40)	high (n=40)	low (n=42)	high (n=38)	low (n=41)	high (n=39)	low (n=41)	high (n=39)
Transformational leadership styles								
II(A) Idealised Influence (A = Attributed)	3.16 (0.52)	3.14 (0.53)	3.21 (0.49)	3.09 (0.56)	3.11 (0.56)	3.20 (0.48)	3.01 (0.55)	3.30 (0.45)
II(B) Idealised Influence (B =Behaviour)	3.36 (0.54)	3.38 (0.44)	3.29 (0.52)	3.45 (0.44)	3.38 (0.44)	3.35 (0.54)	3.31 (0.48)	3.42 (0.49)
IM Inspirational Motivation	3.26 (0.55)	3.26 (0.50)	3.21 (0.57)	3.32 (0.47)	3.28 (0.51)	3.24 (0.55)	3.20 (0.53)	3.33 (0.51)
IS Intellectual Stimulation	3.06 (0.51)	3.24 (0.55)	3.13 (0.52)	3.17 (0.56)	3.26 (0.52)	3.04 (0.54)	2.99 (0.52)	3.32 (0.50)
IC Individual Consideration	3.39 (0.43)	3.46 (0.46)	3.36 (0.42)	3.49 (0.47)	3.51 (0.42)	3.34 (0.46)	3.41 (0.51)	3.44 (0.37)
Transactional leadership styles								
CR Contingent Reward	3.15 (0.57)	3.25 (0.58)	3.10 (0.58)	3.31 (0.56)	3.28 (0.59)	3.11 (0.55)	3.11 (0.58)	3.29 (0.57)
MBE(A) Management-By-Exception (A = Active)	2.69 (0.76)	2.78 (0.79)	2.67 (0.65)	2.80 (0.90)	2.77 (0.90)	2.70 (0.63)	2.77 (0.78)	2.70 (0.78)
MBE(P) Management-By-Exception (P = Passive)	0.87 (0.63)	0.64 (0.68)	0.77 (0.60)	0.74 (0.73)	0.76 (0.69)	0.75 (0.64)	0.74 (0.65)	0.77 (0.68)
LF Laissez-Faire	0.50 (0.49)	0.46 (0.58)	0.58 (0.61)	0.37 (0.43)	0.42 (0.59)	0.54 (0.48)	0.48 (0.44)	0.49 (0.63)
Outcomes								
EE Extra Effort	3.16 (0.55)	3.18 (0.56)	3.14 (0.56)	3.19 (0.55)	3.20 (0.54)	3.14 (0.58)	3.07 (0.57)	3.26 (0.53)
E Effectiveness	3.43 (0.41)	3.43 (0.40)	3.43 (0.39)	3.41 (0.42)	3.45 (0.39)	3.40 (0.42)	3.34 (0.43)	3.51 (0.36)
SAT Satisfaction	3.20 (0.45)	3.20 (0.61)	3.15 (0.55)	3.25 (0.52)	3.28 (0.56)	3.12 (0.49)	3.13 (0.51)	3.27 (0.55)

Four-way analysis of variance (without interactions) performed on main leadership style groups (transformational, transactional, and outcomes) showed that participants with high B and D scores used the transformational leadership style more than participants with low B and D scores. As for the outcomes, participants with high quadrant D scores received the three outcome measures more often than those with low quadrant D scores. No main effects were found between quadrants dominance and the transactional leadership style (table 5).

Table 5: F-values ANOVA for 4-way analysis of variance in main leadership styles and outcomes

Variables	A		B		C		D	
	low (n=40)	high (n=40)	low (n=42)	high (n=38)	low (n=41)	high (n=39)	low (n=41)	high (n=39)
transformational	3.25 (0.39)	3.30 (0.34)	3.24 (0.37)	3.30 (0.36)	3.31 (0.37)	3.23 (0.36)	3.18 (0.39)	3.36 (0.32)
F(1, 75)	1.86		7.28**		0.08		14.13***	
transactional	1.71 (0.36)	1.68 (0.41)	1.69 (0.39)	1.70 (0.38)	1.71 (0.44)	1.69 (0.32)	1.68 (0.35)	1.71 (0.42)
F(1, 75)	0.14		0.09		0.15		0.12	
outcomes	3.29 (0.41)	3.29 (0.40)	3.28 (0.39)	3.30 (0.42)	3.33 (0.40)	3.25 (0.40)	3.21 (0.43)	3.38 (0.35)
F(1, 75)	0.24		3.03		0.38		7.15**	

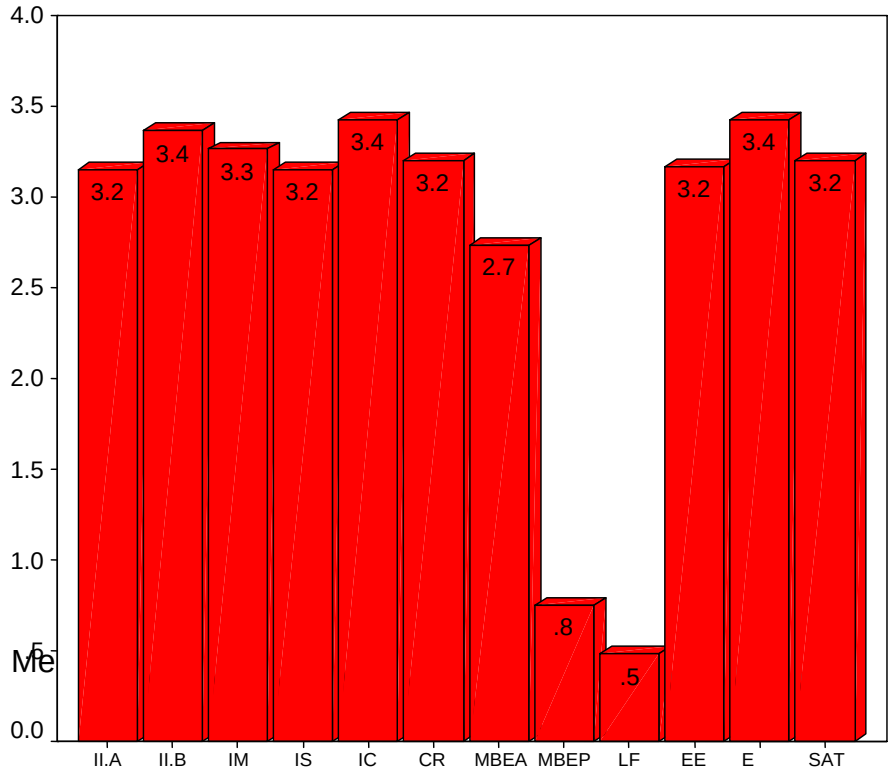
Conclusion 2: It is possible to predict leadership styles and outcomes in study population (with leadership styles and outcomes as the dependent variable and the four quadrant profile scores as the independent variable).

3. Hypothesis 3

Hypothesis three postulated that 'First line managers will use mainly transformational leadership style and will attain better outcomes'.

Findings, presented in Illustration 11 and Tables 4, 6 and 7, partially support Hypothesis 3.

Illustration 11: Entire sample's leadership styles averages



The entire sample's average of leadership styles shows that first line managers do use the transformational leadership style sub-scales, but they also use parts of transactional sub-scale leadership styles CR and MBE(A). Subsequently, they frequently attain higher outcomes associated with the above leadership styles.

The MBE-P transactional leadership style was found to be extremely infrequent in current research population. The findings presented in Illustration 11 reveal that study participants

hardly use this sub-scale of the transactional leadership style, also associated with laissez-faire leadership. The Management-by-Exception (MBE) corrective transaction tends to be less effective than Contingent Reward or transformational leadership components. The corrective transaction may be active, Management-By-Exception (active) (MBE-A), or passive, Management-By-Exception (Passive) (MBE-P). In active MBE-A, the leader arranges to monitor deviances from standards, mistakes, and errors in the followers' assignments actively and to take corrective action as necessary. MBE-P implies waiting passively for deviances, mistakes, and errors to occur and then taking corrective action. The laissez-faire leadership style (LF) implies avoidance or absence of leadership. By definition, it is the most inactive and ineffective style.

The second part of Hypothesis 3, presupposing positive correlations between transformational leadership styles and higher outcomes, was partially supported. Intercorrelations between the MLQ scale findings in current study population resembled the above-mentioned results and were supported by findings presented in Tables 6 and 7.

Tables 6 and 7 show the intercorrelations between the MLQ scales. The transformational scale was found as having low negative correlations or no correlation with LF (Laissez-Faire) and MBE(P) Management-By-Exception (Passive), while in most cases positive correlations with MBE(A) Management-By-Exception (A = Active) and CR Contingent Reward were observed. In other words, these findings show correlations between transactional leadership style sub-scales.

These research findings illustrate correlations between leadership styles and outcomes. Except for MBE(P) Management-By-Exception (Passive) and LF Laissez-Faire, all leadership styles, particularly transformational, showed positive correlations with EE Extra Effort and E

Effectiveness. Low to moderate correlation was found between EE Extra Effort and LF Laissez-Faire. Only two transformational sub-scales II(A) Idealised Influence (Attributed) and IS Intellectual Stimulation were correlated positively with SA Satisfaction.

Table 6: Intercorrelations between leadership styles and the outcomes (without decimal dot)

	SAT	E	EE	LF	MBE(P)	MBE(A)	CR	IC	IS	IM	II(B)	II(A)
Transformational leadership style												
II(A) Idealised Influence (A = Attributed)	44***	49***	41***	-12	06	14	25*	23*	38***	39***	46***	-
II(B) Idealised Influence (B = Behaviour)	20	46***	56***	-28*	-01	33**	52***	45***	42***	63***	-	
IM Inspirational Motivation	18	42***	51***	-22	07	41***	49***	25*	49***	-		
IS Intellectual Stimulation	32**	39***	48***	-09	01	26*	52***	37**	-			
IC Individualised Consideration	46	35**	45***	-37**	-16	06	43**	-				
Transactional leadership style												
CR Contingent Reward	16	34**	41***	-29**	-02	19	-					
MBE(A) Management -By-Exception (A = Active)	11	26*	27*	03	26*	-						
MBE(P) Management -By-Exception (P = Passive)	07	-18	-19	40***	-							
LF Laissez-Faire	13	-21	-28*	-								
Outcomes												
EE Extra Effort	42***	66***	-									
E Effectiveness	41***	-										
SAT Satisfaction	-											

* p<0.05 **p<0.01 ***p<0.001 two-tailed.

Table 7: Intercorrelations between leadership styles and outcomes

	3	2	1
Transformational(1)	**0.70****	**0.26***	**-**
Transactional (2)	**0.08**	**-**	
Outcomes(3)	**-**		

***p<0.05 **p<0.001 two tailed**

In summary, the transformational leadership style and the transactional leadership style were found to have low correlation with each other ($r=0.26$, $p<0.05$), while the outcomes showed high correlation with the transformational leadership style ($r=0.70$, $p<0.001$) and were completely orthogonal to the transactional leadership style ($r=0.08$, $p>0.05$). Moreover, Illustration 11 and Tables 6 and 7 show the high frequency of outcomes resulting from the abovementioned leadership styles, meaning that these leadership styles were found to be effective.

As previously identified, the scale measurement of these variables ranged between 0 - 4. Tables 6 and 7 describe the leadership style and outcome index of this research, compared to the accepted norms appearing in literature (Bass and Avolio, 1995). It seems that the current research sample's averages and medians are located on the extremes in relation to the measurement scales of different variables (variables ranged between 0 - 4). Furthermore, as evident in Table 4, the standard deviation range is small (about ½ point), suggesting that the variance among subjects in the sample was low.

Comparison of data to norms shows that current sample averages are located on the extremes relative to the norms and not only relative to measurement scales. Likewise, the standard deviation in this sample is very low relative to norms. Still, the relationship between scale

averages in current research data resembles the relationship between measurement scale averages, so that the relatively high average in current research is similar to the relatively high norms found in literature (Bass and Avolio, 1995).

It is assumed that the mutual characteristics of both organisations (the army and healthcare organisations) stem from their hierarchical structures and similarity in the essence of occupation and range of responsibilities (the responsibility for the welfare and safety of human beings).

Table 8 : Descriptive statistics for MLQ scales [1] (normes)

Variables	Median	Mean	SD
The leadership style subgroups			
Transformational leadership style			
II(A) Idealised Influence II(A) (A = Attributed)	3.25	3.15 (2.56)	0.52 (0.84)
II(B) Idealised Influence II(B)) (B =Behaviour)	3.50	3.37 (2.64)	0.49 (0.85)
IM Inspirational Motivation	3.25	3.26 (2.64)	0.52 (0.87)
IS Intellectual Stimulation	3.00	3.15 (2.51)	0.54 (0.86)
IC Individualised Consideration	3.50	3.43 (2.66)	0.45 (0.93)
Transactional leadership style			
CR Contingent Reward	3.33	3.20 (2.20)	0.58 (0.89)
MBE(A) Management-By-Exception (A = Active)	2.75	2.73 (1.75)	0.77 (0.77)
MBE(P) Management-By-Exception (B = Passive)	0.75	0.75 (1.11)	0.66 (0.82)
LF Laissez-Faire	0.38	0.48 (0.89)	0.54 (0.74)
Outcomes			
EE Extra Effort	3.00	3.17 (2.60)	0.55 (1.16)
E Effectiveness	3.50	3.43 (2.62)	0.40 (0.72)
SAT Satisfaction	3.00	3.20 (2.57)	0.53 (1.28)
Leadership style main scales (no norms found)			
Transformational leadership style	3.30	3.27	0.37
Transactional leadership style	1.67	1.70	0.38
Outcomes	3.28	3.29	0.40

The relationship between the scale averages in current research data resembles the relationship between the measurement scale averages (relatively high average in the current research is relatively high in the norms found in the literature) (Bass and Avolio, 1995).

Comparison between current data and sub-scales appearing in literature (Bass and Avolio, 1995) shows that the current nurse sample resembles the U.S. Army sample found by Kuzhilin (2001), who claimed that the ability of officers to supervise their men, i.e., to plan and assign missions, organise in an ethical manner for relations with their subordinates and take orders from their superiors with composure. Commanders of all ranks are fully responsible for all the aspects of life and activities relating to their subordinates, as well as for their moral, psychological and physical condition and intellectual development. A member of the officer corps, like any other member of the military, is fully responsible for the failure to perform his or her duties under the Uniform Code of Military Justice of the United States.

As previously mentioned, Hypothesis 3 was supported partially, as it is important to note that the research population appeared to use the effective transactional leadership style sub-scales (CR and MBE-A). For this reason it can be said that the hypothesis was partially supported.

The second part of Hypothesis 3, suggesting positive correlations between transformational leadership styles and higher outcomes was also partially supported. An intercorrelation between the MLQ scale findings (Tables 6 and 7), found in current study population, resembles findings from other studies. A conclusion can be drawn from these findings, that Hypothesis 3, as noted above, was only partially supported. It appears that the active transactional leadership sub-scales (CR and MBE-A) yield similar outcomes to the transformational leadership style sub scales.

4. Hypothesis 4

Hypothesis 4 stated that 'Leadership styles will be different among right and left brained study participants'. The findings, presented in Illustrations 2 - 4 and Table 9, support this hypothesis. In order to understand the significance of these findings, it is necessary to review the following information before examining them.

During the 1960s, further research on corpus callosum caused scientists to postulate a view of the relative capabilities of the two halves of the human brain. Both hemispheres are involved in higher cognitive functioning, with each half specialising in complementary fashion for different modes and thinking, both highly complex. The main emerging theme suggests two modes of thinking, verbal and nonverbal, represented by the left and right hemispheres, respectively (Sperry, 1973).

Restak (2001) stated that the bipartite brain is organised to process emotions alongside logic. Further evidence showed that the left hemisphere mode is verbal and analytic, while the right hemisphere mode is nonverbal and global. New evidence found by Levy (1983) showed that the mode of processing used by the right brain is rapid, complex, whole-pattern, spatial, and perceptual, therefore is not only different from, but comparable in complexity to the left brain's verbal, analytic mode. It was also found that the two modes of processing interfere with each other, preventing maximal performance.

Right brain D+C - Interpersonal, Emotional, Musical, Spiritual, Talker Artistic, Holistic, Imaginative, Synthesiser, Conceptualised (see illustration 3).

Right-mode is the left-handed, right-hemisphere mode. The R is curvy, flexible, more playful in its unexpected twists and turns, more complex, diagonal, and fanciful.

Left brain A+B - Logical, Analyser, Technical, Mathematical, Problem Solver

Organisational, Administrative, Conservative, Controlled, Planner (see illustration 4)

Left-mode is the right-handed, left-hemisphere mode. The Left is Conservative, upright, sensible, direct, true, hard-edged, and forceful. People with left or right brain dominance, or preference, are more "comfortable" with one sort of thinking than the other. For example, Honey and Munford, (1992) found that lawyers, engineers, bankers, and bureaucrats tend to be predominantly left brained, whereas writers, artists, musicians, nurses, and entrepreneurs tend to be predominantly right brained.

The information suggests as follows: comparing the research population right/left brain using t test show that right brain population are characterised more by CR, IS and II(B) *Idealised Influence behaviour* and receiving more EE *(Extra Effort)* and E *(Effectiveness*) than the left brain population.

Checking the main leadership styles group and outcomes reveals that the right brain population, applies more transformational leadership styles. The entire current population group was divided to two groups, right brain and left brain.

Roger Sperry (1973) claimed that the main theme to emerge is that there appear to be two modes of thinking, verbal and nonverbal, represented rather separately in left and right hemispheres respectively. Further, that our education system, as well as science in general, tends to neglect the nonverbal form of intellect. What it comes down to is that modern society discriminates against the right hemisphere.

Sperry's research showed that each side of the brain had characteristic ways of interpreting and reacting to the world. The left and right hemispheres of the brain processes information differently. People tend to process information using their dominant sides. However, using the

brain in a balanced manner, through strengthening the less dominate hemisphere of the brain, enhances the learning and thinking process.

The left side of the brain processes information linearly from part to whole by taking pieces, lining them up, arranging them in a logical order, and then drawing conclusions. In addition, the left brain processes in sequence. A left-brained person is predominantly a list maker, who tends to be comfortable with linguistic and mathematical endeavours. When an individual processes predominantly on the left brain side, he/she looks at life as a series of logical or organisational problems to be solved.

In contrast, the approach of the right brained person is more random and perhaps without having accessed priorities. The right brained person tends to see, feel, or touch the real object. The right brain processes from whole to parts, holistically. It starts with the answer, sees the big picture first, not the details. People who process primarily on the right side of the brain often intuit their response to situations. The right brain pays attention to coherence and meaning. That is, the right brain tells one that a decision 'feels' right, without resort to logic. Finally, right brained people try to change the environment according to the holistic picture formed in their head.

Table 9: Right/left brain leadership styles

Variables	right (n=49)	left (n=20)	t(67)
Transformational leadership styles			
II(A) Idealised Influence (A = Attributed)	3.22 (0.52)	3.03 (0.53)	1.44
II(B) Idealised Influence (B =Behaviour)	3.43 (0.43)	3.19 (0.44)	2.13*
IM Inspirational Motivation	3.34 (0.50)	3.11 (0.53)	1.71
IS Intellectual Stimulation	3.24 (0.53)	2.94 (0.56)	2.04*
IC Individualised Consideration	3.48 (0.41)	3.28 (0.53)	1.77
Transactional leadership styles			
CR Contingent Reward	3.33 (0.53)	2.98 (0.59)	2.42*
MBE(A) Management-By-Exception (A = Active)	2.72 (0.81)	2.60 (0.79)	0.59
MBE(P) Management-By-Exception (P = Passive)	0.70 (0.68)	0.80 (0.56)	-0.59
Outcomes			
LF Laissez-Faire	0.39 (0.58)	0.63 (0.44)	-1.62
EE Extra Effort	3.22 (0.56)	2.92 (0.48)	2.12*
E Effectiveness	3.51 (0.36)	3.16 (0.43)	3.47**
SAT Satisfaction	3.26 (0.57)	3.00 (0.46)	1.78
Transformational	3.34 (0.34)	3.11 (0.41)	2.49*
Transactional	1.68 (0.41)	1.67 (0.29)	0.14
Outcomes	3.36 (0.38)	3.04 (0.40)	3.07**

*p<0.05 **p<0.01

The entire population was divided into two groups, right-brained and left-brained. Comparison of right- and left-brained research participants through t-tests showed that right-brained

participants were more likely to show CR, IS, and II(B) behaviours and received EE Extra Effort and E Effectiveness more frequently than the left-brained participants. Examining main leadership style groups and outcomes revealed that the right-brained population was using more transformational leadership style and received a greater amount of outcomes measures.

5. Hypothesis 5

The following section relates to research hypothesis number five that stated: ‘Lower mode (B and C) brain dominancy will be found among most of the First Line Managers' population’.

The findings presented in Illustrations 6, 12, 13, 14 and 15 and in Table 10 support this hypothesis, suggesting that most first line managers exhibit lower mode (B and C) brain dominance.

Lower mode (B and C) thinkers tend to be organisational, administrative, conservative, controlled, interpersonal, emotional, musical and spiritual (see Illustration 6). They are talkers and planners. Lower right-sided thinkers deal with the question of ‘Why?’ and are perhaps best defined as collaborators. Lower left brained people are implementers or organisers who address the question of ‘How?’.

Table 10 displays the descriptive statistics of quadrant profile scores. On average, profile B seemed to receive the highest scores, followed by C, D, and A. (t-tests for the dependent variables showed significant differences between the four measures: ($t(79)<0.05$).

Table 10: Descriptive statistics for brain dominance measures

Variables	Mean	SD
Profile A score	60.91	20.38
Profile B score	87.95	15.32
Profile C score	81.95	17.85
Profile D score	71.85	21.42
Right brain C + D scores	50.76	9.23
Upper mode A+D scores	43.90	6.50

The data matches the findings relating to subjects' brain dominance, presented in Illustration 15. Likewise, the Rank Order of Preferences by Quadrants (Illustration 12) of the subjects, as illustrated by the Ned Herrmann Group, matches present data as well.

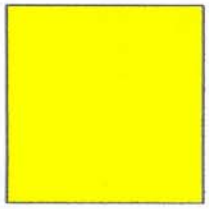
Illustration number 12

Rank Order of Preferences by Quadrant

The rank order of preferences of this team as a whole:

B Quadrant: 88

C Quadrant: 82



D Quadrant: 71

A Quadrant: 62

Illustration 13: Quadrant characteristics versus occupational patterns described in the literature

Quadrant A **Logical** **Engineers** **Analyser** **Lawyers** **Technical** **Financial Managers** **Mathematical** **Problem Solver**	**Quadrant D** **Artistic** **Artists** **Holistic** **Entrepreneurs** **Imaginative** **Strategic Planners** **Synthesiser** **Conceptualised**
Quadrant B **Organisational** **Administrators** **Administrative** **Bookkeepers** **Conservative** **Operational Planners** **Controlled** **Planner**	**Quadrant C** **Interpersonal** **Social workers** **Emotional** **Teachers** **Musical** **Nurses** **Spiritual** **Talker**

- ☐ **Quadrants characteristics**
- ☐ **Occupational Patterns**

Illustration 13 shows some examples of the most pronounced patterns. The empathetic lower right shows up in profiles of social workers, teachers and nurses (Herrmann, 1988). The current research suggests that most nurses exhibit dominance in the lower mode - Limbic (B and C quadrants), and followed by (though not with significance) D quadrant.

Illustration 14: Quadrant characteristics versus occupational patterns as found in this research sample

Quadrant A **Logical** **Engineers** **Analyser** **Lawyers** **Technical** **Financial Managers** **Mathematical** **Problem Solver**	**Quadrant D** **Artistic** **Artists** **Holistic** **Entrepreneurs** **Imaginative** **Strategic Planners** **Synthesiser** **Conceptualised**
Quadrant B **Organisational** **Administrators** **Administrative** **Bookkeepers** **Conservative** **Operational Planners** **Controlled** **First Line Managers (nurses)** **Planner**	**Quadrant C** **Interpersonal** **Social workers** **Emotional** **Teachers** **Musical** **Nurses** **Spiritual** **Talker**

Lower mode - Grounded - Limbic

☐ **Quadrant characteristics**

☐ **Occupational Patterns**

In addition, it can be also seen below in Illustration 15.

Illustration number 15

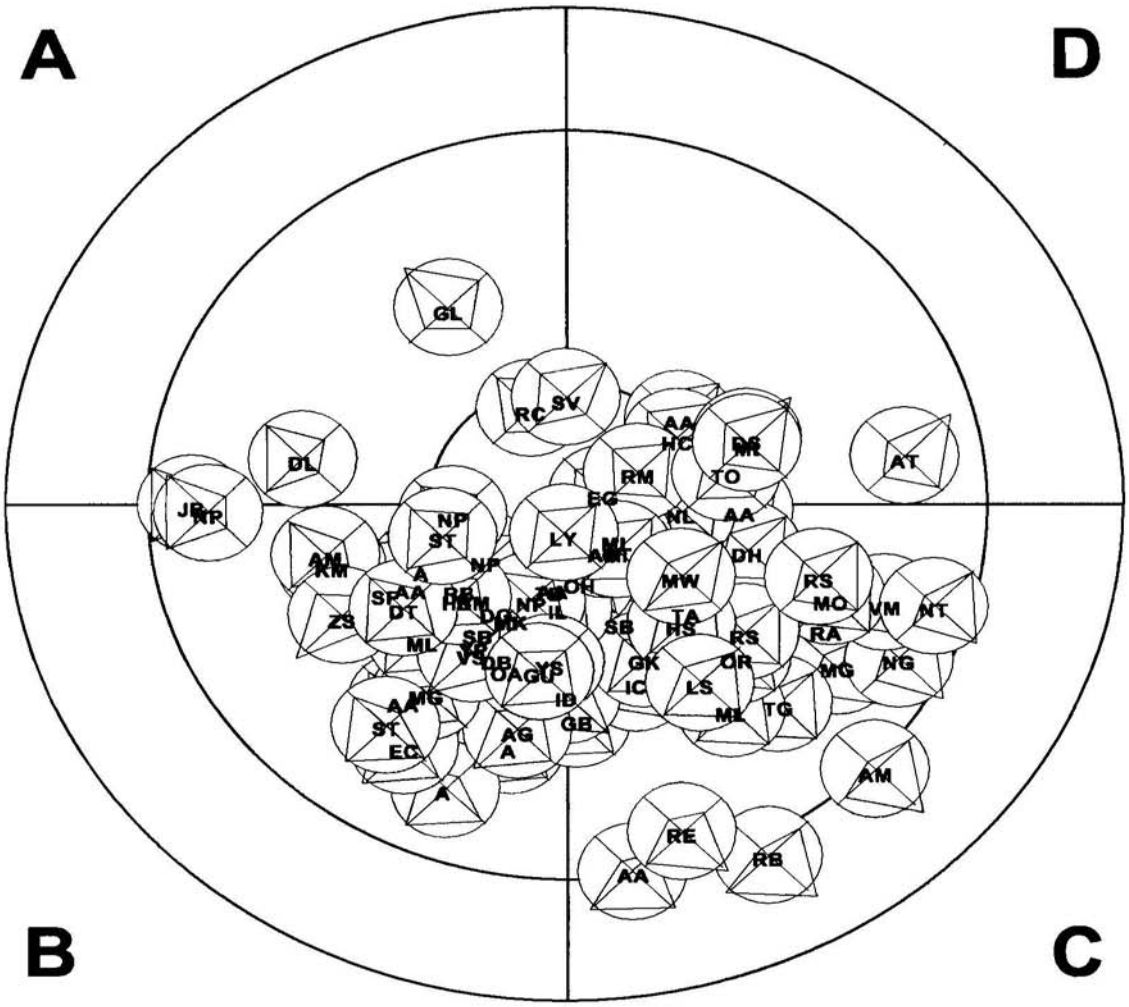
HERRMANN BRAIN DOMINANCE INSTRUMENT

DOMINANCE MAP

18074 - Research Project

July 04

80 Individuals



6. Conclusions

Current research findings support the correlation between brain dominance and leadership styles. Thus, for example, quadrant B is more oriented towards leadership and management than quadrant C. It is note-worthy that while showing typical nursing characteristics, the research participants, who also serve as leaders (first line managers), had high quadrant C, B, and D scores.

It is possible to predict leadership styles and outcomes among the study population (with leadership styles and outcomes as the dependent variable and the four quadrant profile scores as the independent variable).

Although the findings support partially Hypothesis 3, it is important to note that research subjects used the active transactional leadership style sub-scales (CR and MBEA). This fact is the reason for only partial support of this hypothesis. Part two of Hypothesis 3, presuming a positive correlation between the transformational leadership style and higher outcomes, was also partially supported. Intercorrelations between the MLQ scale findings in current study population resembled the above-mentioned findings presented in Tables 5 and 6.

In relation to Hypothesis 4, a comparison of right- and left-brained research participants through t-test showed that the right-brained population showed stronger CR, IS, and II(B) Idealised Influence behaviour and received more EE (Extra Effort) and E (Effectiveness) scores than the left-brained population. The analysis of main leadership style groups and outcomes revealed that right-brained participants were using the transformational leadership style more frequently and received a greater amount of outcome measures (Table 6).

As for Hypothesis 5, the findings illustrate that first line managers participating in the study were highly dominant in quadrants B and C and close to those quadrants, while most of the remainder showed quadrant D characteristics.

Chapter V: Discussion

This study was carried out in order to investigate personal brain dominance cognitive styles, and their connection to the leadership styles of first line nurses. Analyses in these areas have been successfully carried out in the business sector, however in socially-related fields in general, and in particular in the field of health care, such investigation has been lacking. The higher up on the executive ladder the more the following proposition, bolstered by comprehensive research (Kean, 1989; Norris, 1984; Owen, 1986; Soler, 1991), is true: The study of leadership as it relates to brain hemispheric dominance benefits executive managers' leadership styles, as well as the organisations for which they work.

The present research may very well provide valuable and significant direction for the development of educational tools, thus paving the way for the implementation of the fundamentals of brain function development in leadership training, in all that this entails. As such, this study focuses on the connection between leadership styles and brain dominance among first line executive position-holders, while attempting to particularise this physiological-social relationship to the field of nursing and the management thereof.

The need to evaluate more efficient and effective leadership styles is an ongoing result of changes in health care service policies and the changing structure of nursing. These changes have yielded the outcome that former staff nurses are now first line nurse managers. These managers now wield more autonomy and the power to more fully fulfil the true potential of this demanding and exciting social and medical role, than ever before. It is an expectation in the world of modern nursing to realise and put into practice these changes in the role of nursing. In so doing nursing professionals draw attention to and emphasise the import of effectual change management, thus serving for good the health care community as a whole. Therefore, for the sake of the ongoing smooth development of the nursing profession, it is of the essence to

identify and analyse the general leadership characteristics of first line nurse managers, these consisting of leadership styles and brain dominance. Such profiles should serve to channel the development of fitting and effectual training programs and adequate preparation techniques for the new and expanded role of the first line nurse.

Nursing managers should be the vanguard of reinvention for the health care community. To become health care leaders it is incumbent upon them to recognise and understand the requirements of medicine and health care organisational structures. This leadership position admittedly carries time and energy demands for the sake of reflecting, conferring, and finally acting. Yet the upshot is that the fomentation of advantageous leadership perspectives, based on the scientifically guided reflection upon practices that challenges the status-quo, may increasingly result in further autonomy and recognition in the academic world. Nursing leaders should work for an educative system to fundamentally influence and lead the nursing profession. While at the present the profession is on the whole led by forces from the outside, ideally it should be the nurse leaders leading the way for their own cohorts (Coyle, 1994; Skelton-Green, 1995).

The reformation and reorganisation of hospital departments is a foremost focus of today's educational environment in the world of nursing, and this task requires both adaptation and fore-planning. These two elements of engaging pioneering organisational strategies require skills involving left-brain processing, i.e. logic and analysis, and right-brain processing, i.e. conceptualisation and visionary abilities (Herrmann, 1988). To accommodate and take advantage of these differing mental styles hospital administrators should be trained to identify them in individual candidates, and to assign these persons to tasks most relevant and suitable to their unique mental styles.

The ideal nursing leader, bequeathed of an integrated knowledge of the abilities of the right and left hemispheres, serves as the flagship of those who envision a bright future for the revamping of hospital management and the education vital thereof. The head nurse, the leader of his or her nursing team, works along the lines of an inclusive style, with the group, in order to set goals for the realisation of the educators' thorough imaginings. The leader empowers the nursing team to make for itself its own vision to carry through to fruition. The foundation stones of this vision must be sound policy formation, site-based management, and organisational change; these elements equally participate in the social mission of better preparing nursing leaders for the challenges of the new millennia. It is therefore this bequeathing of information, of training, and of the knowledge and awareness of the differing mental processing and leadership styles, which can serve for putting us as a society well on the way of fulfilling these goals. Their impact on administrative effectiveness will serve to restructure the field of nursing, most beneficially for the population being administered.

According to Herrmann, there are four separate and distinct quadrants, consisting of the right and left halves of the neocortex and the right and left divisions of the limbic system. Four quadrant preferences were found in Herrmann's research: quadrant A, the upper-left cerebral mode, with preferences for analysing, solving problems, and fact finding; quadrant B, lower-left limbic mode, with preferences for arranging and organising, being procedural, precise and control-seeker (Herrmann, 1988, 1995); quadrant D, upper-right, with preferences for risk-taking, imagination exercise, and new experiences (Peschanel, 1988; Watson, 1998); and quadrant C, lower-right limbic mode, with emotional, spiritual and intuitive preferences (Herrmann, 1988, 1995). A person's brain dominance profile refers to the scheme of how and to what extent that person uses his or her quadrants.

The possibility exists to develop techniques to balance brain functioning and concurrent leadership styles; these steps would contribute to improving nursing managers' output and general effectiveness. For the sake of the above it was therefore posited that diagnosing leadership styles and brain dominance cognitive processes should be the guiding light for the development of training programs, and should influence routine processes within health care institutions. The following hypotheses were chosen to lay the groundwork for an approach such as this for the nursing profession in particular; they tested the possibilities that brain functioning and leadership styles coincide, that the former may predict the latter, that better outcomes of leadership are rightfully expected from transformational leadership, that leadership styles differ according to which hemisphere is dominant, and that lower mode brain dominance is most found among the population of first line managers.

These hypotheses will now be discussed in depth, each upon the double backdrop of the results of this study and the conclusions of other similar studies.

1. Hypothesis 1

Research findings supported Hypothesis 1, which stated, 'There will be a correlation between personal brain dominance cognitive styles and leadership styles of first line nurse managers'. The data indeed suggested a correlation between these two variables (refer to Chapter IV Illustration 7 for visual description).

Moreover, Table 10 displays the descriptive statistics of quadrant profile scores. It seems that on average, profile B has the highest score (i.e. B dominancy was most represented among the first line nurses), followed by C, D, and A. T-tests for dependent variables have shown significant differences among these four measures. The present research suggests that most nurses utilise the lower, limbic mode (quadrants B and C).

The findings also support the correlation between brain dominance and leadership styles, with quadrant B participants showing greater leadership and managerial orientation than quadrant C participants. There was a correlation between using quadrant B and II(A) Idealised Influence (Attributed), II(B) Idealised Influence (Behaviour) and IS Intellectual Stimulation leadership behaviour, and negative correlation between using quadrant C II (A) and IS behaviour.

With the development of the cognitive theory of brain dominance, emerged the suggestion that hemispheric dominance dictates not only thinking styles but also behaviour patterns (Power and Lundstern, 1997). A major topic explored in the area of organisational development is leadership. Lately, this topic has been studied in the context of brain dominance. Some of these studies took place in educational institutions (Norris, 1984; Cicchetti, 1991; Soler, 1991; Toth, 1991; Wallace, 1992; Craycraft, 1999).

There have previously existed no studies relating to the correlation between the Full Range of Leadership Styles theory and brain dominance. Additionally, it is important to emphasise that there appears to be a lack of studies correlating leadership styles to the four brain quadrants. What there are, are studies linking leadership styles to the hemispheres; however it is clear that analysis according to quadrant contributes to much more exact and significant conclusions than analysis according to merely the two hemispheres.

Since one of the justifications of this study is the promised ability to work up the less dominant brain sections, it is clear that a more exacting determination of the parts that are in need of attention will contribute to a more precise ability to work them up. In other words, a correlation based on quadrants and not only on whether the most used is right or left, serves as grounds for a more precise and focused tool. It enables the training mechanisms to act more precisely. In the

same manner, a more precise theorisation of leadership styles, in terms of the Full Range Leadership Model, leads to a more focused training program.

The positive correlations centred around II(A) Idealised Influence (Attributed) and II(B) Idealised Influence (Behaviour); these are described in the literature as synonyms for what is known as charisma (Avolio and Bass, 1988, 1991; Bass and Avolio, 1990, 1995, 1997, 2000). Charisma, like for example love, according to its broader meaning, is difficult to break down into constitutive factors. Likewise it is difficult to determine when charisma exists and when it does not, or in other words to define which components are vital for it to come into existence. It is something that, it may be said, one either has or does not have. While the rest of the sub-scales may be learned, charisma, according to this view, cannot be.

This fact of charisma's innateness, matches the present writer's position that it is the primary ingredient of leadership, its *sine qua non*. However it is not the only component, and without the remaining sub-scales, the charisma is squandered. It may be assumed that a charismatic leader will be interested in the proficiency of the other components in order to perfect his or her functioning and improve the underlings' satisfaction; to in general have a greater impact for the organisation. In a situation where a leader displays the other sub-scales in leadership but lacks for charisma, the result will be functionality on the day-to-day level but the inability to inspire the subordinates with vision, for example.

This discussion returns us to the more basic question (for this study as well), whether a leader is born or may be taught. Trait theory and the Great Man theory (Stogdill, 1948; Mann, 1959; Lord, DeVader, and Alliger, 1986; Bass, 1990; Kirkpatrick and Locke, 1991) hold that it is innate. This is a fundamental question, one that has the potential, it must be admitted, to undermine the central foundations of this thesis. However the problems with the above theories

have been described, and are manifold. The weakness of these theories lies in the absence of a single agreed-upon list. Furthermore, they do not take into account the situations in which leadership arises, or point out which traits are the most important; finally they are not useful for training new leaders (Stogdill, 1948; Kirkpatrick and Locke, 1991; Fairholm, 1991).

As a means of rectifying these problems, the following compromise may be stated. While the factor of charisma may in fact be innate, something you either have or you don't have, it is still not the only factor in leadership. The other sub-scales are important as well, and they together act as vital to leadership. They also contribute to a state in which an attainment of something like charisma may occur – this charisma is learnable, albeit not as effective and true to the word as innate charisma. This thesis, therefore, proceeds based on the assumption of this rectification's worth, or the worth of some similar means of rectification.

From this discussion it arises that the two sub-scales most correlated with any brain quadrant, but especially with Quadrant B, are related to the element of leadership most difficult to learn. Once these correlations were found to exist, it became possible to examine them in terms of prediction; in other words, knowing the areas where a leader's brain dominance lies, is it possible to predict that person's leadership style? This question was the focus of Hypothesis 2.

2. Hypothesis 2

Support for Hypothesis 1 enabled us to examine Hypothesis 2, which stated, 'It will be possible to predict leadership styles and outcomes among the study population (with leadership styles and outcomes as a dependent variable and the four quadrant profile scores as an independent variable)'.

Based on the findings (Chapter IV Illustrations 8, 9, 10; Tables 3, 4, and 5), Hypothesis 2 was also supported. It was found that the more quadrants B and D were used, the more leadership style II(B) Idealised Influence (Behaviour)was stronger; and the more quadrant C was used, the more IS Intellectual Stimulation leadership was weaker.

More specifically, sequence of multiple regression analysis (Chapter IV Illustration 8 and 9), showed that participants with high quadrant B and D scores used the transformational leadership style more often than those with low scores in these quadrants. The findings demontrated the possibility of predicting II (B) Idealised Influence (Behaviour) (associated with quadrant D), IS (Intellectual Stimulation) (associated with quadrants A and D), and CR (Contingent Reward) (associated with quadrant B). On the other hand, low quadrant C scorers were more likely to use the transformational leadership style and receive the outcomes than high quadrant C scorers.

Similar results to those of the multiple regression analysis were achieved through the 4-way analysis of variance (without interactions) (Chapter IV Table 5). Participants with high quadrant D scores also received more of the three outcomes measures than low quadrant D scores. Still, quadrants B and D quadrants are not significantly transformational, even though most transformational leadership sub-scale results were significant. The main factor (the linear combination of the sub-scales) was not significant and therefore it was decided not to investigate the main groups separately.

As for the outcomes, participants with high quadrant D scores, and to a lesser extent also quadrant B scores, received the three outcome measures more often than those with low scores in these quadrants. No main effects were found between the quadrants dominance on the transactional leadership style.

The present study was based on literature pointing to the possibility that brain dominance suggests indications of a person's leadership style. For example, some studies portray how individuals who prefer left-hemispheric processing are task-oriented and those who prefer right hemispheric processing are people-oriented (Piatt, 1983; Agor, 1984; Herrmann, 1988). Another differentiation divides leadership styles into either initiating structure styles or considerate styles (Halpin, 1959; Stogdill, 1974). However, as mentioned above, the present study is the first to predict leadership styles (MLQ) according to brain quadrants and not hemispheres, furthermore these previous studies did not base their leadership differentiations on the MLQ.

One interesting finding of the present study is the linkage between quadrants B and D. This, along with one between A and C, are called double dominant diagonal opposites. Generally dominancy is limited to a single quadrant or one hemisphere of the two. In a case such as the present, dominancy is double, meaning it occurs in more than one of the hemispheres, and it is diagonal, meaning it occurs in quadrants not directly connected to one another. When dominancy is diagonal, in other words, these two most-used quadrants must interact with one another via one or both of the other two, less dominant, quadrants (Herrmann,1995).

Those people with double dominant diagonal profiles find themselves, therefore, activating quadrants opposite to one another in fundamental ways. Characteristics of such, pit ideas against action, feeling against thinking, people against things, the future against the past, and risk taking against playing it safe. The person employs both values in each case; usually decision-making is based on deciding between two similar, or intra-hemispheric, paths. One might have to choose between approaching a problem organisationally (B) or logically (A), or analytically (A) or imaginatively (D).

However, people such as in our case must choose to tackle an issue interpersonally (C) or logically (A). In a bad situation this may lead to gridlock between the two quadrants or dead-end. Optimally, however, it has the potential to bring about integrated functioning:

> *An entrepreneur for example, with a 2-1-2-1 profile, can envision the business as it can be and do the down-and-dirty detail work required to get it there. A financial person with 1-2-1-2 profile has not only the A quadrant necessary for determining the financial arrangements, but also the C quadrant, which gives him the interpersonal ability to package and present his services effectively on face to face basis.* (Herrmann, p. 88)

In the case of the present study, therefore, head nurses were predicted to possess double dominant diagonal profiles. For the better, these nurses may be best equipped to be conscientious planners when the situation demands, and imaginative synthesisers of the new. This format of profile did not only occur within the individual nurses, however; it also occurred in the sample as a whole, meaning many nurses displayed a preference for quadrant B, while others for quadrant D. Knowledge such as this may be very helpful, for instance in pairing head nurses, it would be important to recognise and weigh the potential good of matching a B nurse with a D nurse, and the potential bad.

Regarding quadrant C, the participants with lower scores more predictably used transformational leadership styles and attained the outcomes more frequently than high quadrant C scorers. Again, quadrants B and D were found predictive of transformational leadership style, while quadrant C showed the opposite trend. Therefore overall it may be said that the higher a head nurse's quadrant C score (in case this quadrant is the only dominant quadrant), the less of a transformational leader she was, and vice versa.

The fact of this negative correlative prediction is interesting, as quadrant C is in fact the quadrant most characterised by good communication skills with others and the assurance of understanding between others and the self, or with subordinates. It was this quadrant in particular that did not register in our study as predictable, by itself, of transformational leadership. The results suggested on the contrary, that the more this quadrant was used, the less the leaders employed transformational leadership sub-scales. According to Bunderson (1995) communication is critical for effective leadership. One with good communication skills is better able to understand, and thus predict, the effect that different approaches may produce on communication. This has impact on choosing and implementing successful leadership styles, to communicate well with colleagues and subordinates.

These findings of are consistent with other, prior studies, such as those of Mackay (1989) and Drach-Zahavy and Dagan (2002). Mackay, for example, found that the most valued attribute of a nurse in charge was 'being approachable'. Furthermore, Smith (1992) reported that the 'ideal' nurse has a 'caring side'. In like manner many authors insist that as head nurses emerge from patient care into management, they often attempt to manage their subordinates as they formerly managed their patients. Thus they neglect the leadership role, for if patients are not to be 'led', subordinates are (Duffield, 1994; Agich and Foster 2000; Laurent, 2000).

Nevertheless, this negative prediction of quadrant C does become a factor in the testing of Hypothesis 4, regarding left and right brain dominance. There, although quadrant C does not predict transformational leadership, when it is linked together with quadrant D it most certainly does. Therefore the conclusion gleaned from this aspect of the study, in agreement with prior

literature, is that aptitude in communication alone is not a good predictor of transformational, and thus the most effective and productive, leadership.

3. Hypothesis 3

Hypothesis 3 claimed that 'first line managers will use mainly transformational leadership styles and gain better outcomes'. This hypothesis was partially supported. The averages of the entire sample's leadership styles in the current study indeed showed that first line nursing managers use transformational leadership styles sub-scales. However the CR and MBE(A) transactional sub-scales were also found to be used; significantly, the result was nonetheless favourable outcomes. The present hypothesis was based upon agreement with the literature of previous studies, reviewed previously in Chapter II. Therefore if the results of this study are not at one with the hypothesised and expected results, then the results do not agree with the literature as well.

Whereas this study referred to sub-scales leadership styles, other studies mentioned in the literature mainly focus on the two leadership styles (transformational and transactional) and on the outcomes, as a whole and not analysed by the sub-scales. The results of the present study were more precise on account of using the bifurcated, and thus more sensitive, delineations of transactional and transformational leadership. In such a way it was learned that not only is transformational leadership required, but some elements of transactional leadership as well.

It was Burns (1978, 2003) who first introduced the theory of transformational and transactional leadership styles idea. He defined transformational leadership as behaviours that inspire followers with a personal desire to achieve goals. Transactional leadership, on the other hand, were defined as behaviours that obtain commitment for the achievement of goals through a

promise of rewards or agreed-upon exchanges and by taking corrective actions for inadequate performance.

However, the model of the Full Range of Leadership adds two things to Burns' original conception. It breaks down the two modes of transformational and transactional leadership, and it asserts that every leader displays each style to some amount. The person with the optimal profile infrequently displays MBE(P) Management-By-Exception (Passive) and LF (Laissez-Faire) leadership styles, if at all. This individual displays successively higher frequencies of the active sub-scales of transactional leadership styles, of MBE(A) (Management-By-Exception (Active) and CR (Contingent Reward), and the transformational components most frequently. In contrast, a poorly performing person tends toward inactivity and ineffectiveness, exhibiting MBE(P) Management-By-Exception (Passive) and LF Laissez-Faire most frequently and transformational components least frequently. But the emphasis is on this all playing out on a scale, in which you may have more of one than of another, but rarely will you be all of one, and none of a lesser. The present study therefore used the MLQ sub-scales as opposed to merely the transformational and transactional scales for the sake of procuring more exact results.

The current study therefore revealed correlations between leadership sub-scales and outcomes. Save for MBEP Management-By-Exception (Passive) and LF (Laissez-Faire), all leadership styles had positive correlations with EE (Extra Effort) and E (Effectiveness). In other words, all of these leadership styles contributed to subordinates appropriating for use extra effort than that of their original allocation, and finishing the job more effectively.

Nevertheless, a low to moderate correlation was found between EE (Extra Effort) and LF (Laissez-Faire). On the other hand, only two of the transformational leadership sub-scales, II(A)

Idealised Influence (Attributed) and IS Intellectual Stimulation, correlated positively with the outcome SAT (Satisfaction).

The first innovation apparent from the present results, regarding the find that the active transactional sub-scales also lead to positive outcomes, is that not only do all leaders have a little of all the leadership sub-scales, but that it is even beneficial that they have a little of those not considered the most effective. This indeed supports, and even surpasses, Bass and Avolio's theory that leadership runs on a continuum and lacks a break between the two modes of leadership. Burns (1978) viewed transformational and transactional leadership styles as separate and existing at the opposite ends of the spectrum. Bass and Avolio (1995) describe transformational leadership and transactional leadership not as two distinct behaviours; rather, such behaviours coexisted and in some instances complemented one another. The present study has found that not only do they often coexist and even complement one another, the transactional sub-scales can be of benefit in their own right.

Many leadership studies have been undertaken in such various fields as business and industry, government, the military, educational institutions, and non-profit organisations. All of them have shown that transformational leaders, as measured by the MLQ survey instruments, are more effective and satisfying as leaders than transactional leaders, although the best of leaders frequently do some of the latter but more of the former. Follow-up investigations have shown that developing transformational leadership with training in its components can enhance effectiveness and satisfaction as a leader and contribute to the attainment of better outcomes (Bass and Avolio, 1990, 1993, 1995, 1997; Bass, 1998).

Again, however, it is important in light of these studies to emphasise the finds of the present study, that also transactional leadership characteristics and skills contribute to positive

outcomes as measured by the MLQ. The studies have a habit of sweeping transactional qualities under the rug, and lumping all transactional sub-scales in the same bad outlook. Rather, the transactional qualities must be differentiated from, for example Laissez-faire leadership, or Management-by-exception (Passive). These latter are by all accounts detrimental. It has been found by the present study that Management-by-Exception (Active) and Contingent Reward do contribute to effective and satisfying leadership.

There have been many studies, as was just pointed out, to find that positive outcomes are the result of transformative leadership, in other words linking the outcomes to this kind of leadership in particular. Perhaps the most famous of these belongs to Bass (1985) who found that transformational leadership has the greatest power to engender loyalty and commitment. Jung (2000-2001) added to this concept arguing that such leaders employing transformational styles make efforts to clarify designated outcomes, in order to intensify their subordinates' awareness of important outcomes. In addition they try to transform their subordinates' personal values into supporting an organisational vision, thus creating a motivating environment.

The high frequency of the positive outcomes in the current study population is similar to the findings of Butler, Cantrell and Flick (1999), who found positive relationships between transformational leadership on the one hand and satisfaction with supervisors and trust on the other hand. These findings support the high congruence of outcomes in the current study population (displayed in Illustration 11 and Tables 6 and 7). MacKenzie, Podsakoff and Rich (2001) also report a strong, both direct and indirect, relationship between performance and transformational leadership. Hoover (1991) claims that transformational leadership is positively correlated with perceptions of superiors' effectiveness, while Yammarino, Spangler and Bass (1993) discovered correlations between performance and transformational leadership.

There have also been positive associations in other studies in particular between transformational leadership and the Contingent Reward component of transactional leadership (Brown and Dodd, 1999; Waldman, Bass and Yammarino, 1990).

Furthermore, in a study upon the impact of leader-member exchange, transformational leadership, and transactional leadership, Howell and Hall-Marenda (1999) found the relationship between employee-perceived transformational leadership and transactional leadership to be a positive influence. Jung and Avolio (2000-2001) used path analysis to determine the effect that transformational leadership and transactional leadership had on followers' trust and value congruence. They concluded that transformational leadership has both direct and indirect effects, while transactional leadership is limited to indirect effects. Again, however, our study shows a clear connection between the active sub-scales of transactional leadership and the three positive outcomes of the MLQ.

As for the passive transactional sub-scales, in the present study laissez-faire leadership was correlated with the worst results (see Chapter IV Illustration 11) The MBE(P) Management-By-Exception (Passive) sub-scale was also found to be extremely low among the research participants. The study population hardly ever used this transactional sub-scale associated with the laissez-faire leadership style.

Indeed, researchers have consistently reported that laissez-faire leadership is the least satisfying and effective of all the styles (Bass, 1990b). In general (and notwithstanding the abovementioned positive results), sub-scales of transactional leadership behaviour have been accompanied by low senses of accomplishment, clarity, and group unity (Bass, 1990b). This is supported by early research by Lippit and White (1943) and White and Lippit (1960), which showed that laissez-faire leadership resulted in less concentration and poorer work quality. As

another more modern example of this finding, Yammarino et al. (1993) also reported that laissez-faire leadership was negatively related to the military performance of the United States Navy Officers. These findings of Yammarino resemble and confirm those of the current study.

This research tends to be positively inclusive of Bass's 1985 results, while not supporting as strongly Burns's work of 1978. Current research findings coincide with the results reached by MacKenzie et al. (2001), Hoover (1991), Yammarino et al. (1993), Howell and Hall-Marenda (1999), Butler, Cantrell, and Flick (1999), and Jung and Avolio (2000-2001).

Regarding intercorrelations between the two scales, the transformational scale was found as having low negative correlations or no correlation with both the LF Laissez-Faire and MBE(P) Management-By-Exception (Passive) sub-scales, while in most cases positive correlations with MBE(A) Management-By-Exception (Active) and CR (Contingent Reward) were observed. In other words, these findings show correlations between transactional leadership style sub-scales, and they resemble Bass and Avolio's findings from their 1995 research.

Transformational and transactional leadership styles were found in the current study as having low correlation with one another. The outcomes were found as correlating with the transformational leadership style and to the active sub-scales of the transactional leadership style. These findings show very high outcomes associated with the use of these leadership styles, suggesting their effectiveness.

Another interesting result revealed in the current study data worthy of discussion is that the current research sample's averages and medians were located to the extremes in relation to the measurement scales of different MLQ variables (ranging between 0 - 4). In other words the participants rated themselves at the extremes. Furthermore, as can be seen in Table 4, the

standard deviation range is small (about one half a point), showing that the variance among the subjects in the sample was low. This latter finding may be explained by the fact that for the past five years, the Sheba Medical Centre has been offering its leaders intensive and systematic training, including emphasis on leadership and leadership styles. This could explain the low variation in leadership style results within the research population.

The relationship between the scale averages in the current research data resemble the relationships between measurement scale averages found in Bass and Avolio (1995). The data also show a resemblance to the U.S. army sample researched by Kuzhilin (2001). It may be assumed that in comparison to other organisations, the army and public health care organisations offer less freedom to choose a personal leadership style. Unlike private bodies, which draw employees from different backgrounds, the overwhelming majority of army and medical facility leaders emerge from within their organisations. They have therefore tended to absorb their organisations' norms and values. Resemblance may therefore stem from the similarities in the hierarchical structure of these organisations and the essence and responsibilities of both occupations, dealing as they do with the welfare and safety of human beings.

In conclusion, the MLQ results from the present study resembled those of the army population as researched by Kuzhilin (2001). The variance was low, and the participants rated themselves at the extremes.

As was said before, the current findings only partially supported Hypothesis 3, as the research population appeared to use the active components of the transactional leadership style, CR Contingent Reward and MBE(A) Management-By-Exception (Active), as well. The second part of Hypothesis 3, suggesting a positive correlations between transformational leadership styles

and better outcomes, was partially supported as well on account of the intercorrelations between the MLQ scale revealing that CR and MBE(A) also returned good outcomes.

The specific linkage between transformational leadership style and the nursing profession as described in the literature (i.e. Leddy and Pepper, 1998); Chambers, 2002; Vance, 2004) is supported in the current research findings, in the first line managers' use of transformational leadership. It is supplemented in the research findings by the fact of the first line nursing leaders' use of elements of the transactional sub-scales, (these are the more active elements). At this point we shall discuss the more theoretical underpinnings of leadership in the field of nursing, touching when relevant on the elements of transformational and transactional contingencies.

The quickly redeveloping reality of the modern business and organisational world calls for new ways of thinking in terms of management. Thus current thinking in the context of organisational development emphasises the vital function of learning. Learning in this context indicates the abilities both to learn from mistakes and to innovate. The new aspiration and focus of improvement therefore becomes the learning organisation. Thus, this new management paradigm combines the art and the science of organisational endeavour (Peters and Waterman, 1996). The focus of leadership within this construct is to ensure that people learn, by reflecting upon and discovering what they do best and working so as to bring them to perform even better (Kanter, 1996). Hence, some researchers regard leadership skills as the first step toward realisation of the learning organisation (Senge, 1996).

The recent world-wide crisis in health care systems has brought nursing, as a significant ingredient in the health system, to look for new solutions. The key solution concentrated upon leadership. Sullivan, in Sullivan (1993), Drache and Sullivan (1999), and Sullivan and Decker

(2001), described the alterations in her field: health care reform, massive changes in the management of hospitals, home health agencies, and physician office practices. The conclusion: The whole field of health care is becoming more and more business-like. Structural changes are required for this alteration to be successfully adapted by the workforce.

The management of a national health system has what to benefit from the new paradigm of the learning organisation, especially in relation to its abilities to liberate human potential and facilitate creative collaboration (Mullins, 1993). Yet the average nurse has yet to benefit from such (Starkey, 1996), and seems instead to be awaiting instruction from above on how exactly to proceed with the new paradigm in mind.

There exists a current theoretical and practical consensus regarding the significance of leadership in the nursing profession. Barrett, Gessner and Phelps (1975) assert that strong nursing leadership is crucial for the sake of nursing professionalism, and that it is only with strong leadership that the quality of care needed and expected by clients may be provided. Moreover, nursing literature follows management literature in emphasising the importance of devolving and delegating power and responsibility.

Springer (2003) has shown considerable evidence that the hierarchical management of nursing teams is in decline. In its place, Sullivan (1993) and Sullivan and Decker (2001), in their aforementioned articles, assert that today employers expect an empowered, flexible, motivated, responsible, and diverse workforce. They claim that a mutually dependent workforce requires a manager bearing skills very distinct from the authoritarian and paternalistic manager of the years past. Lambert (2002) also notes the importance of a democratic and 'permissive' leadership style of ward nurses. This trend towards the democratic is dominant in some hospitals, where leadership is distributed and developed. Clifford and Horvath (1990) similarly

argue that the function of leadership as shared leadership is relevant to all levels of professional nursing. All nurses must be given the opportunity to influence their work environment, define their own practice, and make available their expertise throughout the organisation.

Though the significance of leadership is evident the search for an adequate leadership style is still in process. Chambers (2002) and Vance (2004) suggest that the qualities required by individuals leading health care in today's context are those of a transformational leader.

The development of nursing competencies spotlighting attention on technology, scientific methods, critical thinking, and technical skills are currently a primary focus in the application of nursing education. The focus on leadership skills thus enhances the development of critical thinking and collaborative, empowering, and transformational approaches (Leddy and Pepper, 1998).

Present and future nurse leaders must have professional attributes that enable them to see the 'big picture' in health care and the place of the unique contribution of nursing within that milieu. Granted they must display transformational leadership skills which enable them to articulate this vision and win the hearts and minds of their teams in a commitment to driving and shaping the change agenda in partnership with, and for the benefit of, patients and clients. However, at the same time, it is direly necessary for them to be able to draw upon a range of practical, managerial skills, to enable them to take the lead in implementing the called-for innovations (Chambers, 2002; Vance, 2004).

According to Davidhisar (1993), transformational leaders possess charisma. As was found and emphasised in the present study in Hypotheses 1 and 2, with regard to the correlation between personal brain dominance cognitive styles and leadership styles and the ability to predict these

leadership styles, transformational leaders demonstrate confidence and exceptional enthusiasm towards their personal commitments, coupled with an ability to relate to others. To attain the transformational vision, leaders must also provide the structure and process. Transformational leadership supplies the necessary qualities to fulfil the dream such as the ability to identify and communicate a vision for the future, articulate and gain commitment to shared values, and empower colleagues to work towards achieving organisational goals (Dunham-Taylor, 2000). Another asset of the transformational leader is the ability to see situations from a perspective that questions basic assumptions (Dunham and Klafehn, 1990).

It is appreciable how transformational leadership is similar to the workings of the learning organisation, as described previously in Chapter 2. Both lay emphasis on innovation and change. Transactional leadership on the other hand is similar to adaptive learning, in that there is a give and take in both; in the former the give and take is found in the relations between the employee and the leader, while in the latter it is found in the relation between a new development and the leader's response. The essence of the learning organisation, and of transformational leadership, is the ambition always to be one step or a few steps ahead, to be creative and innovative and affect the environment before the environment affects them. Thus we see how studies upon leadership from the bottom, and studies upon the organisation from the top, converge in similar theories of effectiveness.

At this point we continue in our discussion to note the benefits of transformational leadership to nursing. Barker (1990) and McDaniel and Wolf (1992) in their studies, tested the transformational leadership theory and found its factors to be similar to leadership qualities described in magnet hospitals. They acclaimed the leadership strategy, calling it visionary leadership, which may help address the current crisis in the health care system. Both nurse

executives and mid-level nurse administrators scored higher on measures of transformational than on transactional leadership. This shows the innate affinity of nursing to transformational leadership.

Medley and Larochelle (1995) found a relationship between first line managers exhibiting a transformational leadership style and the job satisfaction of their staff nurses. This is yet another example of the benefits of transformational leadership for the nursing profession. Their study indicated that the transformational leadership style promotes retention and prevents turnover; this finding carries important economic implications and consequences for hospitals.

In another study linking the two, Dunham (2000) studied leadership practices of top nursing officials in hospitals across the United States, surveying approximately 396 nurse executives in all fifty states. Findings indicated that leaders adhering to the transformational style are often those who encourage creative problem-solving and decision-making at various levels within the organisation. These leaders encouraged employees to assume greater responsibility for developing better services and improving performance. Finally, nurse executives who practiced transformational elements in leadership were found to enjoy much higher job satisfaction among their employees. Along the same lines, nurse executives' supervisors, who also participated in the research project, ranked overall work group effectiveness much higher among the transformational leaders.

Dunham (2000) specified the main benefits of the transactional type of leadership. First, satisfaction among nurses is likely to result in positive behaviour, better interaction and more enthusiastic retention. Second, empowering employees and devolving responsibility are integral to transformational leadership and result in more effective performance. Finally, engaging employees in the decision-making process promotes the rationale that the more power is given,

the more power is possessed. Clearly, Dunham's three main benefits correspond to the MLQ's own three outcomes.

The Dunham-Taylor (2000) study found that nurse executives holding higher degrees were more likely to be transformational, suggesting that advanced education may enhance such characteristics. Larger hospitals tend to have more transformational leaders, and it is a fact that nurse executive employees usually look for job opportunities in hospitals that will allow them to continue with the same leadership style. Studies by McDaniel and Wolf (1992), Dunham and Klafehn (1996), and Morrison et al. (1997) also supported these findings. Perhaps by a trickle-down effect also the smaller hospitals will soon adopt transactional motifs for their nursing leaders.

Many authors highlight the leadership function of the head nurse, contending that to make a significant impact on performance and goal achievement, especially while pursuing new reforms and strategies, head nurses must be able to inspire, challenge, motivate and unite staff in a common purpose (Manfredi, 1996; Fox et al., 1999; Agich and Foster, 2000; Foster, 2000). These happen to be precisely the characteristics of the transformational leader according to the Full Range Leadership Model. However, very few empirical studies (if any) have tested the extent of the head nurses' engagement in leading during their day-to-day work. This might perhaps be a worthy course of future research.

It is agreed that leadership is the most important aspect of the first line manager's activity (Mintzberg, 1994; Sanchez et al., 1995; Manfredi, 1996; Fox et al., 1999). Specifically, Fox et al. (1999) examined the impact of first line managers' time devoted to leadership on the units' personnel productivity. Findings indicate that of all activities engagement in leadership contributes most substantially to a unit's productivity. For this reason the findings of the present

research are important: Engaging in leadership may improve productivity, but engaging in transformational leadership, considered the most effective leadership type, yields the best results. The findings contained in this study, particularly regarding the third hypothesis, are proof of the importance of encouraging transformational leadership in the nursing profession.

It is fitting after the fact established in the study regarding nursing leaders using the transformational style of leadership, that current research indicates gender differences in leadership styles. Evidence of all kinds implicates women in leadership positions as being more transformational and as displaying less managing by-exception than their male counterparts. Moreover, they are seen by their subordinates and colleagues alike as slightly, but significantly, more effective and satisfying as leaders (Eagly, Johannesen-Schmidt and van Engen, 2003). Being that nursing leaders are primarily female, one would expect these leaders to use the more proficient of the leadership styles; and in fact they do, as the current research has served to show.

That women employ transformational leadership as a general tendency may be seen from the following important study. According to Bass, Avolio and Atwater (1996), data from the MLQ (Form 5) gathered from four separate investigations between 1986 and 1992, support the conclusion that women display more transformational and less transactional leadership. In all four studies the women leaders attained higher scores for all four components of transformational leadership: charisma, inspirational motivation, intellectual stimulation, and individualised consideration. The same was true for contingent reward, although such effects generally were not statistically significant in the separate studies (Bass, 1998).

An explanation for the male-female differences in transformational leadership may be due to the well-known, documented tendency of women to be more nurturing (Eagly, 1991). In our

research context, nurturing is integral to the nursing profession. Feeding, sustaining, supporting and caring are all 'feminine' activities, and are also central to nursing. Therefore the following observation may be raised: Nursing has traditionally been a profession lacking a strong leadership at its head. In the past, as has been mentioned, nurses were seen merely as a secondary force in the hospital, subservient to the real healing power, doctors. Nurses, if they were looked upon as having or needing leaders, found these leaders in the form of the doctors and hospital staff.

Therefore, it was precisely their feminine nature in the role of the nurturer, which held them back from creating for themselves their own leadership schema. In the present, it is precisely this feminine asset, nurturing, which is being tapped as the root of a new nursing leadership. Nurturing is a two-edged sword, which originally caused nurses not to create a leadership schema, but also presently grants nurses the ability to be most effective and efficient, in a word, transformative.

The study upon Hypothesis 3 therefore yielded results similar to those of other studies. Most studies investigating the connection between transformational leadership and nursing have shown a positive correlation between this type of leadership and organisational outcomes, team satisfaction, and overall work group effectiveness. Our study showed this as well according to the MLQ. A number of studies apply the outcomes to real-life qualities; they have in this way found transformational leaders to achieve better retention rates, reach higher academic levels, and work in larger organisations. The latter factor may or may not be considered positive, but the previous factors are significant in terms of achievement. In general, then, it may be said that the fact of the higher rate of transformational leaders in nursing is a boon to the profession, one that will no doubt make waves in a field so enveloped by change.

Additionally, it must be recalled the worth found in the positive sub-scales of transactional leadership. In the present study these elements were found to produce positive outcomes in their own right. Therefore as much as transformative leadership has been held up as the ultimate in leadership and the producer of the best results and outcomes, we must not forget the positive association transactional leadership retains with these same outcomes.

In the coming two hypotheses we re-examine leadership under the lens of brain dominancy as revealed by the HBDI. We shall see that while quadrants B and D are more associated with transformative leadership, it is whole brained leadership that yields the best results. If so, we may find that transactional leadership plays a part as well in the crafting of the optimum leader.

4. Hypothesis 4

Hypothesis 4 stated that 'leadership styles will be different among right and left brained study participants'. The findings, presented in the previous chapter's Table 9, supported this hypothesis. It was found by means of the t-test that right-brained research participants were more likely to display CR Contingent Reward, IS Intellectual Stimulation, and II(B) Idealised Influence (Behaviour) sub-scales, and receive EE Extra Effort and E Effectiveness outcomes than the left-brained participants. The other sub-scales and outcomes were not significantly found in either right-brained or left-brained participants. However, it is important to note that taken together, every one of the more positively considered sub-scales, and every one of the outcomes, received a higher score by those right-brained than by those left-brained, regardless of whether that difference was significant or not. Only MBE(P) Management-By-Exception (Passive) and LF Laissez-Faire received higher scores by those left-brained. This in itself is significant, and points to a real edge by the right-brained participants over their left-brained peers.

To recap, the basis of the differences between the two hemispheres was derived by Herrmann (1988, 1995). He found that the left side of the brain processes verbal, abstract, and analytical information in a linear, sequential manner, focusing on differences and contrasts, seeing small signs that represent the whole, and concerning itself with reasoning abilities such as math and language. The right side of the brain processes non-verbal, concrete, and spatial information, looking at similarities in patterns and forming a whole picture. It processes parts in relation to the whole and concerns itself with artistic abilities, such as music and graphics.

Bunderson (1995) claims that according what is known today, Left vs. Right scores and the four quadrant scores are involved in a pervasive and predictable way with the mental processes involved in measures of other constructs: Personality type, the Myers-Briggs Type Indicator (MBTI), Cognitive style/cognitive abilities, and Learning style. Thus, not only can brain dominance be predicted, but other mental processes and constructs are predictable according to particular brain dominance.

Along the lines of these mental processes, certain studies have claimed that individuals who prefer left hemispheric processing are task-oriented, while those preferring right hemispheric processing are people-oriented (Piatt 1983; Agor, 1984; Herrmann, 1988). In like manner the literature points to two, seemingly parallel kinds of information processing along the lines of the specialised cerebral functions of the left and right hemispheres. Measures of creative style tend to be positively and significantly related to the right side of the brain (Gowan, 1979). The left hemisphere deals with verbal, analytical, temporal, and digital materials and specialises in logical and sequential processing. The right cerebral hemisphere operates nonlinearly and holistically and deals with diverse data and information (Gazzaniga, 1970, 1975). Levy and Trevarthen (1976) also developed this concept by demonstrating another fundamental difference between the right and left hemisphere. While the left hemisphere is characterised by

an analytic level of operation, the right is characterised by a more spatial approach. Given a task to match objects, the left hemisphere will match them by the object's function while the right by their appearance.

It is important to emphasise that while people differ in their preferences, and thus in their mental styles, it is possible and desirable to develop capability in the less-preferred styles thus increasing one's effectiveness in widely varying situations. The HBDI makes it possible to identify the preferred thinking style. Diagnosing brain dominance may enable the application of simple and effective techniques for increasing mental performance. Rational and strategic thinking processes may be applied to issues and opportunities, while the 'brain software' can respond quickly and creatively to change (Herrmann, 1988, 1995).

As was mentioned above in the discussion of Hypothesis 3's results, the leadership of women is characteristically transformative. The present findings listed previous at the beginning of Hypothesis 4 supplement that those right-brained tend more to display the qualities of transformational leadership. These findings, in which the only significant sub-scales and outcomes were handed to the right-brained leaders and the right-brained leaders in general scored higher in the more positive sub-scales and the outcomes, work well with the well-documented observation that females are more right-brained (Craycraft, 1999; Hauser, 1996). The following studies are additionally of note in this regard.

Studying brain dominance and work perceptions of educational administrators, Wallace (1992) found the most significant variance to be attributed to gender. Males were more left hemispheric, A and B-quadrants dominant; females were more right hemispheric, C and D-quadrants dominant. In spite of significant differences in thinking styles, there was remarkable

congruence shown in the rating of work dimensions while leadership is rated first by both genders.

Similar findings were shown by Cicchetti (1991), who studied educational and corporate leaders. Significant differences were found between brain dominance mean scores of male and female leaders, with each group showing a stronger preference for left and right hemispheres respectively. Interestingly, fewer differences were found between corporate males and females than between males and females in the field of education leadership. While there were no significant differences between education and corporate males, moderate differences were found between education and corporate females.

A major finding of the present study was the prevalence of right-brained thinking in the study population, of a ratio of nearly three to one. Right-brained thinking, we must remember, is comprised of quadrants C and D. A thinking pattern such as this is considered to be a double dominant profile in the same hemisphere. The term 'double dominant profile' alone might describe one with quadrants C and D or A and B dominant, or one with A and D or B and C dominant. Emphasising that the dominant quadrants are found in the same hemisphere has certain important ramifications. If one with a single dominant profile tends to feel internally integrated, having both of the quadrants dominant in one hemisphere actually strengthens the quality of the two together. The two play off each other, such that, for example, for the person with both C and D dominant,

> *the gifts of D quadrant are deepened and made more available to others because of the service concerns of C[, and] the sensitivities of C take on a broader character because of the visionary inclinations of D quadrant.* (Herrmann, 1995, p.87)

The downside of being double dominant in the same hemisphere is that the bearer of such a profile tends more easily to avoid the modes of the other hemisphere in which he or she is lacking. The more this double dominancy is exclusive, the more the excluded are spurned. The fact of this exclusivity might make the bearer of this profile difficult to be around for people bearing profiles of the spurned hemispheres (Herrmann, 1995).

On the other hand, as has been mentioned above, an important and persistent observation in the study of brain dominancy and leadership is that it is good to have in a leadership board many characters with differing profiles. In other words it is not good if all or most members of the board are right-brained, as they would all float away in a sea of dreams. Nor is it good for all to be left-brained, or they would bore themselves to death with the minutiae of statistics and well-organised graphs. It is best to have many of one, and many of the other; in this vein it is also best to have many who are double dominant in one hemisphere, as well as many others who are double dominant in the other hemisphere.

The supposed reason for this preferred dichotomy may be stated as follows: To have everyone being a little bit of one and a little of the other, would cause neither to be fully realised, brought out of the potential. To have each specialising in one, allows that one to be fully emancipated into the tangible. It is the interaction of these fully-realised profiles that makes for the most dramatic leadership team. Not accidentally, this rationale for a dichotomy is strikingly similar to systemic thinking. This will be further explored in the discussion upon Hypothesis 5.

At the top of this leadership team must always be one or a small amount of those whose profiles specialise in both hemispheres, so as to lead the interaction, or conduct the dialogue between the two profiles of dominancy. To this category of brain dominance our discussion now turns.

This category of brain dominance is called whole brain thinking, in which both the left and the right hemispheres are used according to when the occasion demands it. The present study measured the extent to which the nursing leaders, being women, were right-brained or left-brained. The result, as wrecorded, was that there were nearly three times more right-brain leaders as left-brained, and that those right-brained were more effective in their leadership and employed more transformational leadership strategies. Other studies have indicated that whereas men are left brained thinkers, women are more balanced, whole brain thinkers. Studying leadership among educational administrators, Norris (1984) suggested that women were more characteristically whole-brained than men. Soler (1991) also found that female superintendents revealed a holistic brain dominance profile. Thus, gender has been proved to be a significant predictor of brain dominance (Hauser, 1996).

Whole-brained thinking relates to processing information by both hemispheres and incorporating them. Integrated processing functions in a complementary manner, views the whole picture, and considers a variety of circumstances. This integrated thinking exceeds hemispheric dominant thinking (Carthey, 1993), described above. In such a manner one may view the same problem or situation through the lens of the specialties of the four quadrants, and different problems depending on which quadrant is most needed. The whole-brained style of thinking is characterised by a tendency to synthesise parts to form a whole (Woltz, 1978).

The integrated thinking of whole-brained dominancy, information processing characterised by both left and right hemispheres, qualitatively exceeds hemispheric dominant thinking. The integrated processing functions in a complementary manner to view the whole picture and consider a variety of circumstances (Carthey, 1993). What is sought is a working partnership between the two hemispheres depending on the activity (Peters and Waterman, 1982). Research indicates that at top management levels, right-brain and whole-brain skills characterise effective

leaders (Spinola, 1988; Johnson and Daumer, 1993). Our present study affirms the fact about right-brain skills, while leaving open the possibility of that regarding whole-brained thinking. This latter style of thinking is rarer, however it can be taught, researchers having experimented with instructional sets to prepare subjects to switch between the use of one hemisphere and the other (Boles, 1989).

Whole-brained thinking is relevant for the present discussion, as it is the most-effective form of brain dominancy. If the subjects in the present study had been found to employ this form of brain functioning, we might have seen more significant adoption of the positive sub-scales, those associated with transformational leadership, and obtaining of positive outcomes.

With regard to educational institutions, the literature is replete with references suggesting that leaders of this sort of institution must be comfortable with using both hemispheres of the brain as well (Mintzberg, 1976; Agor, 1985; Taggart, Robey and Kroeck, 1985). Moreover, Blodgett (1988) found that organisations in general that achieve higher rates of organisational growth have presidents who are more right-brained and who tend to build executive teams with divergent thinking style preferences that complement one another and compensate for areas in which they have low preference. Interestingly, the composite thinking styles of successful management teams were characterised as balanced and whole-brain.

In fact, while the HBDI is used by many organisations for the assessment of individuals, it is also used for the assessment of team-work and the purposes of whole organisations. At the individual level one can identify the worker's own style, gain insight into the ways his preferences unconsciously shape his style of leadership and patterns of communication (Leonard and Straus, 1997). At the team level it is recommended to create 'whole-brained' teams, the role being that teams should not concentrate on one particular cognitive style. These

whole-brained teams have a wide repertoire for decision making and problem solving. Thus, using a team concentrating on just the right brain or the left brain is not enough; it is best to use a whole-brained team (Leonard and Straus, 1997). Likewise, in an analysis of the organisation Singh (2002) found the essential characteristics of hemisphericity deployed accordingly. Left hemisphere dominant people wish for more organisational changes than those who are right hemisphere dominant. Ideally, as with Blodgett (1988) and Leonard and Straus (1997), Singh thus believes that an equal distribution of the hemispheres within large organisations is desirable.

In a hypothetical case, an ideal situation would be one in which the school administrator surrounds him or herself with some right-brained personnel on the one hand, and some left-brained personnel on the other, with a smattering of whole-brained personnel for good measure throughout.

The importance of whole-brained thinking has been recognised upon discernment of the specific qualities the two hemispheres separately exhibit. For example, Halpin (1957) and Stogdill (1957, 1974) divided leadership styles into two groups: those exhibiting initiating structure styles (task oriented) and those exhibiting consideration styles (people oriented). These two groups can be conveniently paired with the right and left hemispheres. The HBDI combines the power of the whole brain model with individual training in integrated leadership style. Leaders can be categorised as effective and efficient when they are people-oriented, with styles that emanate from the right or integrated hemisphere (Mitchell and Tucker, 1992). Literature also points to a relationship between brain dominance and individual learning styles (McCarthy, 1987, 2000; Campbell, 1989).

As another example, Farley (1994) claims that, regarding the restructuring of schools as a major focus of today's educational environments, both change and planning are required. These crucial elements of moving toward innovative organisational strategies require both logical, analytical skills (left-brained processing) and conceptual, visionary abilities (right-brained processing) (Herrmann, 1988).

Toth (1997) revealed that school superintendents who preferred right hemispheric processing (being conceptual, synthesisers, interpersonal, holistic) usually demonstrated a preference for a consideration leadership style (people oriented), while the majority of superintendents, who preferred left hemispheric processing, did not demonstrate a preference for the initiating structure leadership style (task-oriented). Toth held that school administrators should be trained to identify individuals' mental styles (along the lines of the brain dominance style) and assign them the appropriate tasks through strengthening the transformational leadership style.

Similar results, pointing to the dearth of right-brained superintendents, were found by Coulson and Strickland (1983). In this study 23 superintendents of schools were compared to 22 business executives. It was revealed that the superintendents had higher left-hemisphere preferences than the business executives. Moreover, leadership styles and brain dominance were studied among selected school superintendents in Texas by Soler (1991). Findings showed that educational leadership was predominantly left brained, utilising leadership skills of organising, administrating, planning, and controlling. A rationale for this preference for left-brained thinking may be found in the fact that the western educational systems are based on logic and rational thinking. These systems promote verbal and analytical processes, while arguably neglecting holistic and innovative thinking (Walker, 1995).

In a study by Norris (1984), the factors of creative leadership and brain dominance were studied among selected educational administrators. The study's sample was comprised of superintendents, principals, and supervisors. It was found that superintendents strongly tended towards a left-hemispheric style and exhibited more developed technical than conceptual skills. Principals exhibited a balance in left or right brain dominance and a high level of perceived innovation. As a group, the principals were ranked highest in conceptual skills, while supervisors, the most whole-brained of the three groups studied, ranked highest in human skills.

Agor (1985), and earlier, Mintzberg (1976), claimed that the nature of organisational functions and routine heavily favour left hemispheric functioning and effectively precludes right brain information processing. However, against this, Agor subsequently (1991), and others such as Wonder and Donovan (1984), Toth (1991) and Herrmann (1995), claimed that creativity is one of the missing leadership characteristics which requires fostering by modern educational leadership training programmes. Thus the suggestion that professors of educational leadership should evaluate their training programs to ensure potential leaders have an effective balance of left brain and right brain propensities.

Thus it may be said of school superintendents that they are characterised by a brain dominance style which prefers the logical, organised, and controlled processes of the left hemisphere. School superintendents generally possess a more authoritative leadership style and generally lack the conceptualisation skills required by leaders administering to a system in an environment characterised by the need for risk taking and acceptance of change. It goes without saying that the two fields of education leadership and health care leadership are similar in the regard that researchers are experimenting with and innovating ways to inspire them to be more open to change and efficiency in a changing world.

Similarly, then, restructuring of hospital departments is a major focus of today's educational environment requiring both change and planning. These crucial elements of moving toward innovative organisational strategies require both logical, analytical skills (left processing) and conceptual, visionary abilities (right processing) (Herrmann, 1988, 1995). It would therefore be a boon for hospital administrators to be trained to identify individuals' mental styles and assign them the appropriate tasks. Such training might mirror work undertaken in the educational field.

The current literature makes it clear that in general leaders must be creative, innovative, and change-oriented (Pinchott, 1985; Agor, 1991; Hooper, 1995). The creative process seems to depend on freeing our right brain from the often overbearing control of our left brain. Managers tend to reward people for left-brain thinking, which is rigorous and precise (Klemm, 2000). Yet this precision is only part of the picture; it is clear that the essence, or at least a very significant part, of leadership, is the creativity that comes with charisma. These two elements are neither rooted in the right hemisphere nor in the left, but in both. Therefore the best leaders must be, as has already been emphasised, whole brained. Innovation, moreover, is the product of the difference – different opinions, different attitudes and different cognitive styles. The cognitively diverse environment generates innovation (Leonard and Straus, 1997).

Both creativity and innovation are critical elements of the organisational reality. These forces comprise the essence of what the leader must bequeath to those he or she leads. Yet innovation and creativity are perceived as mysterious forces that a leader can not obtain control of, and in fact this is not so. It *is* possible for a leader to apply a progressive leadership that creates a climate which encourage innovation and creativity. The success some high-tech companies have experienced is a case in point; these have inspired leaders to stimulate creativity and innovation, in any work place, by using specific leadership initiatives (Klemm, 2000).

The source of this climate that encourages innovation and creativity is whole-brained thinking, both on the level of the individual and on that of the organisation. As found in a study by Kean, Leary and Toth (1993), successful innovative leadership is related to integrative brain processes. Leaders who adopt whole-brained thinking strategies are better adjusted to changing reality and mentally and emotionally balanced. On the other hand, a clear relationship has also been found between innovation and the right hemispheric style of processing (Torrance and Horng, 1980). At the very least it may be said to reconcile these two findings that the left brain is required for innovative thinking to temper it with reality and apply it to the realm of the concrete, numbers, statistics, and facts.

The competitive imperative for virtually all businesses today is 'innovate or become extinct' (Leonard and Straus, 1997). Innovation is also the challenge of the health care system future. As Kerfoot (1998) has suggested, leadership of health care services should concern itself with leading a movement of creative change. For that to be accomplished whole brain thinking is needed.

The considerate leader, the integrated hemispheric thinker, embodies the skills to champion the vision for the future of hospitals' educational management. The head nurse, as a leader, works with the group to set goals to give substance to the educators' dreams and empowers the group to accept the vision as its own. Policy formation, site-based management, and organisational change are all facets of the movement to implement the impetus to better prepare nursing leaders for the society of the next century. Knowledge, training, and awareness of mental processing or brain dominance styles and leader styles and their impact on administrative effectiveness, could assure a positive movement forward to the accomplishment of that goal (Toth, 1997).

Identification of brain dominance is required for developing first line manager leadership. Diagnosing leader's style and brain dominance cognitive processing may guide the development of training programs and enlighten the influence processes within health care institutions. Educational programs should integrate between the two cognitive styles as they are reflected by hemispheric dominance (Shoemaker, 1991). Moreover, techniques for balancing brain functioning and leadership styles will likely advance the nursing manager's work.

The research population observed in the current study was determined, by means of the t test, to be mostly right-brained dominant. These subjects are no doubt more creative, spatially aware, intuitive, spontaneous, holistic, visual and symbolic. Therefore, there may be a need to place emphasis on developing the left hemisphere (not least the higher left = A quadrant), which operates on a more analytical, sequential, concrete and rational level. In this way, it will be possible to obtain a whole-brained leader, able to switch from use of one hemisphere to the other according to the situation. This leader will be effective, creative, innovative and supportive, the better to institute and foster the requisite changes in the ever-developing worlds of health-care and nursing.

5. Hypothesis 5

Hypothesis 5 claimed that 'lower mode (B and C) brain dominance will be found among the majority of the first line managers' population'. The findings of this study supported Hypothesis 5, attributing quadrants B and C dominance to most first line managers taking part in the study. Herrmann suggested that nurses are quadrant C dominant, while nursing supervisors are quadrant B dominant (Herrmann, 1988, 1995). Therefore these findings match Herrmann's results to a substantial degree. The fact that quadrant B was most represented while quadrant C was the second most, is therefore in agreement with Herrmann as the study sample was

comprised of first line nursing managers. Quadrant B characteristics displayed in Illustration 12 which confirms this idea.

Specifically, the present findings show that this research population, consisting of first line managers, was highly dominant in quadrants B and C and close to those quadrants; furthermore it is clear that most of the remainder was located in quadrant D. This supports the findings described in the literature, indicating that nurses, as a whole, are quadrant C dominant (Herrmann, 1988, 1995). Furthermore, current research findings support the correlation between brain dominance and leadership styles, suggesting that quadrant B profiles are more oriented towards leadership and management than the quadrant C population. It is note-worthy, that while showing typical nursing characteristics, the research participants, who also serve as leaders (first line managers), had high quadrant C, B and D scores. In other words, although nurses usually show quadrant C characteristics such as sensitivity, people-orientation, and the ability to communicate easily and meaningful with others, nurses serving as leaders are dominant in quadrants C, B and D, while the B and D quadrants are correlating mainly with the transformational leadership style (which the training and courses are focused on).

For the moment we drop the emphasis on quadrant D, as of the three quadrants said to be most represented in the population sample of the current study, it was represented least (see Illustration 12). At once we see that Hypothesis 5 is vindicated, that quadrants B and C are the most represented. This gives a schema of a workforce possessing the profile termed limbic double dominant. The double dominant profile occurs when the two primary quadrants are found to be in opposing hemispheres side by side each other – the other possibility for a double dominant profile is for it to be cerebral, or comprised of quadrants A and D.

Being double dominant comes with benefits and drawbacks. The benefits are that one possesses an inexhaustible ability to iterate, going back and forth between the hemispheres and their specialties indefinitely. The switch may be from fact-based to experimental, or from nonlinear thinking to verbalising the thought. On the side of drawbacks, this switching back and forth is not an easy phenomenon and may take time to foster and develop.

Succinctly, the difference between possessing a limbic double dominant profile and possessing a cerebrally double dominant profile is that the former is conservative in its decision making and the latter is more action-based. In our case, one of a limbic double dominancy, the benefit is the ability to be a people-person and also an administrator, and to switch back and forth, iterate in other words, between these two different faculties. However there is the possibility of an overemphasis on tradition and precedent, and not enough on willingness to change and innovation. Yet this problem in the current circumstances is partially assuaged by the appearance of a moderate show from quadrant D, linked as it is with transformative leadership.

It seems that of the two limbic quadrants most associated with nurses and their supervisors, quadrant C is most helpful. Equipped with notable studies, Herrmann (1995) found according to research scientists that nurses are lower right (C quadrant) dominant. Furthermore, out of Mintzberg's ten managerial roles (1973), the role which is more familiar than others and has received more emphasis depending upon the situation is directing and motivating subordinates, and training, counseling, and communicating with subordinates (Baxter, 1993). This managerial role may be clearly linked to the C quadrant specialty of interpersonal relations.

As Lumsdaine and Binks (2002) have claimed,

> *people who prefer C quadrant thinking mode tend to enjoy working in groups; teachers, social workers, training counsellors, nurses and musicians have strong preference for the interpersonal and therefore, quadrant C thinking.* (p. 42)

In order to stress the importance of C quadrant characteristics as a basis/condition for quadrant D characteristics, meaning to go from being nurses to being innovative managers and leaders, here are some of the main findings referring to nursing and management. Goldenberg (1990) found that despite variations in administrator characteristics and extent of constraints, the perceived leadership style, consistently and effectively, was relationship/interpersonal oriented in order to develop others, build teamwork, and supportively communicate. Skills include those required to manage the future: innovation, promotion of change, the creative solving of problems, the articulation of an energising vision, and the motivation of others (Cameron and Quinn, 2006). We see from here that, in the words used by Goldenberg, while the leadership style is relationship/interpersonal oriented, skills required to manage the future have much more to do with change, innovation, and motivation. If the former element is a restatement of the essence of quadrant C, the latter is a restatement of that of quadrant B.

Current research findings partially contradict recent study results attained by Drach-Zahavy and Dagan (2002), who found that first line managers engaged extensively in clinical practice and exhibited inter-unit orientation, focusing more on internal aspects of their job (caring) than on external ones (promoting the unit's interests by presenting them to management). According to the nomenclature of the brain dominance theory, they are using their C quadrant (Herrmann, 1985). The key concepts of this quadrant include relationships, reflection and collaboration which are already integral to many nursing curricula (Gosling and Mintzberg 2003). At the

same time these first line nurses neglect their B quadrant functioning which may be characterised as organisational, administrative, conservative, controlled and planning.

Moreover, although leadership is considered the first line manager's most important function, findings (in the study by Drach-Zahavy and Dagan) demonstrated that leadership occupied only 10% of their time. Here is where a contradiction may be relevant to the current study. These findings imply that first line managers exhibited a management style orientated to maintenance rather than to re-creation, focusing more on the 'doing' and the 'here and now' aspects of the job than on leading, planning, being visionary and proactive problem solving (Mintzberg, 1994). Yet in our study it was rather found that the first line nurses practiced not only C quadrant functioning, but also, and to an even greater extent, B quadrant functioning (focusing on administrative tasks). Furthermore, the more active right hemisphere quadrant, D, was also represented among our nurses (albeit to a lesser extent than the other two quadrants), thus signifying a more visionary approach to aspects of leadership, such as to change and innovation.

The present findings are however satisfyingly consistent with some other prior studies. Mackay (1989), for example, found that the most valued attribute of a nurse in charge was 'being approachable'. Smith (1992) reported that the 'ideal' nurse had a 'caring side'. Furthermore, many authors have maintained that as first line managers emerge from patient-care to management, they often attempt to manage people as they have managed patient care, thus neglecting the leadership role (Duffield, 1994; Agich and Foster, 2000; Foster, 2000; Laurent, 2000).

Based on the current findings, first line managers use the B and C quadrants, meaning that they are functioning according to both modes, as some of the theoreticians view them as doing. Other theoreticians see the two functions of caring and leading as conflicting. One explanation

for this phenomenon can be that first line managers may consider leadership in nursing as a caring kind of work, caring for their nurses the way they had cared for their patients. This can be caused by insufficient emphasis given to the values of acquisition of knowledge, skills and attitudes associated with leadership (Mintzberg, 1994). Finally, other authors have highlighted the linking function in the first line manager's role. For example, McCloskey et al. (1996) discerned an important function of nursing in its 'glue function', namely that it is nurses who maintain the holistic overview of the care given to the patient by all members of the health care team. The linking function is perceived as closer to caring and hence as 'natural' to nursing.

To say that first line nurses excel in quadrants B and C is an admission of their deficiency in the other two quadrants. This deficiency prevents them from reaching their full potential as whole-brained leaders. It is clear that the nurse must learn to use quadrant D, as this is elemental for transformative leadership, as we have said. However, and this refers back to the closing note of the discussion upon Hypothesis 3, also the emphases of quadrant A are needed to complete the puzzle. The implication is therefore that while transformative leadership makes up a larger portion of whole-brained thinking, transactional leadership plays a part as well. In order then to attain whole-brained leadership, this other style of leadership must in some ways also be employed. The finding that the active sub-scales of transactional leadership also lead to positive outcomes seems to corroborate this requirement for quadrant A. All of the quadrants are important for the obtaining of whole-brained thinking.

According to the findings from the literature mentioned above, it may be clarified that to the extent to which it is needed to move the first line nurses from caring towards leadership, this movement may be carried out by means of more effective communication systems, constructive feedback from colleagues, a support network within departments for the sake of encouraging the attainment of greater skills, and rewards and resources. All these must be implemented

without neglecting the practical nurse programs for the sake of greater support for providing patient care and creating supportive work environments.

Also important in this context is that these upcoming first line nurses must be taught the core concepts of the learning organisation and of systemic thinking. The learning organisation embodies the demands upon the modern leader, and a case may be made comparing it to the organisation that employs whole-brained thinking in the way it devolves leadership responsibilities. The proponents of this theory of the ideal organisation explain that it tends to develop collaborative management teams, so that imagination and motivation hold sway as much as planning, action, and evaluation (Starkey, 1996). Similarly, whole-brained leadership must collaborate the specialties of the left brain, these being such as planning and logic, with those of the right brain, such as imagination and motivation.

The learning organisation, as delineated by Senge in his book *The Fifth Discipline*, is comprised of five areas of concentration. These are personal expertise, mental models of thinking styles, a common goal, team learning, and systemic thinking. This last, systemic thinking is a mental model that attempts to break down a whole into parts so as to allow the parts to function fully, yet still manages to see the whole as a whole, i.e. a conglomerate of parts. The whole-brained organisation was described similarly in the discussion upon Hypothesis 4 (however there it was not yet called whole-brained). Lacking systemic thinking an organisation can fall prey to the silo effect, in which one mistake can be passed around and never dealt with, thus ‘passing the buck’. Thus systemic thinking calls for communication between the parts, much the same way whole-brained thinking demands all the quadrants of the brain to be converged and integrated into the whole.

The basic lesson learned at this point in the current discussion is that in order to develop future nursing leaders, it is necessary to recognise who in the population has the appropriate skills correlated with the other quadrants beyond quadrant C and to ready them for advancement to become future leaders. While the importance of quadrant C is recognised and valued, it must also be recognised that development of this quadrant is not enough for advancement to leadership; for this profiles with developed and strengthened quadrants B, D, and albeit it to a lesser extent, A, are also required.

It has been said that the agreed-upon best type of leader, the transformative leader, puts to use a combination of quadrants B and D. Quadrant B is the administrative quadrant and quadrant D is the area in which change is prized and innovation nurtured and encouraged. In the present research population the C quadrant was especially represented; this is typical of nurses as this quadrant is very associated with nurturing and caring, the fortes of nursing. Quadrant B, specialising in administration, was in fact the most represented of the quadrants. This fact bodes well for the first line nursing. Yet B is not enough for the effective leader, as for this quadrant D is needed for change and innovation. It is, therefore, this quadrant which requires the most strengthening. And quadrant A was the least represented. If whole-brained leadership is to be sought, this area must be strengthened as well.

Chapter VI – Conclusions

1. Innovations of the current research

The modern work environment is one in which the stability criterion of leadership performance becomes difficult to maintain and sustain. Therefore all professions, and the nursing profession no less (or even especially), must learn to prepare for building this capability, so they can flourish despite the lack of stability. The dilemma between certainty and ambiguity becomes a challenge for managers engaged in building all organisations. Strategies must be strategised and innovations innovated to create leaders mindful of this capability. This study contains such strategy, and, it is hoped, such innovation.

The design of the current research as presented in this paper was to study the relationship between factors of leadership styles and those of brain dominance. It has been the **twin** assertion of the present writer that studying such a relationship will contribute to a better understanding of the particular and special needs of leadership in the nursing profession, and to a better framework for educating nursing leaders of the essentials and rudiments of their field. Thus, this research has the potential to enhance nurses' leadership, through the inclusion of brain function development fundamentals in nursing leaders' training. The sub-scales comprising transformational leadership within the MLQ are nebulous, and, it might be argued, more un-teachable. It is possible, however, to instruct and coach a potential leader (or anyone) on how to strengthen a particular brain quadrant. The argument of this study is that by correlating these two measurements, upon appropriate coaching of strengthening quadrants, it will be possible to develop better leaders.

As has previously been mentioned, analysis of cognitive processing styles and leadership styles has been explored in the business and education sectors, but little such analysis has been done in the field of health care or in other social science fields. This fact indicates that leadership ought

to be studied as it relates to brain dominance. Both leaders and their organisations will benefit from this procedure. Another important innovation of the present research has been analysing leadership as it corresponds to the brain quadrants, not the hemispheres. The clear benefit of such a move is the refinement of results: Instead of learning what type of leadership corresponds to what hemisphere, we have been able to schematise what type of leadership corresponds to what quadrant, be it A, B, C, D, or any combination of these.

Changes in health service policy and the structure of nursing have made charge nurses into ward managers, first line nurse managers, with the autonomy and power to fulfil the true potential of this demanding but exciting role. Nowadays, first line nurses are expected to implement this change in their own role as nurses, and in doing so highlight the importance of effective change management for the benefit of the whole health care organisation. Hence, it is crucial to identify and analyse the first line nurse manager's general characteristics. Knowing the role profile will guide the developing of appropriate training programs and enable the supply of knowledge and adequate preparation for the new role.

An understanding of the needs of medicine and the health care organisational structure is essential for any health care leader. But one of leadership and management ought to be as well. Nurse leaders should be in the forefront of change in health care institutions. This position requires time and energies for them to reflect, confer, and then to act. Leadership perspectives addressing reflection on practices that challenge the status quo may result in increased autonomy and academic recognition. Nurse leaders should strive for an education system that will influence and lead the nursing profession rather that the profession being managed and lead by outside forces (Coyle, 1994; Skelton-Green, 1995).

Restructuring of hospital departments, a major focus of today's health care environment, requires an understanding of both change and planning. These crucial elements of moving toward innovative organisational strategies require both logical, analytical skills (left-brain processing) and conceptual, visionary abilities (right-brain processing) (Herrmann, 1988, 1995). Hospital administrators may be trained to identify individuals' mental styles and assign to them the appropriate tasks.

The considerate leader and whole-brained thinker embodies the skills to champion the vision for the future of hospital's educational management. The first line manager, as a leader, works with the group to set goals to give substance to the educators' dreams and empowers the group to accept the vision as its own. Policy formation, site-based management, and organisational change are all facets of the movement to implement the national impetus to better prepare nursing leaders for the society of the next century. Knowledge, training, and awareness of mental processing styles and leader styles and their impact on administrative effectiveness could assure a positive movement forward to the accomplishment of that goal (Toth, 1997).

Diagnosing leader's style and brain dominance cognitive processing may guide the development of training programs and enlighten the influence processes within health care institutions. Moreover, techniques for balancing brain functioning and leadership's style will likely advance the nursing manager's work.

While a knowledge of the history of leadership theory is certainly helpful, it is at least clear that Carlyle's Great Man Theory and Stogdill's Trait theory (1948) (Mann, 1959; Stogdill, 1974; Lord, DeVader and Alliger, 1986; Kirkpatrick and Lock, 1991) were not supported by this study's findings. In fact, they run contrary to this thesis's central idea, which is based on the notion that leadership styles and brain quadrant dominance can be studied, developed and

fostered. Through proper curriculum and preparation people can improve and change their cognitive styles, enhancing their success in leadership roles. The impact of this work was partly prompted by the notion that leadership is not necessarily an inborn trait, but instead, effective leadership methods can be taught to employees (Saal and Knight, 1988). The researchers espousing this notion have made great progress toward identifying the actual behaviours that differentiate leaders from followers so those behaviours could be taught. Another impact of this line of thinking deals with the broadening of management's focus to include people-oriented as well as task-oriented activities.

These views are similar to the situational approach adopted by Fiedler (1964), who claimed that different situations call for different kinds of leadership. With this argument he paves the way for the behavioural and situational approaches which are now evident. Situational theorists found that successful leaders adapted their behaviours to meet the demands of their particular situation (Hersey, 2000). According to this theory, in order to be successful, the leader needed to utilise different styles of leadership based on the task readiness of the follower (Hersey and Blanchard, 1977).

Several famous examples suggest that the same person may be a leader, or a follower, depending on the situation. In other words, even people with leadership abilities might reach the end of their career without realising that they possess this ability. This way of thinking asserts that no list is correct; however it does not take situations into account, it does not point out which traits are most important and it isn't useful in training new leaders.

In a different approach, Peters, Waterman and Philips (1980) described what they called the visionary leader. These researchers take the view that developing a vision and living it vigorously, essentially the charisma to bring it all to fruition, are essential elements of

leadership. Great leaders have a simple, compelling, and crystal-clear vision. This is in fact similar to Bennis' dictum (1980), that leadership ought to be defined as the capacity to create one's own vision and render it into action and maintain it. It is clear, therefore, that this vision is essential.

On the other hand, Golema (1990) has asserted that it is not just vision but emotional intelligence and social skills that make great leaders. He emphasised the importance of relationship-building skills: social awareness, empathy, reading the social currents of organisational life, influencing skills, communication skills, building social bonds, facilitating teamwork, and collaborating. Bossidy and Charan (2002) claimed that although vision and relationship building skills are important, culture and environment have an effective impact, so clearly implementation is the essence of leadership.

Many of the above-mentioned scholars stress one aspect of leadership, be it emotional intelligence and vision. As Farley (1994) has eloquently put it, some leaders specialise in vision, some in the relationships that must be created and sustained, and some in getting the job done with maximum efficiency and care. Yet it is not necessary for one leader to play all three of these roles. The overall point is two-fold: One, a leader must choose a leadership style in line with the given situation; two, a leaders must be assigned with a leadership environment that matches his or her leadership strengths and weaknesses. This point complements the idea of identifying, developing and strengthening the relevant brain quadrant dominance in the training of leaders, turning mere characteristics into inherent capabilities. In this view, training is for the sake of strengthening the appropriate brain quadrant in preparation of the appropriate leadership environment.

Bennis and Nanus (1985) have made the differentiation that 'managers are people who do things right and leaders are people who do the right things. The differences may be summarised as activities of vision and judgment – effectiveness versus activities of mastering routines – efficiency' (p. 21). In other words, a manager is responsible to see that things get done, while a leader, who might also have this responsibility, is the source of creativity and charisma. The leader innovates, literally, leads those behind him with bigger and better ideas. It therefore has been said that the leader, while he or she must additionally excel in use of the B quadrant, has an extra dose of quadrant D, which allows her or him to think out of the box. Their excitement in the process of creation is the source of leadership, it spills over, infects their charges. The manager may be thought of as on the same plain as those he or she manages, while the leader pulls the subordinates up by their bootstraps, and transforms them and the project at hand.

This conception of transformational leadership as always one step ahead is similar, as was discussed in the previous chapter, to that of the learning organisation. Management as we have described it, and transactional leadership, can be said to employ adaptive learning. Here the manager or leader reacts to facts on the ground as they develop. On the other hand the transformational leader, and the learning organisation, both practice proactive learning, the object being to constantly pre-empt and anticipate the facts on the ground. Furthermore it may be said that they bring the "facts on the ground" to follow them.

One important find contained in the present research was the high representation of quadrants B and C. Herrmann (1988, 1995) has similarly shown how nurses are in general C dominant, while their supervisors are generally B dominant. Undifferentiated, this limbic double dominant profile is a cause of less innovative and more conservative leadership. A task of leadership education in this regard is to teach proficiency in the ability to iterate back and forth between these quadrants. When the situation calls for administration, the leader is able to switch to use

of quadrant B, and when the situation calls for smoothing over the differences between people and streamlining relations, the nursing leader is able to concentrate efforts through quadrant C.

It was previously discussed that a possible hindrance to the preparation of nursing leaders is their concentration on quadrant C. C may be considered the nursing quadrant *par excellence* as the profession of nursing is so involved with people. The phenomenon of this quadrant's detriment was seen by the fact that those nurses proficient in this quadrant (alone) displayed less transformational leadership abilities. Furthermore we call to mind the study by Drach-Zahavy ad Dagan (2002) in which it was found that first-line nursing leaders engage in clinical practice, and focus more on internal aspects of their job, such as caring, at the expense of external ones, such as promoting the unit's interests by presenting them to management. The possibility arises that being people-oriented will keep the nurse grounded too much in management of inter-social affairs, and not enough on administration, innovation and leadership (Duffield, 1994; Agich and Foster 2000; Laurent, 2000). Thus the iteration mentioned in the previous paragraph must serve as well here, to devolve concentration on this quadrant, working up other quadrants, especially B and D.

Quadrants B and D, as has been discussed, are associated with the transformational leader. This double dominant diagonal profile pits ideas against action, or feeling against thinking. But we must not forget the findings of the present research to the effect that not only transformational leadership sub-scales, but also transactional sub-scales, lead to positive outcomes, as measured by the MLQ. This fact leads to a further validation of the notion of the superiority of whole brained thinking and leadership. Each quadrant can be used, must be used as much as possible, to further the leadership's agenda. Quadrant A, usually forgotten, must be utilised for the sake of number crunching, analysis and logic, skills the leader must be proficient in for the sake of understanding consequences of actions to be taken and so forth. Quadrant B may be called the

management quadrant, a prerequisite for effective leadership. And how can one lead and inspire without the people skills latent in the C quadrant? This region of the limbic system helps one appreciate the nuances of people, and bring out their best.

Finally, quadrant D is the wellspring of new ideas. One who lacks proficiency in this quadrant may be a good manager, but lacks the ability to innovate, to create. Charisma may be the element without which leadership stalls, however this element cannot be sparked from a void. It comes from the person's own motivation to create. It may even be said, and this Conclusion is without a doubt the venue to say it, that the creativity of quadrant D that leads to charisma is a three-way street: Intersecting are the person's own creativity, the creativity that spills over onto the subordinates, and, last but not least, the person's creativity in fashioning and nurturing the relationship between leader and subordinates, the leadership itself and all that entails. This latter way of creativity most definitely involves at least quadrants B, C, and D.

An area of interest in the previous Discussion was the comparison between leadership by one leader and that by a team. The ideal leader is whole-brained, one who accesses all four quadrants of the brain; the ideal leadership team is whole brained as well. The whole-brained leader must be able to switch from quadrant to quadrant according to the situation, and this means part of being whole-brained is precisely, knowing when to use which. On the scale of the organisation, the leadership team must have itself compartmentalised, systematised, so that each element of the system knows precisely when it is to function, and how. In this way systemic thinking plays a significant part in the running the leadership team. Each part of the system must be given to a specific type of functionality, and we would say each should be in some accordance with the endowments of a specific brain quadrant. Therefore we agree with Blodgett (1988), Leonard and Straus (1997), and Singh (2002), that an equal distribution of the

hemispheres (of course at this point we would prefer quadrants) within a large organisation is preferable.

As we have seen, to be a successful leader takes the many diverse skills corresponding to the brain quadrants. However it is impossible to be absolutely proficient in all of them. Whole-brained leadership looked at another way, nobody needs all the skills at the same time and in every situation. There are many types of successful leaders, and each is sufficient provided the situation calls for it. Undoubtedly there is a style of leadership that suits each person's unique characteristics, and other people she/he can partner with, who have complementary qualities and strengths. This thesis supports this philosophy, advancing the claim that a leadership training curriculum should enable leaders or potential leaders to apply different leadership styles and operate different brain quadrants (or the whole brain) depending on the situation. What must be kept in mind is that no matter which qualities and strengths a person might hold, while a leadership training program must recognise these, the aspiration is always to strengthen the weaker ones and work towards whole-brained leadership.

The study of leadership and brain dominance has the potential to aid in developing educational, administrative, practice modalities, tools and strategies, for addressing the evolving health care system. In such a way the whole health care system, including management, staff, and patients, would benefit. Furthermore, these factors focus energies, improve processes, and assist nurse managers in setting realistic, effective and efficient standards. The findings of such research upon these factors hopefully provide the information necessary for improving the educational preparation of first line managers, while increasing the understanding of managerial roles, facilitating better compatibility, and subsequently providing high quality patient care.

The ability to switch hemispheres and/or quadrants is a mark of balance or wholeness in an individual. Knowledge and internalisation of this facilitates the study of leadership styles of nurse managers within the organisational structure of the present hospital. Furthermore, by analysing these styles, it is hoped that this study has played a significant part in identifying the most effective styles of nursing leadership, thus providing information to educate nurse managers, develop leadership skills and strategies for addressing the evolving health care issues, and create criteria for selecting the best head nurses in the future.

Hopefully, the results of this study will pave the way for the creation of a tool, to help focus on the positive factors, so as to increase staff satisfaction and organisational commitment, and to reach better insights for the sake of improving nursing education. The end result shall be, of course, betterment of the nurse's experience in the hospital or health care facility, and of the patient's experience in his or her stay at these facilities. Hopefully, leaders in the near future will be able to review their own leadership styles, thinking styles, emotional competencies, and career motivations. Such assessment will enable leaders or potential leaders to gain a greater understanding of them selves, resulting in significant growth and development.

2. Limitations of the study

The research tool conducted for this study was the survey. Several usual limitations exist in survey research (Cohen, Manion, and Morrison 2000); this study no less guilty of these, nevertheless an attempt was made to mitigate them to the greatest possible extent. First of all, nurses participated on a volunteer basis, thus making the study an analysis of those who volunteered and not necessarily of the actual research population.

Second, there is the possibility that the nurses answered according to their perception of what would be socially desirable. For this limitation the solution might have been to subject the

subordinate nurses to the same tests as were the head nurses, however with the head nurses as the subjects instead of themselves; in this way their answers could be checked against those of the head nurses. This however was an impossible alternative for procedural reasons.

Finally, the motivation of the head nurses to answer accurately and truthfully is unknown. This, as are the previous two, is a limitation to survey-based studies in general, and is not necessarily relegated to this research alone.

This research had several other specific limitations not derivative of the survey tool. The population sample consisted exclusively, it must be mentioned, of first line managers from only one Israeli public medical organisation. It must be emphasised that the Chaim Sheba Medical Centre is the largest of its kind in the Middle East. Despite this fact, results might still be very different for employees working in medical centres at other geographic locations and coming from other cultures (with different characteristics, norms, values, and beliefs). Managers from private organisations could also supply different results. A larger, more cross-cultural sample with different demographic characteristics could have revealed different findings.

Moreover, this research examined the study sample in its entirety and as one entity. For future research, the current researcher suggests examining individual units or departments within the organisation. Medical centres can vary in terms of different personal characteristics. According to the literature (which can be found in the Introduction) there are two types of departments. These are the ‘acute departments’ such as intensive care units (ICU), surgical units, emergency room (peopled by triage nurses) and paediatrics units, which are found as characterised with the ability for coping with high levels of uncertainty and complexity. The other type of department is the ‘chronic department’ (including geriatrics, psychiatrics, rehabilitation and the like. These

departments are less characterised by the components of intensive care and uncertainty and complexity.

On top of this, types of nurses display differences in the complexity of the care they are charged with giving. These differences depend on characteristics such as those of the patients and those of the environment for instance; some nurses specialise in planning and arranging work activities**,** interpersonal and technical skills. A critical asset is being intellectual, in other words thinking ideas through, making connections, rising above the noise of the ward to reconsider priorities and options. Clinical competence in this regard consists of five competencies: clinical skills, knowledge and understanding, interpersonal attributes, problem-solving and clinical judgments, and technical skills. The general competence includes intelligence, motivation, learning skills, general knowledge base and personality.

It can be seen that there are differences between nursing manpower working in each type of department. This is an interesting reason why it may be worthwhile to divide nurse administrators into two different groups in order to find out if there may be differences. This approach may enable each nurse, and, as a result each organisation to benefit and make the best out of each employee. The basis of such a approach is the situational theory of leadership, as this theory assumes that different situations call for different types of leadership; in our case the various forms of nursing might each demand a different style of leadership. For instance the triage nursing leader must streamline the activities and routines of her staff in a way that the geriatric leader does not have to, while the geriatric nursing leader must constantly be focusing on improving the well-being and nutrition of her charges in a way the triage leader need not.

3. Recommendations for future research

Above we mentioned the following suggestions for future research based on the limitations of the present study. Following are additional recommendations.

- A larger population sample of nursing administrators from different managerial levels might be investigated. In the present research only mid-level nurse administrators were used; however again, based on situational leadership theories different positions require different leadership skills. It could be posited perhaps that the higher up one goes in management, the larger the benefit of being whole-brained.
- All the nurses involved in the present research had already undergone leadership training prior to their involvement. This is not necessarily a limitation of the study, as its purpose was to assess the leadership styles and brain dominance of the nursing leaders as they stood at the time of the testing, regardless of any contingencies such as prior leadership training. However one direction for future research would in fact be to assess leadership style and brain dominance before and after training, and to compare the population samples from before and after. This type of research would actually be testing the effectiveness and worth of the training more than the actual styles and dominance of the nursing leaders.
- Another tack along these lines would be to study the effect of nurse training in only one of these theories (brain dominance or leadership), comparing behaviour and capabilities in the untreated field. It was mentioned above that training for the strengthening of a brain quadrant or towards whole-brained thinking might be easier than training for better leadership.
- Future research might consider increasing attention to international comparative research, with a willingness to cross boundaries into other disciplines. Such an endeavour would be recognised as a strength and is an important venue for future research. First, results from the current research could be compared with similar findings from research done in other hospitals in Israel, and other hospitals worldwide. Second, results could be compared to those of research

upon other fields, such as high-tech management, education administration, and the military. All other research would have in common their twin assessment according to the MLQ and HBDI.

- Few if any empirical studies have tested the extent of the head nurse's engagement in leading during their day-to-day work. What are the components of her leadership on a regular basis? Not the point here are the implementations of long-term goals; rather the emphasis is on day-to-day innovations, charisma. Where does charisma, that elusive element of leadership, come to play in the mundane (and not so mundane) workings of the head nurse? These questions would comprise a worthy platform for future research.
- A new training program based on this above study upon day-to-day work might focus on on-the-job and individual coaching, on how to inject charisma into a profession in need of change, and efficiency into a profession bogged down by unforeseen contingencies.
- A topic of discussion in the last chapter was the manifold similarities between the learning organisation and systemic thinking, and the transformational leader. It has seemed repeatedly that these two theories talk about the same thing, one focused on the micro level of the leader, the other focused on the macro level of the organisation as a whole. Therefore a subject for a more theoretical-based study would be a thorough analysis and comparison of the two theories, as well as a comparison of leadership on the micro level versus that on the macro level. Does leadership always follow the same principles and patterns be it by the one leader or by a team of leaders, or as those abided by in the case of the learning organisation?
- Finally, a positive step would be for the results of this study to significantly contribute to the creation of a tool, the purpose of which would be the screening and assessment of candidates for nursing leadership. The tool would indicate who is eligible for advancement to leadership positions, and what skills must be strengthened for the fashioning of the best possible nursing leadership. In particular, this study provides us with the knowledge or affirmation that:

- The positive sub-scales of transactional leadership also lead to sought-after outcomes, and should not necessarily be overlooked.
- Quadrants B and D are most indicative of transformational leadership.
- Most nurses come to their profession with already strong C quadrants. Unless quadrants B and D are strengthened, this emphasis on people-skills can be more detrimental than positive.
- A nursing leader specialising in quadrants B and C will be a good administrator, but not particularly helpful in innovation and unstable situations.
- Once the nursing leaders has strengthened her B quadrant, she must be taught how to effectively switch between hemispheres as the situation demands. This is the particular challenge of having a double dominant profile, to switch between the hemispheres. The developing of quadrant D all the more makes this ability to switch back and forth a necessity, as being wholly dominant in the right hemisphere must encumber switching from it to the other hemisphere.
- While quadrant A is not mentioned in particular, it is still important to strengthen and develop it, as this will also be helpful to the leader.

4. Implications for practice

Most organisations invest a great deal in their past practices. Consequently, leaders are often reluctant to change processes, structures and tasks that have served the organisation well in the past. This is most definitely true in the world of nursing and health care administration. However, many practitioners believe that understanding and assessing an organisation's leadership styles, and the brain dominance of employees, can mean the difference between success and failure in today's fast-changing health care environment. Knowledge of these factors can provide a basis for the development of educational, administrative and practice

modalities, tools and strategies to address the constantly changing health care field and positively impact the whole system: managers, staff, and patients.

Over the last two decades, the transformational leadership style theory has been used as a foundation for extensive studies in the nursing arena. These studies examine the theory, its components, and links as well as the connection between theory and results. The prominent result factors were the leaders' efficiency as perceived by the team, the degree of staff nurse job satisfaction and their retention rate. The population of most such studies consisted of nurse executives, the highest nursing function in hospitals. Only a minority of these studies have been conducted with mid level nurse administrators. Therefore, this study can claim to have contributed in the mid-level zone of the nursing profession.

It is very much the desire of the present research that the results of this research will further enable nurse managers to focus energies, improve processes, and set standards that are realistic, effective, and efficient. They may also provide information for improving the educational preparation of first line managers, heightening the understanding of leadership and managerial roles, and facilitating better and more appropriate matches, subsequently providing higher quality patient care. Furthermore, hopefully the understanding of the connection between leadership styles and brain dominance will create the ability to focus on specific skill-building practices that lead to increased leadership effectiveness.

An important innovation would be to test all team leaders and inform them of their brain dominance profile and style of leadership, the better that, aside from any remedial or supplementary training, it will give them the chance to be conscious of their strengths and weaknesses for the sake of personal improvement.

The ability to 'switch' hemispheres (to call upon the appropriate hemisphere at the appropriate moment) should be a mark of balance or wholeness in the individual. Combining leadership styles and brain dominance theories could enable nurse leaders to develop their leadership skills and strategies for addressing the evolving health care field and set up criteria for selecting future nurse leadership. Finally, by studying the leadership styles of nurse managers within the organisational structure of the present hospital, it is hoped to construct the most effective style of nursing leadership.

A vital aspect to emphasise is the critical nature of the need to explain, teach and persuade all of the upper-level managers (with budgetary responsibilities) of the importance of the subject of leadership and brain-dominance education, and of its great implications for the future of the field. Efforts must be initiated to persuade these managers to fund projects such as that described in the pages herein. Since the results of activities such as this will not be seen in the near future, but rather somewhat down the road, those responsible for the budget are not generally endeared to this type of allocation. These managers see the most important issues to be those of immediate life and death; it must therefore be strategically explained to them that issues of leadership are also matters of life and death, albeit more in the long run.

The research conducted in this study should be significant for innovations in the field of leadership and management in other fields. To know which quadrants must dominate to create the best leader in the world of high-tech, for example, and to match these findings with a knowledge of leadership requirements as per the MLQ, would complement and corroborate research such as this nicely. It is not only the health profession that is undergoing a time of great upheaval and change. In the health profession a new segment, that of nurses, is being exposed to leadership for in many ways the first time, and this exposure is the perfect opportunity for experts and researchers to apply their cutting-edge theories for brilliant results. Many other

fields can use the positive results of this application of leadership to nurses for their own good. In this nursing plays the role of guinea pig, perhaps, but it also is honoured to play the role of groundbreaker and carrier of the torch.

Hopefully, in the near future, the results described in these pages will contribute to the creation of a tool, helping to focus on the preferable factors, for increasing staff satisfaction and organisational commitment through better insight into the relationship that may lead to improved nursing education.

Glossary

The following sources were used to compile this glossary; each entry is traceable to these sources via the preceding symbols. Where no symbol precedes the entry, the entry was written by the present author.

††† Definitions, Website created and maintained by: Mark Lefers and the Holmgren Lab last updated: July 26, 2004, World Wide Web (WWW) is a source of information available in and to the classroom. http://www.ed.psu.edu/nasa/genetxt.html http://students.ou.edu/E/Tevin.A.Endres-1/concepts.html retrieved on 2006.

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†† Finkelstein, E. (2006). *How to Develop Charisma*. Retrieved on 2006 , from http://72.14.207.104/search?q=cache:xP7TrfcFB6kJ:www.presentation-pointers.com/showarticle.asp%3Farticleid%3D375++Charisma-+a+spiritual+power+or+personal+quality+that+gives+an+individual+influence+or+authority+over+large+numbers+of+people.&hl=iw&gl=il&ct=clnk&cd=1

* Gerrig, R J., & Philip G. Zimbardo. (2002). Psychology and Life (16th ed.). Boston: Allyn and Bacon.

** Glossary - http://www.blackwellpublishing.com/intropsych/glossary.html#chapterY-Z#chapterY-Z http://www.blackwellpublishing.com/intropsych/glossary.html#chapterQ-T#chapterQ-T Retrieved on 2006.

§§ Tissot, P, (2004) Terminology of vocational training policy: a multilingual glossary for an enlarged Europe / ed. by Philippe Tissot. *European Centre for the Development of Vocational Training* - CEDEFOP. Luxembourg : EUR-OP

§§§ Health care professionals. Government of Ontario Central Web Site Ontario Ministry of Health and Long-Term Care, Retrieved on 2006 from http://www.health.gov.on.ca/english/providers/program/nursing_sec/amend_965.html

§ Wasylenki, D., Goering, P., Cochrane, J., Durbin, J., Rogers, J., & Prendergast, P. (2000). Tertiary Mental Health Services: I. Key Concepts. *Canadian Journal of Psychiatry, 45*, 179-184. Retrieved on 2006, from http://www.cpa-apc.org/Publications/Archives/CJP/2000/Mar/ReviewPapers.asp

*** Wikipedia. (2006). The free encyclopedia Retrieved on 2006, from http://en.wikipedia.org/wiki/Brain

†††† World Wide Web (WWW) is a source of information available in and to the classroom. http://www.ed.psu.edu/nasa/genetxt.htmlhttp://students.ou.edu/E/Tevin.A.Endres-1/concepts.html retrieved on 2006.

A

† **Adaptive learning** – Refers to the most common way for a neural network to learn, namely supervised learning. Using a training sample which should produce known responses, the connection weights are adjusted so as to minimise the differences between the desired and actual outputs for the training sample.) Learning where a system programs itself by adjusting weights or strengths until it produces the desired output.

* **Ambiguity** – A perceptual object that may have more than one interpretation.

** **Axon** – The neuronal outgrowth through which the output is transmitted.

B

** **Behaviour** – The actions by which an organism adjusts to its environment.

** **Biological perspective** – The approach to identifying causes of behaviour that focuses on the functioning of the genes, the brain, the nervous system, and the endocrine system.

†† **Charisma** – A spiritual power or personal quality that gives an individual influence or authority over large numbers of people.

*** **Cerebral cortex -** The cerebral cortex, made up of four lobes, is involved in many complex brain functions including memory, attention, perceptual awareness, 'thinking', language and consciousness. (See appendix 5)

** **Correlation** – The extent to which two variables, such as weight and height, are related; a correlation of +1 indicates a perfect positive association, and - 1 a perfect negative association.

* **Cerebral hemispheres** – The two halves of the cerebrum, connected by the corpus callosum.

* **Cerebrum** – The region of the brain that regulates higher cognitive and emotional functions.

* **Cognition** – Processes of knowing, including attending, remembering, and reasoning; also the content of the processes, such as concepts and memories.

* **Cognitive processes** – Higher mental processes, such as perception, memory, language, problem solving, and abstract thinking.

** **Cognitive components** – Basic information-processing routines (e.g. encoding, response selection) which underpin task performance.

* **Concepts –** Mental representations of kinds or categories of items or ideas.

** **Contingency theory** – Fiedler's interactionist theory, specifying that the effectiveness of particular leadership styles depends on situational and task factors.

* **Corpus callosum** – The mass of nerve fibres connecting the two hemispheres of the cerebrum.(see appendix 5)

** **Correlation coefficient** – A measure of the degree of correspondence or association between two variables that are being studied.

** **Cortex** – A structure made of a layer of cell bodies, especially neocortex, the multi-layered outside of the brain (cortex means 'bark' in Latin).

* **Correlation coefficient (r)** – A statistic that indicates the degree of relationship between two variables.

* **Correlational methods** – Research methodologies that determine to what extent two variables, traits, or attributes are related.

* **Creativity** – The ability to generate ideas or products that are both novel and appropriate to the circumstances.

* **Cultural perspective** – The psychological perspective that focuses on cross-cultural differences in the causes and consequences of behaviour.

D

* **Decision making** – The process of choosing between alternatives; selecting or rejecting available options.

** **Dependent variable – T**he variable on which a researcher is interested in monitoring effects or outcomes.

** **Descriptive statistics** – Numerical statements about the properties of data, such as the mean or standard deviation.

E

* **Emotion** – A complex pattern of changes, including physiological arousal, feelings, cognitive processes, and behavioural reactions, made in response to a situation perceived to be personally significant.

** **Emotional intelligence** – The capacity to be sensitive to and regulate our own emotional state, and that of other people emotionality the extent to which we react emotionally – akin to a personality trait, and thought to be partly inherited. Type of intelligence defined as the abilities to perceive, appraise, and express emotions accurately and appropriately, to use emotions to facilitate thinking, to understand and analyse emotions, to use emotional knowledge effectively, and to regulate one's emotions to promote both emotional and intellectual growth.

§§§ **Executive nurse** – nursing executive (CNE) is defined as the senior nurse employed by the hospital that reports directly to the administrator and is responsible for nursing services provided in a hospital. Administrator is defined in the Public Hospitals Act as the person with direct and actual superintendence and charge of a hospital, i.e. the hospital's Chief Executive Officer.

** **External validity** – The extent to which a research finding can be generalised to other situations

****Extraversion** – The tendency to seek and engage with the company of others.

F

* **Face validity** – The degree to which test items appear to be directly related to the attribute the researcher wishes to measure.

** **Factor analysis – A** data reduction technique where relationships between a large number of variables can be reduced to a relationship among fewer hypothetical (i.e. latent) factors.

First line manager- First-line manager is the first level on the ward administrative and clinical ladder. She should be an experienced nurse with strong leadership abilities Note: The terms 'first line manager' and 'head nurses' are used interchangeably.

* **Frontal lobe** – Region of the brain located above the lateral fissure and in front of the central sulcus; involved in motor control and cognitive activities.

G

* **Gender –** A psychological phenomenon that refers to learned sex-related behaviours and attitudes of males and females.

* **Gender identity** – One's sense of maleness or femaleness; usually includes awareness and acceptance of one's biological sex.

* **Gender roles** Sets of behaviours and attitudes associated by society with being male or female and expressed publicly by the individual.

†††† **Generative Learning** – Learners actively participate in the learning process and generate knowledge by forming mental connections between concepts. There are two types of generative activities: activities that generate organisational relationships (titles, headings, questions, objectives, summaries, graphs, tables, and main ideas) and activities that generate integrated relationships between what the learner sees, hears, or reads and memory (demonstrations, metaphors, analogies, examples, pictures, applications, interpretations, paraphrases, inferences).

* **Genes** – The biological units of heredity; discrete sections of chromosomes responsible for transmission of traits.

* **Genetics** – The study of the inheritance of physical and psychological traits from ancestors.

** **Genetic predisposition** – The likelihood of showing a condition or characteristic carried by genetic material

** **Gyrus** – An outgoing fold in the wrinkled cortical surface

H

Hemisphere – One side of the brain, right or left.

* **Hierarchy of needs** – Abraham Maslow's view that basic human motives form a hierarchy and that the needs at each level of the hierarchy must be satisfied before the next level can be achieved; these needs progress from basic biological needs to the need for transcendence.

** **Hypothesis** – A statement about the causal relationship between particular phenomena (i.e. A causes B), usually derived from a particular theoretical framework, which is designed to be tested via research investigation.

I

** **Independent variable** – The treatment variable manipulated in an experiment, or the causal variable believed to be responsible for particular effects or outcomes

** **Information-processing approach** – Understanding how something works by finding out the kinds of information involved and the steps through which it goes in order to accomplish a task.

** **Informed consent** – The ethical principle that research participants should be told enough about a piece of research to be able to decide whether they wish to participate.

** **Internal validity** – The extent to which the effect of an independent (manipulated) variable on a dependent (outcome) variable is interpreted correctly.

J

* **Job burnout** The syndrome of emotional exhaustion, depersonalisation, and reduced personal accomplishment, often experienced by workers in high-stress jobs.

Job satisfaction – A person's attitude (favourable or unfavourable) towards their job.

* **Judgment** – The process by which people form opinions, reach conclusions, and make critical evaluations of events and people based on available material; also, the product of that mental activity.

L

* **Learning** – A process based on experience those results in a relatively permanent change in behaviour or behavioural potential.

Learning organisation - One in which people at all levels, individually and collectively, are continually increasing their capacity to produce results they really care about (Karash, 1996).

* **Limbic system** – The region of the brain that regulates emotional behaviour, basic motivational urges, and memory, as well as major physiological functions.

M

* **Mean** – The arithmetic average of a group of scores; the most commonly used measure of central tendency.

* **Measures of variability** – A statistic, such as a range or standard deviation that indicates how tightly the scores in a set of observations cluster together.

* **Median** – The score in a distribution above and below which lie 50 percent of the other scores; a measure of central tendency.

* **Mode** – The score appearing most frequently in a set of observations; a measure of central tendency.

* **Motivation** – The process of starting, directing, and maintaining physical and psychological activities; includes mechanisms involved in preferences for one activity over another and the vigour and persistence of responses.

N

††† **Neocortex** – Part of the cerebral cortex; constitutes about 85% of the human brain's total mass. The neocortex is thought to be responsible for higher level cognitive functions, such as language, learning, memory, and complex thought.

* **Neuron** – A cell in the nervous system specialised to receive, process, and/or transmit information to other cells.

* **Norms** – Standards based on measurements of a large group of people; used for comparing the scores of an individual with those of others within a well-defined group.

O

§§ **Organisational culture** – A mixture of an organisation's traditions, values, attitudes and behaviours. Different organisations can have very different cultures. In knowledge management, an organisation's culture is extremely important – if it is not based on qualities such as trust and openness, then knowledge management initiatives are unlikely to succeed.

§§ **Organisational learning**

The ability of an organisation to gain knowledge from experience through experimentation, observation, analysis and a willingness to examine both successes and failures, and to then use

that knowledge to do things differently. While organisational learning cannot happen without individual learning, individual learning does not necessarily produce organisational learning. Organisational learning occurs when an organisation becomes collectively more knowledgeable and skilful in pursuing a set of goals.

P

** **Pearson's r** – The commonly used name for Pearson's product moment correlation coefficient

** **Predictive** - Characteristics of an individual or their environment that have some utility in predicting the likelihood of their future offending.

*** **Planum temporale** – The posterior superior surface of the superior temporal gyrus (appendix 5) in the cerebrum. It is a highly lateralised brain structure involved with language.

Process – Subjecting to series of action to achieve result

* **Population** – The entire set of individuals to which generalisations will be made based on an experimental sample.

* **Problem solving** – Thinking that is directed toward solving specific problems and that moves from an initial state to a goal state by means of a set of mental operations.

** **Quantitative research** – Uses methods such as questionnaires, experiments and structured interviews, where the data are analysed using numbers

S

* **Sex differences** – Biologically based characteristics that distinguish males from females.

* **Significant difference** – A difference between experimental groups or conditions that would have occurred by chance less than an accepted criterion; in psychology, the criterion most often used is a probability of less than 5 times out of 100, or $p < .05$.

* **Situational variables** – External influences on behaviour.

** **Split brain** – Occurs when the corpus callosum has been cut (e.g. in order to prevent the spread of epileptic seisures).

* **Standard deviation (SD)** – The average difference of a set of scores from their mean; a measure of variability.

Superior temporal gyrus – One of three (sometimes two) gyri in the temporal lobe of the human brain.(see appendix 5)

T

§ **Tertiary care** – Specialised interventions delivered by highly trained staff to individuals with problems that are complex and refractory to primary and secondary care. This type of care should require referral from secondary care. Criteria for access include the need for higher levels of management and security, staff expertise, and staff and program resources, as well as more detailed and specialised assessment and treatment. Requires highly specialised skills, technology, and support services.

* **Theory** – An organised set of concepts that explains a phenomenon or set of phenomena.

****Training** – Needs assessment identification of learning requirements, to facilitate successful completion of present and future roles.

* **Traits** – Enduring personal qualities or attributes that influence behaviour across situations.

** **Transformational leader** – A leader seen by followers as being endowed with exceptional personal qualities, and who works to change or transform followers' needs and redirect their thinking; a style used by leaders who tend to be dominant and self-confident, need to influence others, while believing strongly in their own values, communicate their goals and visions clearly, and have high expectations of their followers' performance.

V

** **Validity** – The extent to which a given study investigates what it purports to investigate.

* **Variance** – The mean of the sum of squared differences between a set of scores and the mean of that set of scores; the square of the standard deviation.

* **Variable** – In an experimental setting, a factor that varies in amount and kind.

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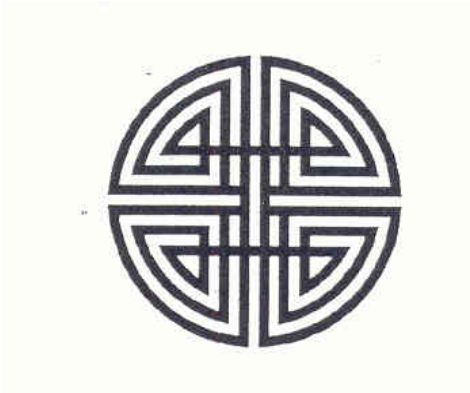
A sample

Appendix 1



Herrmann Brain Dominance instrument

An Instrument to evaluate brain dominance and ways

Your answers to these 120 questions in this questionnaire will enable (us) to develop a model of your preferred ways of thinking. Through knowing your preferences, we can understand the way you learn, the way in which you make decisions, the way you use to solve problems and communicate and why you act this way.

The instrument checks preferences and not talents and abilities. This is not a test. There are no rights or wrong answers. By giving answers in a true and honest manner you will be able to know and understand how you act.

INSTRUCTIONS

A model of your personal preferences and styles of thinking can be determined with the help of your answers to the following questions. Answer each question by marking a number or word as requested (in relevant places mark with X). **This is not a test.** There are no rights or wrong answers. You just indicate your preferences. Please answer all questions as honestly as you can, while you think of yourself as a whole person at home and at work. Upon completion of the questionnaire please check that you answered all questions.

Please relate to the following list of terms in order to clarify the terms appearing in the questionnaire. Keep this list to help you when you receive the results of your personal style of thinking.

List of terms (Glossary).

ANALYTIC This separates the whole into its parts so as to examine the parts and the way they complete the whole.

HOLISTIC Able to grasp and understand the complete picture without delving into its elements in the specific details of the idea, the viewpoint or the situation. Able to see the forest not just the trees.

IMPLEMENTATION Implementation/application. Able to take an activity or idea from plan to implementation with attention to carrying out according to concrete indicators (goals) and outcome measures.

INNOVATIVE Able to present new and original ideas and methods.

INTERPERSONAL	Interpersonal ability. Able to easily develop and retain pleasant and significant relationships with a wide variety of people.
PROBLEM SOLVING	Solves problems. Able to solve complex problems by using a logic way of thinking.
RATIONAL	Rational. – Acts according to his wisdom. Makes his choices and decisions on a causal and by reaching conclusions, and not according to feelings.
RIGOROUS THINKING	Thorough. Thinks in a fundamental way, solves problems in detailed and in depth way.

CHARACTERISTICS

Choose **8** statements which describe you best. Write the number 2 next to each one of your eight choices. When you have completed this, pick one from amongst the **eight** which **best** describes you, and change the number to 3.

26.	_____	Logical	**35.**	_____	Emotional	**43.**	_____	Symbolic
33.	_____	Analytical	**42.**	_____	Mathematical	**50.**	_____	Factual
34.	_____	Goes into details						

Please check that **7** statements are marked with the number **2** and **one** (the eighth) with the number **3**. if there is a need to correct, please do it.

HOBBIES

Mark no more than 6 of your hobbies. Write the number 3 next to your most preferred hobby. Write the number 2 next to the main hobbies, and the number 1 next to the less-preferred hobbies. Please take care to mark the number 3 only once.

51.	_____	Handcrafts/art	**59.**	_____	Gardening	**67.**	_____	Sewing
53.	_____	Camping/hiking	**61.**	_____	House design and improvement	**69.**	_____	Swimming /diving
57.	_____	Creative writing	**65.**	_____	Reading		_____	Other_____

75. Are you able to read while traveling in a car without feeling nauseous, or feeling like vomiting? A. Yes _____ B. No _____

PAIRS

Choose from each pair of expressions the expression which best describes you. Tick one in each pair, even if the choice is difficult. Please, take care to answer for each pair.

76.	Conservative	□	/	□	Empathetic	**88.**	Imaginative	□ /	□ Systematic
79.	Solves problems	□	/	□	Plans	**91.**	controlled	□ /	□ Emotional
84.	Spiritual	□	/	□	Creative	**96.**	Organised	□ /	□ Logical
86.	Innovator	□	/	□	Examines	**98.**	Likes it when	□ /	□ Mathematical

and proves	things are
ideas	planned

Please check your answers to ensure that each pair is marked, and only one statement is marked for each pair.

GENERAL QUESTIONS

Please circle the most appropriate answer.

These are the details of the scale

1. Agree very much 2. Agree 3. No opinion 4. Do not agree 5. Do not agree at all

		Agree very much ▼	Agree ▼	No opinion ▼	Don't agree ▼	Don't agree at all ▼
104	I prefer to be known as truthful rather than imaginative	1	2	3	4	5
106	I rely on positive or negative gut feelings while in the process of problem-solving	1	2	3	4	5

Please check that you have answered all 120 questions

Appendix 2

Multifactor Leadership Questionnaire for leaders (Bass & Avolio, 1997)

A sample

Instructions: The questionnaire is to describe your leadership style as you perceive it.

Use the following rating scale:

0= Not at all 1= Once in a while 2= Sometimes 3= Fairly often 4= Frequently, if not always.

1. I provide others with assistance in exchange for their efforts 0 1 2 3 4

5. I avoid getting involved when important issues arise 0 1 2 3 4

6. I talk about my most important values and believe 0 1 2 3 4

7. I am absent when needed 0 1 2 3 4

9. I talk optimistically about the future 0 1 2 3 4

10. I instil pride in others for being associated with me 0 1 2 3 4

12. I wait for things to go wrong before taking action 0 1 2 3 4

13. I talk enthusiastically about what needs to be accomplished 0 1 2 3 4

18. I go beyond self – interest for the good of the group 0 1 2 3 4

19. I treat others as individuals rather that just a member of the group 0 1 2 3 4

20. I demonstrate that problems must become chronic before I take action 0 1 2 3 4

21. I act in ways that built other's respect for me 0 1 2 3 4

25. I display a sense of power and confidence 0 1 2 3 4

26. I articulate a compelling vision of the future 0 1 2 3 4

28. I avoid taking decisions 0 1 2 3 4

39. I get others to do more than they expected to do 0 1 2 3 4

40. I am effective in meeting organisational requirements 0 1 2 3 4

41. I am effective in representing others to higher authority 0 1 2 3 4

42. I work with others in a satisfactory way 0 1 2 3 4

45. I lead a group that is effective 0 1 2 3 4

Appendix 3

DEMOGRAPHIC SURVEY QUESTIONNAIRE

Please answer every question. This survey may take about 10 minutes or less to fill out.

Participation is strictly anonymous.

Gender: Female_____ Male_____

Age range in years

20-25 ☐

26-30 ☐

36-40 ☐

41-45 ☐

46-50 ☐

51-55 ☐

56-60 ☐

61-65 ☐

Years in Nursing Practice?

0-5 ☐

6-10 ☐

11-15 ☐

16-20 ☐

21-25 ☐

26-30 ☐

31-35 ☐

36-40 ☐

Years in your current status as first line manager:

0-5 ☐

6-10 ☐

11-15 ☐

16-20 ☐

21-25 ☐

26-30 ☐

31-35 ☐

36-40 ☐

Education:

Diploma ☐

BA ☐

MA ☐

PhD ☐

Appendix 4

Leadership styles and brain dominance questionnaires

Dear first line manager,

I am currently a doctoral student working on my dissertation towards a PhD degree in educational management. The study explores personal brain dominance cognitive style and leadership style of first line managers: Analysis of cognitive processing style and leadership style has been explored in the business sector, but little analysis in this area has been done in the field of health care or in other social science fields. Extensive research has indicated that leadership is ought to be studied as it relates to brain hemispheric dominance, specifically at the executive level. Leadership style will benefit from this procedure, as well as the organisation. This study seeks to demonstrate that a focus on brain dominance and according to the findings – one can have the ability of enforcing the less dominant functions. This might be important to the development of nursing education, which will include brain functions developmental fundamentals in the developing of leader's educational knowledge. The current research studies the relationship between leadership styles and brain dominance among first line managers in order to apply this link as a managerial tool in the nursing work.

You are respectfully requested to participate in this research project. Your taking time completing the surveys would greatly be appreciated and is essential for the success of this research.

Enclosed please find three surveys form: 1. Leadership styles questionnaire 2. Brain dominance questionnaire 3. Demographic data sheet. This task will probably take no more than 50 minutes.

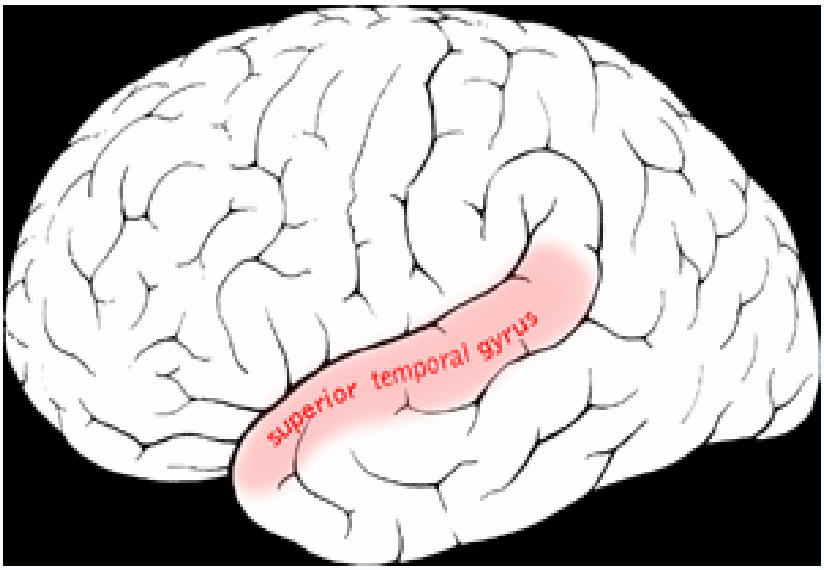
Appendix 4 (continued)

The questions appearing in the questionnaires measure only personal attitudes and information. Accordingly, there are no "right" or "wrong" answers. The value of the survey depends on your responses, therefore please reply to each question with the utmost seriousness and honesty.

The questionnaires will be anonymous. The confidentiality of the questionnaires results is guaranteed. All the data will be maintained at the researcher's close cabinet and will serve academic purposes only. The questionnaires will be coded so the ward and data will be identified.

I wish to thank you in advance for your cooperation, Shoshanna Reiss

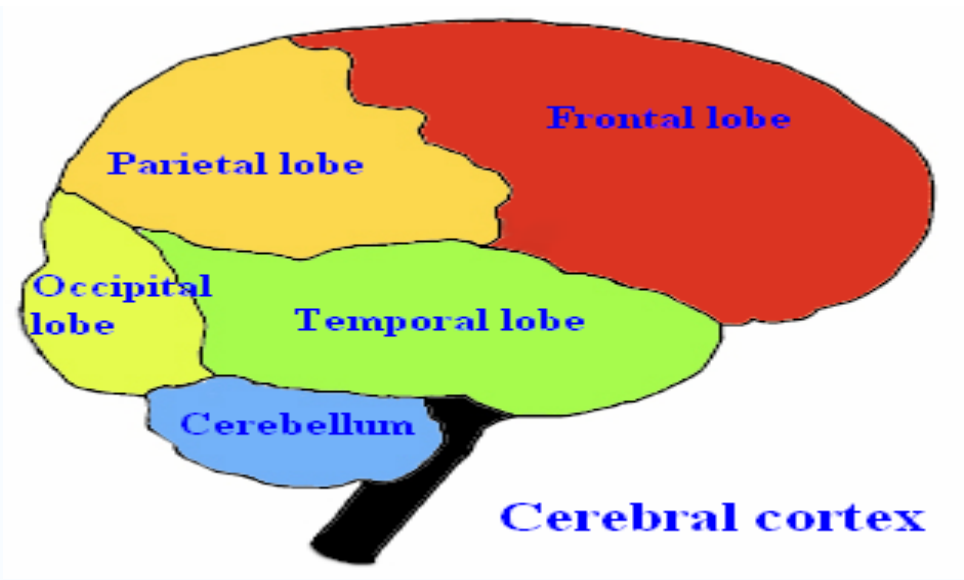
Appendix 5 Examples of the brain's structure



Superior temporal gyrus of the human brain.

From Wikipedia, the free

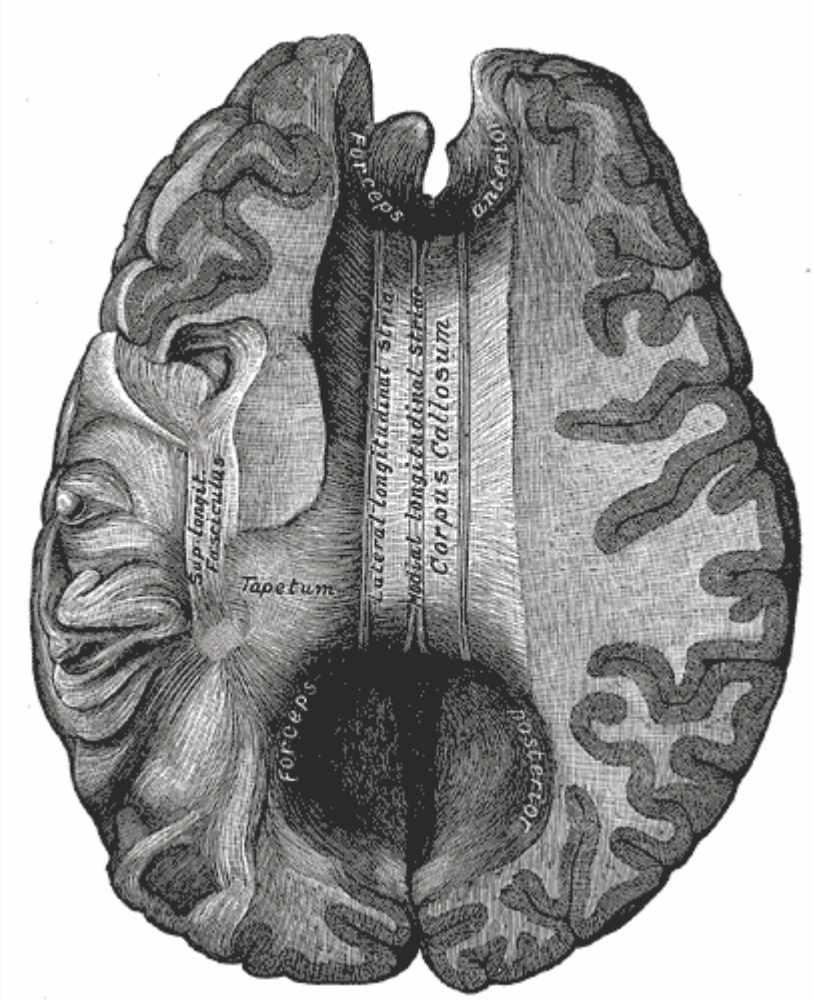
encyclopaedia



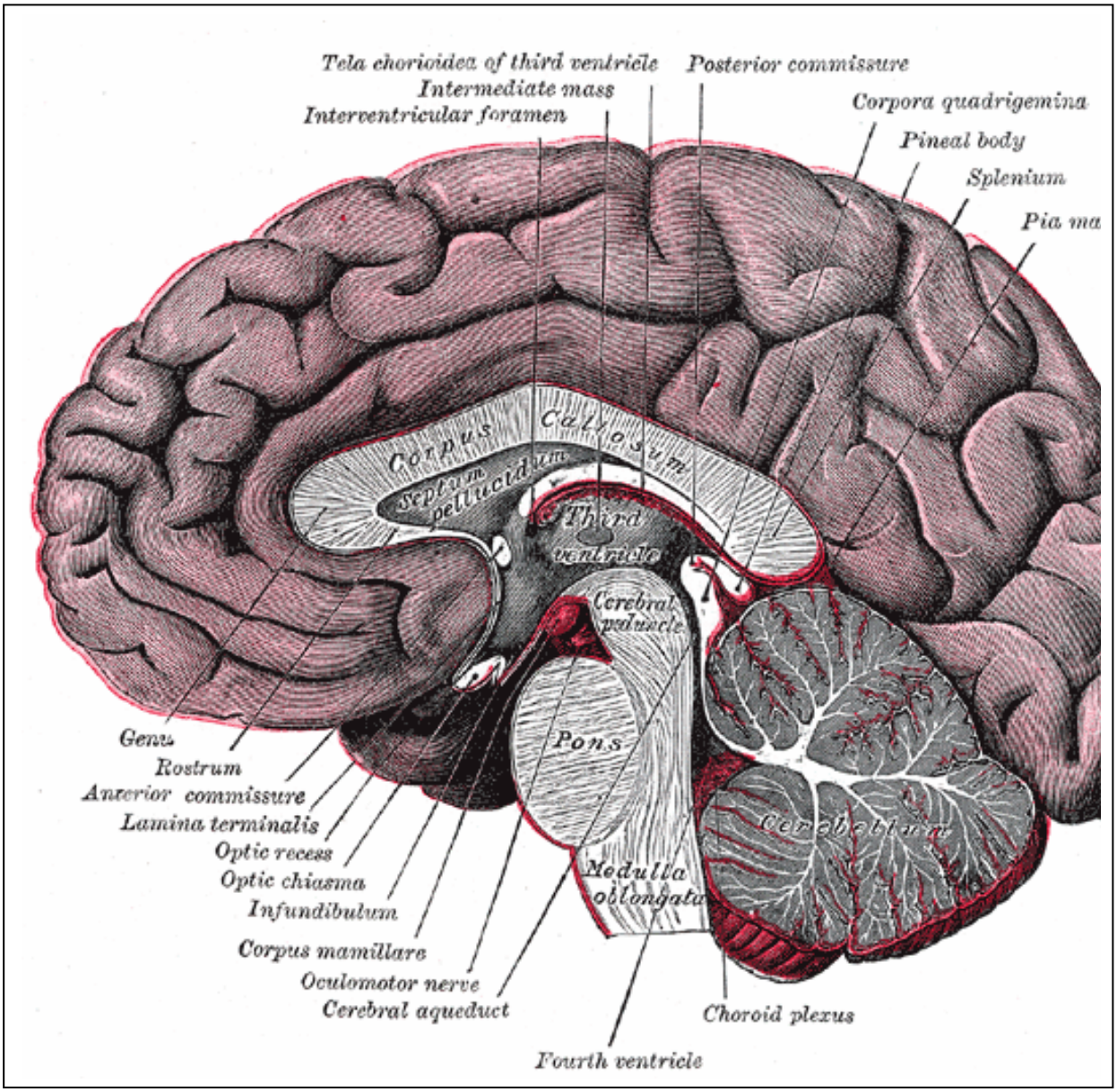
Appendix 5 (continued)

From Wikipedia, the free encyclopedia

Corpus callosum from above



Appendix 5 (continued)



Corpus callosum - Median sagittal section of brain. The relations of the pia mater are indicated

by the red colour is the delicate innermost layer of the meninges - the membranes surrounding the brain and spinal cord.