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MODELING SELF-DETERMINATION AMONG THE ELDERLY: A PSYCHOMETRIC STUDY OF HEALTH CARE DECISION-MAKING

by

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DISSERTATION

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Approved by:

Thomas S. Lawlowsky 12/17/93
Advisor **Date**

Dedicated with Gratitude to My Loving Parents

JANE and FREDERICK

for Instilling in Me the Quest for Knowledge and

for Teaching Me Very Early the Elements of Success.

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PREFACE

We stand at the threshold of a new millennium. As we embark on the 21st century, we are faced globally by a population mean age that is continually shifting towards an older age. With the advances in medical technology, patients, families, and physicians are faced with ethical dilemmas. Today, our society recognizes the patient's right to make health care decisions—Patient Self-Determination Act—including the right to refuse care.

Self-determination is an important aspect of patient care and decision-making. The two-fold purpose of this study among the elderly is: 1) to evaluate the impact of self-determination on their participation in health care decision-making, and 2) to model self-determination as a component of health care decision-making.

The contents of this dissertation on self-determination is organized into five chapters. In Chapter I, *Introduction*, various definitions, concepts, and applications are discussed, and the purpose, significance, and limitations of the study stated. Chapter II, *Review of Literature*, describes self-determination models relevant to the health care environment, and states the hypotheses being tested. Chapter III, *Methodology*, presents the research design, the sample, the measures used for assessment, the data collection procedures, and the statistics applied for analysis of data. Chapter IV, *Results*, provides a tabulated analysis of the results. Finally, Chapter V, *Discussion and Conclusion*, discusses the findings, and provides directions for future research.

Although, it cannot be ensured that reading this dissertation will result in improved health care decision-making capacity, it is sure to stimulate the thought process and also shed light on health care issues of importance.

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CHAPTER I

INTRODUCTION

During the latter half of the twentieth century, there have been rapid advances in medical technology that have increased the human life span, contributing to complex ethical decisions in health care. Patients are frequently kept alive at a substantial cost, and perhaps often without sufficient consideration to their quality of life (President's Commission, 1982; 1983). Fostering of patient autonomy or self-determination in medical care is, therefore, among the most important tenets subscribed to by members of the World Medical Association and the American Medical Association (Beauchamp & Childress, 1994).

The principle of self-determination, long regarded as the moral framework of Western societies, has strong philosophic roots. Self-determination was embodied in the spirit of benevolence of the Eighteenth century Age of Enlightenment (Freedberg, 1989) and relates to philosophical concepts advanced by Kant (1959, 1964), Bentham (1970), Mill (1977), Ross (1930) and Rawls (1971).

In Kantian philosophy, respect for autonomy or self-determination flows from the recognition that all persons have unconditional worth, each having the capacity to determine her or his own destiny. To violate a person's autonomy is to treat that person as a means in accordance with other's goals, without regard to that person's own goals (Kant, 1959; 1964). In particular, Mill (1977) was concerned with the autonomy or individuality of people in the shaping of their lives. Mill's perspective required both non-interference and an active strengthening of autonomous expression, whereas the principles of Kant necessitated a moral imperative of respectful treatment of persons as

ends rather than as means. Rawls (1971) aligned his position with the Kantian theory of autonomy without making a commitment to the deontological moral theory of Kant. On the whole, both of these philosophies support the principle of the respect for autonomy. Self-determination is a right that supports various rights including the rights of autonomy, confidentiality and privacy (Beauchamp & Childress, 1994).

Self-Determination: Definitions, Concepts & Applications

Self-determination pertains to the basic right of individuals to act in accordance with their values, goals, and personal choices (Nicholson & Matross, 1989). Historically, the term *self-determination* was used to refer to the right of a nation to self-governance. It has since been applied in the social arena to denote individual empowerment — actions that enhance the possibilities for individuals. This is especially important for people with disabilities (Nirje, 1972), in terms of the need to control their lives (Rappaport, 1981). Self-determination theory emerged from research on young people and portrays individuals as active organisms striving for effective interaction with the environment in a context of autonomy (Deci & Ryan, 1985a; 1987; 1991).

The construct of self-determination has recently been the focus of increased interest. Many researchers have put forth varying definitions based on the different facets of self-determination, and the impact of self-determination in their field of work. For example, Ward (1988) referred to self-determination as the attitudes which lead people to define goals for themselves and the initiative to achieve those goals. Field and Hoffman (1994) defined self-determination as "the ability to identify and achieve goals based on a

foundation of knowing and valuing oneself" (p.161). Wehmeyer (1992, 1996a, 1996b) conceptualized self-determination, in terms of characteristics of actions or events, as "acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influence or interference" (1996b, p.24). The term causal agency in this context implies that an outcome was purposeful and the action was performed to achieve that end. A causal agent is someone or something that makes or causes things to happen.

According to Wehmeyer (1996b), an act or event is considered self-determined if it contains four essential characteristics: 1) the action is autonomous, 2) the behavior is self-regulating, 3) the initiation and response to events are performed in a psychologically empowered manner, and 4) the action is self-realizing. These attitudes (psychological empowerment and self-realization) and abilities (behavioral autonomy and self-regulation) are necessary if the individual is to be considered *self-determined.* In order to fulfill these characteristics, a person must be competent in a number of related skills which Wehmeyer (1996b) referred to as component elements. These include skills such as choice making, decision making, problem solving, goal setting and attainment, self-observation, evaluation, reinforcement, having an internal locus of control, bearing positive attributions of efficacy and outcome expectancy, possessing self-awareness, and self-knowledge.

Self-determination is an important component of a patient's decision-making process and has played a significant role in the delivery of health care. At a time when the study of health care decision making has grown in importance, so have health care providers struggled to understand and manage ethical problems of increasing complexity

(Benbenishty, 1992). Decision-making capacity of a patient is defined by the President's Commission (1982) as: 1) the possession of a set of values and goals, 2) the ability to communicate and understand information, and 3) the ability to reason and to deliberate about one's choices. The non-fulfillment of one or more of these requirements would result in the patient being judged less competent in decision-making capacity.

Shared decision making by patients and clinicians has been advocated as the method for medical decisions (Kuczewski, 1996). The self-care and consumer movements which encourage people to make their own decisions are considered part of a larger contemporary trend toward more active participation in decisions. Some clinicians, however, are doubtful about patients' interest in participating in treatment decisions (Strull, Lo, & Charles, 1984). Decision making in clinical practice is facilitated by adherence to a set of bioethical principles. These principles (American College of Physicians, 1992) include:

1. Nonmaleficence — the duty to do no harm,
2. Autonomy — the right of the patient to self-determination,
3. Confidentiality — respect for the patient's control over his or her information,
4. Beneficence — the duty to promote the good of the patient,
5. Veracity — telling the truth, and
6. Justice — fairness in the distribution of goods and services.

The acceptance of the principle of patient autonomy is an example of the way in which moral decision-making controls action in medicine. Patient autonomy began to grow as an antidote to physician paternalism — the supposed tendency of physicians to

assume almost complete responsibility for determining what treatment patients would have — and in recognition of the fact what treatment patients should have is a normative as well as a scientific determination (Meisel & Kuczewski, 1996). Autonomy requires that individuals critically assess their own values and preferences; determine whether they are desirable; affirm, upon reflection, that these values are ones that justify their actions; and thereafter, are free to realize them (Emanuel & Emanuel, 1992). The ethical principle of autonomy and the legal tenet of informed consent — a concept predicated on the duty of the physician to disclose to the patient information necessary to enable the patient to evaluate a proposed medical or surgical procedure before submitting to it — prohibits forcing competent patients to undergo treatment against their will, even if it is perceived to be for their own good.

Competence is a legal concept that refers to the ability of an individual to manage one's own affairs. Competence can only be determined by a court of law and not by a physician. This provision facilitates a balance between protecting patients from the consequences of bad decisions and protecting their autonomy. Competent patients are mandated to give informed voluntary consent before a medical procedure is performed and after its benefits and risks have been explained (President's Commission, 1982).

There are many theoretical arguments against patient self-determination. Some of them are limited understanding of medical issues by patients, greater expense incurred through seeking other options or marginal treatment options, and the possibility of irrational fears and concerns influencing decisions. Nevertheless, the importance of individual freedom as a moral value has led to the development of self-determination as a

major principle of medical ethics.

The Patient Self-Determination Act (PSDA) became law on December 1, 1991. This is the first federal statute to focus on advance-treatment directives (i.e., living will, which is a document stating the person's treatment preference in the event of future incompetence and health care durable power of attorney, which is the appointing of a proxy decision maker) and the right of adults to refuse life-sustaining treatment. The law applies to all health care institutions receiving Medicare or Medicaid funds, including hospitals, skilled-nursing facilities, hospices, home health and personal care agencies, and health maintenance organizations (HMOs). The ethical principle of beneficence is integral to the PSDA.

The PSDA requires that all health care institutions and providers, especially those receiving federal funds (Medicare or Medicaid), distribute printed information to patients concerning their legal rights to accept or refuse medical or surgical treatment, the right to formulate advance-treatment directives, and the relevant policies of the institution. The goal of the PSDA is to foster communication between patients and physicians about patients' preferences for life-sustaining therapies, such as tube feeding, dialysis, mechanical ventilation, cardiopulmonary resuscitation and antibiotic therapy. Use of such therapies in medical care is commonly referred to as aggressive treatment. Health care providers are not entitled to reimbursement under the Medicare or Medicaid program if they fail to meet PSDA guidelines. The U.S. Supreme Court's *Cruzan* decision suggested that advance directives are protected by the federal Constitution (*Cruzan v. Director*, 1990). In addition, one year after the PSDA was enacted, a majority of the states (46 states and the District of Columbia) had specific statutes recognizing advance-treatment

directives (Teno, Sabatino, Parisier, Rouse, & Lynn, 1993).

As the world approaches the 21st century, there are more older people on the earth than have reached old age throughout history (Dychtwald & Flower, 1989). Every month this group of people is joined by an additional 1.2 million worldwide who attain the ranks of the elderly (Macfadyen, 1990). The elderly are vulnerable to reversible problems that contribute to disability and clinicians are frequently called on to assist them in decisions that have a direct impact on their quality of life (Gallo, Reichel, & Andersen, 1995).

Caring for the *elderly* (65 years of age or older) patient can pose special challenges. The goals set and the outcomes expected for the younger patient are often not achievable for the elderly, nor are they generally appropriate (Reichel, 1995). Providing care to geriatric patients necessitates being able to deal with a multitude of medical, psychosocial, and ethical dilemmas, such as initiating, withholding, or terminating life-sustaining medical treatments (U.S. Congress, Office of Technology Assessment, 1987). Quite often, elderly patients are characterized by multiple interacting medical problems that eventually affect their routine functions and quality of life. This poses a challenging task to geriatricians who are confronted with ethical issues in clinical practice and have to deal with the ethical aspects of medical decision-making that are perplexing, time-consuming, and emotionally draining. Many researchers studying the elderly (e.g., Baltes & Baltes, 1986; Fry, 1989; Shupe, 1985) support the view that providing the elderly with choices, control, or personal responsibility enhances their feelings of control or self-determination and has positive effects on their adjustment and well-being. Nonetheless, self-determination is frequently the first right to be violated to facilitate expediency, protection, or cost-containment (Tower, 1994).

There is a general belief that in any treatment decision, the alleviation of pain should be of utmost importance. The other views on this subject include: vitalism (human life is very meaningful and must be preserved regardless of pain or degree of consciousness) and life-sustaining treatment is in the best interest of the patient only if the patient has the capacity to experience the care and love provided. Emanuel (1987) made an argument against treatment if the patient has lost the capacity for autonomous living.

Traditionally, family members or relatives followed by care providers and medical professionals have made the necessary medical decisions as to what was best for individuals who were cognitively impaired or incapacitated in expressing their care preferences. Self-determination is irrelevant when the patients' ability for autonomous decision-making is significantly reduced. Veatch (1984) was of the opinion that, within certain parameters, the family should make such decisions based on their own values. Even though advance-treatment directives cannot be considered synonymous with self-determination, they do provide an avenue for patients who are unable to make their own decisions and who do not have family support. The PSDA was intended, particularly, to support the wishes of such patients who forgo medical treatments that are not life-saving, but death prolonging.

The elderly are the focus of this study, primarily because this segment of the population is increasing in number at a significant pace with recent estimates of 12.5% elderly (14.4 % females and 10.4% males) and 36,000 centenarians (U.S. Bureau of the Census, 1991). Secondly because the purpose of PSDA was to facilitate execution of advance-treatment directives among Medicare recipients, who are principally elderly.

Purpose of the Study

The purpose of this study is two-fold:

1. to evaluate the impact of self-determination among the elderly on their participation in health care decision-making, and
2. to model self-determination as a component of health care decision-making among the elderly.

Thus, there are two research questions that are being posed.

Research Questions

1. How does self-determination among the elderly impact upon their health care decision-making process? and
2. Is there a correlation between self-determination and physical functional disability levels among the elderly?

Significance of the Study

This study on a geriatric population has a four-fold significance. Primarily, the significance of this study stems from the fact that the elderly, over age 65, represent a unique group of individuals and presently make up 12.5% of the population in the United States. This proportion has been projected to increase to 20% by the year 2025 with the oldest old, over 85 years, being the fastest growing segment of the population (Campion, 1994; U.S. Bureau of the Census, 1985; 1991). The elderly are more susceptible than the young to a variety of special problems. In addition to the physiological changes of aging (e.g., chronic illness, adverse drug reactions and declining social support systems) the

elderly are vulnerable to progressive functional deterioration, with subsequent need for home care or institutional care, adding to the burdens of the over extended health care system. Consequently, geriatric perceptions of health care are valuable in every health care decision-making process and cannot be over emphasized.

Second, self-determination is an emerging construct and construct validity is an ongoing process necessitating the integration of numerous studies. Most of the research studies to date, other than the studies by Cox (1985), and Cox, Miller, and Mull (1987), have evaluated self-determination among children and adolescents with physical or mental disabilities in the context of education and have been mainly restricted to a school setting. Therefore, it is essential that more studies validate instruments (in this study, Self-Determination Student Scale of Hoffman, Field, & Sawilowsky, 1995) among other populations and settings. This process of instrument validation (testing whether the instrument measures the trait it is designed to measure) would not only provide valuable information but also contribute to the theory of self-determination.

Third, this study is significant because there is a paucity of psychometric studies on self-determination in the health care arena. The data obtained from this research will empirically test many hypotheses and also provide the much needed practical information to health care professionals.

Finally, it is visualized that the knowledge of what contributes to the self-determination among the elderly will facilitate an improvement in physician-patient communication, in educating patients in health care decision-making process and overall, in efficient management of geriatric health care resources.

Limitations of the Study

The primary limitation of this study is external validity and stems from the use of a purposeful sample. This study has been carried out in the Detroit metropolitan area which has a large proportion of African Americans (*circa* 90%). Thus, it may not represent other cities in the United States. In addition, the data were collected using the self-determination scales (Hoffman, Field, & Sawilowsky, 1995; Cox, 1985), and the physical functional status scales (Older Americans Resources and Services Program, 1978) which are a self-report measure in a single moment in time; as a result, one cannot predict what could happen over time with respect to the observed relations. Therefore, a cautious approach to the generalization of the findings of this study is recommended.

CHAPTER II

REVIEW OF LITERATURE

There are numerous scholars who have contributed to the growing literature on self-determination (e.g., St. Peter, Field, & Hoffman, 1992; St. Peter, Field, Hoffman, & Keena, 1992; Stout, Field, Hoffman, & Sawilowsky, 1993). Most of the researchers have used the concept of self-determination to describe characteristics of individuals that may be classified essentially into four categories: autonomy, self-regulation, psychological empowerment, and self-realization. The emergence of these characteristics in an individual are facilitated by the development of six major categories of skills that include: choice and decision-making, problem-solving, goal setting and attainment, internal locus of control orientations, positive self-efficacy and outcome expectancies, and self-knowledge and understanding.

A study of the literature on self-determination shows that three different theoretical approaches have been used to measure or evaluate self-determination of individuals in different settings. These approaches may be classified in operational terms by their primary focus into the following types of models:

1. Input or Genesis model (Deci & Ryan, 1985b),
2. Process or Transformation model (Field & Hoffman, 1994), and
3. Output or Outcome model (Wehmeyer, 1996b).

Input or Genesis Model

The Deci and Ryan (1985b) causality orientations theory of self-determination is a general organismic approach to human motivation. The theory focuses around three sets

of motivational processes (e.g., intrinsic, extrinsic, and amotivational) and their relationship to the concept of self-determination. This theory posits that there are two types of self-determined behaviors. The first is an intrinsic motivation, and the second is an extrinsic motivation, which is generally considered as self-initiated and choiceful. The regulation of intentional behavior varies along a continuum from autonomous (i.e., self-determined) to controlled. Thus, behaviors can be seen as more or less self-determined. The general organismic theory classifies initiating and regulating events as informational, controlling, and amotivating. This research by Deci and Ryan (1985b) demonstrates that autonomy orientation promotes self-determination functioning, control orientation is strongly related to pressured compliance (or rebellion) and impersonal orientation promotes self-regulation and amotivation. Overall, informational events have been proven to facilitate self-determined behaviors.

The causality orientations scale of Deci and Ryan (1985b) assessed three different modes of functioning in terms of the source of initiation and regulation of behavior. The scale is composed of 12 vignettes and 36 items. One item following each vignette measures each of the three personality orientations in decreasing order of self-determination (e.g., autonomy, control, and impersonal) by the three subscales of the instrument. A person who completes the scale has a score on each of the three subscales that can be used separately or in combination to predict the behaviors, cognitions, and affects that are theoretically related. The scale has been shown to be internally consistent and temporally stable (Deci and Ryan, 1985b).

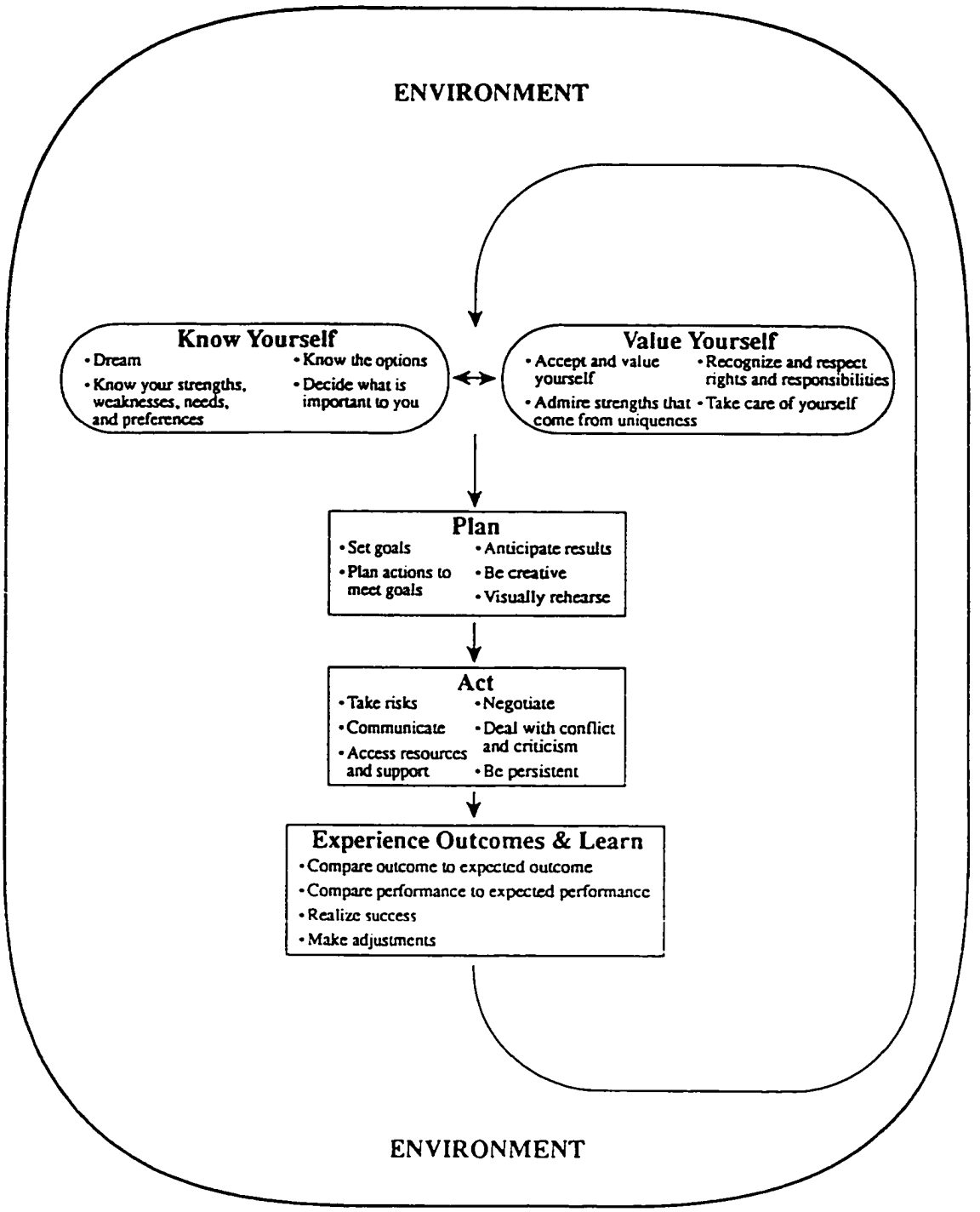

Figure 1: Model for Self-Determination. (Reproduced with permission. Source: Field, S., & Hoffman, A. (1994). Development of a model for self-determination. *Career Development for Exceptional Individuals*, 17(2), 159-169.)

Process or Transformation Model

The self-determination model of Field and Hoffman (1994) uses the assessment approach to measure cognitive, affective, and behavioral factors related to self-determination (Figure 1). These factors are assessed from the perspectives of a student, a teacher and a parent. The model focuses on and delineates those variables related to self-determination that are within the individual's control and are potential targets for instructional intervention. The Field and Hoffman (1994) model is based on self-determination defined as "the ability to identify and achieve goals based on the foundation of knowing and valuing oneself" (p.161). According to this model, self-determination is affected by skills, knowledge, and beliefs of the individual and factors that are environmental in nature (e.g., opportunities for choice and attitudes of others).

The Field and Hoffman (1994) self-determination model consists of five components: 1) Know Yourself, 2) Value Yourself, 3) Plan, 4) Act, and 5) Experience Outcomes and Learn (Figure 1). Each of these five components of the model is made up of specific subcomponents. The first two components, Know Yourself and Value Yourself, are the main framework and provide the foundation and content for becoming self-determined. The other three components of this model, Plan, Act, and Experience Outcomes and Learn, describe the skills that enable the individuals to attain whatever they desire.

Output or Outcome Model

The framework on which the Wehmeyer (1996b) self-determination model is based, proposes that self-determination is an educational or adult outcome. This model is

founded on the presumption that self-determination is an outcome that emerges, based on learning across the lifespan, and chronological age and level of self-determination should be positively correlated (Doll, Sands, Wehmeyer, & Palmer, 1996). Nevertheless, Wehmeyer (1996b) has noted that although children and adolescents can be self-determined, full self-determination is primarily an adult outcome and only when one moves into adulthood, and assumes the responsibilities of adulthood, is one fully able to express self-determination. Within this framework, self-determination is conceptualized in terms of characteristics of individual's actions and, thereafter in terms of the frequency and consistency of actions that are self-determined. The framework of Wehmeyer (1996b) was empirically validated among adolescents with mental retardation.

The self-determination behavior model of Wehmeyer (1996b) consists of four characteristics (i.e., a set of abilities, behavioral autonomy and self-regulation, and a set of attitudes, psychological empowerment and self-realization) that are essential if an individual is to be self-determined. *The Arc's Self-Determination Scale* (Wehmeyer & Kelchner, 1995a; 1995b) consists of 72 items in four sections measuring these characteristics of self-determined behaviors, especially of adults with cognitive disabilities (Wehmeyer, Kelchner & Richards, 1996). This instrument has been designed to measure individuals' behaviors in six principal domains: 1) home and family living, 2) employment, 3) recreation and leisure, 4) transportation, 5) money management, and 6) personal leadership.

People who are self-determined act autonomously, self-regulate their behavior, and are psychologically empowered and self-realizing. Self-determination is reflected in personal attitudes of empowerment, active participation in decision-making, and self-

directed action to accomplish personally valued goals. The essence of self-determination is flexibility in managing the interaction between oneself and one's environment (Deci & Ryan, 1985a). Demographic and sociographic variables such as age, economic status, opportunity, capacity and circumstances have been reported to have an impact on the degree to which any of the characteristics of self-determination are present. In addition, occasional variations in relative self-determination expressed by an individual, either over time or across environments, have also been noted (Wehmeyer, 1996b). Self-determined people make choices in their lives and have control over the decision-making processes and outcomes (Deci & Ryan, 1985a; Lovett, 1991; Nosek & Fuhrer, 1992; Price, 1990). Self-determination is evident when individuals are free to exercise control and experience outcomes of their choices free from coercion, obligation or artificial constraints.

A review of the literature suggests that self-determination as a concept is difficult to define and is therefore devoid of any simple or concise definition. Even though the theory of self-determination continues to develop, most of the researchers have defined self-determination either as a set of behaviors, characteristics or traits of an individual, including autonomy, decision-making, psychological empowerment, self-regulation, self-knowledge, self-awareness, self-esteem, self-realization or self-actualization. Furthermore, research on these characteristic elements reveals that, although related, each one of them contributes uniquely to self-determination (Wehmeyer, Kelchner, & Richards, 1996). Consequently, these self-determined behaviors or traits which contribute to the definition of self-determination are enumerated and discussed in the context of health and wellness.

Health Belief Model

The Health Belief model (Rosenstock, 1974) directed much of the research in the field of health care. The model (developed to explain health behaviors) is based on the assumptions that behavior is influenced most directly by cognitions and perceptions, rather than by objective reality; and by the present environment rather than the past. The main constructs of the Health Belief model are perceived susceptibility to and severity of a disease, as well as perceived benefits and barriers to preventive action (Becker & Maiman, 1975; Mikhail, 1981). The perceptions of susceptibility and severity provide the energy to act, whereas the difference between perceived benefits and barriers provides the direction for action. Furthermore, it is derived from the model that if individuals perceive their own susceptibility to a disease, believe that the disease is severe, recognize many benefits and few barriers to preventive action, and are generally self-determined in issues of health care, there is a high likelihood of these persons engaging in preventive health care behaviors (Becker & Maiman, 1975; Mikhail, 1981). Due to the principal focus of the Health Belief model on perceptions and subjective probability estimates of benefits and barriers to action, it is described as a cognitively based decision-making model. The perceived barriers to patient self-determination are: limited understanding of medical issues by patients, greater expense incurred through seeking other options or marginal treatment options, and the possibility of irrational fears and concerns influencing decisions (Koval & Dobie, 1996).

Health Self-Determinism Index

Cox (1985) proposed and presented validation evidence (Cox, Miller, & Mull,

1987) for the Health Self-Determinism Index (HSDI), a scale that attempts to capture the motivational components of health behavior. The index is derived from the theoretical perspectives on intrinsic motivation (Deci, 1980; Deci & Ryan, 1985a) and health, as well as from a clinical perspective that views motivation as a potentially important manipulable client characteristic. The multidimensional construct consists of four subscales that address an individual's: 1) self-determined health judgments, 2) self-determined health behavior, 3) perceived competency in health matters, and 4) internal-external cue responsiveness. The HSDI has been designed to identify populations at risk for decreased health and well-being — throughout their life span — owing to specific motivational responses. The differential effects of chronic versus acute illness on an individual's motivational response can also be evaluated. Additionally, the design of the instrument permits examination of efficacy of interventions on specific health outcomes. A study on the elderly (Cox, Miller, & Mull, 1987) using the HSDI noted gender differences, with women consistently having scored more intrinsically than men. Overall, general well-being, education, perceived health status, race and sex, were the significant predicators of the elders total HSDI score.

Self-Determination Components

Researchers studying self-determination have generally described self-determined behavior as consisting of many components. These form the basis of various empowerment theories impacting self-determination. Some of these theories related to decision-making, in health care, are described below.

Self-efficacy theory (Bandura, 1977a; 1977b; 1982), derived from a social learning perspective, suggests that, given a threatening situation, one engages in coping behavior primarily because of expected reinforcements for doing so. The principal construct of this theory, self-efficacy, is defined as the judgement of how well one can act in a stressful situation. Perceived competence is another construct that has been similarly defined. In laboratory research based on self-efficacy theory, modeling of coping behavior — both with and without subject participation — has been observed to be positively correlated with perceived self-efficacy as well as with engaging in coping behavior (Bandura, 1977b; 1982)

Autonomy is a very important component of self-determined behavior. According to Webster's Encyclopedic Unabridged Dictionary (1989), the word autonomy is derived from the Greek words *autos* (self) and *nomos* (law). Sigafoos, Feinstein, Damond and Reiss (1988) conceptualized that human development involves a progression from dependence on others for care and guidance to self-care and self-direction. The outcome of this progression is known as autonomous functioning and the term behavioral autonomy is used to describe the actions of individuals achieving this outcome.

A behavior is considered autonomous if the individuals act: 1) according to their own preferences, interests or abilities and 2) independently, free from undue external influence or interference. The more autonomous the behavior, the more it is endorsed by the whole self and is experienced as action for which one is responsible. When autonomous, individuals experience themselves as initiators of their own behavior; they select desired outcomes and choose how to achieve them. It must, however, be noted that

individuals are, in general, not totally autonomous or independent. Therefore, autonomy also depicts the interdependence of all family members, friends, and other persons with whom an individual interacted on a routine basis, as well as the influences of environment and history. Deci and Ryan (1987) noted that the concept of autonomy was a theoretical rather than an empirical one, even though it had well defined consequences. Nevertheless, Wehmeyer (1996b) points out that autonomous behavior is not the same as self-centered or selfish behavior and as such the two terms should not be confused.

Self-regulation is defined by Whitman (1990) as "a complex response system that enables individuals to examine their environments and their repertoires of responses for coping with those environments to make decisions about how to act to evaluate the desirability of the outcomes of the action and to revise their plans as necessary" (p.349). Self-regulated behaviors include self-management strategies (e.g., self-monitoring, self-instruction, self-evaluation and self-reinforcement), goal setting and attainment behaviors, problem-solving behaviors, and observational learning strategies, all of which disabled individuals need to become the causal agents in their lives (Wehmeyer, 1996a; 1996b).

The theory of self-regulation, developed from an information processing perspective, specifically addresses how people cope with stressful situations on the basis of valued goals is, therefore, of relevance to the field of health care. In self-regulation theory it is assumed that perceived stress stimulates a process of self-regulation. According to this theory, in order to cope with a given situation, one must have: 1) an adequate schema to guide behavior, 2) a set of coping techniques perceived as efficacious to deal with the stress, and 3) a feedback process as a means to regulate or monitor one's

behavior (Levanthal & Johnson, 1983). Strong empirical support for the self-regulation process has been demonstrated in both stressful laboratory and clinical settings (Carver & Scheier, 1982; Levanthal, Zimmerman, & Gutmann, 1984). Most of this research is based on an experimental design which affords a high degree of control over the study variables and confidence in the results.

Psychological empowerment is a term that has been used to refer to the multiple dimensions of perceived control, including its cognitive (personal efficacy), personality-driven (locus of control) and motivational domains (Zimmerman, 1990). Essentially, people acting in a psychologically empowered manner do so on the basis of a belief that they: a) have control over the circumstances that are important to them (internal locus of control), b) possess the skills necessary to achieve desired outcomes (self-efficacy), and c) have a choice to apply those skills, which would result in the identified outcomes (outcome expectations).

The inclusion of psychological empowerment and self-realization as essential elements for self-determined behavior, demonstrates the importance of both cognitive and behavioral contributions to the self-determination framework of Wehmeyer (1996a). Although cognitive aspects of self-determined behavior are not easily observed, they are essential for an individual to be self-determined. Bandura (1977b) emphasized the role of symbolic activities in his unifying theory of human behavior and added that expectations of competence were also essential for external control.

Self-realization or self-actualization is the highest level of human function defined by Maslow (1959) and implies inner motivation free to express the most unique self. Self-determined individuals are self-realizing so long as they use a comprehensive, and

reasonably accurate, knowledge of themselves and their strengths and limitations to act in a manner that capitalizes on this knowledge in a beneficial way. Self-knowledge and self-understanding are believed to be formed through experience with and interpretation of an individual's environment and are influenced by evaluations of significant others, reinforcements, and attributions of one's own behavior.

Health Care Decision-Making

In a study on medical decision-making, Strull, Lo, and Charles (1984) reported that outpatients with hypertension desired considerable amount of information from their physician. It was also indicated that clinicians often underestimated the patients' desire to obtain medical information pertaining to their health. Nevertheless, it was noted that these patients preferred a limited role in the actual decision making process. To facilitate an improvement in patient-clinician communication and decision making process, it has been suggested that clinicians encourage their patients to take a more active role in decisions that affect their health. As pointed out by the authors this may have a positive impact in restoring the patients' self-esteem and self-reliance (Strull, Lo, & Charles, 1984). Furthermore, the patients' participation in health care decision-making process is reported to augment the clinicians' awareness of the patients' needs, expectations and preferences (Brody, 1980). This is supported by the results of Schulman (1979) which concluded that enhanced patient participation resulted in an overall improvement in health outcomes.

Research Hypotheses

Hypothesis$_1$: Patients' self-determination score as measured by Self-Determination Health Scale (SDHS) will be positively and highly correlated to patients' Health Self-Determinism Index (HSDI).

The patient Health Self-Determinism Index (HSDI) was proposed by Cox (1985) and later validated (Cox, Miller, & Mull, 1987). HSDI attempts to measure the motivational components of health behavior, and the index is derived from the theoretical perspective on intrinsic motivation as proposed by Deci (1980), and Deci and Ryan (1985a). From a clinical perspective, patient motivation is a potentially important manipulable patient characteristic. The HSDI is based on four subscales that measure patients' a) self-determined health judgments, b) self-determined health behavior, c) perceived competence in health matters, and d) internal-external cue responsiveness. The HSDI was designed to: a) identify populations at risk for decreased health and well being owing to specific motivational responses, b) for studying the impact of patient perceptions of chronic versus acute illness on their motivational response, and c) for examining the efficacy of medical/clinical interventions on specific health outcomes.

This hypothesis relates to research question one. If this hypothesis is supported, it may provide additional and proven measures such as the HSDI to motivate patient self-determination to engage in preventive health care.

Hypothesis$_1$, if supported, may establish the nomological validity of the Self-Determination Health Scale.

Hypothesis$_2$: Self-determination among the elderly patients will be inversely related to their levels of physical functional disability.

Physical functioning will be measured using the OARS Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) scales (Older Americans Resources and Services Program, 1978). The scales of self-determination and OARS ADL and IADL have been validated for their internal consistency reliability and discriminant and convergent validities.

According to Field and Hoffman (1994) self-determination is the "ability to identify and achieve goals based on a foundation of knowing and valuing oneself" (p.161). Ward (1988) conceptualized self-determination as a set of attitudes which lead people to define goals for themselves and the initiative to achieve these goals. Wehemeyer (1996b) characterized self-determination as "acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influence or interference" (p.24). Wehemeyer (1996b) specified the four basic qualities of self-determination: autonomous action, self-regulating behavior, psychologically empowered initiative and response to external stimuli, and self-realizing actions. These definitions concur with the report of the President's Commission (1982, 1983) on health care, and was also the basis for the PSDA of 1991.

Thus, all these definitions agree that self-determination involves some identification and understanding of self-realizing goals and the ability to initiate and sustain certain self-regulated actions that can achieve these goals. Additionally, elderly patients are often affected by multiple interacting medical problems that eventually affect their routine functions and quality of life (U.S. Congress, Office of Technology Assessment, 1987).

Therefore, when self-controlled physical functioning decreases (that is, disability sets in) among the elderly patients, most of the basic requirements of self-determination are not met, and hence the justification of hypothesis$_2$.

This hypothesis is related to research question two. If this hypothesis is supported, then it may be possible to infer the level of self-determination among the elderly from their levels of physical functioning (which is easy to measure), or infer physical functioning levels from self-determination. Both could be useful to geriatric health care management.

Hypothesis$_3$: Self-determination among the elderly ambulatory patients will be significantly higher than the corresponding hospitalized patients.

The hypothesis$_3$ is a corollary to hypothesis$_2$ as patients who are hospitalized are generally functionally more severely impaired. Additionally, hospitalization of a patient is normally resorted to following a higher disease severity.

If this hypothesis is supported, it would indicate a need to develop programs to improve the self-determination of the hospitalized patients as this may help in reducing the length of hospital stay and consequently enhance the cost containment of elderly health care.

Hypothesis$_4$: Self-determination among the elderly will decrease with age.

Wehemeyer (1996b) indicated that a) self-determination is an adult outcome that emerges based on learning across one's life-span; b) and hence self-determination and chronological age should be positively related. Apparently, this position may contradict hypothesis$_1$. However, this may imply that self-determination is not linearly and positively

related to age, but the relation between the two variables may be non-linear, specifically an inverted-U relationship or the bell curve. That is, self-determination increases linearly and positively up to a particular age (post middle life crisis or between 50 to 55), then may start decreasing as elderly age creeps in. In which case, hypothesis$_1$ will be supported.

The survey instruments will be administered to a younger respondent control group. This may serve both to verify hypothesis$_1$, and as a control group procedure for validation (discriminant validity) of the scale instrument.

This hypothesis is related to research question two. If this hypothesis is supported, it would enable the study of self-determination decay curve after age 65, and accordingly determine an appropriate time frame to administer advanced directives or PSDA guidelines. Both aspects could facilitate better management of geriatric health care.

Hypothesis$_5$: Self-determination among the elderly will be a function of their gender.

The literature suggests that elderly women are more self-determined than their male counterparts. There is evidence that around age 65 women assume greater control, stay healthier, live longer, decide more often and better, are more autonomous, self-competent, and hence more self-determined. For instance, elderly female patients consistently scored higher than males in the HSDI study (Cox, Miller, & Mull, 1987).

This hypothesis is related to research question two. If this hypothesis is supported, then there is all the more reason for studying the self-determination patterns across genders, as this would provide a better understanding of the need for preventive health care and health education counseling based on the patient's gender. The findings could be useful to geriatric health care management. Thus, for instance, insurance carriers could charge lesser

premiums to the gender who takes more preventive care and consequently has lesser health risks.

Hypothesis$_6$: Self-determination among the elderly will be a function of their age, gender, education, income, ethnicity, functional status, and health status.

This hypothesis is related to both research questions being posed in the study. The elderly are known to be different not only physically but also in their social and health behaviors. Consequently, if this hypothesis is supported, it will provide an overall picture of the behavior of the elderly as it relates to their health care. This may also enable the improvement of physician-patient communication, especially among the elderly and provide the much needed knowledge for improved management of the health care for the elderly.

CHAPTER III

METHODOLOGY

This chapter addresses the research methodological aspects of the study which are described under the following subheadings:

1. Research Design,
2. Sample,
3. Measures,
4. Data Collection Procedures, and
5. Data Analysis.

Research Design

This research is a psychometric evaluation of the self-determination among the elderly in health care decision-making. Self-determination was assessed using modified versions of the self-determination instruments (Hoffman, Field, & Sawilowsky, 1995; Cox, 1985) that measure motivational components of health and wellness behaviors. In addition, physical health as defined by activities of daily living (ADLs) and instrumental activities of daily living (IADLs) as well as sociodemographics were measured. This study used a expost-facto, posttest-only research design (Campbell & Stanley, 1963).

A face-to-face interview technique was used to collect the data in view of: 1) the need to record multidimensional health data that is confidential or sensitive to the individual, 2) the rapid turnaround in data collection, 3) the decreased probability of obtaining socially acceptable responses, and 4) maximizing the response rate.

Sample

Participants for this study were recruited from among the patient population of the Detroit Medical Center and its satellite facilities (all modalities) located throughout the metropolitan Detroit area. The Detroit metropolis ranks among the large cities in the United States and is characterized by a wide socioeconomic range that includes the city of Detroit, numerous middle class and suburban communities, and some rural districts. The study was approved by the Wayne State University Human Investigation Committee and the Hospital's Medical Review Board. A total of 200 participants consisting of two groups, the *elderly* and the *young*, were recruited for the study employing a systematic randomized selection technique. Elderly are defined as "persons 65 years of age or older". Participants of ages 21-50 comprise the young group.

To be included in the study the individuals were required to:

1. provide a written consent to participate (Appendix A),
2. be 21-50 years of age or 65 years of age or older, and
3. be free from cognitive or psychiatric conditions according to the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, DSM-IV criteria (American Psychiatric Association, 1994), as evaluated by the attending physician.

Measures

A number of measures were used to assess self-determination and physical health or physical functional status of the participants.

Self-determination was evaluated using: 1) Self-Determination Health Scale (Appendix B), a modified version of the Self-Determination Student Scale (Hoffman,

Field, & Sawilowsky, 1995), and 2) Health Self-Determinism Index (Cox, 1985).

Measurement of physical health or functional assessment constitutes an important element of geriatric assessment and is classified into three categories: 1) general physical health or absence of illness, 2) activities of daily living (ADLs) or activities needed for basic self-care — dressing, bathing, toileting, mobility, eating, and continence; and 3) instrumental activities of daily living (IADLs) or activities needed to support independent living — cooking, shopping, using a telephone, taking medications, doing laundry, housekeeping, handling finances, and using public transportation. In addition to specific medical diagnoses, functional status is associated with the care the patient needs, the risk of institutionalization, and mortality. Physical functional status (physical disability) was assessed using: 1) ADL, and 2) IADL scales (Older Americans Resources and Services Program, 1978).

Instruments

An important aspect of all assessment instruments is reliability and validity. Reliability is the degree to which results of repeated measures of an instrument are consistent or reproducible. Methods for testing reliability include test-retest, inter-rater, and internal consistency. Reliability of an instrument holds good only if the instrument is used to evaluate under similar conditions of setting, population, and procedure. Validity is the degree to which a measure reflects the attribute it is intended to assess. Types of validity include predictive, content, concurrent, convergent, and criterion validity. Validity of an instrument is generally difficult to establish with abstract concepts. The

assessment instruments used in this study are discussed below in light of their reliability and validity features.

Self-Determination Scales

Self-Determination Health Scale: The Self-Determination Health Scale (SDHS) is a scale modified from the Self-Determination Student Scale (SDSS). Item numbers 14, 15, 22, 33, 35, 43, 44, 48, 53, 57, 58, 62, 64, 65, 66, 67, 72, 74,77, 81, 82, 85, 90, 91, and 92 on the SDSS were appropriately modified to evaluate health perceptions in a positive specific, negative specific, positive general, and negative general situation. The primary author of the SDSS together with the author of this dissertation decided the modified items to conform with their original intent and had the explicit permission of the authors of the scale (Hoffman, Field, & Sawilowsky, 1995). This 92-item self-report instrument measures both affective (feelings, emotions), and cognitive (beliefs) aspects of self-determination. The items contain a brief stimulus to which an individual responds by marking "that's me" or "that's not me".

This self-determination scale yields four subscales:1) general positive, 2) general negative, 3) specific positive, and 4) specific negative, as well as a number of minor subscales, based on the components of the model. The general scale relates to an individual's sense of global self-determination; whereas the specific subscales relate to their health, home, and related environmental settings. The positive subscale indicates self-determination in the areas of strengths, whereas the negative subscale indicates self-determination in the areas of weaknesses. The four subscales have high reliability as

measured by the Cronbach's coefficient α of 0.75-0.83. Values of 0.92-0.95 were obtained for the full scale estimates of reliability using Spearman-Brown Prophecy formula. The subscales were negatively correlated with the average correlation being −0.40 ($p < 0.01$). Factor analysis and confirmatory factor analysis are reported to have provided factor structures consistent with the components of the model.

A pilot study of the SDHS was carried out on a sample of 22 participants. Reliability analysis of the scale yielded a Cronbach's coefficient α of 0.55.

Health Self-Determinism Index: The Health Self-Determinism Index (HSDI) is a measure that attempts to capture the motivational components of health behavior and was proposed by Cox (1985) and validation evidence was presented by Cox, Miller, & Mull (1987). This multidimensional construct consists of four subscales that address an individual's: 1) self-determined health judgments, 2) self-determined health behavior, 3) perceived competency in health matters, and 4) internal-external cue responsiveness. The HSDI has been designed to identify populations at risk for decreased health and well-being, throughout their life span, owing to specific motivational responses. The differential effects of chronic versus acute illness on an individual's motivational response can also be evaluated. Additionally, the design of the instrument permits examination of the efficacy of interventions on specific health outcomes. The Cronbach's coefficient α was used to assess the homogenity of the HSDI. An α coefficient of 0.78 was obtained for the total 17-item scale. Six items of the scale demonstrated less than the ideal item-to-total correlation. In view of the effect the dropping of these items would have on the overall coefficient α, the items have been retained.

Physical Functional Status Scales

Activities of Daily Living: Scores of the Activities of Daily Living (ADLs) instrument are based on degree of independent functioning for each of the 7 activities or the degree and type of assistance needed for the activities. The Older Americans Resources and Services (OARS) ADL scale relies on a self-report of the patient or a report by a relative. A global score is obtained for the ADL functioning which prohibits comparison with other ADL instrument scores. The OARS instrument has been widely used in community-based gerontology research (Older Americans Resources and Services Program, 1978). The term "frailty" has been used to describe elderly persons whose management of day-to-day tasks is tenuous. The frail elderly have been defined in functional terms as elders who need help performing ADLs (Blazer & Siegler, 1984; Woodhouse, Wynne, Baillie, James, & Rawlins, 1988) and whose impairment has effects on their behavior and quality of life (Schulz & Williamson, 1993). Frail elders may need to rely heavily on neighbors or family members to perform routine jobs that fully independent individuals do for themselves. Frailty implies health conditions that require frequent hospitalizations, medication, and visits to the clinician.

Instrumental Activities of Daily Living: The Instrumental Activities of Daily Living (IADLs) consist of a set of 7 activities required for independent living that are more complex and demanding than the ADLs. The set of IADLs are essentially slanted toward tasks traditionally performed by females, especially for the present cohort of elderly persons (Teresi, Cross, & Golden, 1989). This bias notwithstanding, these activities are necessary for most individuals to live independently and if any of them cannot be performed by an elderly individual, it necessitates assistance from a caregiver.

Additionally, the inability to perform IADLs is a good predictor of further functional decline (Mor, Murphy, Masterson-Allen, Willey, & Razmpour, 1989), institutionalization (Mor, Wilcox, Rakowski, & Hiris, 1994), and mortality (Fillenbaum, 1985; Koyano et al., 1989).

Sociodemographics Scale

The participants' sociodemographics were assessed using a 20-item instrument especially designed for this research. The instrument included sociodemographic items such as age, gender, education, ethnicity, marital status, annual household income, occupation, and health insurance. Additionally, the instrument also incorporated items pertaining to health behaviors, advance directives, health care beliefs and values, patient status, and annual physical exam.

Data Collection Procedures

All the participants were interviewed by the same research investigator either at an ambulatory clinic or in a hospital ward. A total of 200 participants, fulfilling the inclusionary criteria, were selected using a systematic randomized selection technique. Every second patient on the daily roster of patients from among the ambulatory patients (100 participants) of two clinics and the hospitalized patients (100 participants) of two hospitals at the Detroit Medical Center were selected. If any of the participants did not fulfill the inclusionary criteria, the next individual was considered a potential participant for the study.

Data collection consisted of an in-depth personal interview of the participants consisting of one hundred elderly group and one hundred younger group. Each group, made up of fifty ambulatory and fifty hospitalized individuals, was administered the SDHS, the HSDI, the ADL, the IADL and the sociodemographic instruments.

Data Analysis

The data obtained were coded, entered into a data file, and analyzed using SPSS for Windows software, Release 7.0. (SPSS Inc, 1995). The SDHS scale was scored and scores for all the scales (SDHS, HSDI, ADL and IADL) and the Health Status variable were computed. Statistical methods used for analyzing the self-determination data included reliability testing using Cronbach's standardized coefficient α, Pearson's Correlation, Student's two-sample *t* test, ANOVA, ANCOVA and structural equation modeling (LISREL) to identify major patterns determining choice of health care among the elderly. Items with continuous response variables or scaled responses were tested with linear regression. Confounding variables among the subgroups were adjusted using ANCOVA analyses. Statistical significance for all tests was established at a nominal α level of 0.05.

The statistics applied for the analysis of the six hypotheses which include the model that was tested are summarized in Table 1. Some of these statistics are briefly discussed in the following paragraphs.

Table 1: Statistical Analysis

Hypothesis	Variables	Statistical Analysis
H_1: Patients' self-determination score as measured by SDHS will be positively and highly correlated to patients' HSDI.	Criterion Variable SDHS Predictor Variable HSDI	Pearson's Correlation
H_2: Self-determination among the elderly patients will be inversely related to their levels of physical functional disability.	Criterion Variable SDHS Predictor Variable ADL & IADL	Pearson's Correlation ANOVA, *t* test ANCOVA
H_3: Self-determination among the elderly ambulatory patients will be significantly higher than the corresponding hospitalized patients.	Criterion Variable SDHS Predictor Variable Patient Status	*t* test
H_4: Self-determination among the elderly will decrease with age.	Criterion Variable SDHS Predictor Variable Age	Pearson's Correlation ANOVA, *t* test ANCOVA
H_5: Self-determination among the elderly will be a function of their gender.	Criterion Variable SDHS Predictor Variable Gender	ANOVA, *t* test ANCOVA
H_6: Self-determination among the elderly will be related to their age, gender, income, education, ethnicity, health status, and functional status.	Criterion Variable SDHS Predictor Variable Age, Gender Education, Income, Ethnicity, Functional Status & Health Status	ANOVA, ANCOVA, Linear Regression, Structural Equation Modeling (LISREL)

Pearson's Correlation Analysis

The basic data analytic methodology for verifying three of the five hypothesis that are stated in Table 1 is Pearson's correlation analysis. The Pearson's bivariate coefficient r ($-1 \geq r \leq +1$) assesses the degree of linear relationship between any two continuous variables. In this study, r can assess statistically significant correlations between the dependent variable (SDHS) and various independent variables such as HSDI ($hypothesis_1$), ADL and IADL ($hypothesis_2$), and age ($hypothesis_4$). The significance of the correlation is based on n−1 degrees of freedom, where n is the smaller of the two sample sizes involved. Correlational analysis assumes that both correlated variables are metric data, and that they bear a linear relationship between them. Correlational significance is sensitive to sample size, unequal sample sizes, and missing data (Tabachnick & Fidell, 1996).

Analysis of Variance

When the independent or predictor variables are nonmetric and are either nominal or categorical, then analysis of variance (ANOVA) is applied between the dependent variable (SDHS) and the independent variables such as patient status (ambulatory versus hospitalized; $hypothesis_3$) and respondent gender (female versus male, $hypothesis_5$). ANOVA is a set of analytic procedures based on a comparison of two estimates of variance: one estimate comes from differences among scores within each group; this estimate is considered random or error variance; the second estimate comes from differences in group means and reflects group differences or treatment effects plus error.

If these two estimates of variance do not differ appreciably, one concludes that all of the group means come from the same sampling distribution of means, and the slight differences among them are due to random error, and hence the null hypothesis is accepted. Otherwise, the null hypothesis is rejected, and it is concluded that the group means were drawn from different sampling distribution of means.

Differences among variances are evaluated as ratios, where the variance associated with differences among sample means is in the numerator, and the variance associated with error is in the denominator. The ratio between these two variances forms an F-distribution, whose critical value (judged against degrees of freedom in the numerator versus denominator) can be assessed from standard F tables.

If the respondent groups are divided along only one dimension (e.g., gender or patient status), then the *one-way between subjects* ANOVA is generally used. However, quite often the respondents are divided along several dimensions (e.g., gender by patient status by age group), in which case *factorial between-subjects* ANOVA is appropriate (Norusis, 1993; Tabachnick & Fidell, 1996).

Analysis of Covariance

Analysis of Covariance (ANCOVA) is used to filter the effects of extraneous variables or covariates on the dependent variable (SDHS). Covariates are chosen because of their known or assumed association with the dependent variable. Hence if there are no covariates, then only ANOVA is usually performed. A number of covariates in this study are known to have a significant effect on SDHS such as respondent's age, education, income, and so on necessitating an ANCOVA.

Basically, ANCOVA is ANOVA performed on SDHS residuals generated by first conducting a regression analysis wherein the extraneous variables are the independent variables. By analyzing the residuals, rather than raw SDHS scores through ANOVA, one can expect to get a clearer picture of the effects of other independent variables of interest on SDHS. However, a key requirement of ANCOVA is that the extraneous variables to be included in the analysis should be parametric data (Tabachnick & Fidell, 1996).

Predictor variables such as education (measured as number of years at school or college), respondent age (measured as actual number of years) and respondent income status (as expressed in several income categories of equal interval) are metric data. Since these variables affect scores on the SDHS, the ANCOVA was used to filter out the effects of these variables on the SDHS, to permit the assessment of the relationship between the residual SDHS and other predictor variables such as age, patient status, ADL and IADL. Thus when simple ANOVA may not support certain hypotheses (i.e., $hypothesis_2$ - $hypothesis_5$), one can foresee the use of ANCOVA. Once the effect of relevant covariates on SDHS has been removed under each case, the effect of independent variables such as ADL and IADL ($hypothesis_2$), patient status ($hypothesis_3$), age ($hypothesis_4$) and gender ($hypothesis_5$) on the residual SDHS is more clearly assessed.

Structural Equations Modeling

Structural equations modeling is a collection of statistical techniques that allow examination of a set of relationships between one or more independent or predictor variables, either continuous or discrete, and between one or more dependent or criterion variables, either continuous or discrete. Any of the dependent or independent variables

can be either factors or measured variables. In this study, the dependent variable, SDHS, was posited to be related to many other measured variables such as certain sociodemographics (i.e., age, gender, education, income and ethnicity), measures of physical functional disability (i.e., ADL and IADL), and other specific health-related variables (e.g., patient status and health care status).

A path diagram indicates a set of hypothesized relationships between these variables, the structural equation model (SEM). These relationships can be directly translated into the equations needed for the SEM analysis. It is customary to represent measured or observed variables by squares or rectangles. Unmeasured variables which are derived from a set of one or more measured variables are called factors or latent variables (also called constructs or unobserved variables) are represented by circles or ovals in path diagrams. Relationships are indicated by lines or curves. A line or curve with one arrow represents a hypothesized direct relationship between one or more independent variables and their dependent variable. A line or curve with two arrows on both ends indicates an unanalyzed relationship; it is simply covariance between the two variables with no implied direction of effect (Arabuckle, 1997; Jöreskog & Sörbom, 1996).

From the literature review on the various determinants of SDHS score (self-determination), the following SEM was hypothesized:

1. A latent variable called socioeconomic status (SES) that results from three socioeconomic measured variables: education, income and ethnicity.
2. Another latent variable called physical functional status that is generated is the physical functional capacity as measured by scores of ADL and IADL.

3. Both latent variables SES and physical functional status would directly impact the SDHS score.
4. Three measured variables: age, gender and health care status would directly, but independently, impact the SDHS score; age of the patient was measured in years; health care status was measured as a function of several observed variables indicating practice of positive health behaviors such as not smoking, not consuming alcohol, regular exercise, and annual physical exam. Patient status (ambulatory or hospitalized), a good indicator of the health condition (severity of illness) of a patient was also factored into the health care status measure. Positive health behaviors and the ambulatory patient status were each assigned a score of 1 in the computation of the health care status measure, for a minimum score of 0 and a maximum score 5.
5. The presence of a residual indicates imperfect prediction. All measured independent variables, except age (i.e., education, income, ethnicity, health care status, ADL and IADL) and the dependent variable, SDHS were posited to have their respective residuals. The residuals are usually marked by ovals with an arrow indicated toward the corresponding measured variable.

The hypothesized SEM of the determinants of SDHS score is sketched (Amos, Version 3.6 for Windows, 1996) under Figure 2. To help in the evaluation of the SEM the following statistical measures of fit and fit indices (Bollen, 1989; Arabuckle, 1997) were used: 1) Chi-Square (χ^2) test, 2) Goodness-of-Fit Index (GFI), 3) Adjusted Goodness-of-Fit Index (AGFI), and 4) Root Mean Square Error of Approximation (RMSEA).

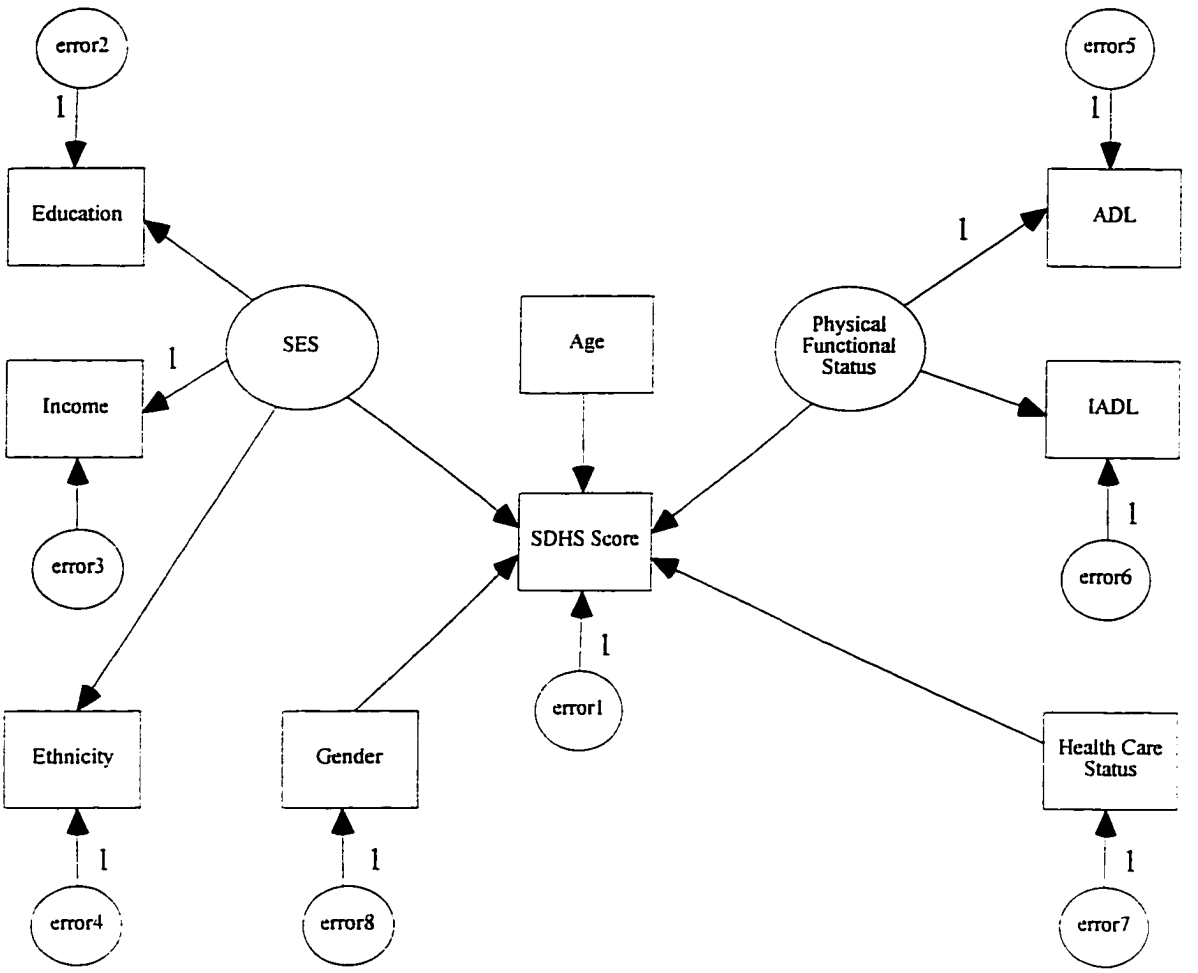

Figure 2: A Hypothesized Structural Equations Model of Determinants of SDHS scores.

CHAPTER IV

RESULTS

A descriptive summary of the sample of 200 voluntary participants who were provided health care at the Detroit Medical Center located in Detroit, Michigan during a three-month period (July-October, 1997) and who fulfilled the inclusionary criteria of the study is presented in Table 2. The sample was predominately African American (68.5%), retired or unemployed (57.5%) of low to moderate income level, with a higher proportion of females in three of the four subsamples. The ages of the young group and the elderly group ranged from 21-50 years and 65-92 years respectively, with a mean (M) age of 56.5 years and standard deviation (SD) of 20.0 years. Among the participants in the study, a large percentage were married (37%) and the mean level of education was 12.3 years.

The primary health insurance of the majority of participants was Medicare (51%) and Medicaid (13.5%). Blue Cross Blue Shield was the primary insurance among 16 percent of the young group while 9 percent of the young participants reported having no health insurance. Less than a third of the participants smoked (29%) or consumed alcohol (30%). A sizable number had an annual physical (76.5%) and exercised regularly (43.5%), but only a fifth of the participants had any form of advance directives. Even though, 51.5 percent and 67 percent of the participants indicated that, if the need arose, they were willing to be placed on an artificial respirator or a dialysis machine, respectively. Nevertheless, when the patients were asked about their evaluation of future life in the context of length of life versus quality of life, over three-fourths of the participants (77.5%), both elderly (76%) and young (79%), considered quality of life more important than length of life.

Table 2: Sample Sociodemographics (n=200).

Variables	Age Group				Sample Total
	Young		*Elderly*		
Subsample Size	Ambulatory (n_1=50)	Hospitalized (n_2=50)	Ambulatory (n_3=50)	Hospitalized (n_4=50)	(n=200)
Gender					
Female	35 (70.0 %)	21 (42.0 %)	28 (56.0 %)	30 (60.0 %)	114 (57.0 %)
Male	15 (30.0 %)	29 (58.0 %)	22 (44.0 %)	20 (40.0 %)	86 (43.0 %)
Ethnicity					
African American	29 (58.0 %)	42 (84.0 %)	33 (66.0 %)	33 (66.0 %)	137 (68.5 %)
Caucasian	15 (30.0 %)	8 (16.0 %)	17 (34.0 %)	14 (28.0 %)	54 (27.0 %)
Others	6 (12.0 %)	0 (0.0 %)	0 (0.0 %)	3 (6.0 %)	9 (4.5 %)
Marital Status					
Married	23 (46.0 %)	12 (24.0 %)	24 (48.0 %)	15 (30.0 %)	74 (37.0 %)
Separated/Divorced	12 (24.0 %)	13 (26.0 %)	8 (16.0 %)	8 (16.0 %)	41 (20.5 %)
Widowed	0 (0.0 %)	0 (0.0 %)	16 (32.0 %)	25 (50.0 %)	41 (20.5 %)
Never Married	15 (30.0 %)	25 (50.0 %)	2 (4.0 %)	2 (4.0 %)	44 (22.0 %)
Age (years)	36.9 $\pm$ 8.2	39.1 $\pm$ 7.8	74.3 $\pm$ 5.7	75.6 $\pm$ 8.6	56.5 $\pm$ 20.0
Education (years)	14.8 $\pm$ 2.5	11.9 $\pm$ 1.9	12.1 $\pm$ 3.9	10.4 $\pm$ 3.8	12.3 $\pm$ 3.5
Occupation					
Employed	49 (98.0 %)	30 (60.0 %)	6 (12.0 %)	0 (0.0 %)	85 (42.5 %)
Unemployed	1 (2.0 %)	20 (40.0 %)	44 (88.0 %)	50 (100.0 %)	115 (57.5 %)
Income					
≤ $ 15,000	6 (12.0 %)	35 (70.0 %)	19 (38.0 %)	32 (64.0 %)	92 (46.0 %)
$ 15,001-30,000	15 (30.0 %)	6 (12.0 %)	18 (36.0 %)	11 (22.0 %)	50 (25.0 %)
$ 30,001-45,000	12 (24.0 %)	4 (8.0 %)	7 (14.0 %)	3 (6.0 %)	26 (13.0 %)
$ 45,001-60,000	7 (14.0 %)	3 (12.0 %)	2 (36.0 %)	2 (22.0 %)	14 (7.0 %)
$ 60,001-75,000	5 (10.0 %)	1 (2.0 %)	0 (0.0 %)	0 (0.0 %)	6 (3.0 %)
≥ $ 75,001	5 (10.0 %)	1 (2.0 %)	4 (8.0 %)	2 (4.0 %)	12 (6.0 %)
Primary Health Insurance					
Medicare	2 (4.0 %)	3 (6.0 %)	49 (98.0 %)	48 (96.0 %)	102 (51.0 %)
Medicaid	4 (8.0 %)	22 (44.0 %)	0 (0.0 %)	1 (2.0 %)	27 (13.5 %)
BC/BS	12 (24.0 %)	4 (8.0 %)	0 (0.0 %)	0 (0.0 %)	16 (8.0 %)
HMO/PPO	29 (58.0 %)	10 (20.0 %)	1 (2.0 %)	1 (2.0 %)	41 (20.5 %)
Other	2 (4.0 %)	3 (6.0 %)	0 (0.0 %)	0 (0.0 %)	5 (2.5 %)
Self-Pay	1 (2.0 %)	8 (16.0 %)	0 (0.0 %)	0 (0.0 %)	9 (4.5 %)
Healthcare					
Smoke	14 (28.0 %)	29 (58.0 %)	8 (16.0 %)	7 (14.0 %)	58 (29.0 %)
Consume Alcohol	22 (44.0 %)	18 (36.0 %)	18 (36.0 %)	2 (4.0 %)	60 (30.0 %)
Regularly Exercise	21 (42.0 %)	21 (42.0 %)	28 (56.0 %)	17 (34.0 %)	87 (43.5 %)
Annual Physical	41 (82.0 %)	23 (46.0 %)	49 (98.0 %)	40 (80.0 %)	153 (76.5 %)
Advance Directives	5 (10.0 %)	4 (8.0 %)	14 (28.0 %)	17 (34.0 %)	40 (20.0 %)

Note. Values are M $\pm$ SD or n and %. Percentages are derived from column totals.

Preliminary analyses were carried out to determine the reliability of the instrument, test the hypotheses and determine whether the criterion variable, self-determination as measured by the Self-Determination Health Scale (SDHS) was related significantly to the predictor variables of Health Self-Determinism Index, physical functional disability, patient status, age, gender, education, income and ethnicity. The SDHS instrument consisting of 92 items had a high coefficient of reliability as evidenced by a Cronbach's coefficient α of 0.8546.

Evaluating the assumption that the data analyzed comes from a normal distribution is very important to statistical inference. Therefore the normal probability plot was examined for the six continuous variables (n = 200) in the analysis, and the Lilliefors (modified Kolmogorov-Smirnov) test statistic results are presented in Table 3a.

Table 3a: Testing Normality Assumptions.

Variable	Lilliefors Test Statistic	DF	*p* (two-tailed)
SDHS	0.060	200	0.075
HSDI	0.043	200	0.845
ADL	0.356	200	0.000
IADL	0.351	200	0.000
Age	0.137	200	0.000
Education	0.106	200	0.000

Based on the Lilliefors test statistic, only SDHS and HSDI are normal, whereas the hypothesis of normality has to be rejected for the other four variables, ADL, IADL, age and education. The dependent variable of interest in this research SDHS (and HSDI) was normally distributed. Regarding the other four variables, it is to be noted that it is almost impossible to find data that are exactly normally distributed, and for most

statistical tests, it is sufficient that the data are approximately normally distributed. However, age as defined in the study is not a continuous variable because the sample was selected from among the young (21-50 years) and the elderly (65+ years) with no observations in the middle age range (51-64 years). Consequently in the case of age, the distribution is as expected.

The assumption that all groups come from populations with equal variances should be tested, as this is also an underlying assumption of ANOVA. Table 3b provides Levene's homogeneity-of-variance test statistics for some key pairs of variables in the study. As observed from Table 3b, all the relevant variable pairs used in ANOVA report homogeneity of variance. Therefore, for all pairs of variables the null hypothesis that all group variances are equal is not rejected.

Table 3b: Levene's Test of Homogeneity-of-Variance.

Variable Pairs	Levene's Test Statistic	DF	*p* (two-tailed)	Hypothesis
SDHS & ADL	0.025	2, 198	0.875	$Hypothesis_2$
HSDI & IADL	1.995	2, 198	0.159	$Hypothesis_2$
SDHS & Young	0.282	1, 98	0.597	$Hypothesis_3$
SDHS & Elderly	0.498	1, 98	0.482	$Hypothesis_3$
SDHS & Age	2.262	2, 198	0.134	$Hypothesis_4$
SDHS & Gender	0.039	2, 198	0.844	$Hypothesis_5$

The results of the hypotheses tested are presented below in numerical order:

$Hypothesis_1$

The $hypothesis_1$ states that the patients' self-determination score as measured by SDHS will be positively and highly correlated to HSDI. The results of Pearson's correlation between criterion variable SDHS and predictor variable HSDI are presented in

Table 4. At the overall level (n = 200), the correlation coefficient (r) is significant, low and positive (r = 0.311, p = 0.000), which contributes weak support for hypothesis$_1$. The correlation between SDHS and HSDI also weakly supports the nomological validity of the SDHS. However, when the total sample was partitioned as indicated in Table 4, the results are mixed. Hypothesis$_1$ is slightly more strongly supported in the case of young and hospitalized (r = 0.416, p = 0.003), but not in relation to the other three subsamples, young ambulatory (r = 0.200, p > 0.05), elderly ambulatory (r = 0.267, p > 0.05), and elderly hospitalized patients (r = 0.217, p > 0.05).

Table 4: Correlation between SDHS and HSDI.

Variables	Age Group				Total Sample
	Young		*Elderly*		
Subsample Size	Ambulatory (n_1 = 50)	Hospitalized (n_2 = 50)	Ambulatory (n_3 = 50)	Hospitalized (n_4 = 50)	(n = 200)
Criterion					
SDHS	78.82 ± 7.42	74.20 ± 8.32	74.08 ± 8.88	69.26 ± 9.05	74.09 ± 9.04
Predictor					
HSDI	56.24 ± 7.44	52.46 ± 8.86	52.24 ± 8.71	52.28 ± 9.50	53.31 ± 8.76
r	0.200	0.416	0.267	0.217	0.311
p	0.164	0.003	0.061	0.130	0.000

Note. Values are M ± SD.

These mixed results in terms of significance may be partly due to reduced sample size (n_i = 50, i = 1, 4) within each subsample, given that the correlation coefficient *r* is sensitive to sample size. Also, age and patient status (ambulatory versus hospitalized) are possibly intervening or moderator variables between SDHS and HSDI.

Table 5a: Correlation between SDHS and measures of Physical Functional Disability.

Variables	Age Group				Total Sample
	Young		*Elderly*		
Subsample Size	Ambulatory (n_1 = 50)	Hospitalized (n_2 = 50)	Ambulatory (n_3 = 50)	Hospitalized (n_4 = 50)	(n = 200)
Criterion					
SDHS	78.82 ± 7.42	74.20 ± 8.32	74.08 ± 8.88	69.26 ± 9.05	74.09 ± 9.04
Predictor					
ADL	13.88 ± 0.59	13.70 ± 0.89	13.68 ± 1.02	13.06 ± 1.63	13.58 ± 1.14
r	0.430	0.058	-0.101	-0.027	0.121
p	0.002	0.688	0.486	0.851	0.089
Predictor					
IADL	13.86 ± 0.86	13.60 ± 1.28	13.36 ± 1.76	12.10 ± 3.01	13.23 ± 2.01
r	0.432	0.090	-0.061	-0.053	0.135
p	0.002	0.533	0.675	0.717	0.056

Note. Values are M ± SD.

Hypothesis$_2$

The hypothesis$_2$ states that self-determination among the elderly patients will be inversely related to their levels of physical functional disability. Pearson's correlation between criterion variable SDHS and predictor variable ADL and IADL are presented in Table 5a. At the overall level (n = 200), the correlation coefficient between SDHS and ADL ($r = 0.121$, $p > 0.05$) and between SDHS and IADL ($r = 0.135$, $p > 0.05$) was not significant, offering no support for hypothesis$_2$.

However, when the total sample is divided into the four groups as indicated in Table 5a, there is weak support for hypothesis$_2$ only in relation to the young ambulatory patient group in the case of both predictor variables ADL and IADL. These mixed results could be due to subsample size and moderator variables between SDHS and ADL or IADL.

Other possible explanations are:

1. The fact that SDHS is significantly related to ADL and IADL only in relation to the young and ambulatory group, it may be surmised that age and patient status (ambulatory versus hospitalized) are intervening variables between SHDS and ADL or IADL.
2. The activities described under ADL or IADL may not be directly related to SDHS: for instance, one could be physically impaired, but still highly self-determined, especially if the patient is young. Being physically impaired may not always impact the level of self-determination.
3. The nature of ADL and IADL scores: Both ADL and IADL involve a set of seven questions dealing with normal every-day physical functions: doing the function without help scores 2, with some help scores 1, and completely unable to do the function scores 0. The highest score is 14 under each, and the minimum score is 0. Judged from Figure 3, both ADL and IADL scores of the respondent sample are extremely skewed. The maximum ADL and IADL score of 14 (no physical functional disability) was scored by 166 (83%) and 163 (81.5%) respectively; the remaining few respondents were rather uniformly spread along other score points 0-13 (functionally disabled). This extremely skewed ADL and IADL scores could bias the results.

More work is necessary to speculate on the moderator variables and their specific role in relation to SDHS. At this juncture the effects of certain moderator variables on SDHS are being filtered out prior to correlating SDHS with ADL and IADL. This is done using Analysis of Covariance (ANCOVA).

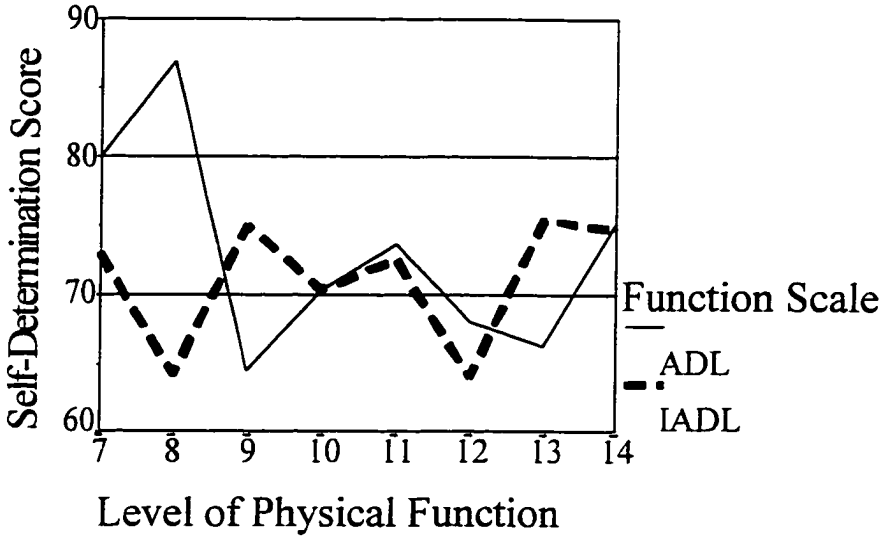

Figure 3: SDHS scores by levels of ADL and IADL.

Assuming that respondent education (measured as number of years at school or college), respondent age (measured as actual number of years) and respondent income status (expressed as income categories of equal interval, Table 2) are extraneous variables that can affect SDHS, these variables were included as covariates in the ANCOVA. Once the effect of these covariates on SDHS has been removed, then the real effect of independent variables such as ADL or IADL on the residual SDHS can be assessed.

Table 5b presents the ANCOVA results. All the three covariates were significant: age ($F = 5.236$, $p = 0.023$), income ($F = 8.993$, $p = 0.003$), and education ($F = 16.740$, $p = 0.000$). Their combined effect on SDHS is very strong ($F = 21.517$, $p = 0.000$). The main effects of ADL ($F = 8.442$, $p = 0.004$) and IADL ($F = 4.473$, $p = 0.036$) were significant, but not at the two-way interaction level ($F = 2.983$, $p > 0.05$). Hence, there is weak and mixed support for hypothesis$_2$.

Table 5b: ANCOVA Analysis to study the effect of ADL and IADL on SDHS with Age, Income and Education as Covariates (n = 200).

EXPERIMENTAL sums of squares Covariates entered FIRST					
Source of Variation	Sum of Squares	DF	Mean Square	F	*p*
Covariates	3897.273	3	1299.091	21.517	0.000
Age	316.112	1	316.112	5.236	0.023
Income	542.954	1	542.954	8.993	0.003
Education	1010.690	1	1010.690	16.740	0.000
Main Effects	516.402	2	258.201	4.277	0.015
ADL	509.709	1	509.709	8.442	0.004
IADL	270.033	1	270.033	4.473	0.036
2-Way Interactions	180.089	1	180.089	2.983	0.086
ADL IADL	180.089	1	180.089	2.983	0.086
Explained	4593.764	6	765.627	12.681	0.000
Residual	11652.616	193	60.376		
Total	16246.380	199	81.640		
Covariates	Raw Regression Coefficient				
Age	-0.067				
Income	1.266				
Education	0.753				

Further, based on the results of the Multiple Classification Analysis (Table 5c) it appears that ADL explains 24% variance in the residual SDHS (see Eta) and when adjusted for independent variables and covariates ADL also explains 24% of the variance in residual SDHS (see Beta). Similarly, IADL explains only 14% variance in the residual SDHS (see corresponding Eta) but when adjusted for independent variables and covariates it explains 18% of the variance in residual SDHS (see corresponding Beta). Both ADL and IADL combined explain 27.2 percent of the variance in residual SDHS (see Multiple R Squared in Table 5c).

Table 5c: Multiple Classification Analysis of SDHS scores by ADL and IADL with Age, Income and Education as Covariates (n = 200).

Variable (Category)	N	Independents and Covariates			
		Unadjusted		Adjusted	
		Deviation	Eta	Deviation	Beta
ADL (disabled)	34	-4.85		-4.81	
ADL (not disabled)	166	0.99		0.98	
			0.24		0.24
IADL (disabled)	37	-2.66		3.39	
IADL (not disabled)	163	0.60		-0.77	
			0.14		0.18
Multiple R Squared					0.272
Multiple R					0.521

Given the results in Table 5c, it is possible to further probe the relationship between SDHS and the different levels of ADL or IADL. Further, on the basis of their physical functioning, patients may be classified as functionally disabled or not functionally disabled. Therefore the sample was categorized into groups based on the patient's functional status as functionally disabled (those with ADL or IADL score ≤ 13), or not functionally disabled (those with ADL or IADL scores = 14) and the impact on SDHS scores evaluated. Table 5d presents the results.

At the overall level (n = 200) there is significant difference between the SDHS scores of those who were functionally disabled and those who were not functionally disabled ($t = -3.533$, $p = 0.000$). The relationship between SDHS and IADL was also significant ($t = -1.996$, $p = 0.047$). Hence SDHS is related to physical functional levels, and hypothesis$_2$ is provided some support.

Table 5d: Impact of Physical Functional Disability on SDHS scores.

Variables / Subsample Size	*Young* n_1		*Elderly* n_2		Total Sample n	
Criterion						
SDHS						
Predictor						
ADL (disabled)	9	69.44 ± 9.25	25	69.16 ± 8.81	34	69.24 ± 8.79
ADL (not disabled)	91	77.21 ± 7.78	75	72.51 ± 9.29	166	75.08 ± 8.78
t		-2.811		-1.581		-3.533
p		0.006		0.117		0.000
Predictor						
IADL (disabled)	8	70.00 ± 7.31	29	71.83 ± 7.45	37	71.43 ± 7.36
IADL (not disabled)	92	77.08 ± 8.04	71	71.61 ± 9.93	163	74.69 ± 9.29
t		-2.404		0.107		-1.996
p		0.018		0.915		0.047

Note. Values are M ± SD.

When the same analysis is done in relation to the elderly (n = 100) and the young (n = 100), the relation of between SDHS is significant among the young but not among the elderly. This indicates, that even though ADL and IADL instruments were designed primarily for the elderly, they are more sensitive to SDHS among the young than among the elderly.

Hypothesis$_3$

The hypothesis$_3$ states that SDHS scores among the elderly ambulatory respondents will be significantly higher than the elderly hospitalized patients. Table 6 furnishes the results. The mean SDHS score among the elderly ambulatory is 74.08 with a SD of 8.88, whereas among the elderly hospitalized it is 69.26 with a SD of 9.05. The result of the two-means *t* test (t = 2.688) is significant (p = 0.008). Thus support is

provided for hypothesis$_3$ and hence the discriminant validity of the SDHS. The same results for hypothesis$_3$ applies to the young group ($t = 2.93$, $p = 0.004$) as well.

Table 6: SDHS scores by Patient Status.

Variables	Patient Status		*t*	*p*
Subsample Size	Ambulatory (n_1=100)	Hospitalized (n_2=100)		
Criterion				
SDHS				
Predictor				
Young	78.82 ± 7.42	74.20 ± 8.32	2.930	0.004
Elderly	74.08 ± 8.88	69.26 ± 9.05	2.688	0.008

Note. Values are M ± SD.

Hypothesis$_4$

The hypothesis$_4$ states that SDHS scores among the elderly will decrease with age. Table 7a provides the results.

Table 7a: Correlation between SDHS and Age.

Variables	Age Group				Total Sample
	Young		*Elderly*		
Subsample Size	Ambulatory (n_1=50)	Hospitalized (n_2=50)	Ambulatory (n_3=50)	Hospitalized (n_4=50)	(n =200)
Criterion					
SDHS	78.82 ± 7.42	74.20 ± 8.32	74.08 ± 8.88	69.26 ± 9.05	74.09 ± 9.04
Predictor					
Age	36.94 ± 8.24	39.12 ± 7.84	74.26 ± 5.72	75.56 ± 8.55	56.47 ± 20.01
r	0.257	-0.192	-0.224	-0.123	-0.283
p	0.071	0.181	0.119	0.396	0.000

Note. Values are M ± SD.

At the aggregate level (n = 200) the correlation coefficient for SDHS and respondent age is r = -0.283 and p = 0.000. This negative but low correlation between SDHS and age offers weak support for hypothesis$_4$ that self-determination decreases with

age. However, when the total sample is broken down into four groups as indicated in Table 7a, none of the correlations between SDHS and age are significant.

The impact of age on SDHS scores is presented in Table 7b. In both the cases, ambulatory as well as hospitalized patient status, the SDHS scores of the elderly group of patients were significantly lower ($p = 0.005$) than the young group. This provides supports to hypothesis$_4$.

Table 7b: Impact of Age on SDHS scores.

Variables	Age Group		*t*	*p*
	Young	*Elderly*		
Subsample Size	(n_1 =100)	(n_2 =100)		
Criterion				
SDHS				
Predictor				
Ambulatory	78.82 ± 7.42	74.08 ± 8.88	2.896	0.005
Hospitalized	74.20 ± 8.32	69.26 ± 9.05	2.841	0.005

Note. Values are M ± SD.

Further, the various components of SDHS could also be differently impacted by age. Accordingly, the SDHS scale was divided into its theoretically predetermined component constructs and the effect of each component on the patient's age group was examined. Table 7c provides means and standard deviations of divided SDHS scores, and the effect that the patient's age group has on these divided constructs. From Table 7c it is clear that all the five SDHS components are significantly affected by age. Consequently, the fact that all the different components of SDHS are significantly impacted by the patient's age, hypothesis$_4$ has additional support.

Table 7c: Impact of Age on SDHS Component Scores.

SDHS Component	n	*Young*	*Elderly*	F	*p*
Know Yourself	200	12.970 ± 1.702	12.160 ± 2.141	8.773	0.003
Value Yourself	200	13.280 ± 1.970	12.530 ± 2.200	6.452	0.012
Plan	200	15.790 ± 2.276	14.980 ± 2.160	6.665	0.011
Act	200	20.870 ± 3.090	19.410 ± 3.032	11.373	0.001
Experience Outcomes & Learn	200	13.600 ± 1.975	12.590 ± 2.174	11.823	0.001

Note. Values are M ± SD.

Hypothesis$_5$

Hypothesis$_5$ states that SDHS scores among the elderly will be a function of their gender. As is clear from Table 8a, hypothesis$_5$ is neither supported among the elderly ambulatory nor among the elderly hospitalized patients. That is, the respective SDHS means are not significantly different among elderly males and females. Therefore, it appears that self-determination is not a function of gender among the elderly.

Table 8a: SDHS scores by Gender.

Variables	Age Group				Total Sample
	Young		*Elderly*		
Subsample Size	Ambulatory (n_1=50)	Hospitalized (n_2=50)	Ambulatory (n_3=50)	Hospitalized (n_4=50)	(n=200)
Criterion SDHS					
Predictor					
Female	80.86 ± 5.72	77.33 ± 7.27	73.18 ± 9.19	68.83 ± 8.51	75.16 ± 8.97
Male	74.07 ± 8.86	71.93 ± 8.40	75.23 ± 8.54	69.90 ± 10.00	72.67 ± 8.98
t	3.242	2.371	-0.807	-0.406	1.943
p	0.002	0.022	0.423	0.687	0.053

Note. Values are M ± SD.

However, hypothesis$_5$ is somewhat supported in relation to the young (Table 8a): that is, SDHS scores are significantly higher among the females both in the case of ambulatory (female mean = 80.86, SD = 5.72; male mean = 74.07, SD = 8.86; t = 3.242, p = 0.002) as well as in the case of hospitalized (female mean = 77.33, SD = 9.19; male mean = 71.93, SD = 8.40; t = 2.371, p = 0.022) patients. At the aggregate level (n = 200), female SDHS scores (mean = 75.16, SD = 8.97) are higher than among males (mean = 72.67, SD = 8.98) with t = 1.943 and p = 0.053.

Various explanations for this result may be proffered. There is, however, a possibility that the raw SDHS scores are unrelated to gender. Hence using ANCOVA the effects of independent variables such as age, education, and income on SDHS (Table 8b) were filtered out, and the residual SDHS began to show a stronger relationship to gender.

Table 8b: ANCOVA Analysis to study the effect of Gender on SDHS with Age Education and Income as Covariates (n = 200).

EXPERIMENTAL sums of squares Covariates entered FIRST					
Source of Variation	Sum of Squares	DF	Mean Square	F	*p*
Covariates	3897.273	3	1299.091	20.839	0.000
Age	316.112	1	316.112	5.071	0.025
Education	1010.690	1	1010.690	16.213	0.000
Income	542.954	1	542.954	8.710	0.004
Main Effects	193.105	1	193.105	3.098	0.080
Gender	193.105	1	193.105	3.098	0.080
Explained	4090.378	4	1022.595	16.404	0.000
Residual	12156.002	195	62.338		
Total	16246.380	199	81.640		
Covariates	Raw Regression Coefficient				
Age	-0.067				
Education	0.753				
Income	1.266				

Nevertheless as observed in Table 8b, at the aggregate level (n = 200), SDHS does not appear to be a function of gender ($F = 3.098$, $p > 0.05$). Speculating that gender could affect SDHS better when interacting with ethnic status, the same ANCOVA was run with age, education and income as covariates, and gender and ethnicity as independent variables (Table 8c). The results were not significant: main effects of gender on SDHS was $F = 2.891$, $p > 0.05$.

Table 8c: ANCOVA Analysis to study the effect of Gender and Ethnicity on SDHS with Age Education and Income as Covariates (n = 200).

EXPERIMENTAL sums of squares Covariates entered FIRST					
Source of Variation	Sum of Squares	DF	Mean Square	F	*p*
Covariates	3897.273	3	1299.091	21.323	0.000
Age	316.112	1	316.112	5.189	0.024
Education	1010.690	1	1010.690	16.589	0.000
Income	542.954	1	542.954	8.912	0.003
Main Effects	589.681	2	294.840	4.839	0.009
Gender	176.127	1	176.127	2.891	0.091
Ethnicity	396.576	1	396.576	6.509	0.012
2-Way Interactions	1.111	1	1.111	0.018	0.893
Gender Ethnicity	1.111	1	1.111	0.018	0.893
Explained	4488.066	6	748.011	12.278	0.000
Residual	11758.314	193	60.924		
Total	16246.380	199	81.640		
Covariates	Raw Regression Coefficient				
Age	-0.067				
Education	0.753				
Income	1.266				

The various components of SDHS scores could differently affect gender. Therefore, the effect of gender on each of the theoretically predetermined component constructs of the SDHS was examined. Table 8d provides means and standard deviations of the SDHS component scores, and the affect that patient's gender has on these

decomposed constructs.

As observed in Table 8d, gender has a significant impact (F = 4.779, p = 0.030) only on one of the SDHS components (Plan). Thus, overall, there is not much support for hypothesis$_5$.

Table 8d: Impact of Gender on SDHS Component Scores

SDHS Component	n	Male	Female	F	*p*
Know Yourself	200	12.772 ± 2.061	12.291 ± 1.821	2.951	0.087
Value Yourself	200	13.149 ± 2.058	12.581 ± 2.161	3.574	0.060
Plan	200	15.684 ± 2.191	14.988 ± 2.278	4.779	0.030
Act	200	20.316 ± 3.087	19.907 ± 3.213	0.830	0.363
Experience Outcomes & Learn	200	13.237 ± 2.023	12.907 ± 2.268	1.174	0.280

Note. Values are M ± SD.

Structural Equations Modeling of Determinants of SDHS Score

The predicted model (Figure 2) to test hypothesis$_6$ did not fit at the aggregate level as judged by the goodness of fit measures. Hence, assuming that the model would fit better among the elderly as opposed to the young, the SEM was run (Amos Version 3.6 for Windows, 1996) first on the elderly patients (n = 100), and then on the young patients (n = 100).

In order to achieve an acceptable level of goodness of fit, the model in Figure 2 was modified along the following lines:

1. Physical functional status was related to the measured variables ADL and IADL.
2. Ethnicity was made to relate to SDHS score independently. Hence, SES would be

related only to education and income.

3. The latent variable SES was allowed to correlate with the measured variable age.
4. The latent variable physical functional status was allowed to correlate with the measured variable age.
5. The two latent variables SES and physical functional status were allowed to correlate.
6. Gender was removed from the model.

The resultant model is depicted in Figure 4a and the specifications of the model are presented in Table 9a.

Table 9a: Model Specifications.

Variables	Number
Total in the Model	17
Observed	8
Unobserved	9
Exogenous	10
Endogenous	7

The measures of fit for the elderly model (Figure 4a) are presented in Table 9b.

Table 9b: Measures of fit for the Elderly Model (n = 100).

Fit Measures	
Chi-square (χ^2)	15.654
Degrees of freedom (*df*)	15
Probability level	0.405
Goodness-of-fit index (GFI)	0.964
Adjusted goodness-of-fit index (AGFI)	0.914
Comparative fit index (CFI)	0.997
Root mean square error of Approximation (RMSEA)	0.021 (CI 0.000, 0.098)

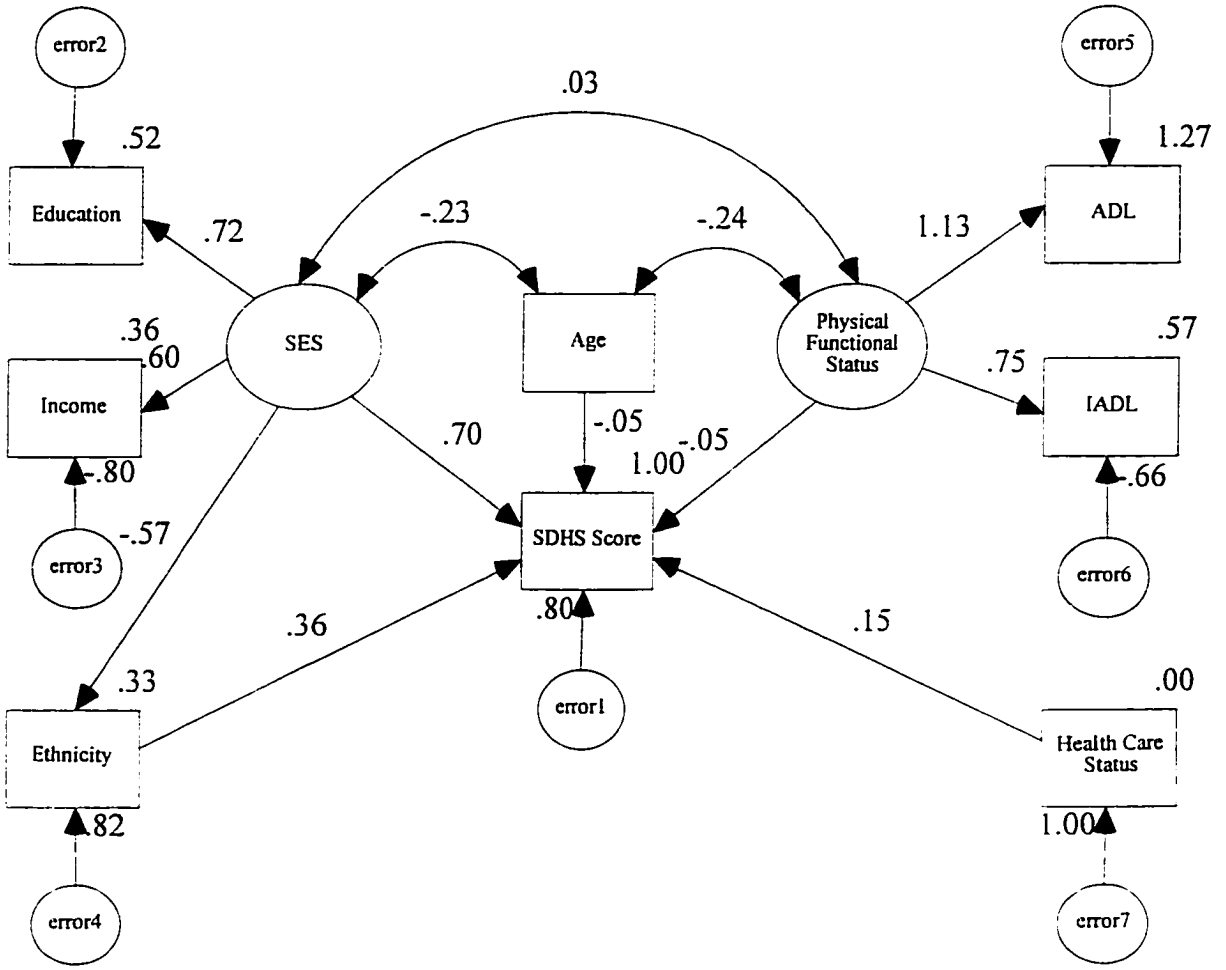

Figure 4a: A Model of Self-Determination among the Elderly in Health Care Decision-Making.

The covariance structure hypothesis is that $\Sigma = \Sigma(\theta)$. The overall fit measures help to assess whether this hypothesis is valid, and if not, they facilitate the measure of departure of Σ from $\Sigma(\theta)$. The Chi-square with 15 degrees of freedom (Table 9b) is not significant ($p > 0.05$), indicating a good fit of the model. The goodness-of-fit index (GFI), and the adjusted goodness-of-fit index (AGFI) are indices that measure the relative amounts of variance and covariance jointly accounted for by the model. They are considered to be robust against departures from normality. Values of GFI, AGFI and Comparative fit index (CFI) close to 1 indicate a good fit. The Root Mean Square Error of Approximation (RMSEA) is a good indicator of the error of approximation. Values between 0 to 1 are obtained for RMSEA. The closer to 0 the value of RMSEA obtained for a model, the better is the overall model fit (Bollen, 1989; Tabachnick & Fidell, 1996).

The measures of fit of the elderly model (Table 9b), if judged by this standard, are all within acceptable levels (Bagozzi & Youjae, 1988; Bollen, 1989; Tabachnick & Fidell, 1996). Therefore, the elderly model (Figure 4a) has a good fit. Major determinants of the SDHS score are SES (socioeconomic status), ethnicity, and health care status. Education and income are strong determinants of the latent variable SES. ADL and IADL are also strong determinants of the latent variable physical functional status. Age is a poor determinant. SES is negatively related to ethnicity, especially since the sample was predominantly made up of African Americans having lower income and education.

Maximum Likelihood Estimates (MLE) for the elderly model (Figure 4a) are presented in Table 9c. The Critical Ratio (CR) is obtained by dividing the MLE by the Standard Error (SE) and is relevant to the null hypothesis test. Any $CR > 1.96$ ($p < 0.05$)

is significant and rejects the corresponding null hypothesis.

Table 9c: Maximum Likelihood Estimates for the Elderly Model.

Regression Weights	MLE	SE	CR
Unstandardized			
Ethnicity - SES	-0.345	0.091	-3.786*
Education - SES	3.566	0.785	4.540*
SDHS Score - SES	8.199	2.576	3.183*
Income - SES	1.000		
ADL - Physical Functional Status	1.000		
IADL - Physical Functional Status	1.215	0.373	3.259*
SDHS Score - Ethnicity	7.068	2.929	2.413*
SDHS Score - Physical Functional Status	-0.284	0.485	-0.586
SDHS Score - Health Care Status	1.404	0.849	1.653
SDHS Score- Age	-0.067	0.128	-0.522
Standardized			
Ethnicity - SES	-0.571		
Education - SES	0.719		
SDHS Score - SES	0.700		
Income - SES	0.598		
ADL - Physical Functional Status	1.129		
IADL - Physical Functional Status	0.752		
SDHS Score - Ethnicity	0.364		
SDHS - Physical Functional Status	-0.048		
SDHS Score - Health Care Status	0.147		
SDHS Score - Age	-0.053		

*$p < 0.05$

The same modified model (Figure 4a) was applied to the young (n = 100). This self-determination model is depicted in Figure 4b and the measures of fit are presented in Table 9d.

Table 9d: Measures of fit for the Young Model (n = 100).

Fit Measures	
Chi-square (χ^2)	36.993
Degrees of freedom (*df*)	15
Probability level	0.001
Goodness-of-fit index (GFI)	0.920
Adjusted goodness-of-fit index (AGFI)	0.809
Comparative fit index (CFI)	0.840
Root mean square error of Approximation (RMSEA)	0.122 (CI 0.073, 0.172)

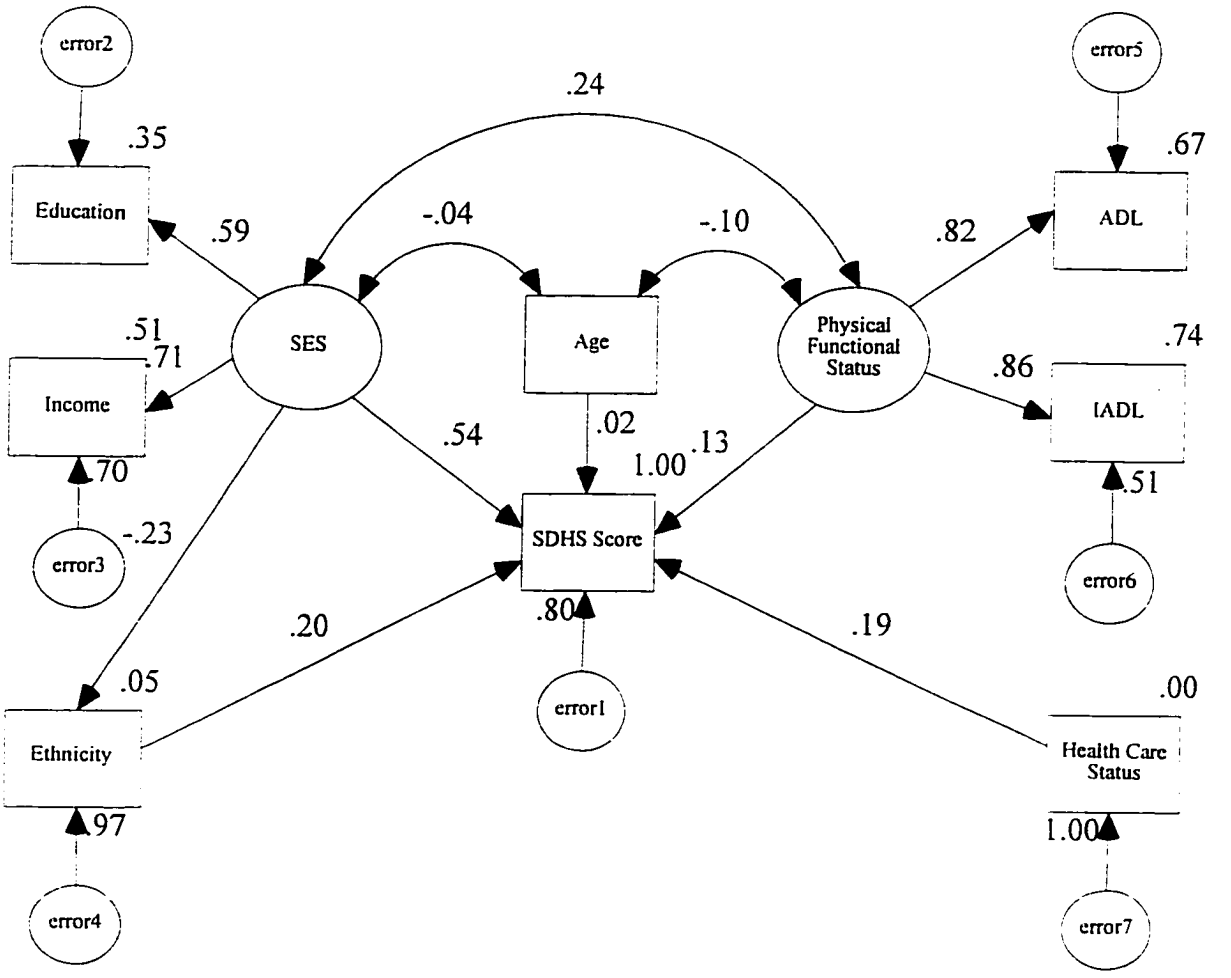

Figure 4b: A Model of Self-Determination among the Young in Health Care Decision-Making.

Table 9e: Maximum Likelihood Estimates for the Young Model.

Regression Weights	MLE	SE	CR
Unstandardized			
Ethnicity - SES	-0.097	0.056	-1.732
Education - SES	1.451	0.404	3.589*
SDHS Score - SES	3.902	1.226	3.184*
Income - SES	1.000		
ADL - Physical Functional Status	1.000		
IADL - Physical Functional Status	1.517	0.486	3.123*
SDHS Score - Ethnicity	3.462	1.685	2.054*
SDHS Score - Physical Functional Status	1.710	1.391	1.229
SDHS Score - Health Care Status	1.226	0.561	2.183*
SDHS Score - Age	0.020	0.090	0.224
Standardized			
Ethnicity - SES	-0.232		
Education - SES	0.594		
SDHS Score - SES	0.539		
Income - SES	0.714		
ADL - Physical Functional Status	0.817		
IADL - Physical Functional Status	0.859		
SDHS Score - Ethnicity	0.199		
SDHS Score - Physical Functional Status	0.133		
SDHS Score - Health Care Status	0.190		
SDHS Score - Age	0.020		

*$p < 0.05$

Table 9e provides the Maximum Likelihood Estimates for the young model (Figure 4b). It is clear from the measures of fit (Tables 9b and 9d) that the modified model fits better among the elderly than among the young. Obviously, the elderly are different.

CHAPTER V

DISCUSSION AND CONCLUSION

The two-fold purpose of this study was to evaluate, among the elderly, the impact of self-determination on their participation in health care decision-making and to model self-determination as a component of health care decision-making. The sample population in the study, generally, does represent the sociodemographics of the Detroit area in terms of gender and ethnicity.

The Self-Determination Health Scale, consisting of 92 items, had a high Cronbach's reliability coefficient α which demonstrates that the items in the scale have a high level of homogeneity. The scores of SDHS were normally distributed. Levene's test of homogeneity of variance provided support to the assumption that all the groups in this study were from populations with equal variances. No correction was resorted to in establishing statistical significance as they were mainly planned comparisons and the selected alpha level of 0.05 affords more power to detect a false null hypothesis than the more conservative alpha level of 0.01. Additionally, Sawilowsky and Blair (1992) demonstrated that the independent-sample *t* tests are reasonably robust to Type I error when sample sizes are equal (as in this study), when sample sizes are large, and when *t* tests are two-tailed than one-tailed.

It is clear from the results that the elderly have a relatively high level of self-determination, although, as anticipated, significantly lower than the young. Overall, the data suggest that self-determination is related to age, health care status and levels of education, income and physical functional disability. These findings are similar to those reported in another study (Cox, Miller, & Mull, 1987).

The positive correlation between the Self-Determination Health Scale and the Health Self-Determinism Index supports nomological validity of the SDHS. However, even though the correlation between the two scales was significant, the correlation was not of a high order and points to dissimilarities in constructs of the two scales. SDHS was modified from the Self-Determination Student Scale which was developed to measure self-determination among students in an educational environment. Consequently, this aspect of the SDHS scale offers scope for improvement and future research.

Functional assessment is critical because elders' ability to remain independent hinges on their ability to perform the activities of daily living (Applegate, Blass, & Williams, 1990; Mosqueda, 1993). There were few among the sample who had physical functional disabilities as measured by ADL and IADL. However, the SDHS scores obtained by the patients with disabilities were significantly lower than those obtained by patients without disabilities. This was, particularly, true among the young group of patients but not among the elderly. This appears surprising because the ADL and IADL scales, used to assess the physical functional status, were designed for the elderly. There is, however, the possibility that these scales are not very sensitive to small changes in functional status. Additionally, with advancing age and the gradual decrease in functional status, at times temporary (Pawlson & Parrott, 1997), there may not be a strong impact on the elderly individual's self-determination at a level detectable by SDHS. Wehmeyer (1996b) noted that people with disabilities relied on dependency-creating systems as a result of which many of them failed to reach maximum levels of independence.

Ambulatory patients scored significantly higher on the SDHS scale than the hospitalized patients. This was clear among the elderly as well as the young group of

patients. These findings are interesting as SDHS clearly discriminates between the status of a patient. The patient status, ambulatory or hospitalized, is directly related to disease severity as hospitalization generally occurs with increase in disease or illness severity of a patient. The ability of SDHS to discriminate between hospitalized and ambulatory patients may provide a health care professional an opportunity to detect and treat individuals at risk of hospitalization at an early stage. However, more studies are necessary.

The significant negative correlation between SDHS and age shows that self-determination decreases with advance in age. Although there was no correlation between SDHS and the two age groups, elderly or young, both the elderly ambulatory as well as hospitalized groups scored significantly lower in comparison to their young counterparts. This supports the discriminant validity of the SDHS.

In this research, the young females were noted to be more self-determined than the young males. However, the level of self-determination among the elderly was not different between genders. This gender difference among the young possibly reflects the fact that young women, especially during their child bearing age, are clinically at greater health risk than men (Braverman & Strasburger, 1997; Hibbard & Pope, 1986), and hence may be more health vigilant. If this means that younger women decide to seek health care more often than younger men, then it could imply that younger women exercise self-determination more often, and thus score higher on the SDHS than men.

The second finding has some indirect support in the literature. It is reported that with advances in age, both men and women are at equal risk, and that both genders seek equal amount of health care and social support (Dychtwald & Flower, 1989; Reichel,

1995; Rakowski & Pearlman, 1995). These factors may tend to equalize the SDHS scores among the elderly. Even though, in a previous study on motivation among the elderly (Cox, Miller, & Mull, 1987), gender differences were observed, with women consistently scoring higher than men., the authors were doubtful of the sample's responses being inflated due to the higher proportion of females in the study.

Structural Equations Model of Determinants of SDHS Score

The Structural Equations Model of the determinants of SDHS score (Figures 4a and 4b) supports the following conclusions: 1) There is a better fit of the Structural Equations Model for the elderly when compared with the young. Therefore, given the determinants, the SDHS has a better predicting capacity for the elderly. 2) The major determinant of SDHS score as judged by the Critical Ratios (CR) in Tables 9a and 9b, is SES, which in turn is determined by education, income and ethnic status. In general, current health care status and physical functional status do not significantly impact SDHS score. 3) Although, ADL and IADL significantly determine physical functional status, the latter does not directly impact SDHS. This is, possibly, due to the fact that the SDHS scores reflect long-term decision making of patients. Whereas, physical functioning, at times, reflects only present or temporary conditions of patients. 4) Health care administrators could use ethnic status, education and income levels of patients as significant predictors of patient SDHS scores. Further studies, to support and confirm the findings of this model, among other populations are necessary.

Internal Consistency of the SDHS

Although the internal consistency reliability and validity of the Self-Determination Student Scale (SDSS) has been established by the authors of the scale (Hoffman, Field, & Sawilowsky, 1995), the question naturally arises if the internal consistency reliability and validity of the modified scale, Self-Determination Health Scale (SDHS) can also be ascertained. This would not only establish the robustness of the SDSS in relation to audiences other than it was originally intended, but also prove the usefulness of SDHS as an extended SDSS.

Table 10: Assessing Reliability and Content Validity of the SDHS.

SDHS scale	N of items	Sample size	Cronbach's α
SDHS	92	200	0.855
Know Yourself	16	200	0.422
Value Yourself	16	200	0.575
Plan	19	200	0.512
Act	25	200	0.663
Experience Outcomes & Learn	16	200	0.592

Reliability is measured by the similarity of test-results provided by independent but comparable measures of the same object, or trait, or construct using maximally similar methods (Churchill, 1979; Churchill & Peter, 1984). Reliability assures that the measures used are dependable, that they are stable and robust across various testing conditions, test administrators methods, testing times, test duration, and so on. Evaluating the reliability of any measuring instrument consists of determining how much of the variation in test scores is due to inconsistencies in measurements. Several statistical measures of reliability are known in psychometry: the most used is Cronbach's coefficient

α (alpha). Therefore, Cronbach's standardized coefficient alpha was used to measure the reliability coefficient of SDHS as a whole, and its five components.

The Cronbach's standardized coefficient alpha used to measure reliability of the SDHS as a whole, and its five components are presented in Table 10. For scale development purposes α should be greater than or equal to 0.70 (Nunnally, 1978). Judged by this standard, SDHS is sufficiently reliable on the whole, but not among its five constitutive subscales.

Establishing Validity of SDHS

Validity, in general, establishes that the measure tested really measures the trait the instrument is meant to measure. Several validity measures are known: pragmatic validity, content validity, construct validity, convergent validity, discriminant validity, and nomological validity.

Pragmatic validity is a procedure that focuses on the usefulness of the measure as a predictor of some other characteristics of the individual; hence called "pragmatic". It ascertains how well the measures predict the criterion or characteristic; hence also called "predictive" validity. For example, if SDHS can best predict impending mental sickness or depression or any physical disease among the elderly, then the measure has predictive or pragmatic validity. If there is high correlation between SDHS and any specific behavior that is normally associated with lack of physical health, then the measure has pragmatic validity. Since ADL and IADL measure lack of physical functioning, significant correlation between SDHS and both ADL and IADL scores can support

pragmatic validity of SDHS. This is precisely what is stated in hypothesis$_2$, which was supported especially in the case of residual SDHS (that is, when the effects of age, income and education were filtered out from SDHS). This establishes the pragmatic validity of SDHS and also indicates the significance of hypothesis$_2$.

Content validity focuses on the adequacy with which the domain of the characteristic is captured by the measure. Thus, it tests whether the SDHS instrument has all the features, attributes or symptoms of the particular trait that self-determination is measuring. Content validity is also called "face validity" because one could "eye-ball" the measure to see if it has the usual domain of the trait measured.

The key to content validity is the procedures used to generate the items in the measure. Conceptually the trait self-determination is measured by five components (know yourself, value yourself, plan, act, and experience outcomes & learn) — five important dimensions which are considered adequate and complete for measuring self-determination. The measure of internal consistency Cronbach's alpha for these five components is used in order to establish content validity of the SDHS (Table 10). The Cronbach's alpha for the five components of SDHS ranged from 0.42 to 0.63. In general, for content validation of each of the subscales, a Cronbach's alpha of 0.70 and above is recommended (Nunnally, 1978). Content validation of the SDHS subscales therefore offers scope for further research.

Construct validity concerns with the question of what the instrument is, in fact, measuring (Peter, 1981). It tests what construct, trait, or concept underlies self-determination of a given respondent. If SDHS clearly exhibits the underlying construct,

then it has construct validity. It is necessary to ensure, through the plans and procedures used in constructing the instrument, that there is adequate sampling of the domain of the trait (content validity), and that there is internal consistency among the items of the domain (construct validity): the higher the correlation among the items of the test, the higher its construct validity.

Content validity answers the question: does it work? (i.e., does the measure predict the behavior related to the trait measured?) Construct validity answers the question: why does it work? (i.e., why does the measure predict the behavior related to the trait measured?) Construct validity is very difficult to establish, and yet is the most important of all the validity measures. Several construct validity measures have been developed. Three are most used: convergent, discriminant, and nomological validities.

Convergent validity is related to the correspondence in results between attempts to measure the same construct by two or more independent methods, whether they be different scaling techniques, or testing methods. If the same test score results despite multi-methods used, then SDHS has convergent validity. Hence the need to use different methods to evaluate SDHS (e.g., self-administered questionnaire, interviews, focus-group interviews; solicit instrument responses in writing, expressing, drawing and acting).

The data collection procedure used in this SDHS study was only by personal interviewing of the respondent patient in a clinic (ambulatory) or hospital (hospitalized). Consequently, the convergent validity of SDHS cannot be established using the multi-method variance approach. This is a direction for future research.

However, another approach to test for convergent validity is to check whether SDHS correlates significantly with other measures that also purport to measure self-

determination, such as its internal subcomponent scales. Table 11a provides the results of inter-component correlation matrix of SDHS on the entire sample population.

Table 11a: Construct Validity of SDHS (n = 200).

	Know Yourself	Value Yourself	Plan	Act	Experience Outcomes & Learn
Know Yourself	1.000	0.437	0.508	0.485	0.545
Value Yourself		1.000	0.504	0.546	0.442
Plan			1.000	0.519	0.487
Act				1.000	0.525
Experience Outcomes & Learn					1.000

All correlational coefficients significant at $p < 0.001$.

Table 11b: Construct Validity of SDHS among the Young (n = 100).

	Know Yourself	Value Yourself	Plan	Act	Experience Outcomes & Learn
Know Yourself	1.000	0.427	0.499	0.360	0.528
Value Yourself		1.000	0.536	0.459	0.310*
Plan			1.000	0.430	0.438
Act				1.000	0.377
Experience Outcomes & Learn					1.000

*Significant at $p = 0.002$; all other correlational coefficients significant at $p < 0.001$.

Table 11c: Construct Validity of SDHS among the Elderly (n = 100).

	Know Yourself	Value Yourself	Plan	Act	Experience Outcomes & Learn
Know Yourself	1.000	0.409	0.490	0.546	0.520
Value Yourself		1.000	0.445	0.591	0.506
Plan			1.000	0.572	0.493
Act				1.000	0.609
Experience Outcomes & Learn					1.000

All correlational coefficients significant at $p < 0.001$.

The results of inter-component correlation matrix of SDHS on the young participants and on the elderly participants are presented in Tables 11b and 11c,

respectively. All inter-component subscale correlations were significant at $p < 0.01$. Hence, SDHS has convergent validity.

A comparison between the Cronbach's alpha values obtained for the SDHS among the young and the elderly is presented in Table 12. Overall, the reliability of SDHS was higher among the elderly as evidenced by a Cronbach's alpha of 0.854 versus an alpha of 0.836 among the young.

Table 12: Assessing Convergent Validity of the SDHS (n=200).

SDHS scale	N of items	Cronbach's α	
		Young	*Elderly*
SDHS	92	0.836	0.854
Know Yourself	16	0.300	0.476
Value Yourself	16	0.522	0.610
Plan	19	0.564	0.447
Act	25	0.690	0.606
Experience Outcomes & Learn	16	0.568	0.583

Discriminant validity concerns the extent to which a measure is unique and not simply a reflection of other variables. In practice, discriminant validity is indicated by low correlations between SDHS and other measures that do not measure the same construct, unless both measures have high levels of method variance. In general, the higher the convergent validity of SDHS, the lower its discriminant validity.

In this research study, other instruments that do not measure self-determination were not included. Consequently, it is not possible at the present time to establish discriminant validity using this approach. Nonetheless, discriminant validity can also be established if SDHS can clearly discriminate between various groups. For example, in

this study, ambulatory or hospitalized patients, and young or elderly patients, were evaluated in terms of their theoretically expected SDHS scores. To the extent that $hypothesis_3$ is true, SDHS clearly distinguishes between the ambulatory and hospitalized respondent groups; $hypothesis_4$ shows discrimination of the SDHS by age as the young and elderly groups; and $hypothesis_5$ demonstrates discrimination of the SDHS by gender, especially among the young. Considering the fact that all these hypotheses were supported, as theoretically expected, helps establish the discriminant validity of SDHS. This fact also demonstrates the significance of testing these three hypotheses.

Nomological validity is a measure that relates to expectations of the measure. If it produces a pattern of relationships with other measures (both in signs and magnitude) as expected, or as prespecified by theory, then the SDHS has high nomological validity. The higher the reliability and convergent validity of SDHS, the higher its nomological validity (Peter, 1981). The fact that overall there was support for $hypothesis_1$, the Self Determination Health Scale correlated significantly and positively with the related health measure Health Self-Determinism Index, nomological validity of the SDHS is supported.

Interpreting the SDHS Scores

There are few studies that have evaluated self-determination in a health environment. SDHS is unique, and the SDHS scores may not be directly comparable with other self-determination scores obtained in previous studies. However, for interpreting the SDHS scores obtained in this research, and for a prospective user to get a better understanding of the self-determination scores as it relates to those obtained by others, a comparison is presented in Table 13. It is clear that the HSDI scores obtained in this

study are comparable to those of Cox, Miller, & Mull (1985). However, the scores obtained on SDSS by Eke (1996) are lower and may not be comparable to this research findings possibly due to the fact that the participants in the study were substance abuse individuals undergoing rehabilitation.

Table 13: A Comparison between SDHS and HSDI scores obtained in this study and previous studies.

Scale(Range)	Study	Participants	Setting	Sample Size	Mean ± SD	Range of Score
SDSS(0-92)	Eke (1996)	Adult Substance Abuse Individuals (19-63 years)	Detroit, Michigan	103	58.16 ± 11.43	26-79
SDHS(0-92)	This Study	Ambulatory & Hospitalized Patients (21-50 & 65+ years)	Detroit, Michigan	200	74.09 ± 9.04	45-89
SDHS(0-92)	This Study	Ambulatory & Hospitalized Elderly Patients (65+ years)	Detroit, Michigan	100	71.67 ± 9.24	45-89
SDHS(0-92)	This Study	Ambulatory & Hospitalized Young Patients (21-50 years)	Detroit, Michigan	100	76.51 ± 8.18	51-89
HSDI (0-85)	Cox, Miller, & Mull (1985)	Elderly (59-101 years)	Large City in Midwest	379	55.90 ± 8.30	35-85
HSDI (0-85)	This Study	Ambulatory & Hospitalized Patients (21-50 & 65+ years)	Detroit, Michigan	200	53.30 ± 8.76	30-75
HSDI (0-85)	This Study	Ambulatory & Hospitalized Elderly Patients (65+ years)	Detroit, Michigan	100	52.26 ± 9.07	30-73
HSDI (0-85)	This Study	Ambulatory & Hospitalized Young Patients (21-50 years)	Detroit, Michigan	100	54.35 ± 8.36	31-75

Summary

To summarize, it must be noted that the results of this psychometric study indicate that the preliminary evaluation of the Self-Determination Health Scale — the modified version of the Self-Determination Student Scale — was successful. The instrument, overall, demonstrates a high level of internal consistency reliability. Testing of the SDHS provided evidence that establishes the pragmatic, discriminant, convergent and nomological validities of the instrument. A model that predicts self-determination in health care decision-making among the elderly has been proposed. This model is supported by the empirical results both in terms of goodness-of-fit and parameter estimates. The parameter estimates are consistent with the empirical predictions derived from the proposed model.

Conclusions

There are a number of conclusions that can be drawn from this study:

1. The modified scale — Self-Determination Health Scale — shows promise as an health evaluation instrument. Nonetheless, as with any evaluation instrument in the early stages of development, the Self-Determination Health Scale must be used with utmost caution and discretion.
2. The Self-Determination Student Scale is a scale robust enough to be applied across non-student populations.
3. Proper administration of the Self-Determination Health Scale across other patient populations could further validate and improve the instrument.

4. The Self-Determination Health Scale may be used as a diagnostic tool for assessing psychologically perceived health status of patients especially in relation to their self-determination.
5. Patient scores on the Self-Determination Health Scale could facilitate better physician-patient communication and improved management of health education and health care of the patient.
6. Patient scores on the Self-Determination Health Scale may enable the physician to determine the level of competence or self-determination in order to execute advance-treatment directives.
7. The differential responses of the ambulatory versus hospitalized patients on the Self-Determination Health Scale would enable evaluation of individuals at risk of hospitalization (or developing severe health conditions).
8. The Self-Determination Health Scale scores of patients throughout their lifespan may be evaluated to detect changes in health behaviors.
9. Although the Patient Self-Determination Act became law on December 1, 1991 and the elderly patients that were evaluated have a relatively high level of self-determination, yet only 31% had any form of advance-treatment directives executed.
10. A model that predicts the self-determination in health care decision-making among the elderly from their age, ethnicity, income and education level, physical functional status and health care status was developed.

Appendix A

PERMISSION FORMS & LETTERS

Wayne State University
Human Investigation Committee

Medical Institutional Review Board
University Health Center, 8C
4201 St. Antoine Blvd.
Detroit, MI 48201
(313) 577-1628 Office
(313) 993-7122 Fax

Notice of Expedited Protocol Approval

To: Anil Aranha, MS. ABD, Internal Medicine
5C – University Health Center

From: Adnan S. Dajani, M.D, Adnan S. Dajani
Chairman, Human Investigation Committee

Date: May 27, 1997

RE: H 06-02-97(M01)-ER; Modeling Self-Determination Among the Elderly: A Psychometric Study of Health Care Decision Making (Departmental Funding)

The above protocol and revised consent form submitted on May 14, 1997, was **APPROVED** following Expedited Review by the Wayne State University Institutional Review Board (M01), for the period of May 27, 1997 through May 27, 1998.

This approval does not replace any departmental or other approvals, which may be required.

All changes or amendments to your protocol or consent form require review and approval by the Committee **BEFORE** implementation. You are also required to submit a written description (Adverse Reactions and Unexpected Events Form) for any unexpected, more frequent than expected, more severe than expected, or fatal events to the HIC office and appropriate regulatory agencies within 72 hours of the occurrence.

Federal regulations require that all research be reviewed at least annually. It is your responsibility to obtain review and approval of the Continuation Form before expiration of the approval. Approximately two months in advance of the due date for annual review, you will receive a letter of notification for annual review of your protocol. You will be requested to complete and submit a Continuation Form to the HIC office. Failure to submit a request for continuation will result in automatic suspension of the approval of your protocol.

CONSENT FORM

STUDY TITLE: Modeling self-determination among the elderly: a psychometric study of health care decision-making.

You are being asked to consent to participate in a study to evaluate your self-determination as it relates to your health care decision-making process. This project involves answering a self-determination questionnaire.

POTENTIAL BENEFIT: This study will facilitate an improvement in physician-patient communication and will also enable design of materials to educate patients in the health care decision-making process.

POTENTIAL RISKS: None. Your participation will require you to answer a questionnaire so that we can evaluate your level of self-determination and we will also assess your physical and mental status.

In the unlikely event of any injury resulting from the research, no reimbursement, or compensation will be offered by Wayne State University. All information collected in this study will be confidential. You will not be identified personally in any publication that may result from this study. Your participation is voluntary, and you have the right to withdraw from the study at any time without any effect on your present or future medical care. You will receive a copy of this signed consent form for your records.

You have the right to ask questions about the study at any time. You may contact any of the investigators/doctors conducting the study whose names appear below.

Anil Aranha, MS, ABD (313) 577-0366
Lavoisier Cardozo, MD (313) 577-2868

If you have any questions regarding your rights as a research participant, you may contact Adnan Dajani, MD, Chairman of the Human Investigation Committee at (313) 577-1628.

_____ _____
Volunteer Signature Date

_____ _____
Witness' Signature Date

_____ _____
Investigator's Signature Date

APPROVED

MAY 2 7 1997

WAYNE STATE UNIVERSITY
HUMAN INVESTIGATION COMMITTEE

Wayne State University

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339 Education Building
Detroit, Michigan 48202
October 27, 1997

Anil Aranha
5-C W.S.U. Health Center
Department of Internal Medicine
Wayne State University
Detroit, MI 48201

Dear Mr. Aranha:

The purpose of this letter is to give you permission to modify the Self-Determination Student Scale to assess the self-determination of the elderly in relation to their health care. The name of the modified instrument will be the Self-Determination Health Scale (SDHS). I understand that you intend to use the SDHS in your dissertation: Modeling Self-Determination Among the Elderly: A Psychometric Study of Health Care Decision-Making.

Sincerely,

Alan Hoffman, Ed.D.
Associate Professor

Sharon Field, Ed.D.
Associate Professor (Research)

Shlomo Sawilowsky, Ph.D.
Professor

Division of General Internal Medicine

DMC The Detroit Medical Center

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October 30, 1997

Dr. Michael Benz
Coeditor
Career Development for Exceptional Individuals
University of Oregon
Eugene, OR 97403

Re: **Permission to reproduce copyrighted material**

Dear Dr. Benz,

I am writing to request permission to reproduce copyrighted material from the article: Field, S., & Hoffman, A. (1994). Development of a model for self-determination. *Career Development for Exceptional Individuals*, 17(2), 159-169.

I am specifically requesting permission to reproduce the Figure 1: Self-Determination, published on page 165 in my Doctoral Dissertation entitled *Modeling self-determination among the elderly: A psychometric study of health care decision-making*. The dissertation is being submitted to the Graduate School of Wayne State University for the Doctor of Philosophy degree in Evaluation and Research and will be copyrighted.

Thank you. I look forward to hearing from you.

Yours Sincerely,

Anil Aranha, MS, ABD

Request approved as stated in this letter.

Michael R. Benz, Co-Editor

Appendix B

INSTRUMENTS

Self-Determination Health Scale

Directions: Read each statement carefully. If the statement describes you or your beliefs, place an "X" in the circle (O) labeled "**That's me.**" If the statement does not describe you or your beliefs, place an "X" in the circle (O) labeled "**That's <u>not</u> me.**"
The term ***Doctor*** whenever stated refers to all Health Care Providers including Physicians, Physician Assistants, and Nurse Practitioners.
For example, if the statement below describes you, an "X" is placed in the circle "**That's me.**"

	That's me	That's <u>not</u> me
A. I always prefer eating healthy foods.	⊗	O

	That's me	That's <u>not</u> me		That's me	That's <u>not</u> me
1. I am a dreamer.	O	O	10. I can only think of one way to get something I want.	O	O
2. I know what is important to me.	O	O	11. I can be successful even though I have weaknesses.	O	O
3. I have the right to decide what I want to do.	O	O	12. I can figure out how to get something if I want it.	O	O
4. When I do <u>not</u> get something I want, I try a new approach.	O	O	13. Sometimes I need to take risks.	O	O
5. I forget to take care of my needs when I am with my friends.	O	O	14. I do <u>not</u> have any goals for my physical well-being this year.	O	O
6. To help me the next time, I evaluate how things turned out.	O	O	15. I would <u>not</u> practice in my mind giving a speech to a group of people because it would just make me nervous.	O	O
7. There are <u>no</u> interesting possibilities in my future.	O	O	16. I do <u>not</u> know my weaknesses.	O	O
8. Nothing is important to me.	O	O	17. My weaknesses stop me from being successful.	O	O
9. No one has the right to tell me what to do.	O	O	18. I do things without making a plan.	O	O

	That's me	That's not me
19. I know my strengths.	O	O
20. I do not know where to find help when I need it.	O	O
21. It is a waste of time to reflect on why things turned out the way they did.	O	O
22. I dream about what my life will be like after I am healthy.	O	O
23. I tell others what I want.	O	O
24. If I want something, I keep at it.	O	O
25. I think about how I could have done something better.	O	O
26. I make decisions without knowing if I have options.	O	O
27. I forget to think about what is good for me when I do things.	O	O
28. I am frequently surprised by what happens when I do things.	O	O
29. I am too shy to tell others what I want.	O	O
30. I am too scared to take risks.	O	O
31. Criticism makes me angry.	O	O
32. I am embarrassed when I succeed.	O	O
33. I explored many options before choosing this doctor/treatment.	O	O
34. I prefer to negotiate rather than to demand or give in.	O	O
35. I would rather have the doctor tell me what foods to eat than select foods on my own.	O	O
36. I am unhappy with who I am.	O	O
37. My life has no direction.	O	O
38. I imagine myself failing before I do things.	O	O
39. I like to know my options before making a decision.	O	O
40. I think about what is good for me when I do things.	O	O
41. Before I do something, I think about what might happen.	O	O
42. My friends are lucky to know me.	O	O
43. I know what goals I am working toward for my physical well-being.	O	O
44. Doing well taking the prescribed medication/ treatment does not make me feel good.	O	O
45. When I want something different from my friend, we find a solution that makes us both happy.	O	O
46. It is important for me to know what I do well in being a good friend.	O	O

	That's me	That's not me
47. In an argument, I am responsible for how I act on my feelings.	O	O
48. I wish someone would tell me what to do to feel healthy again.	O	O
49. I like who I am.	O	O
50. Goals give my life direction.	O	O
51. I imagine myself being successful.	O	O
52. Personal hygiene is important to me.	O	O
53. My experiences with my doctor will not affect my choice of health care in the future.	O	O
54. When I am with friends, I tell them what I want to do.	O	O
55. If I am unable to solve a puzzle quickly, I get frustrated and stop.	O	O
56. I make changes to improve my relationship with my family.	O	O
57. I do not know if my parents' beliefs are important to me.	O	O
58. If I need help with a health problem, I can figure out where to get it.	O	O
59. I am easily discouraged when I fail.	O	O
60. I do things the same way even if there might be a better way.	O	O
61. I know what is important when choosing my friends.	O	O
62. I could not describe my strengths and weaknesses related to my health.	O	O
63. I like to solve puzzles.	O	O
64. Nothing good could come from admitting to myself that I am having difficulty with my treatment.	O	O
65. At the end of the treatment period, I compare my health to what I expected.	O	O
66. It is silly to dream about what I will do when I am healthy again.	O	O
67. I do not participate in community activities because I have nothing to contribute.	O	O
68. I accept some criticism and ignore some.	O	O
69. I give in when I have differences with others.	O	O
70. I do not look back to judge my performance.	O	O

	That's me	That's not me
71. I tell my friends what I want to do when we go out.	O	O
72. I know how to compensate for my physical/health weaknesses.	O	O
73. I ask directions or look at a map before going to a new place.	O	O
74. I like to be questioned by my doctors.	O	O
75. When I am angry with my friends, I talk with them about it.	O	O
76. I like it when my friends see me do well.	O	O
77. When going through the doctor/hospital list, I pick the first one.	O	O
78. I know how to get help when I need it.	O	O
79. I prefer to flip through pages, rather than to use the index.	O	O
80. I think about how well I did something.	O	O
81. I do not volunteer information to my doctor because I will be embarrassed if it did not apply.	O	O
82. I do not know where to get help to decide which activities are appropriate when I am healthy again.	O	O
83. If my friends criticize something I am wearing I would not wear it again.	O	O
84. I do not like to review my medical test results.	O	O
85. Before I talk to my doctor, I go over it in my mind.	O	O
86. I talk about people without considering how it might affect them.	O	O
87. I feel proud when I succeed.	O	O
88. When we are deciding what to do, I just listen to my friends.	O	O
89. When deciding what to do with my friend, it is not possible for both of us to be satisfied.	O	O
90. When I want to improve my health, I do my best until I get better.	O	O
91. If my health recovers, there is nothing to be gained by reviewing my health care.	O	O
92. Before starting any job or physical activity, I think about how it might affect my health.	O	O

Respondent's Sociodemographic Information

(Mark a "x" in the box that applies to you)

Birth Date: ___/___/___ Age:_____ Gender: []Female []Male Education: Years of Schooling: _____

Highest Degree: []None []High School []Trade/Technical []Associate's []Bachelor's []Master's []Doctoral []Other

Ethnicity: []African American []Asian American []Caucasian []Hispanic []Native American []Other _____

Marital Status: []Married []Separated/Divorced []Widowed []Never Married

Occupation: []At Home []Unskilled []Secretarial []Supervisory []Sales []Technical []Self-employed []Other

Annual Household Income (US$): []up to 15,000 []15,001-30,000 []30,001-45,000
[]45,001-60,000 []60,001-75,000 []75,001+

Health Insurance: []Medicare []Medicaid []BC/BS []HMO_____ []PPO _____ []Self-Pay []Other _____

Do you: 1) Smoke []Yes []No 2) Consume Alcohol []Yes []No 3) Exercise regularly []Yes []No

Advance Directives (Health Proxy): []Not Executed []On Medical Record []Other _____

In case of a life threatening condition would you consider being placed on:
1) An Artificial Respirator []Yes []No 2) Dialysis Machine []Yes []No

When I have to decide between the length of life versus the quality of life, I prefer:
1) length of life regardless of the quality of life [] 2) quality of life regardless of the length of life []

To be recorded by the Doctor Health Care Provider:_____

Patient Status: []Ambulatory []Hospitalized Annual Physical Exam: []Yes []No

Hospitalization:
1) Date: ___/___/___ # of Days:_____ Diagnosis: 1)_____ 2)_____ 3)_____

Diagnosis List:

1) Cardiac:	[]CHF	[]CAD	[]Syncope	[]Arrhythmia
2) ID:	[]UTI	[]Abdominal Abscess	[]Pneumonia	[]Cellulitis
3) Endocrine:	[]Diabetes	[]Diabetes Ketoacidosis	[]Hypothyroidism	
4) GI Tract:	[]Bleeding	[]Inflam. Bowel Disease	[]Diverticulitis	[]Gastritis
5) Hepatic:	[]Cirrhosis	[]Hepatitis	[]Pancreatitis	
6) Pulmonary:	[]COPD	[]Asthma	[]Pneumonia	
7) Neurology:	[]Seizure	[]Dementia	[]Depression	[]CVA
	[]Parkinson	[]Neuropathy		
8) Oncology:	[]Lung Cancer	[]Head & Neck Cancer	[]Lymphoma	[]GI Cancer
	[]Breast Cancer	[]Leukemia	[]Other Cancer	
9) Renal:	[]Acute RF	[]Chronic RF		
10) Rheumatology:	[]Rheumatoid	[]Osteoarthritis		
11) Nutrition:	[]Anemia	[]Anorexia		
12) Bone:	[]Osteoporosis	[]Hip Fracture	[]Spine Fracture	
13) Other:	[]Incontinence	[]_____		

SDHS

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ABSTRACT

MODELING SELF-DETERMINATION AMONG THE ELDERLY: A PSYCHOMETRIC STUDY OF HEALTH CARE DECISION-MAKING

by

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***Background & Purpose*:** Self-determination (SD) is an important aspect of patient care and decision-making. The two-fold purpose of this study among the elderly was: 1) to evaluate the impact of SD on their participation in health care (HC) decision-making, and 2) to model SD as a component of HC decision-making.

***Methods*:** A total of 200 participants — 100 each elderly (65 years or older) and younger (21-50 years) group, made up of 50 each ambulatory and hospitalized individuals — were selected using a systematic randomized selection technique from among the patients provided HC at Detroit Medical Center, Detroit, Michigan. The participants were administered the Self Determination Health Scale (SDHS), the Health Self-Determinism Index, the Activities Daily Living (ADL), the Instrumental ADL, and the Sociodemographic instruments. Statistical significance was established at a nominal α level of 0.05.

***Results*:** Preliminary evaluation of the SDHS — the modified version of the Self-Determination Student Scale (SDSS) — was successful. Testing of the SDHS instrument

demonstrated a high level of internal consistency reliability and provided evidence that establishes the pragmatic, discriminant, convergent and nomological validities. The elderly have a high level of SD, although, significantly lower than the young. Overall, the data suggest that SD is related to age, HC status and levels of education, income and physical functional disability. A model that is supported by the empirical results both in terms of goodness-of-fit and parameter estimates and predicts SD in HC decision-making among the elderly has been proposed.

Conclusions: The SDHS shows promise as an health evaluation instrument. The SDSS is a scale robust enough to be applied across non-student populations. The SDHS may be used as a diagnostic tool for assessing psychologically perceived health status of patients especially in relation to their SD. Patient's SDHS scores could facilitate better physician-patient communication, improved management of health education and HC of the patient, and also enable the physician to determine the level of competence or SD in order to execute advance-treatment directives (AD). The differential responses of the ambulatory versus hospitalized patients on the SDHS would enable evaluation of individuals at risk of hospitalization. The SDHS scores of patients throughout their lifespan may be evaluated to detect changes in health behaviors. Although the Patient Self-Determination Act became law on December 1, 1991 and the elderly patients that were evaluated have a relatively high level of SD, yet only 31% had any form of AD executed. A model that predicts the SD in HC decision-making among the elderly from their age, ethnicity, income and education level, physical functional status and HC status was developed.

AUTOBIOGRAPHICAL STATEMENT

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Anil N. F. Aranha manages geriatric research projects in the Department of Internal Medicine at Wayne State University School of Medicine, Detroit, Michigan. He received a BS (Chemistry, 1981), and an MS (Biochemistry, 1985) from the University of Bombay, India; an MLS (Technology Management, 1990) from Eastern Michigan University, Ypsilanti, Michigan. He recently obtained from Wayne State University an MS (Nutrition & Food Science, 1994) from the College of Science, and a Graduate Certificate (Community Health Services Research & Evaluation, 1995) from the School of Medicine. He has, with the Public Lecture Presentation-Defense of this Dissertation, fulfilled the requirements for a PhD (Evaluation & Research, December 1997) from Wayne State University. He also received training in Radiological Health & Radiation Safety at Wayne State University. His Doctoral Dissertation research project entitled *Modeling self-determination among the elderly: A psychometric study of health care decision-making*, was awarded the Blue Cross Blue Shield of Michigan Foundation 1997 Student Award Program Grant. He also has to his credit many presentations and publications in the field of health care. Among his recent articles are *A Scale for Assessing Multicultural Ethical Sensitivities to Information Disclosure of HIV/AIDS and Cancer*, and *Improving Preventive Health Care in a Medicine Resident Practice*. His research interests include community health education, health care utilization, health outcomes, patient satisfaction, and medical intervention cost-effectiveness. He is actively involved in community service and is a member of a number of professional, social, and cultural organizations.