Our Future In Geriatrics:

An Examination Of The Knowledge, Attitudes And Career Choices Of Physical Therapy Students In Ontario

A Pretest-Posttest Study

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ABSTRACT

There continues to be a shortage of health professionals interested in providing care for the older adult. Part of the problem seems to stem from the negative perceptions of geriatrics as a clinical speciality. This study examines the knowledge, attitudes and career decisions of physical therapy students in Ontario before and after an educational intervention.

Surveys were conducted with 144 physical therapy students from five universities before and after their geriatrics course in order to measure their knowledge, attitudes and interest in working with older adults. The incoming class of physical therapy students (n = 186) acted as control subjects for the study. The Revised Palmore Facts On Aging Quiz measured the students' knowledge of aging (Miller & Dodder, 1980). The Revised Tuckman-Lorge (Axelrod & Eisdorfer, 1961) and the Kogan Old People Scales (Kogan, 1961) were used to examine attitude. An environmental scale was developed based on the work of Snape (1986) to measure the impact of the working conditions on the students' career choices. A 10-point Likert-type scale based on the work of Michielutte & Diseker (1985) was modified and used to measure career interest in working with the elderly.

On independent sample t-tests, positive attitudes were related to the demographic characteristic of gender; ethnicity was negatively related; and marital status was found to be unrelated to attitude (p<.05). Having a relationship with an older adult and taking courses in gerontology were also
found to be positively related to attitude \((p<.05)\). Results on a between-subjects design which compared students before and after the course found that knowledge scores improved from pretest to posttest \((p<.05)\). In general, attitude scores improved from T1 to T2 on both measurement tools \((p<.05)\).

The environmental and vocational interest scales yielded statistically significant differences between the control and experimental groups during the intervention period \((p<.05)\). The results of this research indicated that knowledge and attitudes improve after an educational intervention; however, there was little impact on the students' overall career decisions. Further research is indicated to examine the complex relationship between attitude and behaviour and its impact on students' career choices. In addition, the impact of geriatric clinical environment on students' attitudes and career decisions needs to be further explored.
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They say that doing a Master's is a real learning process. As I complete these final corrections, I realize that they were right.

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DEDICATION

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CHAPTER ONE: INTRODUCTION

Increased life expectancy and decreased birth rates have led to dramatic increases in both the actual and proportionate numbers of persons who are 65 years of age and older. The needs of and services to older adults will vary from those required by the general population. Nowhere is this felt more than in the health care system. It has been reported that the elderly consume health care resources in excess of their representation within the population (Reed, Beall & Baumhover, 1992; Reuben, Fullerton, Tschann & Croughan-Minhane, 1995; Rosenberg & Moore, 1995). It has been speculated that this will steadily increase over the next two decades (Reuben et al., 1995; Rosenberg & Moore, 1995).

With the increasing number of older adults in the population, their greater use of the health care system, and the focus on maintaining them within the community, additional health professionals will be required to work with the elderly (Marsman, Wishart & Richardson, 1996; Stadynk, Compton & Johnson, 1995). Literature on the provision of services has suggested there is a shortage of professionals to provide this care (Brown, Gardner, Perritt & Kelly, 1992a; Coren, Andreassi, Blood & Kent, 1987; Guccione, 1993). In addition there appears to be a reluctance on the part of those entering the health care field to work with this population (Brown, Gardner, Perritt & Kelly, 1992b; Guccione, 1993; Intrieri, Kelly, Brown & Castilla, 1993; Pickles, Compton, Cott, Simpson & Vandervoort, 1995).

The delivery of these services continues to be of interest to researchers
(Guccione, 1993; Intrieri et al., 1993; Rosenberg & Moore, 1995); however, in many institutions, geriatrics still remains an underserviced or neglected area of care (Coren et al., 1987; Feldbaum & Feldbaum, 1981; Guccione, 1993; Pickles et al., 1995). Many authors have speculated that the problem seems to stem from its devaluation as a subspecialty of medicine due to inadequate staffing, lower salaries and weak administrative support (Collins & Brown, 1989; Feldbaum & Feldbaum, 1981; Hasselkus & Kiernat, 1989; Shimamoto & Rose, 1987). Others feel that it is the negative attitudes of the health professionals themselves that have led to recruitment difficulties (Gardner, Kuder & Rich, 1995; Guccione, 1993; Hasselkus & Kiernat, 1989; Pickles et al., 1995).

Attitudes toward older adults are a multifactorial issue (Goldstein, 1980; Vanderzanden, 1985; Worchel, Cooper & Goethals, 1991). They are not simply the results of personal experiences, societal perceptions or biological determination. Rather the origins and perceptions have been determined by a combination of ideas and conditions pervading society over time (Binstock & Shanas, 1985; Guccione, 1993). Gerontologists have long been aware of the importance of understanding the nature of our attitudes about aging (Binstock & Shanas, 1985).

Despite the fundamental importance of identifying and understanding the structure and dynamics of societal perceptions of aging and the aged, further research continues to be needed. Most of the current studies have been
limited to other health professional groups (Gardner, Kuder & Rich, 1995; Intrieri et al., 1993; Reed, Beall & Baumhover, 1992; Smith & Wattis, 1989). Few if any researchers have examined the attitudes of physiotherapists or, more importantly, physiotherapy students who have extensive involvement in the rehabilitation of the elderly (Brown et al., 1992b; Coren et al., 1987; Kvitek, Shaver, Blood & Shepard, 1986).

Physical therapists are involved in the assessment and rehabilitation of clients. Their scope of practice includes a variety of medical conditions within the domains of cardiology, respirology, orthopaedics and neurology. Their work addresses the needs of patients of all age groups, but in particular, those over the age of 65.

Physical therapists have been chosen for this study because they are a unique professional group; yet at the same time, they share many of the characteristics of other health professionals involved in the care of the elderly, such as the predominance of women, and work that is completed in institutional settings (Canadian Physiotherapy Association, 1996). Physical therapy, because of its focus on promoting independence, has a significant role in the provision of care to older adults.

While physical therapists were encouraged to include older adults in their scope of practice in the 1990s, there continues to be a shortage of therapists involved in the service, research and teaching related to gerontology and geriatrics (Canadian Physiotherapy Association, 1996). It has been
estimated that physical therapists currently spend 25% of their treatment time in the care of older adults; this is expected to rise to 50% by the year 2000 (Brown et al., 1992a). Despite the growth of this population, there appears to be a decreased interest in geriatrics in comparison to the other areas of physical therapy practice, such as orthopaedics and sports medicine. Wong (1988) researched the number of geriatric-related articles printed in the journal Physical Therapy as a measure of interest in this area. Only 5% of all articles annually were dedicated to the geriatric population, even though this population comprised 25% of the physical therapy patient population (Wong, 1988).

In summary, many researchers have attempted to determine the factors which predispose an individual towards negative attitudes and to provide a method of intervention for their improvement. This study is unique in that it examines not only the knowledge and attitudes of physical therapy students before and after an educational intervention, but also the impact of this education on the students' career decisions.

The Statement of the Problem

Research remains very limited in its examination of the attitudes of health professionals. This study expands on the current literature in this area by evaluating a group of students that are rarely studied but who provide an important aspect of care.

Therefore, the purpose of this study is to examine the knowledge,
attitudes and career choices of physical therapy students towards the geriatric client. Within this context certain questions arise. These include: (a) is there a relationship between attitude and the demographic variables associated with each subject; (b) do knowledge scores increase after an educational intervention; (c) do attitudes towards older adults improve after a gerontology course; (d) do the perceptions of the environmental factors related to caring for older adults improve after the educational intervention; and (e) is there a change in students' interest in working with the elderly after the educational program?

Rationale for the Study

The rapid and continuing growth of the elderly population, particularly those 65 years and older, will be accompanied by an increase in the need for health and social services among the aged (Guccione, 1993; Rosenberg & Moore, 1995). Increased life expectancy and decreased birth rates have led to increases in the proportionate numbers of persons who are 65 years of age or older. In Canada, the average length of life increased from 47 years at the turn of the century to 73 years as reported in 1990, and has continued to rise (Rosenberg & Moore, 1995). In 1991, the population 65 years of age and over represented 11.6% of the total population of Canada (Rosenberg & Moore, 1995). In 1991, 60% of older adults in Canada were between the ages of 65 and 74 years of age (Rosenberg & Moore, 1995).
Linked to the basic demographics are measures of disability. In Canada, about 1.2 million older adults living in the community reported disabbling conditions (Rosenberg & Moore, 1995). Multiple disabilities are much higher among the older population and a very high proportion of those with multiple disabilities are mobility disabled, which means access to services can often be a problem (Rosenberg & Moore, 1995). Among the older population living in households, the average number of disabilities reported by those between the ages of 65 and 74 years was 1.87. The average number of disabilities increases to 2.19 among those individuals between the ages of 75 to 84 years; and 2.72 among those 85 years of age and over (Rosenberg & Moore, 1995). Of those reported, most individuals cite problems with mobility, followed by agility, hearing, seeing and speaking (Rosenberg & Moore, 1995). Mobility and agility are key areas addressed by physical therapists.

By 2011, the population of Canada is projected to be about 32 million, of whom 10.6 million or about 33% will be 65 years of age or older, and 4.8 million or about 15% will be over 75 years of age (Law, 1995; Rosenberg & Moore, 1995). The size of the older population will grow by almost 150%, and the old elderly will grow by almost 190% between 1991 and 2031 (Rosenberg & Moore, 1995). Assuming the rate of disability for the population remains constant, in 2011 approximately 1.1 million older adults will have some form of disability (Law, 1995; Rosenberg & Moore, 1995).

This population growth has important implications for the health care
system because older clients consume health care resources in excess of their representation within the population (Reuben et al., 1995; Rosenberg & Moore, 1995). In 1991, 12.6% of the U.S. population that was 65 years of age or older accounted for 23.2% of the ambulatory visits; and in 1990, this age group accounted for 45% of all days of care in hospital (Reuben et al., 1995).

Despite the consensus that additional manpower will be necessary, surveys show that many health care professionals are reluctant to care for this rapidly growing sector of the population (Guccione, 1993; Pickles et al., 1995). Previous research has found that many health care providers have deficits in their knowledge about aging and issues related to older adults (Reed et al., 1992; Reuben et al., 1995). It has also been shown that by improving knowledge we can impact on the attitudes of health professionals (Huber, Reno & McKenney, 1992; Linn & Zeppa, 1987; Shahidi & Devlin, 1993; Wilson & Glamser, 1982).

Previous research has also demonstrated that a health professional's knowledge and attitude will directly impact on the type and aggressiveness of the care that older adults receive (Kvitek et al., 1986; Reuben et al., 1995). Therefore, with the impact of negative attitudes toward and perceived lack of knowledge about the care of the older adult, researchers over the last decade have been trying to examine the influence of gerontological curricular interventions on health professionals. Most of the previous research has been conducted with physicians (Coccaro & Meyerson, 1984; Sachs, McPherson &
Donnerberg, 1984; Smith & Wattis, 1989) and nurses (Brower, 1984; Coe, 1967; Reed et al., 1992) or the students of these professions (Deary et al., 1993; Gardner et al., 1995; Intrieri et al., 1993; Reuben et al., 1995). Many of the studies have been conducted outside of Canada (Deary et al., 1993; Fields, Jutagir, Adelman, Tideiksarr & Olson, 1992; Shimamoto & Rose, 1987) and have had small sample sizes (Adelman, Fields & Jutagir, 1992; Eddy, 1986; Goldstein-Lohman & Aitken, 1995).

Therefore, this study needed to be done in order to provide effective research documentation on the attitudes and career decisions of physiotherapy students towards the geriatric client. With our aging population, it is important that educators and hospital administrators understand the attitudes and vocational choices of these students in order to meet the demands of our aging clients. Furthermore, it is hoped that an increased participation and a willingness of these students to work with older adults will lead to improved treatment and rehabilitation outcomes.

**Limitations of the Study**

With all studies there are limitations imposed on the researcher and the researcher's work. Within this study the following limitations were imposed. This research was limited to physical therapy schools in Ontario and, therefore, generalizability to other areas or health professions may be limited. It examined first- and fourth-year male and female students enrolled during the
1994-1995 academic year. At McMaster University the program is a 2-year post-baccalaureate degree. The control students were surveyed during their introductory block and the experimental students, during their geriatric block which is completed during the summer of their first year. The study included all students enrolled in the geriatrics course with the exception of the University of Toronto, where students must ballot for the course and only 20 are accepted. The remaining fourth-year students were also surveyed. The students needed to be able to understand and write the English language. This was most relevant in Ottawa where the students are educated in French and, for many, English is often a second language.

The study interval occurred during a 14-week period. At McMaster, this was limited to 13 weeks because of the curriculum design. There was no long-term follow-up or reassessment of the study subjects. Given the nature of the study and the fact that the classes were preestablished based on educational level, there was no randomization of the subjects. The assessment of knowledge, attitude, environment and career aspirations were limited by the researcher's choice of assessment tools. These measures do not possess well-established psychometric properties. However, the measures described were used because they possess the best available published assessments.
Assumptions of the Study

In the context of this study the following assumptions were made. It was assumed that students in these classes were representative of physical therapy students in general and that repeating this study would yield similar results in other years or other Canadian schools. It was believed that the first- and fourth-year students were similar in characteristics except for the educational courses and therefore, that the cohort effect would be minimized. It was assumed that the students had little geriatric instruction prior to their enrollment in the course and that all previous interactions and education were reported to the researcher. It was assumed that the students complied with the survey procedure; that they completed the survey honestly and that their answers were a true reflection of their feelings. It was believed that the tools were reliable predictors of knowledge, attitudes and career choice. It was assumed that the students had received no previous instruction on how the tools worked or the "correct" answers. It was assumed that there had been no coercion on the part of the schools for the students to answer in a particular fashion. It was also assumed that the university curriculum was being conducted as outlined and that any changes were reported to the researcher.
Variables of the Study

Dependent Variables

Several measurement tools were utilized within this study. General aspects of both knowledge and perceptions of the elderly were measured by the Revised Palmore Facts On Aging Quiz (Holtzman & Beck, 1979; Laner, 1981; Lusk, Williams & Hsuing, 1995; Miller & Dodder, 1980; Norris, Tindale & Matthews, 1987; Palmore, 1980). The Kogan Attitudes Towards Old People Scale contains seventeen paired responses examining several aspects of aging (Kogan, 1961). The Revised Tuckman-Lorge was also used to assess attitude (Axelrod & Eisdorfer, 1961). Beyond the formalized test measures, environmental, educational and vocational questions were asked. These were based on the work of Snape (1986) and Michielutte & Diseker (1985). These tools will be further examined in Chapter Three.

Independent Variables

The primary independent variable of this study was the geriatrics course that the students received. Beyond this, the students’ sociodemographic data and their experiences with older adults were examined. The sociodemographic data included the subject’s age, gender, marital status and ethnicity. Measures of prior experiences with older adults were also examined in order to determine whether the respondents had a relationship with a grandparent or an older adult and whether they had worked with older persons. Occupational history
measured the respondents' prior and current job history as it involved older adults. The number of additional gerontology courses taken and the contact hours were also measured. Finally, the students' area of clinical interest was identified.

Confounding Variables

Some confounding variables have been identified. These included: the time when the survey was conducted; extracurricular involvement with the elderly; clinical placements; and familial involvement with an older adult, such as a grandparent.

Definition of Terms

Attitudes: Attitudes relate to the feelings, emotions or mental positions about a particular client group and one's work with them (Hughes, 1971).

Clients: In this study, "patients" and "clients" will be used interchangeably.

Elderly/Older Adults: Persons referred to as "older adults" or "elderly" are the same as defined in "geriatrics".

Geriatrics: A branch of medicine that examines a group of clients who are over the age of 65 years who may or may not present with a disorder or group of disorders of the neurological, musculoskeletal, cardiorespiratory or cognitive-affective systems.
Gerontology: A branch of knowledge dealing with aging and the problem of the aged (Merriam-Webster, 1984).

Knowledge: In this study, knowledge is defined as the range of one's information or understanding (Merriam-Webster, 1984).

Participants: In this study, participants will be used interchangeably with "students", "subjects" and "respondents".

Physiotherapy: In this study, the terms "physiotherapy" and "physical therapy" will be used interchangeably as per the Canadian Physiotherapy Association (1996) definition.

Students: Those male and female individuals who are enrolled in first- and fourth-year classes during the 1994-1995 academic year in one of the five Ontario physiotherapy schools.

Outline of the Remainder of the Thesis

The remainder of this thesis examines and reports on research into the knowledge, attitudes and career decisions of physiotherapy students towards the geriatric client. Chapter Two provides a literature review on research into attitudes. It begins by defining the term "attitude" and its components. The theories of attitude development and its relationship to behaviour are explored. Finally, a historical review of the attitudes toward older adults is presented. The factors that influence attitudes are also examined, as well as programs to improve the attitudes of health professionals. Chapter Three outlines the
research methodology. The study design, methodology, research procedures and tools are discussed. Chapter Four describes the results of the study. Chapter Five provides a discussion of the results, with conclusions and suggestions for areas of future research.
CHAPTER TWO: LITERATURE REVIEW

Introduction

Researchers in gerontology continue to be concerned about the negative attitudes expressed by students, clinicians and educators toward working with the elderly and aged of our society. However, a review of the literature revealed a limited number of studies that have examined this issue and even less within the physiotherapy profession (Guccione, 1993; Pickles et al., 1995).

Many researchers have negated the possibility of altering the attitudes of the medical community. As a result, most of the current literature has focused on students or new graduates in the field (Adelman et al., 1992; Deary et al., 1993; Gardner et al., 1995; Intrieri et al., 1993; Reuben et al., 1995). Results of these studies have varied; however, the information collected seems to indicate that early intervention may result in a change to a more positive attitude within these future health care professionals with a resultant benefit to the geriatric community (Brower, 1985; Feldbaum & Feldbaum, 1981; Pickles et al., 1995).

This chapter reviews the literature on attitudinal development. It begins with a definition of "attitude" and a description of the theories of attitude development. Factors that have an influence on attitude formation are examined. It also reviews the current research on attitudinal change following specific curricular interventions.
Defining Attitudes

Gordon W. Allport, a social psychologist provided one of the first definitions of attitudes: "An attitude is a mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (Allport, 1935, cited in Rajecki, 1990, p.4).

This definition needs to be examined in detail in order to gain further understanding of the term "attitude" (Rajecki, 1990):

1. **An attitude is a mental and neural state of readiness.**

   Attitudes in this context reside in the personal experiences of the individual. Essentially every individual has his or her own attitudes and cannot directly experience the attitudes of another individual. However if attitudes do exist, it follows that they can be measured the same as other psychological states.

2. **An attitude is organized through experience.**

   Individuals are not born with a preexisting set of attitudes, but rather they acquire them through single and multiple experiences and direct and indirect interactions. Attitudes towards older adults are formulated through the many varied experiences that an individual may have. These direct experiences are then often integrated with one's indirect experiences. Indirectly, individuals will often share the attitudes of those around them or they seek out the opinions of others in order to formulate their own attitudes.
3. An attitude exerts a directive or dynamic influence upon the individual's response to all objects and situations to which it is related.

In this context, Allport is indicating that attitudes have either a direct effect on the individual's action or an ongoing impact on their behaviour. This results in a response to all situations or events to which the attitude is related.

In this context, there is also a sense of the theoretical context from which this definition was formulated. In many parts of the definition Allport draws upon a traditional learning perspective with his ideas that past experiences shape our attitudes. In addition to this, the author indicates that attitudes result in a set pattern of action, thus emphasizing the influence of the behaviourist perspective.

Three Components of an Attitude

The components of an attitude will now be examined in further detail. This research is based upon the works of Rajecki (1990) and Worche, Cooper & Goethals (1991).

The most common definition of attitudes attempts to combine three components: cognitive, affective and behavioral. The cognitive component consists of all the facts or knowledge related to the attitudinal object. All of these components come together to tell the individual about the functions, implications or consequences of the attitude. Within the cognitive component, there is a whole cluster of cognitions which are linked to the main attitudinal
object. Cognitions are directed not only toward the attitudinal object, but also to the various elements surrounding the object which are perceived as relevant. The affective or evaluative component of an attitude is composed of all the emotions that an individual expresses toward an object. These feelings may be positive, negative or neutral. Therefore, the affective component combines all of the feelings of the separate cognitions and links them to the attitudinal object in question. The behavioral component consists of a person's response or readiness to respond to that object. This is the action component of an attitude and it serves to motivate the recipient's behaviour or course of action. The three-component definition of attitude is the one most commonly used by social psychologists. The components remain distinctive and can be distinguished by their different psychological foundations.

Negative attitudes are also composed of three interrelated but distinguishable elements from the cognitive, affective and behavioral domains. They include: stereotyping, prejudice and discrimination. Stereotypes are the cognitive component of negative attitudes. Essentially, they are beliefs about the personal attributes shared by people in a group or social category. They serve to classify all members of a particular group as the same, while denying their individuality. Prejudice is the affective component and the evaluation of an individual or group based on their group membership. Prejudice is exhibited when members of one group (the ingroup) hold negative attitudes towards members of another group (the outgroup). Negative beliefs or prejudgment
based on ethnicity or race are examples of prejudice. Unflattering stereotypes and prejudice often go together, but remain distinctive elements. Discrimination is the overt behaviour or actions resulting from stereotypes and prejudice.

**Attitudes, Beliefs and Perceptions**

In order to examine the literature adequately, it is important that an attempt be made to clarify some of the existing terms of reference which are present in the literature. These terms are beliefs, attitudes, perceptions and values. According to McPherson (1983) and Wilkins (1990), a "belief" represents knowledge or a body of knowledge held by a group. It may be accurate or inaccurate and is often based upon an examination of evidence. An attitude connotes a feeling, emotion or position toward a state or fact. Through the development of one's attitudes, there is often a predisposition to behave in a positive or negative way toward individuals in a particular group (McPherson, 1983). Perception involves a quick, acute intuitive cognition (Merriam-Webster, 1984); however, it is often used interchangeably with attitude. Values are something that are intrinsically desirable or valuable within a group or society (Watson, 1980). Our values can be evidenced within our society in such things as the media and literature. McPherson (1983) believes that it is our values which serve to perpetuate the existing negative images and stereotypes of the elderly.
The construction of a circuit allows for the analysis of various electrical components and their interactions. Understanding the principles of circuit operation is crucial for the design and optimization of electronic systems. The study of circuit theory provides insights into how currents and voltages behave in different configurations. Various components such as resistors, capacitors, and inductors are interconnected to form complex networks.

By analyzing these circuits, engineers can predict their behavior under different conditions and optimize their performance. Techniques like nodal analysis and mesh analysis are fundamental tools in this process. The ability to analyze circuits helps in the development of new technologies and innovations in the field of electronics.
Theories of Attitude Development

Attitudinal research has been studied through three principal frameworks: learning, cognitive and behavioral theories. In order to understand existing attitudes or to develop programs of change, the theories of attitude development will now be examined. This research is drawn from several sources, although principally from the works of Feldman (1985), Goldstein (1980), Vanderzanden (1985) and Worche!, Cooper, Goethals (1991).

Learning theorists believe that attitudes are developed as the result of a learned response. Classical conditioning (Skinner 1938) and operant conditioning (Pavlov, 1927) theories purport that if a behaviour occurs in a particular situation, and is given positive reinforcement, it is likely to be repeated. Therefore, to learning theorists an attitude is the equivalent of a conditioned response. According to them, attitude formation is based upon the sum of all of the positive and negative responses that have been directed toward a particular attitude. The strength of an attitude will vary according to the strength of the response that it evokes for the individual, as well as its importance to them. The above processes are then reinforced for the individual through reward or punishment which can be critical factors in the acquisition and maintenance of an attitude. Reinforcement may occur in the form of verbal and nonverbal behaviours.

Other psychologists feel that attitudes can also be acquired indirectly by observing the rewards or punishments that others receive for their attitudes.
This phenomenon is known as vicarious learning (Bandura, 1977). It accounts for how an individual who has no direct experience with an attitudinal object can develop an attitude.

In contrast to the learning theorists, who look at attitudes as a conditioned response which is rewarded or punished, cognitive theorists' approach is to examine the existing attitude and attempt to explain how the attitudinal components fit together. There are a number of theories that fall under the cognitive consistency approach. Each theory stresses the basic principle that an individual will seek to maintain consistency among his or her attitude and behaviour.

Cognitive theories of attitudes include the balance and cognitive dissonance theories. The basic premise behind Heider's Balance Theory (1946, 1958) is the individual's desire for coherence and meaning. This theory is evaluative in nature and is based upon an individual's evaluation of the attitudinal object and the person holding that attitude, as well as the recipient's evaluation of the object. The assumption underlying this theory is that individuals hold several beliefs and attitudes and will strive to maintain consistency among those beliefs.

The cognitive dissonance theory was first proposed by Leon Festinger (1957). Dissonance theory examines attitude-behaviour inconsistency: the effects of decision-making and engaging in behaviour that is inconsistent with one's attitude. Cognitive dissonance theory espouses that, when an individual
simultaneously holds two cognitions that contradict one another, he or she experiences a state of cognitive dissonance. Dissonance produces a psychological state of tension, which motivates the individual to action. This can be resolved by a change in either the cognition or behaviour.

Behaviourists criticized the cognitive theories of attitude, particularly the cognitive dissonance theory. They felt that the theories were not measurable or directly observable states (Schlenker, Bonoma, Hutchinson & Burns, 1976). Out of this criticism developed Bem's Self Perception Theory (1965, 1967). Bem's theory builds upon a learning framework. The theory purports that individuals form and develop attitudes by observing their own behaviour. Similarly, an individual will use the behaviour of others as a way of inferring an individual's attitude.

The principal frameworks of attitude development have their basis in the learning, cognitive and behaviourist fields. This section has attempted to provide a brief overview of the many theories of attitudinal development. Each theory in its own way has attempted to explain the complexity of attitudes and attitude-behaviour discrepancies. This information will provide a framework when exploring the factors that influence attitudes and programs for their change. In order to understand these works more fully, I would draw your attention to the original works of these authors.
Behaviour and Attitude Change

When reexamining the definition of attitudes, it appears that they serve as powerful energizers for behaviour (Vanderzanden, 1985). Frequently, the assumption is made that attitudes provide accurate indicators for our actions (Kahle & Berman, 1979). To a significant extent, however, this assumption has not been supported in the literature (Vanderzanden, 1985). In reality, many studies have revealed a limited correlation between expressed attitudes and behaviour (Goldstein, 1980; Vanderzanden, 1985; Worchel, Cooper & Goethals 1991). Various researchers have attempted to resolve this matter by suggesting that behaviour is a function of at least two attitudes--those toward the object and those toward the situation.

Ajzen & Fishbein (in Vanderzanden, 1985) have proposed a further refinement to understand the complex relationship between attitude and behaviour. They feel that our attitudes influence our overall response to the object, but do not predict a specific behaviour pattern. The authors feel that it is our behavioral intentions that underlie our actions. These intentions are shaped by three factors: (a) the individual’s attitude toward the action; (b) the belief others have about them performing the action; and (c) the individual’s motivation to comply with these beliefs.

Dunkle and Hyde (1995) used Ajzen and Fishbein’s theory to identify factors that influence physical therapy and registered nursing students' intention to work with older adults. One hundred and seventy-six students from
accredited physical therapy and RN educational programs were surveyed. The students were contacted after graduation to determine whether their job selection matched their stated job intention. The results showed a statistically significant correlation between intention to work with older adults and expressed behaviour with the physical therapy (r = .262) and nursing (r = .308) students (p<.01). More significantly, the results showed a high degree of unexplained variance within the correlation coefficients indicating that the decision is more than likely, multifactorial in nature. In addition, Dunkle & Hyde (1995) found that certain underlying beliefs shaped attitudes and ultimately their job intention. These included: the belief that there would be time to get to know their patients and families; and the belief that these patients would be pleasant to work with. The results of this study give some support to Ajzen & Fishbein's theory of behavioral intention as an influence on expressed behaviours. They also signify that the relationship between attitude and behaviour is not direct, but rather multifactorial.

**Attitude Change**

Attitude change involves three elements: the communicator, the message and the recipient of the message (Worchel, Cooper & Goethals, 1991). The communicator's role is to convey the message, and to effect attitude change. A highly credible source is preferable to someone with little or no credibility (Worchel, Cooper & Goethals, 1991). Traits such as expertise
and trustworthiness have also been linked to effective communicators; these are evidenced by the individual's level of education, social status and professional attainment. Speakers that are similar in characteristics to the message recipient will also be perceived as more credible (Worchel, Cooper & Goethals, 1991). For effective attitude change, multiple sources, each conveying the same or a similar message, should be used.

Central to the process is the message that is to be conveyed. The communicator wishes to make an attitude change; therefore, in order to be effective, he or she must convey the idea in a form which can be transmitted to the target. Several factors have been shown to influence message transmission. The more details that it includes, the more the listener will assume that the speaker knows what he or she is talking about (Worchel, Cooper & Goethals, 1991). In addition, communications associated with a pleasurable emotion can enhance effectiveness; whereas, those associated with fear can be effective only if the fear is manageable and/or if the recipient is taught a method to reduce the fear (Worchel, Cooper & Goethals, 1991). The effectiveness of one- or two-sided communication will vary according to the target. One-sided communication has been shown to be effective if the audience already agrees with or supports the message (Worchel, Cooper & Goethals, 1991). If the audience is well informed or opposed to the message, two-sided communication will be more useful as it provides a balanced presentation of the information (Worchel, Cooper & Goethals, 1991).
Finally, the personal characteristics of the recipient will influence the effects of any communication. Factors such as their level of persuasibility, their level of knowledge and the importance of the subject matter to them will have an influence on the ability of the communicator to change an attitude (Worchel, Cooper & Goethals, 1991). In summary, attitude change involves three essential features: the communicator, the message and the target. This information will be useful when considering programs to promote attitudinal change.

**Attitudes Toward the Elderly: An Historical Perspective**

Societal perceptions of aging have gone through a complex range of attitudes throughout history. "Ageism" is a term that has been used to describe prejudice against an individual or group of individuals because of their age. Butler (1969) described ageism as a "deep seated uneasiness on the part of the young and middle-aged; a personal revulsion to and distaste for growing old, disease, disability; and a fear of powerlessness, uselessness and death" (p. 43). According to Guccione (1993), ageist attitudes foster beliefs about the capabilities, intelligence and physical skills of our elders. In this section, the history of attitudes toward the older adult will be examined. This research is based upon the work of Binstock and Shanas (1985).
Perception of Age in Ancient Culture

In the Old Testament, there are a variety of positive images presented about old age: "A hoary head is a crown of glory; it is gained in a righteous life" (Proverbs 16:31). Longevity is seen as a reward for prior service (Deuteronomy 4:40); and adherence to the commandments (Deuteronomy 5:33). Respect for age is also seen to govern parent-child relations: "Honour your father and your mother as the Lord your God commands you; that thy days may be prolonged and that it may go well with you, in the land which the Lord thy God gives you" (Deuteronomy 5:16); however, not all the images presented are positive. Ecclesiastes (12:1-8) describes some of the physical manifestations of growing old: trembling arms, stooping legs, missing teeth, failing vision and swollen stomachs.

The ancient Greek myths provide similar points of view about aging and old age. Throughout these ancient myths and folklore, there is a sense of vulnerability about the older adult, as acts of strength and victories are frequently ascribed to younger men. In fact, generational conflict frequently arises when elders do not make way for the younger generation. Once again, older adults are frequently portrayed as gruesome figures; Geras, the god who typified old age, is described as a dreadful monster, with wrinkles, thinning hair and an emaciated body.

Medieval literature and society are also filled with both positive and negative images. William Shakespeare provides several examples of the
conflicting images of old age: doddering old women and foolish men are recurrent characters in his works. King Lear, a depossessed father who is illtreated by his heirs, serves as one example which illustrates the difficulties encountered by the elderly. Folk artists and painters of the time depict power as the result of societal rank rather than the cumulative effects of a long life.

**Modernization**

Modernization began to alter the culture of Western civilization. Advances in health care, personal hygiene and diet improve the quality of life. Demographically, there is a decline in the birth rate as well as an increase in life expectancy. Economically and politically, there is a shift from an agricultural to an industrial society, while modern governments attempt to increase control over everyday life. All of these changes result in a decline in mortality rates with a resultant increase in the aging population.

With the above transformations, lifestyles become more structured. The age of leaving school and the age of marriage are delayed with each passing generation. The concepts of "childhood" and "adolescence" are discovered and society begins to believe that this generation is in the best position to meet the challenges and transformations of the new society.

Advances in science and technology result in a reexamination of old age. Notable efforts are made to understand and to develop treatments for senility. With improved living conditions, improved longevity and decreased
mortality rates, the older adult held what should have been a uniquely beneficial position. Instead, they became the victims of a society that has begun to deny death and old age.

The development of industry also shapes ideas about aging. Older workers are viewed as less competent than their younger counterparts. As a result, a new practice of retiring after the attainment of 65 years of age is developed and represents to society that the older employee is less useful. Evaluations of cost and efficiency and the development of new technologies also help to hasten the rapid departure of the older worker, as younger workers are seen to be faster learners who are easier to train.

Ageism Today

The existence of negative attitudes toward the elderly client today can be found in both cultural and societal forces. The words that are used to describe older adults provide a basis for the formation of ageist attitudes. Nussel (1982) who studied the language of aging observed very few age-specific terms that refer positively to older people. Positive age-specific examples include: "mature", "venerable" and "veteran"; however, many of the ageist terms are used to demean people according to age and gender. "Biddy", "granny" and "hag" are used to describe older women. Similarly, "coot", "geezer" and "codger" are used to describe older males. According to Guccione (1993), elders themselves are often guilty of ageism through their
acceptance of these negative perceptions. He feels that this use of negative terminology is more than a choice of words. It is a verbalization of negatively held beliefs which, if left over time, will become less offensive and more acceptable.

The media, which can reflect as well as shape society's views, has also had a strong impact on the images of the older adult. Studies reveal that older adults are given limited television roles and that their representation is inconsistent with current day societal norms (Bell, 1992). Bell's (1992) research indicates that although the images of older adults portrayed on television are improving, they still have a long way to go. During prime time viewing, elderly characters are seen as more comical, stubborn and eccentric than the other characters. They are more likely to be treated with disrespect. Older adults are frequently portrayed as financially secure, extremely healthy and active physically and socially. Older male characters are likely to appear as powerful, active and in productive roles. On the other hand, older females are given limited screen time and are frequently seen as useful assistants to the male characters.

Advertising on television and in magazines continues to support the negative images portrayed within the media. Commercial messages indicate that older adults are preoccupied with constipation, irregularity and incontinence. Younger adults are urged to erase any signs of aging by "washing away the grey" and using creams to "soften tiny lines and wrinkles."
Factors That Influence Attitudes Toward the Elderly

Attitudes are formed according to learning, behavioral and cognitive perspectives. As they develop, they are influenced by individual, social (family, friends and peers) and environmental (positive and negative influences) forces. Current research has attempted to identify these factors in order to gain an understanding of the attitudes of health care providers.

Personal Characteristics

In many studies, the personal characteristics of an individual have been found to be significant in determining their attitudes toward older adults.

Age: The age of the health care provider has been found to be a significant determinant of attitude. Reuben et al. (1995) examined the attitudes of medical students in a cross-sectional survey using the Aging Semantic Differential and the Maxwell-Sullivan Attitude Scale as their measurement tools. Among the predictor variables, they found that older subjects and subjects with older parents had more positive attitudes toward older adults. This finding was also reported in Coren et al. (1987) and Quinn-Krah & Van Hoozer (1988). Earlier studies found inconsistent results with this variable (Campbell, 1971; Shimamoto & Rose, 1987).

Gender: In the same study, Reuben et al. (1995) found male gender to be associated with less favourable attitudes. In many of the earlier studies, gender was not associated with attitude (Eddy, 1986; Kayser & Minnigerode, 1975).
**Ethnicity:** Health care providers who are members of an ethnic group (such as Asian, Hispanic or Italian) have been shown to have more positive attitudes toward the elderly. Shimamoto and Rose (1987) examined the attitudes of 118 nursing students at the University of Hawaii. They found that only 50% of the Caucasians were interested in gerontology, in comparison to 71% of the non-Caucasians (Pacific-Asians). The authors feel that this interest may well be a reflection of the greater reverence for the aged found in Pacific-Asian cultures. This trend was also found by Feldbaum & Feldbaum (1981) in their study of Asian and Hispanic students. In Reuben et al. (1995) ethnicity was found to be related to more negative attitudes.

**Relationship With Grandparents:** Chumbler & Robbins (1994) in their research with podiatric students found that having had a positive personal experience with the elderly, such as a grandparent, was correlated with a positive attitude toward older adults. This trend was also observed by Robb (1979) and Shimamoto & Rose (1987).

**Educational level:** Luketich (1991) found that higher educational levels such as a Bachelor's or Master's degree was associated with more favourable attitudes toward the elderly. This finding was replicated in Brower (1984) and Reuben et al. (1995).

**Prior Experience With The Elderly:** Coren, Andreassi, Blood and Kent (1987) conducted a survey with Master's level physical therapy students. They concluded that previous experiences such as a job, volunteer work, course
work or clinical placements were correlated with a student's decision to work with the elderly. This finding has also been replicated by others (Reuben et al., 1995; Shimamoto & Rose, 1986; Todd, Rider & Page-Robin, 1986). Some earlier studies have found inconsistent results (Gillis, 1973; Gunter, 1971; Kayser & Minnigerode, 1975).

Several factors have been examined in the literature but have shown inconclusive results. These include: the social class of the individual (Coren et al., 1987); marital status (Reuben et al., 1995; Shimamoto & Rose, 1987); having friends or acquaintances over the age of 65 years (Coren et al., 1986); and having children (Kayser & Minnigerode, 1975). Many of the inconsistencies in the literature are related to the research methods and the measurement tools that are being utilized. In order to determine consistent trends between attitudes and sociodemographic variables within these studies, a more standardized use of assessment tools is required.

**Academic and Clinical Education**

Attitude formation in health care professionals is also influenced by their educational environment. A few articles have examined the issue of clinical education as having a positive influence on attitudes (Christie, Joyce & Moeller, 1985). Clinical placements and internships in a speciality area can help to improve interest levels. Christie et al. (1985) found that fieldwork experiences had the greatest influence on the student's choice of clinical
specialization. In their study, the students' interest level in working with older adults was 16% on pretest. Following clinical exposure through placement, their reported level of interest in working with this client group rose to 62%. Similarly, only 13% of these same students showed an improved interest level following their academic instruction.

This research serves to illustrate the point that several factors are important when considering the impact of clinical education. In their examination of occupational therapy students, Ezersky et al. (1989) found that a positive clinical experience was an important factor in choosing a specialty area. More specifically, the students cited that they needed to feel effective in their treatments within the chosen area of care; and that the care provided needed to be consistent with their personal values.

The type of placement can also have an influence on students' attitudes. In Eddy (1986) students who worked in an ambulatory care wing or nursing home setting showed less favourable attitudes than their classmates who worked at a home care program. Similarly, other studies have demonstrated that the exposure to well elderly clients as opposed to chronic and complex patients can result in a more positive attitudinal change (Collins & Brown, 1989). The timing of the placement is also important. Clinical placements have been found to result in more positive attitudes when the exposure occurred early in clinical training, as attitudinal changes have been more apparent in junior level rather than senior level students (Christie et al., 1985). Most
importantly, in all settings, it is the presence of positive supervising therapists who can act as mentors and role models that is essential (Collins & Brown, 1989).

**Work Environment**

Several researchers have examined the influence of the work environment on physical therapists' career decisions (Kersten, Bakewell & Meyer, 1991; Pearl, 1990; Rozier, Gilkeson & Hamilton, 1992). Pearl developed a questionnaire which was pilot-tested on 50 clinicians. It was then administered to a random sample of 500 clinicians who were members of the American Physical Therapy Association. Half of the pretest group completed the questionnaire again one month after the initial administration to determine the consistency of the responses, which was reported as 80%. The questionnaire consisted of 48 closed and open-ended questions. The questions explored the clinicians' demographic characteristics and the factors that they consider important in job selection.

The sample characteristics of the group were 73.8% women and 26.2% men, ranging in age from 22 to 69 years. The clinicians spent 71% of their day in patient care and 27% in administrative tasks. Thirty-four percent were employed in acute care settings. Twenty-eight percent were in private practice, with the remainder being employed in home health, nursing homes and equipment companies.
The results indicated that salary was the most important factor cited by clinicians (51%) for selecting a position, and remaining in the position, as well as a principal motivator for clinicians to consider leaving a position. This finding is consistent with Dunkle and Hyde (1995). As has been previously stated, one of the major drawbacks in geriatric care remains the amount of remuneration for the work. Many authors have documented that this area of care is frequently underpaid (Collins & Brown, 1989; Guccione, 1993; Pickles et al., 1995). Therefore, it is not surprising that there should be difficulty in recruiting individuals to this area of practice.

The location of employment (38.2%) was the second most frequently cited factor. Opportunity and location of employment are important considerations for many new or recently graduated physical therapists. According to the Canadian Physiotherapy Association (1996) employment trends for new graduates tend to favour large centres, often affiliated with a university. Employment opportunities in smaller, underserviced or Northern communities are often more difficult to fill. Because geriatric practices may be found in acute, rehabilitation and long-term care settings, location as a variable does not appear to be impacting on recruitment.

In examining favoured areas of practice, the author found private practice appealed to 176 therapists (42.3%). The remaining favoured areas of practice were orthopaedic clinics (12%), sports medicine centres (11%), rehabilitation centres (10%) and acute care hospitals (9%). Geriatrics as an
area of care was not mentioned.

The overall context in which the employee functions must also be considered. In this instance, it is the structure of the organization in which the care is given. The variables may include the hours of work, availability of flex hours, weekend work, amount of patient care, number of clients, opportunities for courses, teaching opportunities or faculty appointments. Beyond this would be subjective measures, such as feelings of control in decision-making; pride in the care provided, and in the institution; accessibility of management, and higher management to listen to one's concerns. The clinicians were asked what they liked about their current positions. The top three positive characteristics cited were salary, the "work itself" and autonomy. Negative factors were paperwork, excessive working hours and inadequate benefits.

The results of the Pearl (1990) study send an important message. For many years health care professionals were thought of as altruistic individuals who worked to improve the good of humanity (Pearl, 1990). For the professional of today, things seem to be changing. The clinicians surveyed in this study appear to be motivated by salary, rather than altruistic feelings. Pearl (1990) feels that the allure of autonomy and greater financial remuneration of private practice may drive more clinicians away from hospital, rehabilitation and long-term care settings.

In summary, several variables have been shown to influence an individual's attitude and, ultimately, their decision to work with the elderly.
Several researchers have pointed to the individual's personal characteristics as a strong determinant of attitude while others have looked toward the individual's peers and mentors. It is important to remember that the effects of environmental factors cannot be discounted.

**Attitudes Of Health Professionals**

A review of the research examining attitudes of health professionals has revealed several studies which demonstrate the negative attitudes toward providing care for the older adult (Feldbaum & Feldbaum, 1981; Ganong, Bzdek & Manderino, 1987). In general, the findings illustrate a reluctance to work with the elderly, and the perception of such negative characteristics as isolation, loneliness, irritability and anger as being associated with the older adult. Others have demonstrated that health professionals set less aggressive treatment goals for their older patients in order that they can spend less time in direct patient care (Kvitek et al., 1986; Reuben et al., 1995). Among new graduates, geriatric care is frequently found to be the least favoured speciality (Wright, 1988) with this trend being mirrored across the health disciplines (Coren et al., 1987).

**Programs To Promote Attitudinal Change**

Beyond personal and environmental factors such as the educational and work environments, several researchers have attempted to modify the attitudes
of the health care professional through various programs and educational strategies. Attempts to change attitudes toward the older adult have been met with mixed results. In this section, the various curricular methods in the health sciences field, which have been used to produce attitudinal changes in short- and long-term programs, will be examined. The following is an analysis of some of the existing studies.

**Short-Term Programs**

For the purposes of discussion, short-term programs are those where the intervention time was less than one year. Within the current literature, many of the interventions designed to promote or improve attitudinal changes have been curriculum based.

**Educational Programs**

In an early study, Cicchetti, Fletcher, Lerner & Coleman (1973) examined medical students' attitudes following a geriatric training course. They used a pretest-posttest research design on consecutive years of students. The experimental group \( n = 91 \) consisted of medical students enrolled in a course on social medicine which emphasized the problems of the elderly. There were 18 weekly lectures which included: human ecology, human adaptations to aging, a film on aging with a follow-up discussion, and sessions on interviewing older adults who were residing in the community. The control group \( n = 89 \)
attended lectures on social medicine for 18 weeks, but the course did not emphasize the problems of the elderly. The groups were similar in size and characteristics.

Attitudes toward aging, psychosocial behaviour, societal roles, institutionalization and health care were examined using a 32-item Likert-type scale before and after the course. Positive change was reported in the experimental group only, on 2 of the 32 items. Those items were: increased "incidence of suicide" and "withdrawal of the elderly is due to society" (p<.05). As this information was highly stressed in the content of the experimental group, the authors concluded that the results were due to the acquisition of knowledge, rather than being representative of a true attitude change. On examining the students' attitudes toward the elderly as patients, the authors found: (a) that more of the experimental (46%) than the control group (24%) felt that the elderly could be treated successfully as patients; and (b) that more of the control (28%) than the experimental group (11%) felt that the elderly had emotional problems that made them difficult to work with. The results of this study indicate that the differences found could be attributed to class differences or, perhaps, differences in the instructional methods. It is unfortunate that the authors did not repeat the study using a randomized design or conduct any follow-up assessments of the groups in order to determine the consistency of the effects or changes that occurred.

In a similar study, Wattis, Smith and Binns (1986) examined medical
students' attitudes towards old people. The students of two medical schools were compared at similar points in their education. Using a before-after design, the Nottingham and Leeds' students were compared prior to their clinical training in Health Care of the Elderly. The authors used a modified Rosencranz-McNevin Semantic Differential Scale to measure general attitudes to old age, and a Likert-type scale measured attitudes toward medical care. A questionnaire was completed about career preferences. Analysis was completed using the SPSSX statistical package; within the package, the Mann Whitney U-Test was used to determine significant differences between the groups. Results showed no significant differences between the groups as measured by the modified Rosencranz-McNevin. On the Likert-type scale, the Nottingham students showed a higher score on knowledge, but this was not statistically significant (p>.05); nevertheless, there were significant differences between the schools in medical attitudes and total medical attitude scores (p<.006). In the third part of the questionnaire, students were asked to express their degree of interest in geriatric medicine as a career. Seventy-eight percent of the Nottingham students and 56% of the Leeds' students said they would consider working with the elderly. Fourteen percent of the Nottingham and 40% of the Leeds' students were definitely not interested (p<.001).

The study showed that there was a difference between the schools in terms of attitude and, ultimately, career preference. The results of this study lend support to the idea of the influence of faculty and program as a
determinant in the student's desire to pursue a career in geriatrics. This study may be credited for reporting all outcomes and the statistical methods utilized. It would have been helpful to have had a description of the course content at the two schools for comparison. In addition, a replication of the study would have been useful in order to determine that the findings reported were not due to class or cohort differences.

Another study involved first-year Osteopathic medicine students (Wilson & Glamser, 1982). The program was 2 days in length. It included: 3 hours on the biological, psychological and social changes experienced in aging; visits to a Nursing Home; and visits with seniors in the community. Using a before-after design, the authors assessed change using the Palmore Facts On Aging Quiz as well as the Rosencranz-McNevin Semantic Differential Scale. Attitudes were found to improve by 8% and knowledge by 9%. Unfortunately this study lacked a control group for comparison and long-term follow-up assessments were not conducted.

In a recent study, Deary et al. (1993) completed a survey before and after their geriatric lecture series. This study was conducted with 133 senior-year medical students. The first-year students acted as the control group for the study (n = 114). The geriatric medicine course was 4 weeks in length. During the first week, the students were given lectures on a variety of topics which were largely clinical in nature and included: assessment of an elderly client, delivery of services, cerebrovascular disease and orthogeriatric services.
The students also presented seminars on specified medical aspects of care, which included: mental impairment, locomotor disorders, pharmacology, and incontinence, among others. Throughout the remainder of the program, the students completed clinical rotations which included assessments, home visits and work with other professional staff.

The students completed a 33-item questionnaire that was designed and trialed by the authors. Assessments were completed for half of the experimental students on the first day of the course (n = 64) and 69 students were tested on the last day of the course. The control group completed a questionnaire on one occasion only. The authors found no difference in negative attitude scores between the first-year and senior-year students; however, negative attitudes were reduced after the geriatric course. These authors also examined the type of medical care the students would offer to elderly clients. Medical intervention scores improved from first to clinical year, but were not effected by the course.

This study is unique in that it has examined how attitudes would ultimately impact on the type of medical care; however, the type of research design employed by the authors has undermined the strength of this study. The sampling method of examining half of the students at pretest and half of the students at posttest has compromised the strength of the reported results. In addition, the authors fail to report on all of the findings in the 33-item assessment questionnaire. Their unique statistical methods and unusual
research design have weakened the results of this study.

Fields et al. (1992) conducted a similar study; however, their research was unique from the others as it was completed over three clinical sites: a medical centre, a hospital for the aged, and a teaching hospital with an affiliated nursing home. The study involved pre- and posttest measurements using the Rosencranz and McNevin Semantic Differential, a modified version of the Maxwell-Sullivan attitude scale, and a 31-item factual knowledge test with 127 medical students. The educational intervention was 4 weeks in length and included: lectures, small group sessions, patient problems and presentations. Mean knowledge scores improved by 18.7% on posttest (p<.001). Although the students reported the experience as valuable, there was no significant change in the mean attitude score (p>.05). This study can be credited for its description of the educational methods and use of multiple institutions. The study design might have been strengthened by the inclusion of a control group for comparison.

Huber, Reno and McKenny (1992) studied attitudes and knowledge about aging, before and after attendance at clinical education sessions. Their subject population was unique as it was multidisciplinary and included those individuals in physical therapy, nursing, recreation, administration, housekeeping and dietary. The educational sessions included three 1-hour classes consisting of a simulation of handicaps, normal age-related changes, and myths and realities of aging. The authors used the Palmore Facts On
Aging Quiz, parts I and II, to assess knowledge before and after the course. Overall, the results showed an increase in knowledge scores from pre- to posttest for all groups, except the nurses \((p<.05)\). The study also tested for a negative or positive bias attitude toward the elderly. Although all groups improved upon completion of the study; they continued to show a slightly negative (anti-aged) bias attitude \((p<.05)\). This study was well designed, reproducible and also incorporated a diverse group of health professionals. It would have been of interest to measure the long-term benefits of the program.

Intrieri et al. (1993) used a pre- and posttest design to assess the knowledge, attitudes and interview skills of third-year medical students. The educational intervention was four 90-minute geriatric educational sessions which included: the psychology of aging; sensory-loss associated with aging; sociodemographics of aging; and social interaction training with older adults. Results showed statistically significant improvements in attitudes as measured by the Aging Semantic Differential on the autonomous-dependent and instrumental-ineffective subscales \((p<.05)\). Knowledge as measured by the Revised Palmore Facts On Aging Quiz showed no statistically significant difference. On analysis, the experimental group was shown to use more clarifying statements during their interviews in comparison to the control participants. In addition, the patients talked longer when interviewed by the participants in the experimental program. The results of this study demonstrate that even short-term educational interventions can be effective. The emphasis
of the program on social skills training, in addition to lectures on age-related changes, seemed to better prepare the students when working with elderly clients.

Clinical Programs

Another method of intervention has attempted to sensitize future health professionals to the needs of the geriatric client through clinical programs. The program was developed at the University of Texas Health Science Center (Letter, 1993) and involves a pairing of the future health professional with an elderly client. Since 1990, all third-year medical students have been required to take a 6-week geriatrics course regardless of which specialties they tended to pursue. In addition to completing medical histories, the students complete "life reviews" with their elderly volunteers, asking them to recount their significant events and accomplishments. Although not formally evaluated, the program has helped students to identify the special care needs of the elderly client.

Adelman et al. (1992) conducted a randomized control trial with 93 medical students. Thirty-five students were assigned to participate in a Well Elderly Program and were compared to a control group of 58 students at equivalent sites. The authors completed pre- and post-rotation measures using the Aging Semantic Differential. The groups were compared for compatibility by a one-way ANOVA, student's t-test and chi-square. The groups were found to be comparable in terms of demographic and sociodemographic characteristics.
Surprisingly, attitude scores showed improvements for all students in the program ($p < .05$). The student's site location did not exert a significant interaction effect.

Role playing exercises have been used to develop effective therapeutic behaviours. Brown et al. (1992b) developed a mock Geriatric Clinic to assist physical therapy students ($N = 47$) to develop positive behaviours. The study was a randomized study with pre- and post test measurements. The control group of students spent 6 hours on introductory problem solving and patient management. In addition, these students completed a traditional clinical placement (4 hours/week for 8 weeks). At the completion of the first and fourth weeks, the students met with their clinical instructors. The experimental group spent 8 hours on orientation, introductory problem solving and patient management. These students then completed one traditional placement (4 hours/week for 5 weeks). In addition to their regular clerkship program, the students spent three 4-hour sessions in a mock clinic. Within each session the students had a 30-minute orientation to the clinic. The next 2.5 hours were spent treating patients. Each student had contact with three elderly volunteer patients. The students simulated the role of student-therapist and student-Clinical Instructor (CI). During session one, one student was the student-therapist while his or her partner was the student-CI. In session two, the roles were reversed. In the third session, the students saw patients independently. Feedback was given during the last hour of each session. The authors
believed that the orientation allowed students to discuss their feelings in an honest and nonthreatening manner. The clinic allowed the students access to patients in a controlled setting, while at the same time allowing them to problem-solve during difficult patient interactions. The debriefing session allowed for feedback and reinforcement about treatment skills. Brown et al. (1992b) found that positive attitude scores as measured by the Kogan OPS increased significantly for both groups (p<.02). Negative attitudes decreased significantly for the experimental group only (p<.05). The results of this study give support to the idea that clinical or simulated clinical experiences can be effective in improving attitudes toward older adults.

**Experiential Exercises**

Games and simulations may also be effective in changing attitudes. "Into Aging" is a game developed by Hoffman and Reif. According to Samter and Voss (1992) it allows the individual to actually step into the aging role. Players begin at the identity table where they select an age, lifestyle and identity. Sensory deficits are added with ear plugs and eye patches. Physical impairments can be simulated with weighted limbs. Throughout the game, the players experience role losses through dependency and restraint. More formalized studies are indicated to evaluate the game's effectiveness on improving attitudes.

Other methods of experiential learning have been described by Marte
(1991) in her review article. She discusses the use of activities to understand the impact of changes in vision, hearing, touch, taste, smell, and mobility that occur later in life. Participants are given materials that simulate these changes and are asked to complete routine daily tasks. Later the participants come together as a group to share their thoughts and feelings. She feels that for educators these techniques allow an opportunity to help the participants recognize their own feelings about the older adult, become aware of misconceptions, and to develop positive attitudes toward working with the elderly. Formalized testing of the methods described in the article have not been completed.

Gillis (1991) reviewed various programs to promote attitudinal change. She states that role modelling can also be used to improve clinical expertise and problem solving. In addition, grand rounds, patient conferences and regular inservice training can also provide students and therapists with an opportunity for ongoing support in their clinical practice.

**Long-Term Programs**

Ultimately, the demonstration of long-term attitudinal changes as the result of a specific curricular intervention is essential. Unfortunately, this continues to be an area of limited research.

Smith and Wattis (1989) examined the attitudes of two cohorts of medical students at Nottingham University during the 1983-84 and 1986-87
years. They used a before-after type of design methodology. They hypothesized that: (a) attitudes toward the older adult would remain stable over time; and (b) attitudes toward their medical care would change positively and the likelihood of considering a career in geriatric psychiatry or geriatrics would increase after a 1-month placement. Using the Rosencranz-McNevin Semantic Differential Scale to measure attitudes, the authors found only one subscale showed a statistically significant change: the autonomous-dependent scale registered a worsening effect for the 1983-84 students (p<.01). The remainder of the scales showed no significant changes in attitude. Knowledge scores as measured by a Likert-type scale showed statistically significant improvements for both groups. Its impact on medical attitudes and total medical attitudes was found with only the group of students from the 1983-4 cohort.

A questionnaire on career aspirations was also administered to the students. The 1983-84 group had 8 students expressing a "definitely interested" or "ranks high" response to working with geriatrics, compared to 11 students at the completion of the study. For the 1986-87 cohort, this went from 1 to 9 for the same period. This study supports the effect of education as having a long-term impact on knowledge, attitude and career decisions.

Collins & Brown (1989) were also concerned about the number of nursing students who were graduating with "all the right facts but with the wrong feelings" (p.8). Their project involved changing their existing curriculum in order to address some of these concerns. The focus of the program was to
increase the amount and timing of clinical contact with older adults. Prior to the experience most of the academic content was scant and integrated with normal aging processes. There was also limited clinical contact with elderly clients. With the changes to the curriculum, nursing students were given clinical assignments with a well-elderly, community-dwelling client early in the first year of their program. Subsequent clinical assignments throughout junior and senior years were designed to provide progressive experiences with feedback to build on past learning. These clinical exposures were supplemented with nursing packages which addressed physical assessment and interviewing tools. This program has not been formally tested nor has it been trialed over time; however, it presents a method of providing early exposure to elderly clients in a progressive, yet nontargeting, manner.

In this section, programs to promote attitude change have been examined. Currently, a large number of programs are in existence. Academic and clinical education, role playing and games have all been attempted. The varied outcomes produced by the research in this area are a product of the lack of standardization of the measurement tools utilized as well as their weak psychometric properties. This problem is further compounded by the types of interventions given and the times frames with which they are administered. The diversity of the population types has added to cross-contamination and also adds to the variability of the reported results. What is needed is a more standardized approach to research in this area in order determine the impact
of the interventions utilized. Beyond this, it is apparent that more long-term and follow-up studies are required in order to determine the consistency of these attitudinal changes over time.

**Summary**

Projected demographic changes suggest that the demand for gerontological health care will continue to increase. The above discussion has by no means attempted to examine completely the wealth of information that could be produced in regard to attitudes toward the older adult. An attempt has been made to highlight the major theories and treatments of the topic. It began by defining the term "attitude" and its components. The theories of attitude development and their relationship to behaviour were explored. An historical perspective of attitudes was presented. Following this, a review of the curricular methods was conducted. The review examined short-term and long-term programs which utilized a variety of educational methodologies.
CHAPTER THREE: RESEARCH METHODOLOGY

Introduction

Three hundred and thirty physical therapy students participated in surveys designed to explore their attitudes toward the older adult. The purpose of the study was to determine if there was a change in attitudes following an educational intervention. This study was based on the work of Holtzman, Beck & Coggan (1978), Smith and Wattis (1989), and Wattis, Smith and Binn (1986).

Research Population and Sampling Selection

The target population for this study was the total number of male and female physical therapy students enrolled in an Ontario university program at the time of the study. The sampling frame was the class lists from each of the Ontario universities. Given the nature of the study, the goal was to measure the attitudes of students before and after their geriatrics course. All of the universities with the exception of McMaster have their geriatrics course in fourth year. It was also desired to have a group of comparator students who were similar to the experimental group but who had not received any geriatric education prior to the study nor would they receive any education during the study interval. Thus, the initial sample was drawn from the first- and fourth-year students enrolled during the 1994-95 academic year. Names and home addresses were supplied by the universities making it possible to predict an approximate sample size.
A letter of introduction, informed consent and research study were administered to each research subject. For students who were absent on the dates of the study’s administration, a copy of the survey, letter of introduction and consent were sent to their home addresses with a self-addressed stamped envelope. A follow-up reminder postcard was sent 2 weeks after the mailing. These procedures resulted in a high overall response rate of 90% for the initial administration and 84% for the retest.

Of the 485 potential candidates, 39 attempted contacts were not completed due to student absences at the time of the survey’s administration and no response to mailed surveys and follow-up postcards. Eleven students refused to participate in the study at the time of contact, 7 because it was not a convenient time. On analysis, 105 subjects were lost due to incomplete data on their questionnaires. This brought the final sample size to 330 subjects.

Research Design

This is a quasi-experimental design:

A quasi-experimental design approximates the true experimental type. The purpose of the method is the same--to determine cause and effect--and there is direct manipulation of the conditions. However, there is no random assignment of subjects. A common situation for implementing quasi-experimental designs involves several classes or
schools that can be used to determine the effect or curricular methods or teaching materials. The classes are "intact", already organized for instructional purposes. The classes are not assigned randomly (McMillan & Schumacher, 1989, p. 32).

Methodology

This is a pretest-posttest study. Questionnaires were distributed before and after the geriatric portion of the academic curriculum. Physical therapy students were asked to complete questionnaires to assess their knowledge, attitudes and vocational choices.

This type of design is advantageous as it allows for the assessment of a change in the variables being studied. This method is also commonly used as it can examine large numbers of individuals inexpensively (Makrides, Richman & Prince, 1980). A major disadvantage of the pretest-posttest method is that it often requires a larger sample size in order to account for the loss of participants throughout the study interval (Makrides, Richman & Prince, 1980).

As the classes were previously established based on educational level, this study did not have a true randomized group of control subjects. However, it did have a comparison group similar in characteristics. For the purposes of this study they will be referred to as the "control group". When trying to establish a group for comparison, several possible classes were considered. Fourth-year occupational therapy students were considered, but due to their
potential difference as an occupational group, as well as the differences in their educational content, they were not chosen. Third-year physical therapy students were also considered as they were similar in demographic characteristics and educational level to the experimental group; however, they introduced possible contamination due to previous geriatric education or clinical placements. Therefore, the decision was made to use the first-year students as the group for comparison. They were essentially unbiased by previous education or clinical placements, and they were the same occupational group as the study subjects. They were also similar in characteristics to the experimental subjects (See "Respondents", p.73).

Educational Intervention

This study was completed at five university sites: McMaster University, University of Toronto, Queen's University, University of Western Ontario and University of Ottawa. Educational methods varied at each institution; however, some general trends were observed. All of the students completed a 14-week educational program on geriatrics, with the exception of McMaster University. At McMaster, the educational intervention is 13 weeks and is taught in a self-directed, problem-based format. Course content at all of the universities included normal and pathological aging, as well as psychosocial issues concerning the older adult. The educational methods consisted of lectures, and student presentations or seminars. All of the universities, with the exception of
Ottawa, also had some clinical component. These included: clinical skills, either interview or assessment; and/or visits to well elderly programs or seniors' centres. An analysis of the programs' content is provided in Appendix A.

Data Collection

This proposal was sent to the five Ontario physical therapy programs for review by their ethics committees. Once it had been accepted, contact was made with the professors to determine an appropriate time for the study's administration.

The initial administration was completed during the first week of the geriatric curriculum. A personalized letter of Introduction (see Appendix B) on Brock University letterhead explained the purpose of the study and was given to each student in the sample. The researcher allowed time to clarify and answer questions about the study. Informed consent was given by each respondent prior to the collection of data (see Appendix C).

Upon completion of the initial administration a date and time were arranged for the retesting. The second administration was completed on or around the final week of the academic portion of the geriatric section of the program. The letter of introduction, informed consent and research tools were readministered to the respondents.

The data was collected in an atmosphere and setting that encouraged
the informants to respond openly to the issues (Rubenstein, 1988) and at a
time and place convenient to them. In most instances, the survey was
administered at the end of a regularly scheduled class. For two of the classes,
the administration took part outside of regular class hours.

The data was collected between mid-September and mid-December,
1994 for all of the programs except McMaster University. The study interval
was 14 weeks. The McMaster University data was collected mid-April and mid-
July, 1995. The McMaster University study interval was 13 weeks. The
responses were recorded directly on the survey by the respondent.

**Data Analysis**

Content analysis organized the data through coding of the variables as
outlined in Appendix D. Demographic data was encoded according to the
primary variable. Codes were developed for each possible answer. New codes
were generated as new themes emerged in the data. Coding was completed
under Wordperfect 5.1. Once the coding was completed, the data was
analyzed using SPSSX.

**Research Tools**

Five outcome measures were used in the survey to collect information
about knowledge of the elderly, attitudes towards them and vocational choices.
General aspects of both knowledge and perception were measured by the
Revised Palmore Facts On Aging Quiz (Miller & Dodder, 1980). Initially, Palmore (1977) developed the Facts On Aging Quiz to measure knowledge about old people. It was designed to cover basic physical, mental and social facts about aging (Miller & Dodder, 1980). The original tool had deficiencies such as ambiguous wording and a lengthy format; however, Palmore (1977) claimed that the scale could be used to measure knowledge about aging as well as misconceptions and biases.

The revisions of the original tool were made by Miller and Dodder (1980) in the following areas. Vague terminology was corrected and attempts were made to quantify some terms. Directional changes in some statements also helped to increase their reliability. Clarification was also provided for the subjective statements. One of the test items was eliminated; therefore the current scale is composed of 24 true/false statements (see Appendix E).

Palmore's scale has been used extensively throughout the literature. Assessments of validity have met with some conflicting results. Holtzman and Beck (1979) found that the scale does in fact measure knowledge of the elderly. Other studies cited by Palmore (1980) also attest to the reliability and validity of the instrument. Reliability of the scale is suggested by test-retest scores ranging from .50 to .80 (Palmore 1980, 1981). Palmore (1980) also reports that the quiz has high face validity and that each item is based on empirical research; however there is low item to total score correlations ($r = .24$ to $38$). Internal consistency is relatively low (alpha = .47 to .57) because
the items represent different aspects of knowledge (Palmore 1980, 1981). There is also limited content validity within the scale because the items measure different domains of knowledge. This results in weakened construct validity. Norris et al. (1987) have claimed that the FAQ has criterion validity because of its correlation ($r = .45$) with final grades of gerontology students. Their results remain unsupported because the authors fail to substantiate their claim that grades are a gold standard indicator for knowledge of aging.

The Revised Tuckman-Lorge was used to measure attitudes. It is composed of 137 statements to which respondents answer "yes" or "no" to indicate their agreement or disagreement as it describes a subject group (see Appendix F). In this instance subjects were asked if the statements related to those individuals who were 65 years of age. The statements are grouped into 13 subscales such as physical appearance, personality and mental status. The scale has limited test-retest reliability ($r = .56$ to .62) and poor criterion validity ($r = .173$) (Axelrod & Eisdorfer, 1961).

The Kogan Attitudes Towards Old People Scale (OPS) was also used to measure the physical therapy students' attitudes towards the elderly (Kogan, 1961). It consists of 34 statements (see Appendix G); 17 items express negative perceptions of older people, and the remaining items reverse the content of these negative perceptions into positive perceptions. The negative and positive items are placed in random order on the instrument and each item is rated on a 6-point Likert-type scale with response options ranging from
"strongly agree" to "strongly disagree". The range in scores on the OPS is 17 to 102. For the positive scale, scores range from 59.5 to 102, with higher scores reflecting stronger agreement with positive items. For the negative scale, OPS scores range from 17 to 59.5. The lower scores reflect a stronger disagreement with the negative items. Kogan reported Spearman-Brown test-retest reliability coefficients from .66 to .83 and internal consistency of the scale ranges from .46 to .52 (Kogan, 1961). Concurrent validity has been established because the results correlate with other published studies (Kogan, 1961). Criterion validity has been suggested by the positive correlations with attitudes towards minority groups as well as the mentally and physically challenged (Kogan, 1961).

A questionnaire was designed to assess selected factors that may influence physical therapy students' decisions to work with the elderly. This was based on the work of Snape (1986). A pilot study was conducted with McMaster University students to test the questionnaire. Their feedback was used to modify, clarify and correct ambiguous questions. The "environmental" section included questions about the atmosphere in a geriatric setting as well as more general inquiries about their program's treatment of the geriatric course curriculum (see Appendix H).

Interest in geriatrics as an area of specialization was measured by means of a Likert-type scale. Possible responses to the question include: (1) none, (2) slight, (3) a little, (4) fair, (5) average, (6) moderate, (7) quite a bit,
(8) definitely, (9) very and (10) extremely interested. This was based on the work of Michielutte & Diseker (1985) (see Appendix I).

**Respondents**

The sample characteristics of the sample of 330 physical therapy students is discussed, followed by a description and comparison of the two groups. All respondents were enrolled in one of the five Ontario university physical therapy educational programs. These included: University of Toronto, University of Western Ontario, University of Ottawa, Queen’s University and McMaster University. There were 186 control and 144 experimental respondents. Respondent numbers are listed below: University of Toronto, 40 control and 9 experimental respondents; University of Western Ontario, 47 control and 40 experimental respondents; University of Ottawa, 22 control and 15 experimental respondents; Queen’s University, 27 control and 31 experimental respondents; McMaster University, 50 control and 49 experimental respondents.

There were 84 male and 246 female respondents. The age range was 20 to 42 years, with a median age of 20 years. In terms of marital status, 299 respondents were single and 31 were married. Two respondents were divorced and were classified as being single for the purpose of this study.

Sixty-one of the respondents considered themselves members of another ethnic or cultural group in addition to being Canadian or living and
studying in Canada. The ethnic groups included: Chinese, Korean, Polish, Macedonian, Nigerian, Muslim/Islamic, Japanese, Greek, Egyptian, Vietnamese, Asian, Iranian, Irish, French, Sri Lankan, Jewish, British, Ethiopian, Danish, Russian, Filipino and African.

The research also looked at involvement with older adults across a number of spheres. Two hundred fifty-six respondents had a relationship with their grandparents as a child. Over half (n = 186) of the subjects had worked with older adults in a full- or part-time capacity. A few of the respondents (n = 39) had taken additional courses in gerontology.

There were 186 control respondents from the five Ontario programs. Their age range was from 20 to 42 years with a median of 20 years. There were 47 male (25.2%) and 139 (74.8%) female respondents. Eleven respondents (5.9%) were married and 175 (94.1%) were single. Forty-one (22%) respondents considered themselves members of an ethnic group. One hundred and forty-one (75.8%) of the respondents had a relationship with their grandparents as a child. One hundred and ten (59.1%) of the respondents had worked with older adults and 16 (8.6%) had taken additional courses in gerontology. Their areas of interest on pretest were undecided (56%) and sports medicine (24%). Geriatrics was rated as an area of interest by 3.9% of students. These numbers were essentially unchanged on posttest.

There were 144 experimental respondents with representation from all of the programs. Their ages ranged from 21 to 42 years with a median of 23
years. There were 38 (26.4%) male and 106 (73.6%) female respondents. Sixteen (11.3%) respondents were married. Twenty-eight (19.4%) respondents considered themselves members of an ethnic group. One hundred and fifteen (79.8%) of the respondents had a relationship with their grandparents. Seventy-five (52%) respondents had worked with older adults and 19 (13%) had taken additional courses. On pretest, their areas of interest in physical therapy were undecided (48%), orthopaedics (27%) and sports medicine (8.0%). Geriatrics was an interest area for 2.7% of students. These numbers were similar on posttest: undecided (45.9%), orthopaedics (26.7%), neurology (8.0%) and sports medicine (7.4%).

A comparison of the two groups of respondents yields the following information. The experimental respondents were slightly older than the control respondents. This is hardly surprising given that we are dealing with preestablished classes of first-and fourth-year students. Female respondents composed approximately 75% of both experimental and control groups. This gender representation is also consistent with what is found in the profession (Canadian Physiotherapy Association, 1996). There were twice as many married respondents in the experimental group. This finding is also not surprising given that the experimental respondents are older and closer to graduation. The mixture of ethnic and nonethnic respondents was approximately equal for both groups. Equal numbers of control and experimental respondents had a relationship with their grandparents. More
control than experimental respondents had worked with older adults. The numbers of students taking extra courses in gerontology was approximately equal. Both groups expressed similar areas of interest in clinical practice: "undecided" and an orthopaedic-based specialty (sports medicine or orthopaedics).

**Summary**

The purpose of this study is to determine if there was a change in attitudes following an educational intervention. This chapter has outlined the methodology used in this study and a description of the data collection and analysis procedures. The sample characteristics of the respondents have been reported with a comparison of the first- and fourth-year students. The next two chapters will provide the results of the work and a discussion of the results.
CHAPTER FOUR: RESEARCH FINDINGS

The research findings are examined in five principal sections: demographic variables; Revised Palmore Facts On Aging; Revised Tuckman-Lorge Attitude Scale; Kogan Old People Scale; the environmental and career aspirations scales, which are based on the work of Snape (1986) and Michielutte & Diseker (1985).

Demographic Variables

Demographic information was collected throughout the study. From the literature review, it is apparent that certain variables have been identified and linked with a positive attitude towards the older adult. Below is an examination of the primary analysis of the demographic variables. Variables have been examined against the primary tools utilized in the study. Analysis was completed using independent samples t-tests.

Age

Meyer and Penner (in Eddy, 1986) found positive attitudes were associated with older nurses when compared with new graduates. In this study, the majority of the respondents were clustered in the 18-27 year age group. As there was not an older group of students within the study for comparison, age as a variable was not analyzed.
**Gender**

Historically, females have been thought to have more positive attitudes towards older adults (Reuben et al., 1995). In this study, respondents grouped by gender showed statistically significant differences on the Revised Palmore Facts on Aging Quiz. Female respondents scored higher ($M = 15.286$) than male respondents ($M = 14.423$) on the measurement of knowledge [$t(328) = -2.347, p<.050$].

A relationship between gender and attitude was found on the Kogan OPS. Female respondents (89.336) scored higher than the male respondents (86.345) on the Old People Positive (OPPOS) scale [$t(328) = -2.630, p<.010$] and lower or less negative on the Old People Negative (OPNEG) scale [$t(328) = -3.222, p<.010$]. Therefore, they demonstrated more positive attitudes on the Kogan OPS. This finding was replicated on 2 of the 13 Tuckman-Lorge subscales: conservatism [$t(328) = 2.356, p<.020$] and activity and interests [$t(328) = 2.093, p<.050$]. The results on the remainder of the subscales were found to be not statistically significant.

**Marital Status**

Marital status as a primary variable was also analyzed. For the purposes of this study, divorced students ($n = 2$) were categorized as "unmarried" or single. In the current research, the effect of marital status has shown inconclusive results (Reuben et al., 1995; Shimamoto & Rose, 1987).
In this study, the relationship between marital status and knowledge was found to be not statistically significant \((p>.05)\). A significant relationship between marital status and attitude was found on only one Tuckman-Lorge subscale, cleanliness \([t(328) = -2.512, p<.020]\) and was not replicated on any of the other measurement tools. Therefore, the findings of this study do not seem to indicate a relationship between marital status and attitudes toward the older adults.

**Ethnicity**

The demographic variable of ethnicity and its relationship to knowledge and attitude was also studied. For the purposes of this study, ethnicity was based on self-definition by the students. Sixty-one respondents in this study classified themselves as being a member of an ethnic group. Ethnic respondents scored lower \((M = 14.213)\) on the Revised Palmore Facts On Aging Quiz than those respondents who classified themselves as nonethnic \((M = 15.546)\) \([t(328) = 2.490, p<.020]\).

Previous research studies have reported that being a member of an ethnic group is related to more favourable attitudes toward older adults (Feldbaum & Feldbaum, 1981; Shimamoto & Rose, 1987). In this study, respondents who classified themselves as being "ethnic" held more negative attitudes as measured by the Kogan Old People Positive \([t(328) = 2.826, p<.010]\) and Negative Scales \([t(328) = -3.399, p<.010]\).
On 10 of the 13 Tuckman-Lorge subscales, the ethnic respondents scored higher, indicating more negative stereotypes, than the nonethnic respondents. This finding was replicated on the following subscales: physical (M = 12.3 versus M = 9.981), [t(328) = -3.291, p<.010]; personality (M = 6.033 versus M = 5.461), [t(328) = -1.880, p<.090]; mental deterioration (M = 3.328 versus M = 2.491), [t (328) = -2.326, p<.050]; cleanliness (M = .246 versus M = 0.112), [t(328) = -2.180, p<.050]; conservatism (M = 9.492 versus M = 8.331), [t(328) = -2.628, p<.010]; activity and interests (M = 3.262 versus M = 2.639), [t(328) = -2.304, p<.050]; financial (M = 2.590 versus M = 2.130), [t(328) = -2.361, p<.020]; family (M = 6.098 versus M = 5.082), [t(328) = -4.656, p<.001]; insecurity (M = 5.033 versus M = 3.662), [t(328) = -3.274, p<.005]; and interference (M = 0.590 versus M = 0.264), [t(328) = -3.756, p<.001].

Relationship with Grandparents

In this section, the respondents' relationship with their grandparents was examined. Subjects who had a relationship with their grandparents scored higher (M = 15.355) on the Revised Palmore FAQ than those who had not (M = 15.108). This result was not statistically significant (p>.05).

Researchers have hypothesized that having a relationship with one's grandparents will result in more positive attitudes toward older adults (Shimamoto & Rose, 1987). This premise was supported in these research
findings. On the Kogan Old People positive scale respondents who had a relationship with their grandparents scored higher (M = 89.621) than those who had not (M = 85.054) [t(328) = 3.853, p<.001] and on the negative scale, they scored lower or less negative (M = 42.395) than the other respondents (M = 47.311) [t(328) = -3.333, p<.005].

It was also replicated on 9 of the 13 Tuckman-Lorge subscales. Respondents who had a relationship with their grandparents scored lower on all subscales identified; thus demonstrating less stereotypical attitudes towards the older adult. The following subscales were found significant in analysis: physical (M = 9.973 versus M = 11.959), [t(328) = -2.964, p<.005]; attitude (M = 1.453 versus M = 1.743), [t(328) = -2.076, p<.050]; mental deterioration (M = 2.465 versus M = 3.270), [t(328) = -2.406, p<.050]; cleanliness (M = 0.090 versus M = 0.297), [t(328) = -3.663, p<.001]; conservatism (M = 8.375 versus M = 9.135), [t(328) = -1.839, p<.10]; financial (M = 2.113 versus M = 2.568), [t(328) = -2.568, p<.050]; family (M = 5.180 versus M = 5.581), [t(328) = -1.924, p<.10]; insecurity (M = 3.660 versus M = 4.797), [t(328) = -2.908, p<.005] and sex (M = 0.457 versus M = 0.635), [t(328) = -2.046, p<.050].

On the environmental scale, having had a relationship with one’s grandparents was also related to a desire to work with older adults upon graduation (M = 4.102 versus M = 1.807), [t(328) = 2.059, p<.050].
Work with Older Adults

In this section the relationship between working with older adults and attitude was examined. Respondents who had worked with older adults scored higher \( (M = 15.715) \) on the Revised Palmore Facts On Aging Quiz than those who had not \( (M = 14.764) \) \( [t(328) = -2.266, p < .05] \).

Research has found a relationship between working with older adults and having a positive attitude towards them (Coren, Andreassi, Blood & Kent, 1987). In this study, there was not a strong relationship between these variables. On the Kogan Old People scale, respondents who had worked with older adults scored higher and had more positive attitudes \( (M = 88.753 \text{ versus } M = 88.396) \), but the results were found to be not statistically significant \( (p > .05) \). On the negative scale, these respondents scored lower and less negative \( (M = 42.398) \) than those who had not been employed to work with older clients \( (M = 44.917) \) \( [t(328) = 2.009, p < .050] \). These findings were not replicated on any of the Tuckman-Lorge subscales.

On the environmental scales, having worked with older adults was related to an interest in working with older adults upon graduation. The "workers" scored higher \( (M = 4.323) \) than nonworkers \( (M = 3.528) \) \( [t(328) = -3.511, p < .005] \).
Courses in Geriatrics

In this section, the significance of additional course work in gerontology and its influence on attitude were examined. The collection of this data was based on the self-report of the students who listed the number of courses taken and their contact hours.

On the Revised Palmore FAQ, students who had taken a course in gerontology scored higher ($M = 16.231$) than those who had not ($M = 15.175$); however, the results were not statistically significant ($p > .05$).

Research has traditionally indicated that taking additional courses in gerontology resulted in more positive attitudes toward older adults (Coren, Andreassi, Blood & Kent, 1987). This finding was replicated in this research. On the Kogan Old People scale, students who had taken a course scored higher and held more positive scores ($M = 92.846$) than those who had not ($M = 88.027$) [$t(328) = -3.123, p < .005$]. On the negative scale, the "course" students had lower and less negative scores ($M = 37.231$ versus $M = 44.337$) [$t(328) = 3.745, p < .000$].

This trend was also found on seven of the Tuckman-Lorge subscales. Respondents who had taken a course scored lower and held less stereotypical attitudes on subscales for physical ($M = 8.179$ versus $M = 10.718$), [$t(328) = 2.931, p < .005$]; personality ($M = 4.205$ versus $M = 5.749$), [$t(328) = 4.317, p < .000$]; attitude ($M = 1.103$ versus $M = 1.574$), [$t(328) = 2.621, p < .010$]; conservatism ($M = 6.641$ versus $M = 3.035$), [$t(328) = 4.127, p < .000$]; activities
and interests ($M = 1.769$ versus $M = 2.887$), $t(328) = 3.472$, $p < .005$; insecurity ($M = 2.564$ versus $M = 4.096$), $t(328) = 3.036$, $p < .005$; and sex ($M = 0.231$ versus $M = 0.533$), $t(328) = 2.697$, $p < .010$.

Respondents who had taken additional course work were also found to be more positive in their desire to specialize in geriatrics upon graduation ($M = 4.667$ versus $M = 3.883$) $t(328) = -2.228$, $p < .05$.

**Research Design**

Within the study there were two "groups", experimental (course) and control (no course). This was crossed with 5 "schools" (McMaster University, University of Western Ontario, University of Toronto, University of Ottawa and Queen's University) and 2 "trials" (pre- and posttest). In the ideal situation, there are equal numbers of respondents per cell, such as in the true experimental design. In this study, this was not possible given that the classes were preestablished. Therefore in this study, data was entered sequentially in order to account for the uneven numbers per cell. Analysis proceeded hierarchically with "trial" then "school" then "group" being entered. In an uneven cell design the vectors overlap such that the sums of squares of each of the effects gets shared, and in order to avoid this, data was entered in this manner. Analysis was completed using a $2 \times 5 \times 2$ (trial x school x group) ANOVA. During analysis, the following effects were examined: trial effect; between- and within-subjects school effects; between- and within-subjects
group effects; school-by-group; and trial-by-school-by-group interactions.

Revised Palmore Facts on Aging Quiz

Primary Analysis of the Experimental Design

The Revised Palmore Facts On Aging Quiz is a true-false quiz designed to assess knowledge about older adults. Scores on the test can range from 0 to 24, with the higher scores indicating an increased knowledge of aging. Three hundred thirty cases were processed for data analysis. The remainder of respondents were dropped due to incomplete questionnaires.

The average scores of all subjects ignoring school and group on the Revised Palmore FAQ pretest was 15.300 and posttest 16.779. Under univariate measures analysis, there was a trial effect indicating that there was a difference in scores from T1 to T2. Therefore, the Revised Palmore FAQ posttest average score of 16.779 was significantly greater than the Palmore average score of 15.300 demonstrating an improvement in knowledge from pre- to posttest $[F(1,329) = 80.093, p<.001]$.

In stage two, the "school" effect was entered. There were between-subjects and within-subjects effect. The between-subjects effect indicated that there was a difference between the schools on the Revised Palmore FAQ score averaged across pre- and posttests $[F(4,325) = 10.819, p<.001]$. In order to further examine the differences, schools were analyzed individually during post hoc analysis. Essentially there was an infinite number of analyses and
comparisons that could have been completed. The following schools were chosen because of their unique differences from the others. At McMaster University, the students tend to be older, it is a second degree program and the educational methods are different from the other university curricula. At University of Toronto, gerontology is an elective course for the students and they must ballot for admission. The range of ethnic backgrounds at this school also makes it unique. At University of Ottawa, the students are younger and tend to be Francophone with English as their second language. As graduates they tend to address the needs of rural French communities.

In post hoc analysis for the Revised Palmore FAQ, the average Palmore score (averaged across pre- and posttest) at McMaster University was 0.758 units lower than the average of the other four schools \[ t(325) = -1.912, \ p<.05 \]. This indicates that the McMaster knowledge score was less than the average of the other four schools. University of Toronto's average score was 1.086 units less than the other four schools \[ t(325) = -2.114, \ p<.05 \]. Similarly, the results at University of Ottawa were 0.128 units lower \[ t(325) = -.225, \ p>.05 \]; University of Western Ontario was 1.033 units lower (\( p<.05 \)) and Queen's University was 2.972 (\( p<.05 \)) units higher than the average of the other four schools.

Under within-subjects analysis, there was a trial-by-school interaction which was statistically significant \( F(4,325) = 3.090, \ p<.05 \). Therefore, when analyzing the results across the schools from pre- to posttest, there was a
difference across the trials, but the differences between the schools was not necessarily the same or parallel.

In post hoc analysis the trial-by-school interaction was further analyzed. In examining the University of Toronto data, the pre/post average differences for Toronto were different than the average of the other four schools \[t(325) = 7.008, p<.01\]. The McMaster University and University of Ottawa pre- and posttest differences were not statistically different from the other four schools \((p>.05)\).

In subsequent analysis there was a between-subjects group effect. This means that the experimental and control groups differed when collapsed across schools and averaged across pre- and posttest \(F(1,324) = 78.543, p<.001\]. In post hoc analysis, the experimental group scored 2.948 higher on average than the control group on the Revised Palmore score averaged across pre- and posttest and controlling for school \[t(324) = 8.862, p<.001\]. This indicates that the averaged knowledge score was higher for the experimental group.

The trial-by-group interaction on the Revised Palmore FAQ was found to be not statistically significant \((p>.05)\).

The next analysis examined the between-subjects school-by-group interaction. The experimental and control groups differed on the Revised Palmore FAQ (average pre/post) at each school \(F(4,320) = 16.792, p<.001\]. A comparison of the three principal groups was conducted in post hoc analysis.
The McMaster University experimental-control difference was 4.356 units lower than the same difference for the other four schools \([t(320) = -6.490, p<.001]\). At the University of Ottawa, the experimental-control group difference was 1.94 units higher than the experimental-control group difference for the other four schools \([t(320) = 2.004, p<.05]\). The University of Toronto experimental-control group difference was not statistically significant \((p>.05)\).

The trial-by-school-by-group interaction was found to be not statistically significant \((p>.05)\). This means that there was not a significant difference from pre- to posttest between the experimental and control groups at each school.

**Primary Analysis of the Cell Means**

Across all respondents, the pretest and posttest means were 15.300 +/- 3.806 and 16.779 +/- 3.696. By group, the control respondents had pre- and posttest scores of 14.075 +/- 3.256 and 15.355 +/- 3.195 respectively. The experimental respondents had pretest scores of 16.882 +/- 3.891 and posttest scores of 18.618 +/- 3.490. Therefore, both groups showed improvement from pre- to posttest. The experimental group started out slightly higher and showed greater improvement from T1 to T2. This is given graphic representation in Appendix J.

Analysis across schools with experimental and control groups collapsed together revealed the following. The University of Western Ontario respondents had the lowest pretest score (14.253 +/- 2.763). Their posttest score was
16.425 +/- 3.197. University of Toronto respondents had the smallest change in score from pre- to posttest, 15.102 +/- 3.618 to 15.490 +/- 4.103. Queen's University subjects had the highest pre- and posttest scores, 17.672 +/- 4.964 to 19.414 +/- 4.464. The scores are given graphic representation in Appendix J.

Analysis by school and group revealed an increase in score from pre- to posttest. In examining the control groups, University of Ottawa had the lowest pretest score, 13.000 +/- 4.082. Their posttest score was 14.864 +/- 2.833. University of Ottawa and University of Western Ontario control groups showed the greatest change in score from T1 to T2. The Toronto control group had the smallest change in score from pre- to posttest, 14.425 +/- 3.411 to 14.725 +/- 3.566.

In analyzing the data from the experimental groups, the McMaster University respondents had the lowest pretest scores (14.837 +/- 2.860). Queen's University respondents had the highest pre- (20.839 +/- 4.282) and posttest (22.677 +/- 2.926) scores. University of Western Ontario experimental respondents showed the largest change from pre- to posttest (15.225 +/- 2.106 to 17.800 +/- 2.174). University of Ottawa respondents showed the smallest change in score from T1 (19.067 +/- 2.520) to T2 (19.267 +/- 2.520). These scores and the pre/post averaged scores have been given graphic representation (see Appendix J).
Revised Tuckman-Lorge Attitude Scale

The Revised Tuckman-Lorge is designed to measure attitudes toward older adults. It consists of 137 statements and 13 subscales to which respondents answer "yes" or "no" to indicate their agreement with the statement as it pertains to a client group. In this study, students were asked "if the statements applied to those 65 years of age". This age group was chosen as it indicates adults who are "seniors", but not the frail elderly. It also tends to be representative of the client group that therapists are working with. The data from 330 subjects were analyzed in this section. Primary and post hoc analysis were completed on the first five subscales as they were deemed to be of significance to the author. The remainder of the subscales were analyzed, but without post hoc analysis.

Subscale 1: Physical

Primary analysis of the experimental design. The physical subscale examined the respondents' attitudes toward the sensory changes of aging. It also looked at response times related to these age-related changes. Statements such as "They need glasses to read" and "They feel tired most of the time" are included in this subscale.

The average score of all respondents ignoring school and group on the physical subscale pretest was 10.418 and posttest, 8.985. Under univariate analysis, there was a trial effect which means that there was a difference in
scores from T1 to T2. Therefore, the physical posttest score of 8.985 was significantly less and more positive than the average pretest score of 10.418 \( [F(1,329) = 41.039, p<.001] \).

There was a between-subject school effect which means that there was a significant difference between the schools on the physical subscale averaged across pre- and posttests \( [F(4,325) = 3.742, p<.010] \). In post hoc analysis of McMaster University, the averaged physical subscale score was 1.876 units lower and more positive than the average of the other four schools \( [t(325) = -3.205, p<.005] \). The McMaster pre/post average score was 8.505 and the average of the other four schools was 10.380. Similarly, University of Ottawa scored 2.442 units higher and more negative than the average of the other four schools \( [t(325) = 2.902, p<.005] \). Ottawa’s averaged score on the subscale was 11.959 and the average of the other four schools was 9.52. University of Toronto scored 0.581 units lower than the average of the other four schools, but this result was not statistically significant \( (p>.05) \).

The trial-by-school interaction was not statistically significant \( (p>.05) \).

In subsequent analysis there was a between-subjects group effect. This means that there was a significant difference between the groups on the physical subscale averaged across pre- and posttest while controlling for school \( [F(1,324) = 24.555, p<.001] \). In post hoc analysis, the experimental group scored 2.617 units lower and more positive than the control group on this subscale \( [t(324) = -4.955, p<.001] \).
There was also a trial-by-group interaction. This effect means that the control and experimental group effect differed across trials (pre- and posttest) \[ F(1,324) = 29.881, p<.001 \].

The final analysis looked at the between-subjects school-by-group interaction. The control and experimental groups differed at each school when averaged across pre- and posttest \[ F(4,320) = 3.680, p<.010 \]. At McMaster University, the experimental-control difference was 3.88 units higher (more negative) than the same difference for the other four schools \[ t(320) = 3.382, p<.005 \]. The results at University of Toronto and University of Ottawa were found to be not statistically significant \( p>.05 \).

The trial-by-school-by-group interaction was found to be not statistically significant \( p>.05 \).

**Primary analysis of the cell means.** On examination of all respondents, the pre- and posttest means were 10.418 +/- 5.138 and 8.985 +/- 5.431 respectively. Across schools, the control group's pretest and posttest scores were 11.022 +/- 5.472 and 10.602 +/- 5.927 respectively. Similarly, the experimental group's pre- and posttest scores were 9.639 +/- 4.574 and 6.896 +/- 3.822 respectively. Therefore, the fourth-year students started out with more positive attitudes. Both groups' attitudes became more positive from pre- to posttest, with the experimental group becoming more positive from T1 to T2 (see Appendix K). Analysis by school, and by school and group have been
given graphic representation (see Appendix K). The largest range between control groups was McMaster University with the lowest and most positive scores on pretest (8.580 +/- 4.146) and posttest (8.500 +/- 4.958); and University of Ottawa with the highest and most negative scores on pretest (13.045 +/- 5.876) and posttest (13.773 +/- 5.830).

Across experimental groups, University of Ottawa respondents had the highest and most negative pretest scores (10.800 +/- 3.726). University of Western Ontario respondents had the highest rate of change from pre- (10.425 +/- 5.310) to posttest (6.500 +/- 3.305). University of Toronto respondents had the lowest rate of change from pre- (7.556 +/- 5.434) to posttest (5.111 +/- 3.140). The pre/post averaged cell means have also been given graphic representation (see Appendix K).

**Subscale 2: Personality**

**Primary analysis of the experimental design.** In the personality subscale, the attitudes of the students were measured towards such variables as "kindness, stubbornness and selfishness" as they relate to the older adult.

The average score of all subjects ignoring school and group on the personality pretest was 5.567 and on posttest, 4.933. Univariate analysis showed a trial effect. The average posttest score of 4.933 was significantly lower and more positive than the average pretest score of 5.567 \[F(1,329) = 37.265, p<.001\].
Subsequent analyses demonstrated between-subjects and within-subjects school effects. The between-subjects effect indicated that there was a difference among the schools on the personality score averaged across pre- and posttest \[F(4,325) = 7.027, \ p < .001\]. In post hoc analysis, the average personality subscale score at McMaster University was 1.247 units lower and more positive than the average of the other four schools \[t(325) = -5.312, \ p < .001\]. McMaster respondents scored 4.414 and the average of the other four schools was 5.661. Similarly, University of Ottawa respondents scored 0.9037 units higher and more negative than the average of the other four schools \[t(325) = 2.588, \ p < .050\]. Ottawa's average pre/post score was 6.135 and the average of the other four schools was 5.23. University of Toronto scored 0.161 units higher than the average of the other four schools; however, this result was not statistically significant \(p > .05\).

In within-subjects analysis, there was a trial-by-school interaction which was statistically significant \[F(4,325) = 2.368, \ p < .060\]. In post hoc analysis, the pre/post test averaged cell means for Ottawa were 6.189 and 6.081 respectively. The means of the other four schools for the pre- and posttest were 5.556 and 4.905. Therefore, the decrease (more positive) from pre- to posttest was significantly greater for the other four schools than it was for Ottawa \[t(325) = 2.746, \ p < .010\]. The McMaster University and University of Toronto results were not statistically significant \(p > .05\).

In subsequent analysis, there was a between-subjects group effect
indicating that there was a significant difference between the groups on the personality subscale averaged pre- and posttest scores while controlling for school \( [F(1,324) = 13.077, p<.001] \). In post hoc analysis the experimental group scored 0.806 units lower and more positive than the control group on the personality subscale \( [t(324) = -3.616, p<.001] \).

There was also a trial-by-group interaction. This indicates that the difference from pre- to posttest was different for the control and experimental groups \( [F(1,324) = 23.228, p<.001] \). For further discussion of these differences an examination of the Primary Analysis of Cell Means is indicated and outlined below.

The next analysis examined the between-subjects school-by-group-interaction. This effect indicates that the averaged differences for the control and experimental respondents were different for each of the schools \( [F(4,320) = 4.172, p<.005] \). In a review of the three principal groups for comparison, the McMaster University experimental-control difference was 1.915 units higher (more negative) than the same difference for the other four schools \( [t(320) = 3.969, p<.001] \). Using cell mean analysis, the McMaster difference was 0.453 and the difference for the other four groups was -0.6345. The results from University of Toronto and University of Ottawa were found to be not statistically significant \( (p>0.05) \).

The trial-by-school-by-group effect was found to be not statistically significant \( (p>0.05) \).
Primary analysis of the cell means. Collapsing results across groups, the control group had a pretest mean of 5.731 +/- 2.374 and posttest mean of 5.522 +/- 2.655. The experimental group had a pretest mean of 5.354 +/- 1.815 and a posttest mean of 4.174 +/- 1.699. Therefore, across schools the control and experimental groups started out approximately equal in attitude measurement on the pretest. On the posttest, there was little change with the control group, but the experimental group’s attitudes became more positive (see Appendix L).

Across schools, all groups decreased and became more positive in attitude from pre- to posttest (see Appendix L).

On analysis of group and school, the control groups at University of Ottawa and Queen’s University became more negative between pre- and posttest. McMaster University, University of Toronto and University of Western Ontario control groups became more positive, with Western having the largest change from pre- to posttest. All of the experimental groups’ scores decreased and became more positive in attitude between pre- and posttest. The pre- and posttest scores have been given graphic representation (see Appendix L). The pre/post average cell means for this subscale have also been given graphic representation (see Appendix L).
Subscale 3: Attitude Toward Future

**Primary analysis of the experimental design.** The attitude toward the future subscale examined the respondents' feelings towards the future, death and dying. It is one of the smaller subscales composed of only five items. Statements such as "They think the future is hopeless" and "They are afraid of death" are included in this subscale.

The average of all of the respondents ignoring school and group on the attitude subscale pretest was 1.518 and on the posttest, 1.197. There was a within-subjects trial effect. This effect indicates that there was a difference in the scores from T1 to T2. Therefore, the attitude subscale average posttest score was significantly lower and more positive than the pretest score \[F(1,329) = 29.328, p<.001\].

There were between-subjects and within-subjects school effects. The between-subjects school effect demonstrates that there was a difference between schools on the attitude subscale averaged across pre- and posttest \[F(4,325) = 4.919, p<.005\]. In post hoc analysis of the three principal schools, the McMaster University respondents scored 0.3775 units lower and more positively than the average of the other 4 schools \[t(325) = -3.388, p<.005\]. McMaster subjects scored 1.096 and the average of the other four schools was 1.474. Similarly, the University of Ottawa respondents scored 0.415 units higher and more negatively than the average of the other four groups \[t(325) = 2.590, p<.025\]. Ottawa's pre/post average score on this subscale was 1.730
and the average of the other four schools was 1.315. University of Toronto students scored 0.1275 units lower on the attitude subscale than the average of the other four schools. This result was not statistically significant ($p > .05$).

Under within-subjects analysis, a trial-by-school interaction was found indicating that there was a difference in scores from pre- to posttest across schools [$F(4,325) = 2.802$, $p < .050$]. In post hoc analysis, the results for the three comparison schools were not statistically significant ($p > .05$).

The following analysis examined the between-subjects group effect. Results indicated that there was a significant difference between the groups on the attitude subscale scores averaged across pre- and posttest while controlling for school [$F(1,324) = 12.985$, $p < .001$]. In post hoc analysis, the experimental group scored 0.368 units lower and more positive than the control group [$t(324) = -3.604$, $p < .001$].

The trial-by-group interaction was also statistically significant [$F(1,324) = 6.056$, $p < .025$]. This effect indicates that there was a difference from pre- to posttest for the control and experimental groups. For further analysis, an examination of the Primary Analysis Of Cell Means is indicated.

The final analyses looked at school-by-group; and trial-by-school-by-group interaction. These results were found to be not statistically significant for the attitude subscale ($p > .05$).
Primary analysis of the cell means. The analysis of group found the control subjects had a mean pretest score of 1.618 +/- 1.518 and posttest score of 1.418 +/- 1.188. The experimental group had pre- and posttest scores of 1.389 +/- 0.917 and 0.917 +/- 0.889 respectively. These results demonstrate that the control group started out with more negative attitudes than the experimental group. Both groups became more positive in attitude from pre- to posttest with the experimental group having a larger change in attitudinal score (see Appendix M).

Analysis by schools shows a decrease in scores from pre- to posttest. This indicates that subjects' attitudes became more positive from T1 to T2 (see Appendix M).

In examining the groups-by-school, all of the control group scores showed a decrease (more positive) from pre- to posttest; however the experimental groups showed a higher rate of change in score. The University of Western Ontario had the largest change in scores from pre- to posttest (1.725 +/- 0.933 to 0.800 +/- 0.758) and University of Ottawa had the smallest (1.467 +/- 0.915 to 1.333 +/- 1.047). These results as well as the pre/post average scores have been given graphic representation (see Appendix M).
Subscale 4: Mental Deterioration

Primary analysis of the experimental design. The mental deterioration subscale examines the respondents' attitudes towards the change in mental function in older adults. The statements examine changes in memory, ability to learn new tasks and intelligence. More abstract statements are included in this section such as, "They just like to sit and dream", "They like to doze in a rocking chair" and "They are not useful to themselves or to others."

The average score of all of the respondents ignoring school and group on the mental deterioration subscale pretest was 2.645 and on posttest, 2.100. Under within-subjects analysis, there was a between-subjects trial effect indicating that there was a difference in the mental deterioration subscale scores from T1 to T2 \( F(1,329) = 23.966, p < .001 \).

In subsequent analysis, a between-subjects school effect was found indicating a difference between the schools on the mental deterioration subscale averaged across pre- and posttests \( F(4,325) = 3.846, p < .010 \). In post hoc analysis of the three principal schools, the McMaster University subjects' average pre/post score was 1.084 units lower and more positive than the average of the other four schools \( t(325) = -3.842, p < .001 \). The McMaster students scored 1.662 and the average of the other four schools was 2.746. The average pre/post test score of University of Ottawa respondents was 0.673 units higher and more negative than the pre/post test average of the other four schools \( t(325) = 1.662, p < .010 \). Ottawa subjects' pre/post average
score was 3.068 and the average of the other four schools was 2.394. Similarly, University of Toronto respondents scored 0.3725 units higher than the average of the other four schools. This result was found to be not statistically significant (p>.05).

Under within-subjects analysis, a trial-by-school interaction was found to be not statistically significant (p>.05).

The next analysis examined a between-subjects group effect. This effect indicated a difference between the control and experimental groups on the mental deterioration subscale scores averaged across pre- and posttest while controlling for school [F(1,324) = 32.306, p<.001]. In post hoc analysis, the experimental group scored 1.431 units lower and more positive on average pre- and posttest than the control group [t(324) = -5.684, p<.001]. The experimental group pre/post average score was 1.545 and the control group pre/post average score was 3.013.

The next analysis looked at the within-subjects trial-by-group interaction which examines the difference from pre- to posttest for the control and experimental groups across schools [F(1,324) = 19.886, p<.001]. For further analysis and discussion the Primary Analysis of Cell Means should be reviewed.

The final analysis looked at a between-subjects school-by-group interaction. This effect examined the pre- and posttest average between the experimental and control groups at each school. The results on the mental
deterioration subscale were found to be statistically significant \[F(4,320) = 5.756, p<.001\]. In post hoc analysis of the three principal schools, the McMaster University experimental-control difference was 2.238 units higher than the same difference for the other four schools \[t(320) = 4.148, p<.001\]. Using cell mean analysis, the experimental-control difference for McMaster was 0.23 and for the other four schools, -2.214. Therefore, the McMaster subjects had more negative attitudes on this subscale than the averaged score of the other four schools. Similarly for University of Toronto, the difference was 0.0775 units lower (more positive) and for University of Ottawa the difference was 0.9462 higher (more positive). These results were found to be not statistically significant \((p>.05)\).

The within-subjects trial-by-school-by-group interaction was found to be not statistically significant \((p>.05)\).

**Primary analysis of the cell means.** In this subscale all respondents' scores decreased and became more positive from pre- (2.645 +/- 2.555) to posttest (2.100 +/- 2.568). By group, control subjects' scores decreased from pre- (3.086 +/- 2.787) to posttest (2.941 +/- 2.985) as did experimental subjects' (2.076 +/- 2.096 to 1.014 +/- 1.240) (see Appendix N).

Across schools, all of the scores decreased and became more positive from T1 to T2 (see Appendix N). The school-by-group results have also been examined. In the control groups, University of Western Ontario and University
of Ottawa subscale scores increased from pre- to posttest indicating that the students' attitudes became more negative. McMaster University, Queen's University and University of Toronto scores decreased and became more positive from T1 to T2, with Toronto showing the highest change in score (3.525 +/- 3.194 to 2.800 +/- 2.997). All of the experimental groups showed an improvement in attitude from T1 to T2 with the experimental groups showing larger rate of change in score than the control subjects. The McMaster experimental group showed the largest change in score from pre- (2.429 +/- 2.300) to posttest (0.918 +/- 1.351). The pre/post average for each school and group has also been given graphic representation (see Appendix N).

Subscale 5: Cleanliness

**Primary analysis of the experimental design.** The cleanliness subscale examines the student's perception of older adults hygiene. This is a 3 statement subscale. Items such as "They never take a bath" and "They are untidy and careless about their appearance" are included in this subscale.

The average score of all the respondents ignoring school and group on the cleanliness subscale pretest was 0.136 and on the posttest, 0.094. There was a within-subjects trial effect which indicates that there was a difference in scores from T1 to T2. Therefore, the cleanliness subscale posttest score of 0.094 was significantly lower and more positive than the pretest score of 0.136 \[F(1,329) = 4.304, \ p<.050\].
In subsequent analysis, the effect of school was examined. There was a between-subjects school effect which indicated that there was a difference between the schools on the cleanliness subscale averaged across pre- and posttests \( F(4,325) = 2.543, \ p<.050 \). In post hoc analysis, the average cleanliness score of McMaster University respondents was 0.0937 units lower and more positive than the average of the other four schools \( t(325) = -2.204, \ p<.050 \). The McMaster subjects' pre/post average score was 0.061 and the pre/post average of the other four schools was 0.155. Similarly, University of Toronto and University of Ottawa respondents scored 0.0337 and 0.0837 units higher and more negative than the averaged pre/post test scores of the other four schools. These results were not statistically significant \( p>.05 \).

The trial-by-school interaction was found to be not statistically significant for the cleanliness subscale \( p>.05 \).

In subsequent analysis, there was a between-subjects group effect. This effect indicates that the groups differed across their averaged pre/post test scores when controlling for school \( F(1,324) = 6.696, \ p<.01 \). In post hoc analysis, the experimental group scored 0.102 units lower and more positive on average than the control group when controlling for school \( t(324) = -2.588, \ p<.025 \). In examining the pre/post average cell means, the experimental subjects scored 0.056 and the control subjects, 0.161 on the cleanliness subscale.

The trial-by-group interaction was found to be not statistically significant
The next analysis examined the between-subjects school-by-group interaction. The overall group effect described above was found to differ by school \([F(4,320) = 4.320, \ p<.005]\). In post hoc analysis of the three principal schools, the McMaster University experimental-control difference was 0.2425 units higher than the same difference for the other four schools \([t(320) = 2.834, \ p<.010]\). Under cell mean analysis, the McMaster experimental-control difference was 0.0415 and the difference of the other four schools was 0.2001. Therefore, the McMaster students had more negative attitudes on the cleanliness subscale in comparison to the other four schools. The results at University of Ottawa and University of Toronto were found to be not statistically significant \((p>.05)\).

The final analysis looked at the trial-by-school-by-group interaction. This effect demonstrates that the overall trial effect described above differed by school and group \([F(4,320) = 2.462, \ p<.050]\). For further discussion, a review of the Primary Analysis of Cell Means is required.

**Primary analysis of the cell means.** Reviewing the results for all respondents, the pretest mean was 0.136 +/- 0.437 and posttest mean was 0.094 +/- 0.358. This shows that respondents' attitudes became more positive from T1 to T2. By group, the control subjects' scores went from 0.167 +/- 0.508 on their pretest to 0.156 +/- 0.456 on their posttest. Experimental
subjects' pre- and posttest scores were $0.097 \pm 0.320$ and $0.014 \pm 0.117$ respectively. These results show that both groups' attitudes improved from pre- to posttest and the experimental group showed a higher rate of change from T1 to T2 (see Appendix O).

Analysis by school showed a decrease in score from pre- to posttest for all schools except University of Ottawa (see Appendix O). Results varied for this subscale when looking at the school-by-group results. In examining the control group, Ottawa subjects' scores increased and became more negative from pre- (0.227 +/- 0.528) to posttest (0.364 +/- 0.727). McMaster University (0.040 +/- 0.198) and University of Western Ontario (0.064 +/- 0.323) subjects had no change between their pre- and posttest scores. Queen's University and University of Toronto became slightly more positive from pre- to posttest. All of the experimental groups had a decrease in scores from pre- to posttest, indicating more positive attitudes. Three of 5 groups had posttest scores of 0.000. These groups were McMaster (0.0163 +/- 0.426), Ottawa (0.133 +/- 0.352) and Toronto (0.000). Results have been graphically illustrated in Appendix O. The pre/post average cell means for school and group have also been given graphic representation in Appendix O.
**Subscale 6: Conservatism**

**Primary analysis of the experimental design.** The conservatism scale examines the respondents' perception of older adults' response to change. Statements such as "They are set in their ways" and "They dislike any changes" are included in this subscale.

The average pre- and posttest scores of all respondents ignoring school and group were 8.545 and 7.388 respectively. Univariate measures analysis demonstrated a within-subjects trial effect \[F(1,329) = 61.860, \ p<.001\]. Therefore, the posttest score of 7.388 was significantly lower and more positive than the pretest score of 8.545.

There were also between-subjects and within-subjects school effects. The between-subjects school effect indicated a difference between the schools on the pre/post average scores \[F(4,325) = 3.454, \ p<.010\]. In analyzing these means, the scores ranged from 7.040 +/- 2.915 for McMaster University to 8.534 +/- 3.059 for Queen's University. The within-subjects trial-by-school effect indicated a difference in the averaged pre- and posttest scores of the various schools \[F(4,325) = 3.532, \ p<.010\]. In analyzing the cell means, all of the scores decreased and became more positive from pre- to posttest.

There were between-subjects and within-subjects group effects. The between-subjects group effect means that the control and experimental groups differed when averaged across pre- and posttests \[F(1,324) = 18.164, \ p<.001\]. In pre/post cell mean analysis, the control group scored 8.583 +/- 3.240 and
the experimental group, 7.170 +/- 2.554.

The within-subjects trial-by-group interaction was also statistically significant indicating a difference in the control and experimental scores on the conservatism subscale from pre- to posttest [$F(1,324) = 16.374, p<.001$]. Both groups' scores decreased from pre- to posttest with the experimental group showing a larger and more positive change over time.

The school-by-group interaction demonstrated that the overall group effect described above differs by school [$F(4,320) = 3.082, p<.025$]. These results will be further described in the Primary Analysis of Cell Means. The remainder of the analyses of this subscale were found to be not statistically significant ($p>.05$).

**Primary analysis of the cell means.** Across all respondents, the pre- and posttest scores were 8.545 +/- 3.143 and 7.388 +/- 3.486 respectively. In the analysis of the control and experimental groups, the scores decreased from pre- to posttest with a larger and more positive change seen in the experimental subjects (see Appendix P).

Across schools, scores decreased and became more positive from T1 to T2. The largest change in score was from the University of Western Ontario respondents and the smallest was seen at University of Ottawa. These scores are graphically illustrated in Appendix P.

Across schools and groups, there were consistent decreases in scores
from T1 to T2 indicating more positive attitudes over time. These results and the pre/post cell averages are illustrated in Appendix P.

Subscale 7: Activities And Interests

**Primary analysis of the experimental design.** The activities and interests subscale examined the students' attitudes toward the leisure activities of older adults. The scale has questions on religious interests, politics, sports and current events. It also has a few more stereotypic questions such as interest in dominoes or checkers and collecting "useless things like string and paper...".

Across all respondents, the pre- and posttest scores were 2.755 and 2.364 respectively. There was a within-subjects trial effect indicating that the posttest score of 2.364 was significantly lower and more positive than the pretest score of 2.755 \( E(1,329) = 17.790, p<.001 \).

There were also between-subjects and within-subjects school effects. The between-subjects school effect means that the schools differed across the pre/post average score \( E(4,325) = 4.008, p<.005 \). The pre/post average cell means varied from 2.035 +/- 1.549 at McMaster University to 3.257 +/- 1.910 at University of Ottawa. There was also a within-subjects trial-by-school effect demonstrating that the scores of the schools on the activity subscale varied from pre- to posttest \( E(4,325) = 2.544, p<.050 \). All scores decreased and became more positive from pre- to posttest with the exception of University of
Toronto.

There were between-subjects and within-subjects group effects. The between-subjects group effect indicated that the control and experimental groups differed on the pre/post average score of the activity subscale \[F(1,324) = 44.590, p<.001\]. The control and experimental groups' scores were 3.097 +/- 1.977 and 1.865 +/- 1.332 respectively. The within-subjects group effect indicated that the control and experimental subjects' scores differed at pre- and posttest on the activity subscale \[F(1,324) = 17.792, p<.001\]. The control and experimental scores decreased and became more positive from pre- to posttest. The control subjects' scores at T1 and T2 were 3.118 +/- 1.996 and 3.075 +/- 1.996 respectively. The experimental groups' scores were lower at T1 (2.285 +/- 1.708) and further decreased at T2 (1.444 +/- 1.363).

There was also a between-subjects school-by-group interaction indicating that the control and experimental groups differed at each school on this subscale \[F(4,320) = 3.557, p<.010\]. Further analysis of these results is described in the Primary Analysis of Cell Means.

The trial-by-school-by-group interaction was found to be not statistically significant \(p>.05\).

**Primary analysis of the cell means.** Across all respondents, the pre- and posttest scores were 2.755 +/- 1.919 and 2.364 +/- 2.103. Control and experimental groups' scores decreased from pre- to posttest. The control
group's scores went from 3.118 +/- 1.996 on pretest, to 3.075 +/- 2.293 on posttest. The experimental group's scores were lower and thus, more positive at T1 (2.285 +/- 1.708) and T2 (1.444 +/- 1.363). Across schools, all scores decreased from pre- to posttest, with the exception of University of Toronto.

In analysis by group and school, the control subjects frequently had an increase or no change in the pre- to posttest score. This indicates that scores became more negative or did not change. The exception to this was University of Western Ontario which had a decrease on this subscale. Conversely, all of the experimental groups' scores decreased and became more positive from T1 to T2. The graphic results for this scale are illustrated in Appendix Q.

**Subscale 8: Financial**

**Primary analysis of the experimental design.** The financial subscale is composed of six items and examines the respondents' opinion of how older adults deal with money and financial security. Statements such as: "They have too much power in business and politics" are included in the scale.

The pre- and posttest scores across all respondents were 2.215 and 1.769 respectively. There was a within-subjects trial effect indicating that the posttest score of 1.767 was significantly lower and more positive than the pretest score \( F(1,329) = 42.026, p<.001 \).

There were between- and within-subjects group effects. The between-subject group effect demonstrated that the control and experimental groups
differed on the pre/post average score \([F(1,324) = 21.870, p<.001]\). The pre/post averaged scores for the control and experimental groups were 2.266 +/- 1.366 and 1.635 +/- 1.048 respectively.

There was also a within-subjects trial-by-group effect which indicated that the control and experimental groups' scores differed at T1 and T2 \([F(1,324) = 7.592, p<.010]\). Both the control and experimental groups' scores decreased from pre- to posttest. The control group's scores at pre- and posttest were 2.414 +/- 1.382 and 2.118 +/- 1.569 respectively. Experimental scores were lower and further decreased from T1 (1.958 +/- 1.348) to T2 (1.313 +/- 1.156).

There was also a between-subjects school-by-group interaction which demonstrated that the control and experimental groups differed across schools on the pre/post average cell means \([F(4,320) = 3.854, p<.005]\). These results are further analyzed in the section Primary Analysis of Cell Means. The remainder of the analyses of this subscale were found to be not statistically significant \((p>.05)\).

**Primary analysis of the cell means.** Across all respondents, the pre- and posttest scores were 2.215 +/- 1.383 and 1.767 +/- 1.458 respectively. The control and experimental respondents' scores decreased from pre- to posttest. The control subjects' scores at pre- and posttest were 2.414 +/- 1.382 and 2.118 +/- 1.569 respectively. Experimental subjects' scores were lower and
thus, more positive than the control group at T1 (1.958 +/- 1.348) and T2 (1.313 +/- 1.156). Across schools, all scores decreased and became more positive from pre- to posttest. Across schools and groups, all scores decreased and became more positive from pre- to posttest; however, the experimental groups' scores were lower (more positive) and had a higher rate of change. For graphic illustration see Appendix R.

**Subscale 9: Family**

*Primary analysis of the cell means.* The family subscale examined the respondents' opinion of older adults' relationships with their children and grandchildren. The issue of dependency by parents on their children is explored. Statements such as "They usually live with their children" and "They are not important in family matters" are included in this subscale.

Across all respondents the pre- and posttest scores were 5.270 and 4.876 respectively. There was a between-subjects trial effect which means that the posttest score of 4.876 was significantly lower and more positive than the pretest score of 5.270 [F(1,329) = 24.111, p<.001].

There was also a between-subjects school effect which indicated that the results at each school differed when the scores were averaged across pre- and posttests [F(4,325) = 3.478, p<.010]. The pre/post average scores ranged from 4.687 +/- 1.314 at McMaster University to 5.486 +/- 1.367 at University of Ottawa.
The trial-by-school interaction was found to be not statistically significant (p>.05).

There were between- and within-subjects group effects. The between-subjects group effect found that the control and experimental groups differed across pre/post average scores $[\text{F}(1,324) = 11.883, p<.005]$. The pre/post averaged scores for the control and experimental subjects were $5.339 +/- 1.686$ and $4.729 +/- 0.951$ respectively.

The between-subjects trial-by-group effect was also found to be significant $[\text{F}(1,324) = 6.460, p<.015]$. This effect indicated that there were differences in the pre- and posttest scores of the control and experimental groups. The control and experimental groups' scores decreased and became more positive from T1 to T2. Control scores on pre- and posttest were $5.446 +/- 1.743$ and $5.231 +/- 1.916$ respectively. The experimental group's scores started out slightly lower (more positive) and also decreased from T1 ($5.042 +/- 1.332$) to T2 ($4.417 +/- 1.054$).

There was also a between-subjects school-by-group interaction $[\text{F}(4,320) = 2.919, p<.025]$. These results will be further examined in the Primary Analysis of Cell Means.

The trial-by-school-by-group interaction was found to be not statistically significant (p>.05).
**Primary analysis of the cell means.** Analysis of all respondents showed pre- and posttest scores of 5.270 +/- 1.587 and 4.876 +/- 1.646 respectively. The control and experimental scores decreased and became more positive from pre- to posttest. The control respondents’ pretest scores were 5.446 +/- 1.743 and on posttest, 5.231 +/- 1.916. Scores for the experimental group were initially lower at T1 (5.042 +/- 1.332) and decreased further at T2 (4.417 +/- 1.054) (see Appendix S). Scores across the schools decreased and became more positive from pre- to posttest, with the exception of University of Ottawa. The Ottawa scores had no change from T1 to T2 (see Appendix S).

Analysis across school and group is given graphic representation in Appendix S. The control subjects' scores decreased and became more positive from pre- to posttest, with the exception of University of Ottawa. The Ottawa scores increased and became more negative from pre- to posttest. Across schools, all of the experimental scores decreased from T1 to T2. The pre/post average cell means are also given graphic representation in Appendix S.

**Subscale 10: Best Time of Life**

**Primary analysis of the experimental design.** This is a five-item subscale which examines the students' perception of the lifestyle of older adults. Statements include: "They never had it better", "They love life" and "They are in the happiest period of their life."
Across all respondents, the pre- and posttest scores were 2.121 and 2.106 respectively. The only significant effect found in this subscale was the school effect which indicated that the pre/post average cell means differed at the various schools \[ F(4,325) = 3.744, \ p<.010 \]. These results are given graphic representation in Appendix T. The remainder of the analyses of this subscale were found to be not statistically significant \( p>.05 \).

**Subscale 11: Insecurity**

**Primary analysis of the experimental design.** This is a 20-item subscale. This scale explores the respondents' perception of the target group's areas of fear and insecurity. Statements include "They are suspicious of others", "They are afraid of the dark" and "They are insecure." Other questions seem less applicable or appropriate for this category; such as "They become insane", "They are bad patients when they are ill" and "They are fussy about their food."

Across all respondents, the pre- and posttest scores for this subscale were 3.915 and 3.233 respectively. Under univariate analysis, there was a within-subjects trial effect indicating that the posttest score of 3.233 was significantly lower than the pretest score of 3.233 \( F(1,329) = 25.266, \ p<.001 \).

There was a between-subjects school effect indicating that the pre/post average score differed between the schools \( F(4,325) = 2.875, \ p<.025 \). These scores ranged from 2.949 +/- 2.016 at McMaster University to 4.622 +/- 3.058
at University of Ottawa.

The trial-by-school effect was found to be not statistically significant (p>.05).

There were between- and within-subjects group effects. The between-subjects group effect indicated that the pre/post average score of the control and experimental groups differed significantly on this subscale \[ F(1,324) = 35.026, p<.001 \]. The control and experimental pre/post average scores for the insecurity subscale were 4.323 +/- 3.148 and 2.608 +/- 1.636 respectively.

There was also a within-subjects trial-by-group effect which was statistically significant \[ F(1,324) = 10.892, p<.005 \]. This effect indicated that the control and experimental groups’ scores differed significantly across pre- and posttests. Control and experimental scores decreased from pre- to posttest. The control group’s scores were 4.468 +/- 3.326 on pretest, and 4.177 +/- 3.491 on posttest. The experimental scores on pretest (3.201 +/- 2.331) were slightly lower and more positive. They further decreased on posttest (2.014 +/- 1.496).

There was also a significant school-by-group interaction \[ F(4,320) = 4.307, p<.005 \]. These results will be further described in the Primary Analysis of Cell Means.

The trial-by-school-by-group effect was found to be not statistically significant (p>.05).
Primary analysis of the cell means. In cell mean analysis, the pre- and posttest scores of all respondents were 3.915 +/- 2.996 and 3.233 +/- 2.997 respectively. Across groups, control and experimental scores decreased and became more positive from pre- to posttest. The control group's scores on the insecurity variable were 4.468 +/- 3.326 and 4.177 +/- 3.491 respectively. The experimental group's scores were lower on pretest (3.201 +/- 2.331) and further decreased on posttest (2.014 +/- 1.496). Across schools, all scores decreased and became more positive from pre- to posttest. Across school and group, the control and experimental groups' scores decreased from T1 to T2. The experimental scores in general were initially lower on pretest and showed more of a marked decline on posttest. The above results, as well as the average pre/post scores across schools and groups, are graphically illustrated (see Appendix U).

Subscale 12: Sex

Primary analysis of the experimental design. The sex subscale includes four items which do not examine the issue of sexuality with respect to the target group, but rather the issues of marriage, parenthood and relations with the opposite sex.

The pre- and posttest scores across all respondents were 0.497 and 0.358 respectively. There was a within-subjects trial effect which indicated that the posttest score of 0.358 was significantly lower than the pretest score of
There were between-subjects and within-subjects group effects which were statistically significant. The between-subjects group effect indicated that the control and experimental subjects differed significantly on the pre/post average score \( F(1,324) = 11.197, p < .005 \). The control and experimental groups' pre/post average scores were 0.505 +/- 0.635 and 0.326 +/- 0.411 respectively. There was a within-subjects group effect which indicated that the pre- and posttest scores differed across schools \( F(4,320) = 3.822, p < .010 \).

The pre/post average cell means scores across school and group are illustrated in Appendix V. The remainder of the analyses of this subscale were found to be not statistically significant \( (p > .05) \).

**Subscale 13: Interference**

**Primary analysis of the experimental design.** This is a three-statement subscale which looked at the respondents' perception of how older adults interfere in the lives of others.

The pretest and posttest scores across all respondents were 0.324 and 0.206 respectively. There was a within-subjects trial effect \( F(1,329) = 12.596, p < .001 \). This effect means that the posttest score of 0.206 was significantly lower than the pretest score of 0.324.

There was also a between-subjects group effect which was statistically significant \( F(1,324) = 10.365, p < .005 \). This effect means that the control and
experimental groups’ scores differed significantly when averaged across pre- and posttest. This result is graphically illustrated in Appendix W. The remainder of the analyses were found to be not statistically significant (p>.05).

Kogan Old People Scale

The Kogan Old People scale consists of 17 paired statements. One-half of these statements are negatively worded and the remainder reflect more positive attitudes toward the older adult. The respondents rate their responses on a Likert-type scale. The data of 330 subjects were used in this analysis.

Scale 1: Old People Positive Scale (OPPOS)

Primary analysis of the experimental design. The average score of all respondents ignoring school and group on the OPPOS pretest was 88.597 and on posttest, 89.997. There was a within-subjects trial effect. This effect indicated that there was a difference in scores from T1 to T2. Therefore, the OPPOS average posttest score of 89.997 was significantly higher and more positive than the pretest score of 88.597 [F(1,329) = 10.984, p<.005].

There were between-subjects and within-subjects school effects. The between-subjects effect indicated that there was a difference between the schools on the OPPOS score averaged across pre- and posttests [F(4,325) = 4.686, p<.005]. In post hoc analysis of University of Toronto, the pre/post average was 4.915 units lower (more negative) than the average of the other
four schools \[t(325) = -3.561, p<.001\]. Toronto's pre/post average score on the OPPOS scale was 85.418 and the average of the other four schools was 90.334. Similarly, University of Ottawa's subjects pre/post average score was 5.05 units higher (more positive) than the average of the other four schools \[t(325) = -3.270, p<.001\]. Ottawa's pre/post average score was 93.392 and the average of the remaining schools was 88.34. The McMaster University contrast was found to be not statistically significant \((p>.05)\).

There was a within-subjects trial-by-school interaction which was statistically significant \(F(4,325) = 2.935, p<.025\). This effect indicated that there was a difference from pre- to posttest at each school. In post hoc analysis, the University of Toronto subjects' pre- and posttest differences were different than the average of the other four schools \[t(325) = 8.121, p<.010\]. The Toronto pre- and posttest scores were 86.122 and 84.714 respectively. The average of the other four schools on OPPOS1 and OPPOS2 were 89.34 and 91.322. The McMaster University and University of Ottawa analyses were found to be not statistically significant \((p>.05)\).

There were between-subjects and within-subjects group effects. The between-subjects group effect indicated that the control and experimental groups differed when averaged across pre- and posttest \(F(1,324) = 31.896, p<.001\). In post hoc analysis, the experimental group scored 5.419 units higher (more positive) than the control group on the OPPOS scale averaged across pre- and posttest \[t(325) = 5.648, p<.000\]. In cell mean analysis of the pre/post
averaged scores, the OPPOS scores for the experimental and control groups were 92.49 and 86.83 respectively.

There was also a within-subjects trial-by-group interaction. This indicates that there was a difference from pre- to posttest for the control and experimental groups \( F(1,324) = 14.981, p<.000 \). For further analysis a review of the Primary Analysis of Cell Means is required.

The school-by-group and trial-by-school-by-group interactions were found to be not statistically significant \( (p>.05) \).

**Primary analysis of the cell means.** In examining the cell means by group, the control respondents had pre- and posttest scores of 86.909 +/- 9.781 and 86.742 +/- 10.979 respectively. The experimental respondents scored 90.778 +/- 7.819 and 94.201 +/- 7.761 on their pre- and posttests (see Appendix X). Therefore, the control subjects showed no change and the experimental subjects showed an increase in scores from T1 to T2, indicative of more positive attitudes over time.

All of the analyses by school showed an increase in scores from pre- to posttest with the exception of the University of Toronto respondents (see Appendix X).

A subsequent analysis examined the cell means by group and school. The results with the control subjects were variable. University of Toronto and McMaster University subjects’ scores decreased and became more negative
from T1 to T2. There was essentially no change with the University of Western Ontario control subjects. The scores from Queen’s University and University of Ottawa increased and became more positive from pre- to posttest. Conversely, all of the scores for the experimental subjects increased and became more positive from pre- to posttest (see Appendix X). The pre/post average cell means are given graphic representation in Appendix X.

**Scale 2: Old People Negative Scale (OPNEG)**

**Primary analysis of the experimental design.** The average score of all respondents ignoring school and group on the OPNEG scale pretest was 43.497 and on posttest, 42.424. There was a within-subjects trial effect. This indicated that there was a difference in the scores from T1 to T2. Therefore, the OPNEG posttest was significantly lower and more positive than the pretest score \[ F(1,329) = 6.357, p<.025 \].

There were between-subjects and within-subjects school effects. The between-subjects school effect indicated that there was a difference between the schools on the OPNEG scale averaged across pre- and posttest \[ F(4,325) = 4.156, p<.005 \]. In post hoc analysis, McMaster University respondents scored 5.15 units lower (more positive) than the pre/post average of the other four universities \[ t(325) = -3.815, p<.001 \]. In examining the pre/post cell means, McMaster University respondents scored 39.465 and the pre/post average of the other four universities was 44.61. Similarly, University of
Toronto respondents scored 3.57 units lower (more positive) than the pre/post average of the other four universities \([t(325) = 2.060, p<.050]\). In cell mean analysis, the University of Toronto pre/post OPNEG score was 46.439 and the average of the other four universities was 42.869. The results for University of Ottawa were found to be not statistically significant \((p>.05)\).

There was a within-subjects trial-by-school effect indicating that there was a difference in the scores from pre- to posttest at each of the schools \([F(4,325) = 2.727, p<.050]\). In post hoc analysis, the University of Toronto's pre- and posttest scores were statistically different from the average of the other four universities \([t(325) = 7.561, p<.010]\). In cell mean analysis the pre- and posttest scores for University of Toronto were 45.592 and 47.286 respectively. The pre- and posttest score average of the other four universities were 43.668 and 42.069 respectively. The results for McMaster University and University of Ottawa were found to be not statistically significant \((p>.05)\).

In subsequent analysis a between-subjects group effect was found. This indicated that the control and experimental groups differed on the OPNEG scale when averaged across pre- and posttests \([F(1,324) = 21.741, p<.001]\). In an analysis of pre/post cell means the control and experimental groups scored 45.656 and 39.479 respectively \([t(325) = 6.247, p<.000]\).

There was also a within-subjects trial-by-group interaction. This effect indicated that the control and experimental groups' scores differed across pre- and posttest \([F(1,324) = 17.691, p<.001]\). An in-depth review of these scores
and their graphic representation is provided in the Primary Analysis of Cell Means.

The school-by-group interaction was found to be not statistically significant ($p>.05$).

The final analysis examined the trial-by-school-by-group interaction. This indicates that the control and experimental groups differed from pre- to posttest at each school [$F(4,320) = 2.459, p<.050$]. These results are given further examination and graphic representation in the following section, Primary Analysis of Cell Means.

**Primary analysis of the cell means.** Across all respondents, the pre- and posttest means were 43.497 and 42.424 respectively. Across groups, control and experimental groups scored 45.366 and 41.083 on their pretests, and 45.946 and 37.875 on their posttests. Therefore, there was little attitudinal change with the control respondents. The experimental respondents' scores decreased and became more positive from T1 to T2 (see Appendix Y).

Across universities, all scores decreased or became more positive from pre- to posttest with the exception of University of Toronto (see Appendix Y for graphic representation).

In the analysis of schools and groups, the control groups' scores were variable. University of Toronto's and McMaster University's scores increased on the OPNEG scale from pre- to posttest. This indicated a more negative
attitude from T1 to T2. The control groups' scores at University of Western Ontario and Queen’s University did not change from T1 to T2. The scores for the University of Ottawa control subjects decreased and became more positive from pre- to posttest. Conversely, all scores for the experimental subjects decreased and became more positive from pre- to posttest. The above results are given graphic representation in Appendix Y. The pre/post average cell means by school and group are also illustrated in Appendix Y.

Environmental Variables

In this section the impact of the working environment was examined through a 10-statement questionnaire. Subjects indicated their responses on a 7-point Likert-type scale. The questions were based on the work of Snape (1986). They were trialed for wording and comprehension. Based on this feedback they were modified prior to their initial administration in the study.

The first three questions did not yield any significant results in analysis. Therefore, further analyses were not completed.

Question A: Client Improvement

The original question #38 examined the students' attitudes towards the geriatric client's progress in comparison to other client groups. Ignoring school and group, the pretest score was 4.412 (no opinion) and posttest, 4.352 (no opinion). The scores ranged from no opinion to slightly agree on the scale. The
results yielded a statistically significant school-by-group interaction \( F(4,320) = 2.933, p<0.025 \). This indicated that the control and experimental groups differed significantly at each university. The pre/post average cell mean results are given graphic representation in Appendix Z. The remainder of the analyses were not statistically significant \( (p>0.05) \).

**Question B: Geriatric Physical Therapy as a Challenge**

This question examined the respondents' concept of the perceived challenge within this subspecialty. Across schools and groups, the pretest score was 2.700 (slightly disagree) and posttest score was 2.618 (slightly disagree). There was a between-subjects school effect which indicated that there was a difference between the schools on this question when averaged across pre/post test \( F(4,325) = 4.688, p<0.005 \). In cell mean analysis the scores ranged from 2.328 +/- 1.095 (disagree) at McMaster University to 3.257 +/- 1.337 (slightly disagree) at University of Ottawa.

There were also between-subjects and within-subjects group effects. The between-subjects group effect indicated that the control and experimental groups' answers were different when averaged across pre/posttest \( F(1,324) = 4.366, p<0.050 \). In pre/post average cell means, the control subjects scored 2.785 +/- 1.267 (slightly disagree) and experimental subjects scored 2.497 +/- 1.241 (disagree). There was also a trial-by-group effect which means that the control and experimental groups' scores differed from pre- to posttest \( F(1,324) \)
These results are given graphic representation in Appendix AA. The remainder of the analyses were found to be not statistically significant (p>.05).

**Question C: Geriatric Physical Therapists Are Respected**

This question examined the respondents’ perception of the respect received by geriatric physical therapists in comparison to other specialities. Across school and group, the pretest score was 3.230 (slightly disagree) and on posttest, 3.321 (slightly disagree). There was a between-subjects group effect which was statistically significant [F(1,324) = 5.072, p<.050]. This effect indicated that there was a difference between the control and experimental groups averaged across pre- and posttest on this question. In pre/post averaged cell mean analysis, the experimental group scored 3.483 +/- 1.489 (slightly disagree) and the control group scored 3.116 +/- 1.343 (slightly disagree).

There was also a between-subjects school-by-group interaction. Therefore, the group effect described above differs by university [F(4,320) = 2.778, p<.050]. These differences are given graphic representation in Appendix BB. The remainder of the analyses were found to be not statistically significant (p>.05).
**Question D: Geriatric Physical Therapy Is Depressing**

This question examined the respondents' negative feelings towards geriatric physical therapy. Across school and group, the pre- and posttest scores were 2.606 (slightly disagree) and 2.730 respectively (slightly disagree). In analysis, there was a between-subjects school effect. This effect indicated that there was a difference between the schools on this question averaged across pre- and posttest \[F(4,325) = 4.733, \ p<.005\]. In pre/post cell mean analysis, the scores ranged from 2.424 +/- 1.077 (disagree) at McMaster University to 3.365 +/- 1.475 (slightly disagree) at University of Western Ontario. This is illustrated in Appendix CC.

There was also a within-subjects trial-by-group effect. This effect indicated that the control and experimental groups differed at pre- and posttest \[F(1,324) = 11.145, \ p<.005\]. The remainder of the analyses were found to be not statistically significant \(p>.05\).

**Question E: Geriatric Wards Have an Unpleasant Smell**

This question examined the respondents' perception of the environment in a geriatric setting. The average score of all respondents ignoring school and group on the pretest was 3.830 (no opinion) and on posttest, 3.676 (no opinion). There was a within-subjects trial effect which means that the posttest results were significantly lower than the pretest scores \[F(1,329) = 3.970, \ p<.050\]. The remainder of the analyses were found to be not statistically
significant \((p>.05)\).

**Question F: Geriatrics Is an Uninteresting Speciality**

This question examined the respondents' perception of geriatrics as an interesting and challenging area of practice. Across school and group, the pre- and posttest scores were 2.630 (slightly disagree) and 2.558 (slightly disagree) respectively. In analysis, there was a between-subjects school effect indicating that there was a difference between the universities on averaged pre/post test score of this question \([F(4,325) = 3.338, p<.025]\). The pre/post average scores ranged from 2.354 +/- 1.033 (disagree) at McMaster University to 3.014 +/- 1.283 (slightly disagree) at University of Western Ontario. These results are given graphic representation in Appendix DD.

There was also a within-subjects trial-by-group interaction. This effect indicated that the control and experimental groups differed at pre- and posttest \([F(1,324) = 12.193, p<.005]\). The remainder of the analyses were found to be not statistically significant \((p>.05)\).

**Question G: Geriatric Clients Are Less Motivated**

This question examined the respondents' perception of client motivation. It can be hypothesized that if the clients are less motivated this could be discouraging for the students. Ignoring school and group, the pre- and posttest scores were 3.058 (slightly disagree) and 2.803 (slightly disagree). There was
a significant within-subjects trial effect \[F(1,329) = 7.742, p<.010\].

There was also a between-subjects school effect \[F(4,325) = 4.616, p<.005\]. In analysis of the pre/post average cell means, the scores ranged from 2.586 +/- 1.074 (disagree) at McMaster University to 3.500 +/- 1.307 (no opinion) at University of Western Ontario (see Appendix EE).

There was also a significant between-subjects group effect \[F(1,324) = 33.429, p<.001\]. This effect indicated that there was a significant difference between the control and experimental groups averaged across pre- and posttest while controlling for school. In pre/post cell mean analysis, the experimental subjects scored 2.490 +/- 0.999 (disagree) and the control subjects, 3.272 +/- 1.285 (disagree). These results are given graphic illustration in Appendix EE. The remainder of the analyses were found to be not statistically significant \((p>.05)\).

**Career Aspirations**

**Primary Analysis of the Experimental Design**

This section analyzed the students' career interest in geriatrics through a Likert-type scale at pre- and posttest. The question asked "How would you rate your interest in geriatrics as an area of specialization?" Students indicated their interest along a 1 (none) to 10 (extremely) scale. None of the analyses conducted on this section were found to be statistically significant with the exception of the trial-by-group effect. The within-subjects trial-by-group effect
indicated that the control and experimental groups differed across pre- and posttest \[F(1,324) = 24.280, p<.001\]. These results will be further analyzed in the following section, Primary Analysis of Cell Means.

**Primary Analysis of the Cell Means**

Across all respondents, the scores from pre- to posttest were 3.976 +/- 2.074 and 4.094 +/- 2.197. Scores increased slightly or more favourably, but still remained within the "fair" interest level.

Analysis by group demonstrated a distinct difference in interest levels. Control subjects decreased from 4.027 +/- 2.049 (fair) at pretest, to 3.694 +/- 2.165 (a little) at posttest. The experimental group’s scores increased and became more favourable from pre- to posttest. Their scores ranged from 3.910 +/- 2.112 (fair) to 4.611 +/- 2.136 (moderate) (see Appendix FF).

Analysis by school demonstrated the variability in responses. At University of Western Ontario and McMaster University, the scores increased and became more favourable from pre- to posttest. At Queen’s University, the scores remained essentially unchanged. At University of Toronto and University of Ottawa, the scores decreased and became less favourable towards geriatrics from pre- to posttest (see Appendix FF).

In analyzing the results by school and group, the control group consistently demonstrated a decrease in scores from pre- to posttest. Their results ranged from 3.9 (fair) to 4.1 (fair) on pretest; to 3.4 (a little) to 3.9 (fair)
on posttest. Experimental scores consistently improved from pre- to posttest with the exception of University of Ottawa. Experimental groups’ scores on pretest ranged from 3.2 (a little) to 4.6 (average) and on posttest from 3.1 (a little) to 5.8 (moderate). These results are given graphic representation in Appendix FF.

**Summary**

The results of the research have been presented in this chapter. Analyses examined the demographic correlates of the subjects with attitude and knowledge. Results of the Revised Palmore Facts On Aging Quiz, Revised Tuckman-Lorge, the Kogan Old People Scale and the environmental and career aspirations scales were presented.
CHAPTER FIVE: DISCUSSION AND IMPLICATIONS OF RESEARCH

Introduction

This chapter is composed of two sections: discussion and conclusion. In this final chapter the original research questions will be reviewed in addition to the significance of the research findings. The conclusions will provide areas for future research.

Is there a relationship between attitude and the demographic variables associated with each student?

Certain demographic characteristics have long been associated with positive attitudes towards the elderly. In this study the characteristics of gender, marital status, and ethnicity were examined. The relationship between attitude and having a relationship with a grandparent; having worked with older adults; and taking gerontology courses were also studied.

The issue of gender has had inconsistent results in the literature (Kayser & Minnigerode, 1975; Reuben et al., 1995). In this study, female respondents scored higher on the Revised Palmore Facts On Aging Quiz (p<.05). They also had higher scores on the Kogan OPPOS scale (p<.010) and on two of the Tuckman-Lorge subscales (p<.050).

The findings of this study support the idea that women in physical therapy schools have more favourable attitudes toward older persons than do men. Part of the difference in the strength of the reported findings between the
two attitudinal scales used in this study could be related to the sensitivity of the tools utilized to measure change or the difference in the measurement scales (Likert-type scale verses questionnaire). In addition, it is possible that the results have been biased by the unequal numbers of male and female respondents in the sample.

Marital status as a variable has also shown an inconsistent relationship to knowledge and attitude (Michielutte & Diseker, 1985; Reuben et al., 1995; Shimamoto & Rose, 1987). In this research, single respondents scored higher than married respondents on the Revised Palmore Facts On Aging Quiz; however, the results were found to be not statistically significant (p> .05).

On the attitude scales, the married respondents scored higher and more negatively on only one Tuckman-Lorge subscale (p< .020). Therefore, no statistically significant relationship was found between attitude and marital status in this sample population. Part of the problem in drawing adequate conclusions from the data is the inequality of the two sample groups. In this research, the sample contained very few married subjects (n = 27). In addition, divorced subjects, because of their small number, (n = 2) were not able to be analyzed separately. Therefore, although marital status does not seem to be related to attitude or knowledge in this study, problems with the unequal sample size of single and married respondents has limited further analysis.

There was a large sample of respondents who classified themselves as members of an ethnic group. The literature has indicated that those individuals
of ethnic origin tend to have more positive attitudes towards the elderly (Feldbaum & Feldbaum, 1981; Shimamoto & Rose, 1987). An interesting finding of this research is that respondents who classified themselves as members of an ethnic group scored lower on the Revised Palmore Facts On Aging Quiz \((p<.020)\) and more negatively than nonethnic subjects on both of the attitudinal scales \((p<.050)\). Given the strength of the nuclear family, the lower rates of institutionalization and the anticipated respect of most ethnic cultures, this finding was unanticipated (Marshall, 1980; Reuben et al., 1995; Shimamoto & Rose, 1987).

Several explanations may be considered. A large percentage of the composition of the ethnic groups \((n = 42)\) were drawn from the control group at University of Toronto. Therefore, the results may be due to the confounding effect of group inasmuch as more negative attitudes were found in the control group of subjects. It is also possible that this research may also be capturing a class difference unique to this group of students. Another possibility is that many of these students were born in Canada and, therefore, the ethnic tie that sociologists describe may not be as strong with this group of students.

Shimamoto and Rose (1987) reported that having had a positive personal experience with an older person, such as a grandparent, also correlated with more positive attitudes towards the elderly and an interest in working with them. These findings were replicated in this research. The subjects who had a relationship with their grandparents scored more positively
on both attitudinal scales and had an interest in working with older adults upon graduation (p<.050).

Previous work experiences, such as a job or volunteer work with older adults, has been shown to be related to more positive attitudes towards the elderly (Coren, Andreassi, Blood & Kent, 1987; Shimamoto & Rose, 1987; Todd, Rider & Page-Robin, 1986). This finding was not consistently replicated in this study. The "work" students had higher knowledge scores on the Revised Palmore Facts on Aging Quiz (p<.050). Results on the attitude scales of the Revised Tuckman-Lorge and Kogan Old People Scale were not statistically significant (p>.050). It is possible that this result was confounded by the effect of group inasmuch as more of the control subjects had worked with older adults. Unfortunately the nature of the work experiences was not described by the respondents. It is possible that the work was voluntary or it may have occurred as a part of a mandatory or expected portion of an educational experience. The differences in the nature of the experience might have been significant.

Consistent with previously published studies (Reuben et al., 1995) previous course work on aging was a predictor of positive attitudes on both the Kogan and Tuckman-Lorge scales (p<.10). Therefore, it appears that attitudes may be impacted by previous educational courses in gerontology. Whether the students in this study chose to take an additional course because of their previous interest or whether this interest developed as a consequence of the
course work was not determined.

Therefore, this research indicated that there is a relationship between attitude and the demographic characteristics associated with the students. Positive attitudes were related to female gender; ethnicity was negatively related and marital status was found to be unrelated to attitude \((p<.05)\). Having a relationship with an older adult and taking courses in gerontology were also found to be positively related to attitude \((p<.05)\). Overall, the results of this research suggest that it is possible to identify students who have positive attitudes toward older persons by examining sociodemographic and experiential data.

**Do knowledge score increase after an educational intervention?**

In this study, the Revised Palmore Facts on Aging Quiz was used to measure knowledge before and after the educational intervention. The results of this research found an increase in scores for both the control and experimental groups. Both groups had increases in their knowledge scores, with the experimental group showing a larger and statistically significant change from pre- to posttest \((p<.05)\).

Overall, the results between school and group indicate that the groups differ significantly with respect to their knowledge of the elderly as measured by the FAQ score. The lowest scores are found with the first-year students and the highest with the fourth-year students and these differences are statistically
significant (p<.001). It should be noted that the range of mean scores is 13-16 for the controls and 14 - 22.7 for the experimental group. This is a relatively large substantive difference between the groups, but a moderately low level of knowledge among all groups. Also important are the relatively small deviations in scores for the control groups, indicating considerable homogeneity within the groups in their knowledge of the elderly. The larger deviations found within the experimental groups could be attributed to the effects of the different educational methodologies.

The results across the schools and groups were consistent with what was hypothesized; however there were some exceptions. The McMaster University students showed no difference between the experimental and control groups. This lack of change could be explained by the shorter study interval for these subjects (13 weeks) or reflective of a smaller between-class difference for this school. At McMaster the program is a 2-year post baccalaureate degree, therefore the control and experimental subjects have less than a 1-year difference in their educational experiences in comparison to 3 years at the other schools. There was also a limited change with the experimental group at University of Ottawa. For a large percentage of the University of Ottawa students, English is a second language. Perhaps word choices used in the FAQ were misinterpreted.

Among the students, gender, ethnicity, work experience and having a relationship with a grandparent showed a statistically significant relationship
with knowledge of the elderly (p<.050). Of significance is the fact that the data show little, if any, relationship between knowledge of the elderly and interest in specialization.

In comparison with the published literature, the physiotherapy students' results were similar to those of other groups. In analyzing groups, the control subjects had a mean percentage score of 58.88. The control group had between 1 and 4 years university with the majority having only 1 year. Their scores were equivalent to those of an Education class (59%), but less than nursing students (60%), medical students (63.2 to 70.8%), dentists (64.4%), dental assistants (60%) and other undergraduates (61%) (Michielutte & Diseker, 1985; Palmore, 1980). The experimental group had a mean percentage score of 71.00. This score was consistently higher than previous studies of college or technical school graduates (62%). The physiotherapy students scored higher than published studies of family practitioners, residents, medical students, dentists, social workers, clergy, public health nurses and medical students (Michielutte & Diseker, 1985; Palmore, 1980). Their scores were equivalent to those of registered nurses (71%), but less than graduate students (80%), and nurses with Master's degrees (77%) (Palmore, 1980).

In examining the tool, the Revised Palmore Facts On Aging Quiz has been criticized in the literature for its weakness in terms of its reliability and validity. Norris, Tindale & Matthews (1982) feel that the multi-dimensional nature of the test and the heterogeneity of the test items contribute to this
null
problem with reliability. The quiz attempts to ask questions from a variety of areas in gerontology. The brevity of the scale further compounds this problem. The validity, like its reliability, is also weak. According to Norris, Tindale & Matthews (1982) there is little information about the content validity of the scale.

Nevertheless, the tool does remain useful in terms of Palmore's (1977) originally stated intentions as a tool for promoting discussion, identifying knowledge levels and for comparing differences in knowledge about the aging process. The questions are simple to understand. In addition it is short, portable and easy to administer.

**Do attitudes as measured by the Revised Tuckman-Lorge improve after taking a gerontology course?**

The Revised Tuckman Lorge is composed of 137 statements to which respondents answer "yes" or "no". A "yes" response indicates agreement with a stereotypic statement about an older adult.

In analyzing the study results, the control subjects had higher (more negative) scores on pretest and there was little or no change on posttest. The scores of the experimental group decreased from pre- to posttest indicating less stereotypical views and an improvement in attitude (p<.05). Therefore, results of this research indicate that the attitudes of the students improved after taking a gerontology course.
One finding that was not anticipated was the fact that the control group would start out with lower or more negative scores on pretest than the experimental group. It is possible that what we are seeing is a between-class difference or cohort effect. It could also be speculated that the negative attitudes are present on admission to the physiotherapy program rather than being acquired throughout the educational program. Another possibility is that through a maturation effect, or exposure to informal academic education or clinical placement, the experimental subjects could be developing more positive attitudes. It is possible that this exposure is accounting for the more positive attitudes of the fourth-year students at T1 of the study. Unfortunately it is impossible to predict which variable or variables are operating and to what extent they are having an impact. In any case, the attitudes of the experimental group appear to be more positive at the onset of the study.

Certain subscales yielded more interesting results. Physical, conservatism, mental deterioration and personality subscales showed the most improvement in attitudes. Physical function and mental deterioration are critical areas assessed by physical therapists. These changes seem to be reflective of the impact of the academic curriculum that the students are receiving. Conversely, it is not surprising that items relative to the subscales of sex and interference showed little change during the study.

Among the students, marital status, ethnicity, having a relationship with a grandparent and previous course work showed a statistically significant
relationship with attitude as measured by the Revised Tuckman-Lorge (p<.050). There appears to be a significant relationship between attitude as measured by the Revised Tuckman-Lorge scale, and knowledge, with little impact on interest in geriatrics as an area of clinical specialty.

The scale itself contains 137 questions and 13 subscales which examines several domains of aging. The use of a true-false format makes it easy to administer, but its length can have some drawbacks. Students frequently felt that the questionnaire was too long. In comparison with the other tools used in the study, this instrument often had incomplete data.

This instrument has been criticized on the basis of its nonunidimensionality and on its use of many items which have not been empirically grounded (Rosencranz & McNevin, 1969). Many of the statements appear to describe personality characteristics rather than age-specific traits: "They are calm", "They are bossy", "They are conservative." Some of the statements appear vague or poorly worded: "They never had it better", "They are frequently at loose ends." Given that the scale can be used with all age groups, including those over the age of 50, age-specific statements such as "They should not become parents" should not be included in the tool.

The subscales are also poorly constructed. Some of the statements do not seem necessarily to fit their designated scale. The mental deterioration subscale includes the following statements: "They like to doze in a rocking chair", "They are not useful to themselves or to others." The insecurity
subscale states: "They become insane", "They are bad patients when they are ill."

Some of the subscales were misrepresentative of the topic. The sex subscale does not address the issue of sexuality but issues of marriage, parenthood, and relations with the opposite sex. In addition, some of the subscales are composed of only three or four items, which appears to weaken the strength of the subscales during statistical analysis.

Another concern is the lack of norms for the scale. As it currently stands, the scale's use is limited to pre- and posttest analysis with specific populations. Given these difficulties, one may question its use in differentiating between those with misconceptions about older adults and those with more objective attitudes.

**Do attitudes as measured by the Kogan Old People Scale improve after taking a gerontology course?**

The Kogan Old People Scale is divided into two subscales: negative (OPNEG) and positive (OPPOS). The Kogan scale consists of 34 statements; 17 items express negative perceptions of old people, and the remaining items reverse the content of these negative perceptions into positive perceptions. Each item is rated on a six-point Likert-type scale with response options ranging from strongly agree to strongly disagree.
Old People Positive Scale (OPPOS)

On the Old People Positive Scale (OPPOS), the control and experimental groups had similar pretest scores. On posttest, the experimental group's scores increased reflecting a statistically significant improvement in attitude ($p<.05$). An interesting finding of the study is that the experimental group had slightly elevated pretest scores. This could be due to a between-class difference or cohort effect. It could be reflective of the impact of informal learning from previous academic education and clinical placements as have been previously described.

Across schools, it was speculated that there would be an increase in scores from pre- to posttest. It was thought that the increase would be due to the experimental group effects. Upon examining the results, this trend was evident at University of Western Ontario, Queen's University and University of Ottawa. There was essentially no change with the McMaster University respondents. This could be due to the fact that their study interval was 13 weeks instead of 14 for the other groups. The reverse trend was seen at University of Toronto and was possibly due to the unequal group size between the experimental and control group subjects. In this analysis, control and experimental subjects are grouped together.

Among the students, gender, ethnicity, having a relationship with a grandparent and previous course work showed statistically significant relationship with attitude as measured by the Old People Positive Scale
Comparison with published literature reveals that the control and experimental groups scored higher than the subject groups studied (Brown et al., 1992a). In this research, the scores from the control subjects ranged from 86.9 +/- 9.78 on pretest to 86.74 +/- 10.98 on posttest. Similarly, the experimental group’s scores ranged from 90.78 +/- 7.82 to 94.20 +/- 7.76. The scores of the physical therapy students in the Brown et al. (1992a) on the OPPOS scale from pre- to posttest ranged from 68.8 +/- 6.5 to 74.3 +/- 8.2 for the controls, and 71.6 +/- 6.0 to 79.4 +/- 6.7 for the experimental group.

**Old People Negative Scale (OPNEG)**

In examining the Old People Negative Scale (OPNEG), the control group had higher (more negatives) scores with little change from pre- to posttest. The experimental group’s scores were equal to the control group’s on pretest and the experimental group’s scores decreased and become more positive on posttest (p<.05).

In analyzing the results across school and group, the control groups at McMaster University, Queen’s University and University of Toronto had an increase in scores from pre- to posttest. Therefore, their attitudes became more negative over time. The University of Western Ontario control group had no change in score. Only the University of Ottawa group’s scores decreased and became more positive at posttest. It is also worth noting that the University
of Ottawa subjects had the highest initial pretest score on this subscale. In comparison, the experimental groups showed a consistent drop in their scores over the study interval.

Among the students, gender, ethnicity, having a relationship with a grandparent; and previous work and course work experience showed a statistically significant relationship with attitude as measured by the Old People Negative Scale (p<.050).

In comparison to other published groups, the physiotherapy students had lower or less negative scores on this subscale. The pre/post average score of the control respondents was 45.36 +/- 12.45 to 45.95 +/- 13.43 and for the experimental respondents' scores ranged from 41.1 +/- 9.24 to 37.88 +/- 9.36. Using the more recently published Brown et al. (1992a) data, the physiotherapy students appear to be slightly more negative than those in the Brown study. The results from Brown et al. (1992a) on the OPNEG scale were 41.3 +/- 8.4 to 36.4 +/- 8.5 for the controls and 38.5 +/- 4.6 to 34.7 +/- 7.6 for the experimental group.

The scale itself is short, portable and easy to administer. The questions are reflective of a variety of areas related to aging. The use of a Likert-type scale is advantageous as it gives respondents a range of possible responses; however, as the data is analyzed as a total score, there is less opportunity to examine specific areas of change, as in the Revised Tuckman-Lorge. In addition, a weakness of both attitudinal scales is their limited exploration of the
effect of environmental variables on respondents' attitudes.

Do the perceptions of the environmental variables related to caring for older adults improve after an educational intervention?

A questionnaire to examine the environmental variables based on the work of Snape (1980) was developed and trialed. The tool was able to discriminate between control and experimental subjects; however, many of the multiple analyses did not yield statistically significant results. It was felt that this could be due to weaknesses in the questionnaire. Although the questions were trialed with 20 students and modifications were made to address the issues of content and clarity, the questions were not analyzed for validity and reliability prior to their administration. As a result, their weakness became apparent on analysis. Therefore, future research could address the reliability and validity of the tool. Further work is required in the area of environment and its impact on employment, as it is an underexamined area of geriatric research.

Is there a change in students' interest in working with the elderly after the educational program?

The final section of this study examined the students' career aspirations using a 10-point Likert-type scale. This scale was based on the work of Michielutte and Diseker (1985). It was trialed and modified prior to its
administration. The results showed statistically significant differences between the control and experimental groups. Beyond this, further results were not found to be significant. Once again it could be due to issues of reliability and validity of the tool.

In summary, the results indicate that, although knowledge and attitude are improved by an educational intervention, it seems to have little impact on the students' overall career decisions. It is of significance to note that there was very little change in scores of the physiotherapy students before and after their geriatrics course. Following the course, the mean scores ranged from 3.1 to 5.8 which represents interest from a little to moderate. The low level of interest is also evidenced by the fact that of 330 students only 7 first-year and 4 fourth-year students stated that they intended to specialize in geriatrics. The variables found to be predictive of interest in geriatrics as an area of specialization included having a relationship with a grandparent, previous course work, and work experiences with older adults (p<.050). In comparison to the published literature with medical students and physician assistants (Michielutte & Diseker, 1985), the physiotherapy students had higher mean scores on this scale before and after their educational intervention.
Summary

The findings of this multicampus study indicate that educational interventions can improve the knowledge and attitudes of physical therapy students, but it has little impact on their career decisions.

Many independent predictors of student attitude were identified and of those identified were fairly consistent across attitude scales. Male gender and ethnicity were associated with less favourable attitudes on many scales, whereas, having a relationship with one's grandparent and geriatric course work were predictors of more positive attitudes. These findings are consistent with the published literature (Deary et al., 1993; Fields et al., 1992) and expand the relationships between student sociodemographic variables and student attitudes.

Consistent with other studies (Adelman et al., 1992; Fields et al., 1992; Goldstein-Lohman & Aitken, 1995) knowledge on aging and attitude appear to be related. This finding suggests that attitudes toward the care of the older adult may be modifiable by education that increases a student's knowledge of normal and abnormal aging. Thus, the study provides encouragement that curricular interventions can be effective in improving physical therapy students' attitudes toward the older adult.

The program interventions in geriatrics provided the students with lectures, presentations and problem-based tutorials, clinical visits and interviews with older adults. Since all experimental groups evidenced
significant improvements in their knowledge and attitude scores, it is probable
that these interventions account for the changes observed. The consistent
findings of group and school interactions suggest that there is an interaction of
student, educational material and instructor. Viewing the gains of these groups
in light of the different interventions employed did not yield specific
interactions; however, it seems that programs that included a clinical
component where the student has exposure to well elderly clients may be
more effective in promoting positive attitudes.

Overall, the research results suggest that attitudes toward the older
adult are something of a multifactorial issue which includes a combination of
sociodemographic variables and curricular interventions. Sociodemographic
variables such as gender and ethnicity, as well as familial and course
experiences, are important considerations. The curricular intervention includes
not only the material that is taught but also the educational methods and
instructor.

Ultimately, these educational interventions fall short on their impact on
the students' career decisions. It is apparent that the educational interventions
in our curriculum address the issues of knowledge and attitudes; however,
there is little translation to career vocation.
Introduction

The implications of this study for theory, research and practice are discussed, including the limitations of this study and future considerations.

Implications for Theory

The results of this research have helped to progress the theories behind attitudinal research. This study has examined the three components of attitudes: cognitive, affective and behavioral. The cognitive element which was the educational intervention was measured by the Revised Palmore Facts On Aging Quiz. The affective or evaluative component examined the students' attitudes towards older adults. This was measured by the Revised Tuckman-Lorge and Kogan Old People Scales. Most of the current research up until now has addressed only these two elements. This study has then attempted to draw a link to behaviour, as measured by career decisions, using a Likert-type scale.

Previous research has indicated that educational interventions appear to improve the attitudes of the recipients. This research seems to give support to the idea that we are not enhancing the positive components of attitude, but rather reducing the negative elements of stereotypes, prejudice and discrimination. This is evident when examining the results of the Revised Tuckman-Lorge and Kogan Old People Scales. The results show a significant decrease in scores on the negative scales, with only a slight improvement in
the scores on the positive scales.

Current psychological theories have examined the relationship between attitude and behaviour. Frequently the assumption has been made that attitudes provide accurate indicators for our behaviours (Kahle & Berman, 1979). In reality many studies have shown a limited correlation between these variables (Worchel, Cooper & Goethals, 1991).

This research has helped to support the idea of a nonrelationship between attitude and behaviour. The study has shown that knowledge and attitude were related; therefore, by improving knowledge one can ultimately impact on the student's attitude toward the older adult. From there an attempt was made to link attitude with behaviour, this being the decision to work with the elderly. The results indicated that although attitudes can improve, it does not necessarily translate into a change in behaviour, thus giving support to current psychological theory.

Further, if the Dunkle & Hyde (1995) study is correct, then there will be very few physical therapy students working with older adults. Dunkle & Hyde found a correlation coefficient ($r = .262$) between expressed intention to work with older adults and expressed behaviour. The results of this study indicate that only four members of the graduating class are interested in working with older adults. If Dunkle & Hyde's numbers are correct this translates to one or less than one new graduate employed in this area.

Previous studies have examined the personal characteristics of the
individual in order to relate them to attitudes. Collins & Brown (1989) have argued that attention needs to be given to the interplay between individual characteristics and experiential factors. They continued by suggesting that most of the literature on attitudes emphasizes the individual's personal characteristics, often to the exclusion of other factors.

This study has given attention to both demographic and experiential factors in order to determine their impact on health professionals' attitudes. Positive attitudes were related to the demographic characteristic of female gender; negatively related to ethnicity; and unrelated to marital status. Having a relationship with an older adult, and taking courses in gerontology were also found to be positively related to attitude.

Previous research has measured the effect of educational interventions using small, single-group trials. Therefore, the educational methodology was used to account for the change in attitude. The results of this study evidenced significant improvements in knowledge and attitude scores across a multicentre trial. The consistent finding of group and school interactions suggests that it is not only the educational material that is changing attitudes, but an interaction of student, educational material and instructor.

In summary, this research has advanced attitudinal research by examining not only demographic but social factors which relate to attitude. In addition, by measuring all of the components of attitude, it was determined that there is not a consistent relationship between attitude and behaviour and that
current educational interventions are serving to impact on the negative components of attitude, namely, stereotypes and prejudice.

Implications for Education

Currently the future of geriatric physical therapy seems uncertain. With the increasing number of older adults in our community, the number of geriatric clients will continue to rise. However the academic faculties continue to underestimate its importance. Brower (1984) feels that inadequate preparation at the undergraduate level is the root problem.

In examining the findings of this study, it appears that there are several critical points for intervention by educators in order to improve attitudes. These areas include: Pre-program, Academic Education, and Clinical Education. They will be examined and discussed below.

Prior to the program admission, educators and faculty can examine the attitudes of prospective candidates through their admission procedures. Interviews allow educators the opportunity to examine the nature and quality of the experiences of the candidates. Currently, many of our applicants are gaining their exposure to physiotherapy in orthopaedic settings or sports medicine clinics. It is important to encourage exposure to all groups of clients, including the older adult. Recruitment of students who have had positive contact with older adults, including extracurricular course work or volunteer experiences, before entering the professional program may help to increase...
the numbers graduating from physical therapy programs who are interested in this specialty area.

Academic education needs to integrate the concerns and issues of the older adult. Gerontology and geriatrics should be presented as an area of specialty that is highly regarded academically. We need to ensure that the undergraduate curriculum incorporates more dynamic content and a more positive image of geriatric practice. During the educational program, aging should be presented as part of the normal life courses, with emphasis on the changes that will influence interventions by physical therapists.

Assessment practice needs to address issues of interviewing a group of clients who may have sensory or cognitive impairments. Physical examination techniques need to provide methods for adapting these testing procedures for the older adult. Students need to be taught specific methods for treating elderly clients. It is no longer good enough to expect students to learn these procedures on their own.

Finally, geriatrics and gerontology needs to be integrated into all aspects of the physical therapy curriculum. It needs to be viewed as being as important as other areas of care. Given that this research has found a significant relationship between the student, educational material and instructor, gerontology courses need to be taught by educators who are knowledgeable and truly interested in the subject matter.

Clinically, students need early exposure to this group of patients.
Currently many students are graduating with little or no geriatric exposure. In clinical education, students are often assigned to a large proportion of elderly clients. They are often overwhelmed by the complexity of the client problems that they have not be given adequate preparation to meet. It is not surprising that as new graduates they choose to work in areas where their educational preparation has been more comprehensive. Beyond this, students need mentoring by senior clinicians who can provide them with ideas for assessments and treatment.

Educational interventions need to address three key areas in order to effectively impact on student attitudes. Admission criteria can determine attitudes by examining demographic characteristics and extracurricular activities. Academic education needs to address the issues of the older adult in an holistic and integrated fashion in order to meet their complex needs. Clinical education needs to be introduced early and in a gradual and nontthreatening manner.

**Implications for Clinical Practice**

Within our current clinical practice, physical therapists need to overcome their negative perception of older adults. Currently, negative stereotypes contribute to the perception of older adults as feeble and with limited treatment potential (Kvitek et al., 1986). In many ways these feelings ultimately impact on the decisions about the care they receive. As professionals, we need to
examine our biases both individually and professionally.

Within the practice area, supervisors and clinical leaders need to place equal value on the geriatric physical therapist. They need to serve as mentors in terms of career development in order that students can obtain clinical expertise in their chosen area of specialization.

Another problem lies in the nature of the licensing exams. Testing in geriatric content continues to remain secondary or obscured by such specialties as orthopaedics and neurology. Geriatric physical therapy needs to be given equal consideration to other practice specialties.

More generally, there needs to be more recognition within the profession of physical therapists who choose to specialize in geriatrics. We need to support and develop faculty, researchers and seasoned leaders within the field (Hazzard, 1989). More emphasis also needs to be given to this speciality area at annual conferences, in professional journals, and in continuing education.

Limitations of the Study and Implications for Future Research

Some limitations of this study must be addressed. Only physical therapy students registered in Ontario programmes were surveyed. The use of a nonrandom procedure in the selection of subjects constitutes a limitation of the study in terms of the design. The use of Ontario physical therapy students may limit the ability to generalize the findings to other physical therapists in other geographical areas or to generalize to other health care professionals.
providing care for elderly people. Nevertheless, the programs at the five physical therapy schools are quite different, and seem to represent a wide diversity of physical therapy students.

The students also knew that this was a study about knowledge and attitudes toward aging. This knowledge may have introduced some bias. However, this bias most likely would have been conservative; that is, the socially desirable responses would have been to report positive attitudes toward older persons.

Unfortunately, when dealing with previously established educational groups, there are often limitations to the amount of control one has over the research subjects. The students did not receive any additional academic education throughout the 14-week study interval; however, some members of the experimental group had previous exposure to informal academic education and clinical placements. This may account for the difference in the initial scores at T1, and yet how much of an impact each component had is unknown.

The research tools represent the best available methods for measuring attitudes and knowledge at this time. Unfortunately their weaknesses in terms of reliability and validity may have limited their ability to denote change and, ultimately, may have affected the analysis of the reported results.

Several suggestions for further research were generated in this study. It has been hypothesized that attitudes are modifiable by short-term educational
interventions, but do not remain unchanged over time. Currently there are a very few studies in existence of a long-term nature. Future research could examine the long-term impact of an educational intervention.

Research which examines the relationship between attitude, behaviour and its impact on career decisions needs to be explored. Although this research found no relationship between attitude and behaviour, and no long-term follow-up was completed with the graduating students, future researchers could measure attitudes and track the carer choices of these students. Although beyond the purpose of this study, future research could also examine the impact of a geriatric clinical placement on attitude and career decisions.

The inclusion of different professional groups who provide care to elderly people would be valuable in defining whether different influences are involved in the attitudes of other professions. These other groups might include nurses, occupational therapists and social workers. This would allow for the generalization of the results to a larger variety of health care providers.

Another recommendation for a future investigation would involve the examination of the impact of the geriatric environment on the students' attitudes and career decisions. This is an area that needs to be further explored and, to date, has not been the subject of much research. The tool developed for this study needs further refinement in terms of reliability and validity prior to its administration in subsequent studies.
Summary

With the increasing number of older adults in the population, their greater use of the health care system and the focus on maintaining older adults within the community, additional health care professionals will be required to work with older adults (Stadynk, Compton & Johnson, 1995; Wilkins, 1990). Currently, there is a shortage of health care professionals, particularly physical therapists, to provide this care (Coren et al., 1987; Guccione, 1993; Pickles et al., 1995; Shimamoto & Rose, 1987). Therefore, the purpose of this study was to examine the knowledge and attitudes of physical therapy students toward the older adult and the career choices of these students before and after an educational intervention.

The findings of this study indicate that the positive attitudes were correlated with female gender, having a relationship with an older adult and taking courses in gerontology. Results of this study indicated that knowledge and attitude scores improved after the geriatric course; however, there was little impact on the student’s career decision. The results of this study will contribute to an understanding of the effects of our educational interventions on attitude and address some of the concerns in meeting the needs of our aging population.


Law, B (Ed.). *Corpus Almanac & Canadian Sourcebook*. Toronto: Southam Inc.


Selected Bibliography


## Appendix A
Analysis of Program Content

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Other:
Abuse (W); Environmental adaptations (W); Older athlete (W); Leisure & recreation (W); Vocation (W); Fitness (W); Sexuality (W); Motivation (W); Architectural barriers (W);

**EDUCATIONAL METHODS**

Lectures: Queen's, Western, Toronto, Ottawa, McMaster

Presentations: Western, Toronto, McMaster

Visit to seniors centre/clinical facility: Queen's, Western, Toronto, McMaster

Clinical skills: Western, Toronto, McMaster
EVALUATION METHODS

Examination: Queen’s, Ottawa, McMaster

Presentation: Western, McMaster, Toronto

Research paper: Western, Toronto, McMaster

Participation: Western, Ottawa, McMaster
LETTER OF INFORMATION

OUR FUTURE IN GERIATRICS: An Examination of the Attitudes and Career Decisions of Physical Therapy Students.

Dear Colleague,

I am writing to you about a study that I am conducting as a part of my Master of Education programme at Brock University.

The purpose of the study is to examine the attitudes, knowledge and career decisions of students to work with geriatric clients. Beyond this, I wish to interview some students in order to examine which factors influence their decisions. Current demographic trends show an increase in the number of geriatric clients. Physical therapists have an important role to play in the care of this client group.

Therefore, I would like to invite you to participate in this study. It would involve answering 3 questionnaires that would take approximately 30 minutes. One set would be administered today in class. Another set would be administered in class in December prior to the completion of your course. In January, selected students would be invited to participate in a telephone interview that would take approximately 60 minutes. There are no known physical or psychological risks. There are no known discomforts to participants of the study. All information will be kept confidential and your identity protected; no names will appear on the study or interview material. Your participation is voluntary and at any time you may withdraw or refuse to answer any...
null
questions without jeopardizing your academic standing in school. Upon completion, the results of this study will be made available to all participants. I hope you will be willing to participate in this study. I will be pleased to answer any questions that you have regarding the study.

Your participation in this study is voluntary. You should not be involved with another research project, nor should you begin participation in another project until the completion of this study. Please inform the investigator if you are currently involved in another project.

Thank you in advance for your consideration of this matter.

Sincerely,

Michelle Shilton, BSc(PT)  
St. Peter’s Hospital  
88 Maplewood Avenue  
Hamilton, Ontario L8M 1W9  
(416)549-6525 ext. 222
Appendix C
Consent Form

CONSENT FORM FOR PARTICIPANTS

I agree to participate in a study of student attitudes and career decisions for physical therapy students. I understand that participation is voluntary and that at any time I may refuse to answer any questions.

I understand that I will be participating in a questionnaire and possibly an audiotaped interview. I will be completing the questionnaire today and in December. If selected, I will completed the interview in January. I understand that the questionnaire will be completed during class time and that the interviewer will contact me at my convenience for the interview. I understand that the questionnaire will take approximately 30 minutes and the interview will take 1 hour. All the information that I provide will be kept in the strictest confidence with all reference to my identity being coded. I understand that my identity will be protected in any publications or presentations about the findings of this study.

This study has been explained to me and I understand it. Any questions which have occurred to me have been answered to my satisfaction.
Respondent's Signature: ________________________________

Date: ________________________________

Researcher's Signature: ________________________________

Researcher's Address:
Michelle Shilton, BHSc(PT)
St. Peter's Hospital
88 Maplewood Avenue
Hamilton, Ontario  L8M 1W9
(416)549-6525 ext. 222
CONSENT FORM FOR PARTICIPANTS

I agree to participate in a study of student attitudes and career decisions for physical therapy students. I understand that participation is voluntary and that at any time I may refuse to answer any questions. I understand that I may withdraw without prejudice at any time during the study.

I understand that I will be participating in a questionnaire and possibly an audiotaped interview. I will be completing the questionnaire today and in December. If selected, I will complete the interview in January. I understand that the questionnaire will be completed following class time and that the interviewer will contact me at my convenience for the interview. I understand that the questionnaire will take approximately 30 minutes and the interview will take 45 minutes. All information that I provide will be kept in the strictest confidence with all reference to my identity being coded. I understand that my identity will be protected in any publications or presentations about the findings of this study.

This study has been explained to me and I understand it. Any questions which have occurred to me have been answered to my satisfaction.

Respondent's Signature________________________________________

Date________________________________________________________

Researcher's Signature________________________________________

Researcher's Address: St. Peter's Hospital
88 Maplewood Avenue
Hamilton, Ontario L2N 1W9
(416) 549-6525 ext. 222

Date________________________________________________________

Dr. Marie-des-Anges Loyer
Chair of FHS
Room 2009
451 Smyth Road
Ottawa, Ontario K1H 8M5
(613) 787-6705
CONSENT FORM FOR PARTICIPANTS

OUR FUTURE IN GERIATRICS: AN EXAMINATION OF THE ATTITUDES AND CAREER DECISIONS OF PHYSICAL THERAPY STUDENTS.

I have read the letter of information and have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

Respondent's Signature: __________________________________________

Date: __________________________________________________________

Researcher's Signature: __________________________________________

Researcher's Address:
Michelle Shilton, BHSc(PT)
St. Peter's Hospital
88 Maplewood Avenue
Hamilton, Ontario L8M 1W9
(416)549-6525 ext. 222
Appendix D
Data Analysis and Encoding

Codes

Agreement: Yes=1; No=0

Schools: Q=Queen's; T=Toronto; W=Western; O=Ottawa; M=McMaster

Group: C=Control; E=Experimental

Gender: M=Male; F=Female

Marital Status: S=Single; M=Married; D=Divorced

Citizenship: C=Canadian; L=Landed Immigrant; D=Dual

Speciality Interest: 1=Orthopaedics; 2=Neurology; 3=Cardiorespiratory; 4=Sports Medicine; 5=Geriatrics; 6=Paediatrics; 7=Burns; 8=Undecided

Ethnicity

Ch=Chinese
Ko=Korean
P=Polish
N=Nigerian
Mu=Muslim
I=I)slamic
J=Japanese
G=Greek
E=Egyptian
V=Vietnamese
A=Asian
I=Iranian
Iri=Irish
F=French
Sr=Sri Lankan
Jw=Jewish
Br=British
Et=Ethiopian
D=Danish
R=Russian
F=Filipino
Af=African
Appendix E
Revised Palmore Facts on Aging Quiz

PART II: REVISED PALMORE FACTS ON AGING QUIZ
(Miller & Dodder, 1980)
Please mark the following statements "T" for true, "F" for false, or "?" for don't know.

T F ? 1. The majority (more than half) of older people are senile (defective memory, disoriented, demented, etc.).
T F ? 2. All five senses tend to decline in old age.
T F ? 3. The majority (more than half) of people have no capacity for sexual relations.
T F ? 4. Lung capacity tends to decline in old age.
T F ? 5. The majority of older people say they are happy most of the time.
T F ? 6. Physical strength tends to decline in old age.
T F ? 7. At least one-tenth of older persons are living in long-stay institutions (nursing homes, mental hospitals, homes for the aged).
T F ? 8. Drivers over 65 have more accidents per person than drivers under 65.
T F ? 9. Older workers cannot work as effectively as younger workers.
T F ? 10. Over 80% of older people say they are healthy enough to carry out their normal activities.
T F ? 11. The majority of older people are unable to adapt to change.
T F ? 12. Old people tend to take longer to learn something new.
T F ? 13. The reaction time of older people tends to be slower than reaction time of younger people.
15. The majority of older people say they are usually bored.

16. The majority of older people are lonely.

17. Older workers have more accidents than younger workers.

18. Over 15% of the US population are now 65 or over.

19. The majority of medical practitioners give low priority to older people.

20. The majority of older people have incomes below the poverty level ($3,025 for a person or $3,650 for couples).

21. The majority of older people say they would like to have some kind of work to do.

22. Older people tend to become more religious as they age.

23. The majority of older people say they are usually irritated or angry.

24. The health and socioeconomic status of older people (compared to younger people) in the year 2000 will probably be about the same as now.
Appendix F
Tuckman-Lorge Attitude Scale

PART III: REVISED TUCKMAN-LORGE ATTITUDE SCALE
(Axelrod & Eisdorfer 1961)

I am interested in your opinion about people who are about 65 years old. For each of the following statements, check YES if you think it applies to most people who are about 65 years old. Check NO if you think it does not apply to most people of this age.

They need glasses to read Y N
They are absent minded Y N
They need less food than younger people Y N
They are in the happiest time of their life Y N
They spoil their grandchildren Y N
They are kind Y N
They repeat themselves in conversation Y N
They cannot learn new things Y N
They are poor eaters Y N
They get upset easily Y N
They prefer to live alone Y N
They prefer to be alone Y N
They have to be careful of their diet Y N
They are proud of their children Y N
They are set in their ways Y N
They need less sleep than younger people Y N
They are not important in family matters Y N
They vote for the political candidate who promises the largest old age pension Y N
They are grouchy Y N
They worry about unimportant things Y N
| They are better off in old age homes | Y  N |
| They have to go to bed early | Y  N |
| They expect their children to support them | Y  N |
| They are forgetful | Y  N |
| They are easily moved to tears | Y  N |
| They are more interested in religion | Y  N |
| They have many accidents in the home | Y  N |
| They are old fashioned | Y  N |
| They are a burden to their children | Y  N |
| They feel sorry for themselves | Y  N |
| They need a nap everyday | Y  N |
| They just like to sit and dream | Y  N |
| They are calm | Y  N |
| They are hard to get along with | Y  N |
| They feel cold even in warm weather | Y  N |
| They are unproductive | Y  N |
| They think the world is headed for destruction | Y  N |
| They become insane | Y  N |
| They never take a bath | Y  N |
| They never fully recover if they break any bones | Y  N |
| They usually live with their children | Y  N |
| They are conservative | Y  N |
| They are very talkative | Y  N |
| They are hard of hearing | Y  N |
| They are out of step with the times | Y  N |
| They like old songs on the radio | Y  N |
| They are very stubborn | Y  N |
| They die soon after retirement | Y  N |
| They cannot taste differences in food | Y  N |
| They believe in a life after death | Y  N |
| They have too much power in business and politics | Y  N |
| They liked to be helped across the street | Y  N |
| They like to give advise | Y  N |
| They make friends easily | Y  N |
| They are suspicious of others | Y  N |
| They think the future is hopeless | Y  N |
| They worry about their health | Y  N |
| They cannot manage their own affairs | Y  N |
| They would like to be young again | Y  N |
| They are touchy | Y  N |
| They have few friends | Y  N |
| They never had it better | Y  N |
| They are good to their children | Y  N |
| They have lost most of their teeth | Y  N |
| They like religious programs on the radio | Y  N |
| They respect tradition | Y  N |
| They walk slowly | Y  N |
| They feel that their children have failed them | Y  N |
| They are selfish | Y  N |
They frequently quarrel with their children and relatives
They should not marry
They suffer from constipation
They hold on to their opinions
They are afraid of the dark
They like to be waited on
They spend much of their time in bed because of illness
They cannot remember names
They are lonely
They collect many useless things like string, paper
They have poor coordination
They get no sympathy from their relatives
They play checkers or dominoes
They object to women smoking in public
They hide their money
They like to doze in a rocking chair
They like to think about the good old days
They feel tired most of the time
They are bad patients when ill
They are in their second childhood
They feel that their children neglect them

They are afraid of death
They are fussy about food
Their voices break
They prefer old friends rather than to make new ones
They love life
They spend most of their time reading or listening to radio.
They would like to live their lives over again
They die of cancer or heart disease
They avoid going out in bad weather
They are untidy or careless about their appearance
They take a keen interest in politics
They are frequently at loose ends
They worry about financial security
They should not become parents
They develop infection easily
They are critical of the younger generation
They are tight in money matters
They dislike any change or interference with the established way of doing things

They are usually supported by their children or old age pensions
They are very sensitive to noise
They are in the way
They marry persons much younger than themselves
They are anxious about their future
They are cranky
They suffer much discomfort
They expect obedience and respect from their children and grandchildren
<table>
<thead>
<tr>
<th>Statement</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>They meddle in other people's affairs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They are bossy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They prefer to read newspapers rather than books</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They have no interest in the opposite sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They cannot concentrate even on simple tasks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They have a high automobile accident rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They get love and affection from their children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They like to gossip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They feel miserable most of the time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They are careless about their table, manners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They become less intelligent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They frequently talk to themselves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They do not take part in sports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They feel that young parents do not know how to bring up children properly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They die after a major operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They are a nuisance to others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They are helpless</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They are insecure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They have a high suicide rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They are not useful to themselves or to others</td>
<td></td>
<td></td>
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<tr>
<td>They had a chance to do all the things they wanted to</td>
<td></td>
<td></td>
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PART IV: KOGAN ATTITUDES TOWARD OLD PEOPLE SCALE (Kogan, 1961)

I am interested in your opinion about people who are about 65 years old. For each of the following statements please indicate your feelings as you think it applies to most people 65 years old according to the following scale:

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>N/A</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
</tr>
</tbody>
</table>

1. It would be better if most old people lived in residential units with people of their own age.

1 2 3 4 5 6 7

2. It would probably be better if most old people lived in residential units that also housed younger people.

1 2 3 4 5 6 7
<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>N/A</th>
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<th>Agree</th>
<th>Strongly Agree</th>
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<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
</tr>
</tbody>
</table>

3. There is something different about most old people; it's hard to figure out what makes them tick.

1 2 3 4 5 6 7

4. Most old people are really no different from anybody else: they're as easy to understand as younger people.

1 2 3 4 5 6 7

5. Most old people are set in their ways and are unable to change.

1 2 3 4 5 6 7

6. Most old people are capable of new adjustments when the situation demands it.

1 2 3 4 5 6 7

7. Most old people would prefer to quit working as soon as pensions or their children can support them.

1 2 3 4 5 6 7

8. Most old people would prefer to continue working just as long as they possibly can rather than be dependent on anybody.

1 2 3 4 5 6 7

9. Most old people tend to let their homes become shabby and unattractive.

1 2 3 4 5 6 7

10. Most old people can generally be counted on to maintain a clean, attractive home.

1 2 3 4 5 6 7

11. It is foolish to claim that wisdom comes with old age.

1 2 3 4 5 6 7
12 People grow wiser with the coming of old age.

13 Old people have too much power in business and politics.

14 Old people should have more power in business and politics.

15 Most old people make one feel ill at ease.

16 Most old people are very relaxing to be with.

17 Most old people bore others by their insistence on talking about "the good old days".

18 One of the most interesting and entertaining qualities of most old people is their accounts of their past experiences.

19 Most old people spend too much time prying into the affairs of others and giving unsought advise.

20 Most old people tend to keep to themselves and give advice only when asked.

21 If old people expect to be liked, their first step is to try to get rid of their irritating faults.
<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>N/A</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</thead>
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<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
</tr>
</tbody>
</table>

22 When you think about it, old people have the same faults as everybody else.

1 2 3 4 5 6 7

23 In order to obtain a nice residential neighbourhood, it would be best if too many old people did not live in it.

1 2 3 4 5 6 7

24 You can count on finding a nice residential neighbourhood when there is a sizeable number of old people living in it.

1 2 3 4 5 6 7

25 There are a few exceptions but in general, most old people are pretty much alike.

1 2 3 4 5 6 7

26 It is evident that most old people are very different from each other.

1 2 3 4 5 6 7

27 Most old people should be more concerned with their personal appearance; they're too untidy.

1 2 3 4 5 6 7

28 Most old people seem to be quite clean and neat in their personal appearance.

1 2 3 4 5 6 7

29 Most old people are irritable, grouchy and unpleasant.

1 2 3 4 5 6 7

30 Most old people are cheerful, agreeable and good humoured.

1 2 3 4 5 6 7
<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>N/A</th>
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<th>Strongly Agree</th>
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<td>(3)</td>
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<td>(6)</td>
<td>(7)</td>
</tr>
</tbody>
</table>

31 Most old people are constantly complaining about the behaviour of the younger generation.

1 2 3 4 5 6 7

32 One seldom hears old people complaining about the behaviour of the younger generation.

1 2 3 4 5 6 7

33 Most old people make excessive demands for love and reassurance.

1 2 3 4 5 6 7

34 Most old people need no more love and reassurance than anyone else.

1 2 3 4 5 6 7
Appendix H
Environmental Questionnaire

35 I feel that our program places as much emphasis on Geriatrics as the other speciality areas (i.e. Orthopaedics, Neurology).

1 2 3 4 5 6 7

36 I feel that our program has helped me to develop a positive attitude toward Geriatric Physical Therapy.

1 2 3 4 5 6 7

37 If I was given the chance between working in a Geriatric facility and an acute care hospital, upon graduation I would choose the Geriatric care facility.

1 2 3 4 5 6 7

38 I feel Geriatric clients will not improve as quickly as other client groups (i.e. Orthopaedics, Neurology).

1 2 3 4 5 6 7

39 I feel that Geriatric Physical Therapy is not as challenging as other areas of care.

1 2 3 4 5 6 7

40 I feel that Geriatric Physical Therapists are not as respected as specialists in other areas.

1 2 3 4 5 6 7

41 I feel that Geriatric Physical Therapy would be depressing and unrewarding.

1 2 3 4 5 6 7

42 Geriatric wards have an unpleasant smell.

1 2 3 4 5 6 7

43 Geriatrics is an uninteresting speciality.

1 2 3 4 5 6 7

44 Geriatric clients are less motivated to participate in treatment than other types of patients.

1 2 3 4 5 6 7
Appendix I
Career Interest Scale

"How would you rate your interest in Geriatrics as an area of specialization?"

<table>
<thead>
<tr>
<th>None</th>
<th>Slight</th>
<th>A Little</th>
<th>Fair</th>
<th>Average</th>
<th>Moderate</th>
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<th>Definitely Very</th>
<th>Extremely</th>
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<td>(50%)</td>
<td>(60%)</td>
<td>(70%)</td>
<td>(80%)</td>
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Appendix J
Palmore Facts on Aging Quiz

Palmore Facts On Aging Quiz
ANALYSIS BY GROUP

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<th>SCORE</th>
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<td></td>
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Palmore Facts On Aging Quiz
ANALYSIS BY SCHOOL

SCORE

McMaster 14.87 16.23
Ottawa 15.46 16.65
Queen's SCHOOL 17.67 19.41
Toronto 15.1 15.5
Western 14.25 16.42
Palmore Facts On Aging Quiz
ANALYSIS BY SCHOOL AND GROUP
Palmore Facts On Aging Quiz
ANALYSIS BY SCHOOL AND GROUP

<table>
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<tbody>
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<td>Mac Con Mac Exp</td>
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<tr>
<td>Que Con Que Exp</td>
<td>19.17</td>
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<tr>
<td>Tor Con Tor Exp</td>
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<tr>
<td>West Con West Exp</td>
<td>18.50</td>
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</table>

SCHOOL AND GROUP
Appendix K
Tuckman Lorge: Physical Subscale

Tuckman – Lorge Physical Subscale
ANALYSIS BY GROUP

<table>
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<th>GROUP</th>
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<tbody>
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<tr>
<td>Experimental</td>
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<tr>
<td>Control</td>
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Tuckman–Lorge: Physical Subscale
ANALYSIS BY SCHOOL

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<tbody>
<tr>
<td>McMaster</td>
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<td>Ottawa</td>
<td>12.14</td>
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<tr>
<td>Queen's</td>
<td>10.54</td>
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<td></td>
<td>11.78</td>
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<td>Toronto</td>
<td>10.16</td>
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<td></td>
<td>10.16</td>
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<tr>
<td>Western</td>
<td>11.07</td>
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<td></td>
<td>8.81</td>
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Tuckman–Lorge Physical Subscale
PRE/POST AVR. BY SCHOOL AND GROUP

SCORE

8.54 8.47 13.41 13.06 10.26 11.19 8.46

Mac Con Mac Exp Ott Con Ott Exp Que Con Que Exp Tor Con Tor Exp West Con West Exp

SCHOOL AND GROUP
Appendix L
Tuckman Lorge: Personality Subscale

Tuckman–Lorge Personality Subscale
ANALYSIS BY GROUP

<table>
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<th>GROUP</th>
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Tuckman–Lorge: Personality Subscale

ANALYSIS BY SCHOOL

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<td>Queen's</td>
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<td>Toronto</td>
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<td>Western</td>
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Tuckman–Lorge: Personality Subscale
ANALYSIS BY SCHOOL AND GROUP

SCORE

4.3 4.1 5.2 6.7 6.9 5.5 5.0 5.9 5.7 6.3 5.8 5.8
Mac Con Mac Exp Ott Con Ott Exp Que Con Que Exp Tor Con Tor Exp West Con West Exp

SCHOOL AND GROUP
Tuckman–Lorge: Personality Subscale
PRE/POST AVR. BY SCHOOL AND GROUP

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Tuckman–Lorge: Attitude Subscale

ANALYSIS BY GROUP

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Appendix M
Tuckman Lorge: Attitude Subscale
Tuckman–Lorge: Attitude Subscale
ANALYSIS BY SCHOOL

SCORE

McMaster  1.22  0.97
Ottawa    1.78  1.68
Queen's  1.35  1.24
          SCHOOL  1.47  1.12
Toronto   1.89  1.26
Western   1.26
Tuckman–Lorge: Attitude Subscale

ANALYSIS BY SCHOOL AND GROUP

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<td>Que</td>
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Note: The scores for each group represent the average scores for the Tuckman–Lorge Attitude Subscale.
Tuckman–Lorge: Attitude Subscale
PRE/POST AVR. BY SCHOOL AND GROUP

SCORE

1.96
1.40
1.60
1.31
1.22
1.84
1.26

Mac Con
Mac Exp
Ott Con
Ott Exp
Que Con
Que Exp
Tor Con
Tor Exp
West Con
West Exp

SCHOOL AND GROUP
Tuckman–Lorge: Mental Deterioration Subscale

ANALYSIS BY GROUP

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Tuckman–Lorge: Mental Deterioration Subscale

ANALYSIS BY SCHOOL

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**Note:** The values in the diagram do not match the table entries.
Tuckman–Lorge: Mental Deterioration Subscale

ANALYSIS BY SCHOOL AND GROUP

SCORE

Mac Con 1.8
Mac Exp 1.5
Ott Con 2.4
Ott Exp 0.9
Que Con 2.1
Que Exp 1.1
Tor Con 1.3
Tor Exp 1.0
West Con 3.5
West Exp 2.8
SCHOOL AND GROUP

2.8
2.9
3.3
3.3
4.1
4.5
3.9
4.3
Tuckman–Lorge: Mental Deterioration Subscale
PRE/POST AVR. BY SCHOOL AND GROUP
Appendix O
Tuckman Lorge: Cleanliness Subscale

Tuckman–Lorge: Cleanliness Subscale
ANALYSIS BY GROUP

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0.156

0.1

0.05

0

0.2

SCORE
Tuckman–Lorge: Cleanliness Subscale
ANALYSIS BY SCHOOL

Score

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Tuckman–Lorge: Cleanliness Subscale

ANALYSIS BY SCHOOL AND GROUP

SCORE

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0.2
0.3
0.4
0.5
0.6
0.7

0.04
0.16
0.36
0.44
0.21
0.33
0.20
0.00
0.03
0.03
0.10
0.64

Mac Con
Mac Exp
Ott Con
Ott Exp
Que Con
Que Exp
Tor Con
Tor Exp
West Con
West Exp
Tuckman–Lorge: Cleanliness Subscale
PRE/POST AVR. BY SCHOOL AND GROUP

SCORE

0.04  0.08  0.30  0.07  0.39  0.02  0.20  0.00  0.64  0.06
Mac Con  Mac Exp  Ott Con  Ott Exp  Que Con  Que Exp  Tor Con  Tor Exp  West Con  West Exp

SCHOOL AND GROUP
Appendix P
Tuckman Lorge: Conservatism Subscale

Tuckman–Lorge: Conservatism Subscale
ANALYSIS BY GROUP

Score

Control
8.91

Experimental
8.26
6.26

GROUP

8.01
### Tuckman–Lorge: Conservatism Subscale

**Analysis by School**

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Score range from 0 to 10.
Tuckman–Lorge: Conservatism Subscale
ANALYSIS BY SCHOOL AND GROUP
Tuckman–Lorge: Conservatism Subscale
PRE/POST AVR. ANALYSIS BY SCHOOL AND GROUP

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Appendix Q
Tuckman Lorge: Activity Subscale

Tuckman—Lorge: Activity Subscale
ANALYSIS BY GROUP

score

3.12 3.07

Control

GROUP

2.29 1.44

Experimental
Tuckman–Lorge: Activity Subscale
ANALYSIS BY SCHOOL

SCORE

McMaster  Ottawa  Queen's SCHOOL  Toronto  Western

2.23  1.84  3.43  3.08  2.85  2.72  2.47  2.49  3.16  2.35
Tuckman–Lorge: Activity Subscale

ANALYSIS BY SCHOOL AND GROUP

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SCHOOL AND GROUP

SCORE
Tuckman–Lorge: Activity Subscale
PRE/POST AVR. ANALYSIS BY SCHOOL AND GROUP

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SCORE
Appendix R
Tuckman-Lorge: Financial Subscale

Tuckman–Lorge: Financial Subscale
ANALYSIS BY GROUP

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0 0.5 1 1.5 2 2.5 3
SCORE
Tuckman–Lorge: Financial Subscale

ANALYSIS BY SCHOOL

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Score range: 0.0 to 3.0
### Tuckman–Lorge: Financial Subscale

**Analysis by School and Group**

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Note: Scores represent the financial subscale scores for each school and group combination.
Tuckman-Lorge: Financial Subscale
PRE/POST AVR. ANALYSIS BY SCHOOL AND GROUP

SCORE

1.68 1.80 2.86 2.71 1.77 1.52 2.13 2.49 1.22 1.58

Mac Con Mac Exp Ott Con Ott Exp Que Con Que Exp Tor Con Tor Exp West Con West Exp
Appendix S
Tuckman Lorge: Family Subscale

Tuckman–Lorge: Family Subscale
ANALYSIS BY GROUP

SCORE

5.45 5.23
Control

5.04 4.42
Experimental
Tuckman-Lorge: Family Subscale

ANALYSIS BY SCHOOL

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SCORE
Tuckman–Lorge: Family Subscale
ANALYSIS BY SCHOOL

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Appendix T
Tuckman Lorge: Time of Life Subscale

Tuckman—Lorge: Time Of Life Subscale
PRE/POST AVR. ANALYSIS BY SCHOOL

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Appendix U
Tuckman Lorge: Insecurity Subscale

Tuckman—Lorge: Insecurity Subscale
ANALYSIS BY GROUP

Control
GROUP
Experimental

SCORE

4.47
4.18
3.2
2.01

5
4
3
2
1
0
Tuckman–Lorge: Insecurity Subscale
ANALYSIS BY SCHOOL

SCORE

McMaster | Ottawa | Queen's SCHOOL | Toronto | Western
3.35 | 4.78 | 3.71 | 3.9 | 4.33
2.55 | 4.46 | 3.41 | 3.45 | 3.25
Tuckman–Lorge: Insecurity Subscale
ANALYSIS BY SCHOOL AND GROUP

SCORE

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SCHOOL AND GROUP
Tuckman–Lorge: Insecurity Subscale
PRE/POST AVR. ANALYSIS BY SCHOOL AND GROUP

SCORE

3.09  2.81  6.05  5.24  2.11  2.11  4.03  4.53  2.9

Mac Con  Mac Exp  Ott Con  Que Con  Tor Con  West Con  Que Exp  Tor Exp  West Exp

SCHOOL AND GROUP
Appendix V
Tuckman Lorge: Sex Subscale

Tuckman—Lorge: Sex Subscale
ANALYSIS BY GROUP

SCORE

0.6
0.5
0.4
0.3
0.2
0.1
0

0.55
0.46

Control

GROUP

0.42
0.23

Experimental
Tuckman–Lorge: Sex Subscale
PRE/POST AVR. ANALYSIS BY SCHOOL AND GROUP

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Appendix W

Tuckman Lorge: Interference Subscale

Tuckman–Lorge: Interference Subscale
ANALYSIS BY GROUP

SCORE

0.5

0.4

0.3

0.2

0.1

0

Control

Experimental

GROUP

0.39

0.3

0.24

0.08
Tuckman–Lorge: Interference Subscale
PRE/POST AVR. ANALYSIS BY GROUP

Group: Experiment

Score: 0.34

Group: Control

Score: 0.16
Appendix X
Kogan Old People Positive Scale

Kogan Old People Positive Scale
ANALYSIS BY GROUP

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GROUP
Kogan Old People Positive Scale

ANALYSIS BY SCHOOL

SCORE

McMaster  Ottawa  Queen's SCHOOL  Toronto  Western

89.51  90.25  92.43  94.35  87.16  89.57  86.12  84.71  88.29  91.12
Kogan Old People Positive Scale
ANALYSIS BY SCHOOL AND GROUP

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Note: The chart shows the scores for the Kogan Old People Positive Scale, categorized by school and group.
Kogan Old People Positive Scale
PRE/POST AVR. BY SCHOOL AND GROUP

SCORE

87.50  92.30  92.07  95.33  92.61  94.00  88.40  91.23

Mac Con  Mac Exp  Ott Con  Ott Exp  Que Con  Que Exp  Tor Con  Tor Exp  West Con  West Exp

SCHOOL AND GROUP
Appendix Y
Kogan Old People Negative Scale

Kogan Old People Negative Scale
ANALYSIS BY GROUP

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Kogan Old People Negative Scale

ANALYSIS BY SCHOOL

SCORE

McMaster | Ottawa | Queen's SCHOOL | Toronto | Western

39.99   | 45.97  | 43.38         | 45.59   | 45.33
38.94   | 43.6   | 42.91         | 47.28   | 42.83
Kogan Old People Negative Scale

ANALYSIS BY SCHOOL AND GROUP

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SCORE
Kogan Old People Negative Scale
PRE/POST AVR. BY SCHOOL AND GROUP

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Appendix Z

Environment Question A

ENVIRONMENT: QUESTION A
PRE/POST AVR. ANALYSIS BY SCHOOL AND GROUP

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Appendix AA
Environment Question B

ENVIRONMENT: QUESTION B
PRE/POST AVR. ANALYSIS BY GROUP

Control    2.79
Experimental 2.5
ENVIRONMENT: QUESTION B
PRE/POST AVR. ANALYSIS BY SCHOOL

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ENVIROMENT: QUESTION C
PRE/POST AVR. ANALYSIS BY GROUP

SCORE

3.12
Control

3.48
Experimental

GROUP
ENVIRONMENT: QUESTION C
PRE/POST AVR. ANALYSIS BY SCHOOL AND GROUP

SCORE

3.03  3.21  2.98  3.03  3.43  3.84  2.89  4.83  3.29  3.4

Mac Con  Mac Exp  Ott Con  Ott Exp  Que Con  Que Exp  Tor Con  Tor Exp  West Con  West Exp

SCHOOL AND GROUP
Appendix CC
Environment Question D

ENVIRONMENT: QUESTION D
PRE/POST A.V.R. ANALYSIS BY SCHOOL

Score

McMaster 2.42
Ottawa 3.37
Queen's SCHOOL 2.47
Toronto 2.67
Western 2.78
Appendix DD
Environment Question F

ENVIRONMENT: QUESTION F
PRE/POST AVR. ANALYSIS BY SCHOOL

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ENVIRONMENT: QUESTION G
PRE/POST AVR. ANALYSIS BY GROUP

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GROUP
ENVIRONMENT: QUESTION G
PRE/POST AVR. ANALYSIS BY SCHOOL

SCORE

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Interest In Geriatrics As A Speciality

Analysis by Group

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<td>Experimental</td>
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Interest In Geriatrics As A Speciality
ANALYSIS BY SCHOOL

Score

McMaster
4.55
4.08

Ottawa
3.65
3.30

Queen's SCHOOL
4.23
4.28

Toronto
4.18
4.08

Western
3.72
3.81
Interest In Geriatrics As A Speciality
ANALYSIS BY SCHOOL AND GROUP

SCORE

4.0  3.7  5.4  4.2  4.0  3.4  3.2  3.1  4.2  3.9  4.3  4.6  4.0  3.7  4.7  5.9
Mac Con  Mac Exp  Ott Con  Ott Exp  Que Con  Que Exp  Tor Con  Tor Exp  West Con  West Exp

SCHOOL AND GROUP
Interest In Geriatrics As A Speciality
PRE/POST AVR. BY SCHOOL AND GROUP

SCORE

| Mac Con | 3.84 |
| Ott Con | 3.68 |
| Que Con | 4.06 |
| Tor Con | 4.42 |
| West Con | 5.28 |

| Mac Exp | 4.79 |
| Ott Exp | 3.17 |
| Que Exp | 3.88 |
| Tor Exp | 3.84 |
| West Exp | 3.68 |