

THE EFFECT OF PHYSICAL ACTIVITY ON PERCEIVED COMPETENCE,
LOCUS OF CONTROL AND SELF-ESTEEM IN ELDERLY INDIVIDUALS
WITH MENTAL RETARDATION.

BY

JENNIFER B. MACTAVISH

A Thesis

Submitted to the Faculty of Graduate Studies
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ABSTRACT

The objective of this study was to determine the effect of physical activity on elderly mentally retarded individuals' perceptions of competence, locus of control and self-esteem. A sub-problem was to assess the appropriateness of currently existing instruments as data collection devices with an elderly retarded sample.

Twenty-six older mentally retarded subjects (12 females and 14 males, M age = 55.4, $S.D.$ = 7.5) volunteered to participate in this study. A matched-random assignment procedure was used to derive an experimental ($n = 13$) and a control ($n = 13$) condition. Those assigned to the experimental group participated in a five week activity program designed to facilitate individual choice and responsibility. Data collection interviews were conducted with each subject, in both conditions, before and after the activity intervention.

Results of the reliability measures, on each dependent measure, were well within the acceptable ranges. The analyses of covariance suggested that physical activity may provide a vehicle through which older retarded individuals can exercise an element of control in their lives; and thus enhance their perceptions of competence [$F(3, 22) = 98.200, p < .0001$], locus of control [$F(3, 22) = 126.264, p < .0001$] and self-esteem [$F(3, 22) = 7.86, p < .01$].

The experimental subjects' improvements appeared, in large, to be determined by the success with which the program facilitated control through the decision making process. Thus, to enact psychological change, physical activity or for that matter any other form of programming, must provide the older retarded individual with the opportunity to exercise the fullest degree of control possible.

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CHAPTER 1

Introduction

The psychological benefits to be derived from participation in physical activity has been subject to systematic investigations by researchers such as Crandall (1977), Driver and Knopf (1977), and Tinsley (1978). Unfortunately, the previous research has primarily focused on college-aged and adult participants. Information regarding the psychological benefits older individuals gain from physical activity remains limited.

However, a cursory review of recent research suggests that active participation is conducive to psychological well-being in later life (e.g. Casady, 1975; Nystrom, 1974; Palmore & Kivett, 1977). DeCarlo (1974) reported a positive correlation between leisure participation, which included physical activity, and criteria for successful aging. In other words, the more active the individuals were in physical recreation, the greater their psychological well-being or the more successful their aging.

Thus, emerging is an indication of the positive effect active participation has on the quality of life enjoyed by older individuals. However, further exploration is required. Searle (1989) has noted that there is insufficient information on the effect recreation participation has among the elderly with respect to specific psychological variables such as perceived competence, locus of control and self-esteem. In addition, further study on the utility of leisure as a means to influence psychological well-being must be expanded to include different types of activities and populations (Searle, 1989).

Drawing on these concerns, this investigation focused on the elderly mentally retarded population in an attempt to determine the effect physical activity has on perceived competence, locus of control and self-esteem.

To date, research on the psychological effects of the recreation experience have been confined to "normal" elderly individuals and, to a lesser extent, elderly individuals with mental health problems. Similarly, related investigations in the field of mental retardation focus on the child, adolescent or young adult. Thus, both bodies of inquiry have neglected to question the potential impact physical activity may have on the psychological well-being of elderly people with mental retardation. The significance of this neglect is apparent in light of what is currently known about the elderly mentally retarded and the role perceived competence, locus of control and self-esteem plays in successful aging.

The mentally handicapped population, like the populace as a whole, is an aging one; but unlike the general population relatively little is known about the aged individual with mental retardation. This is not surprising for until recently retarded people generally did not live into their elderly years. Comparing two studies, conducted many years apart, demonstrates this increased life expectancy for the retarded population (Balakrishnan & Wolf, 1976; Dayton, Doering, Hilferty, Maher, & Dolan, 1932). In the 1932 study, 28% of persons studied, at age 10, survived to age 60; in the 1976 study 40% survived to age 60. The trend suggests that over 40% of mentally handicapped people will likely survive to age 60; a percentage that is still lower than that for the general population (Carter & Jancar, 1983; Tait,

1983). Evidence also suggests that mentally handicapped women, ambulatory persons, non-Down's Syndrome individuals, the less severely retarded, and those residing in the community have the greatest life expectancies (Janicki & Jacobson, 1985). Others have noted that the average life expectancy of individuals with Down's Syndrome has also risen; from approximately 10 years in the 1930's to a current mean of over 50 years (Carter & Jancar; Janicki, 1986; Janicki & Wisniewski, 1985; Richards & Siddiqui, 1980). In other words the life expectancy of individuals with mental retardation has increased significantly over the past forty years.

The obvious result of increasing life expectancy is a growing elderly population. The growing number of elderly mentally retarded individuals in our society is well documented (Janicki, 1986; Sayder & Wollner, 1974; Seltzer, 1985; Walz, Harper, & Wilson, 1986). However, the presence of increasing numbers of elderly retarded individuals has not gained much attention from researchers. A cursory examination of the number of investigations specifically related to the gerontology of mental retardation suggests that study of this area has only begun in the past 15 years, with a clear trend toward expanding interest occurring in recent years. In fact, in the 30 year period from 1943 to 1975, only 14 articles were published. In contrast, 17 articles were published in 1985 alone (Sison & Cotten, 1989).

Much of the recent attention has focused on the service delivery needs of the elderly retarded population. Principles of normalization, or more specifically, deinstitutionalization toward the least restrictive living environment has significantly influenced the direction of this research. Thus, investigations of the service delivery needs of the

aged mentally retarded have been limited, almost exclusively, to the question of appropriate residential placement (Sison & Cotten, 1989). Clearly, research pertaining to the need for appropriate living conditions is important; however, it is also important to consider factors which extend beyond the provision of life sustaining essentials.

One such factor, noted by Sison and Cotten (1989) as a caveat to appropriate living considerations, is the need for day programs that accommodate the needs of aged individuals with mental retardation. In the United States the nature and quality of existing day placements has received perfunctory attention amidst discussions pertaining to residential placement issues. To date, the question of suitable day programming has not been examined by researchers in Canada. However, at least one concern raised by American based research is equally appropriate and important within the Canadian context. Specifically, the concern has been whether compulsory day program attendance, initially developed in reference to infant and school aged individuals, should be applied to the elderly retarded population. For example, should a 65-year-old resident of an institution be required to attend hours of daily developmental programming when his/her real desire is to "retire" like his/her community living counterpart? Unfortunately, critics of the current developmental day programmes have not offered any workable solutions; nor have they expanded their focus to considered noninstitutionalized retarded individuals who may, or may, not have access to any form of programming.

The reason for this absence of alternative programming suggestions is unclear when literature pertaining to the generic aging population is considered. As previously stated, participation in

physical activity is gaining recognition as a positive influence on the psychological well-being of older individuals; and as such is becoming an increasingly important component of service delivery for the normal elderly (Kaplan, 1979; McNeil & Teague, 1987). Therefore, is it possible that active participation could also have a positive influence on the psychological well-being of aged retarded individuals? If this could be substantiated, is it possible that physical recreation programs could provide a viable solution to the elderly retarded's need for appropriate programming? In addition and perhaps of greater significance, could physical activity lend quality to the additional years and not simply add years to life (Havighurst, 1961).

Prior to advancing active recreation programming as a positive alternative to the developmental day placements currently accessible to the elderly retarded population it is important that the link between perceived competence, locus of control, self-esteem and successful aging be established. Attribution theory successfully bridges these constructs. Based on the attribution theory of behavior it is posited that people, young and old, constantly seek to find meaning in human behavior (Weiner, 1980). Meaning is sought by attempting to find the causes of behavior. There are two main styles of attributing causality: internal or dispositional attributions - those behaviors that are caused by qualities inherent to the person (e.g. ability); and external or environmental attributions - those behaviors that are the result of situational factors (e.g., luck). The theory further suggests that the primary reason that individuals attempt to find causes of behavior is to exercise control over the environment (MacNeil & Teague, 1987). People feel most in control when behavior can be

attributed to internal qualities because they imply personal causation which produces feelings of competence and self-worth. Conversely, people feel a lack of control when external qualities are believed to govern behavior which may result in feelings of incompetence, helplessness and a lack of self-worth. When attribution theory is applied to the elderly, as posited by MacNeil and Teague, the attributional style used to explain behavior may provide the basis upon which the aging process can be defined as healthy or unhealthy.

Although not specifically concerned with causal attributions studies by Langer and Rodin (1976), Rodin and Langer (1977), and Shary and Iso-Ahola (1989) support the contention that attributional style does influence the aging process. Specifically, they found clear evidence of the impact increased responsibility and control have on attributions of perceived competence, locus of control and self-esteem. This research is also significant in that it was through the provision of recreation participation choices that the enhanced levels of responsibility and control were facilitated. In short, these studies suggest the potential utility of recreation as a means to positively influence the manner in which attributions are ascribed. Having established initial support for the positive effect recreation participation has on perceived competence, locus of control and self-esteem, it is now possible to consider how these applications extend to the elderly retarded population.

Research on the psychological benefits to be gained by elderly mentally retarded participants in physical activity is virtually nonexistent. No doubt this is, at least in part, the result of a lack of instrumentation validated for data collection in the psychological

domain with this population. However, the limited amount of research that has been done with younger retarded cohorts suggests promise for the utility of activity with older individuals.

Gibbons and Bushakra (1989) examined the changes in perceived competence of 24 nine to thirteen year-old participants in a Special Olympics track and field meet. As hypothesized, the participants scored significantly higher on post-test ratings of perceived competence when compared to the non-participants control group. In a similar study, Wright and Cowden (1986) investigated changes in self-concept and cardiovascular endurance of twenty-five 12 to 18 year-old participants in a ten-week Special Olympics swimming program. Comparison of the swimmers to the non-swimmers suggested that the program contributed significantly to the enhancement of self-concept and cardiovascular endurance. These studies provide initial support for the notion that involvement in activity has a positive psychological effect on mentally retarded participants.

However, the extent to which Gibbons and Bushakra (1989) and Wright and Cowden (1986) findings are applicable to the elderly retarded population remains to be determined. Additionally, future research must consider the possibility that additional factors may moderate the effect activity has on psychological variables. Research on the effect active participation has on older adults supports the veracity of this contention. The following variables, among others, have been suggested as possible mediating factors: gender, age, employment status and past activity experience (DeCarlo, 1974; Iso-Ahola, 1980; Palmore, 1979; Riddick, 1985). This issue has not been

addressed by physical activity researchers in the field of mental retardation.

Thus, unknown is whether factors which mediate the psychological effect of activity with non-retarded older adults would similarly affect elderly retarded adults. Also unknown is whether variables specific to these elderly individuals may also moderate the effects of activity on psychological attributions. One possible example of such a variable may be residential placement. This suggestion stems from the notion that attributions of perceived competence, locus of control and self-esteem may, or may not, be as dependent on an individual's living environment as they are on the presence or absence of physical activity (Iso-Ahola, 1980). In other words, the effect of physical activity on the psychological attributions of an individual may differ on the basis of family, group home or independent residency.

A second example of a variable that may mediate the effect of physical activity on psychological attributions is whether or not the individual has Down's Syndrome. Evidence cited earlier in this chapter suggests that individuals with Down's Syndrome have a lower life expectancy than those with retardation stemming from other causes (Carter and Jancar, 1983; Janicki, 1986; Janicki & Wisniewski, 1985; Richards & Siddiqui, 1980). Additionally, Down's Syndrome individuals typically have lower levels of fitness than other retarded persons. These lower levels of fitness are generally thought to be the result of anatomical and physiological problems (Cratty, 1980) which are further exacerbated by a lack of motivation to exercise strenuously (Bennett, Eisenman, French, Henderson, & Shultz, 1989). Will this lack of motivation be another variable on which subjects with Down's

Syndrome differ; thereby effecting the participation of Down's subjects in this study? Will lower levels of motivation, which is an integral component of competence, moderate the impact physical activity has on the psychological domain with Down's Syndrome subjects? In subsequent investigations this factor in concert with type of residential placement, gender, age, employment status and past activity experience must be considered and controlled as they represent potential sources of extraneous variance.

In summary, research pertaining to the elderly retarded is in its infancy and has yet to address the role physical activity may play in psychological well-being in later life. On the other hand, emerging from general gerontological research is an indication of physical recreation's potential as a means to enhance attributions of perceived competence, locus of control and self-esteem. Clearly what is needed is research that extends current knowledge of the normal elderly to other populations. It was these notions that provided the basis on which the following investigation was conducted.

Statement of Problem

The purpose of this investigation was to determine the effect of a physical activity program on elderly retarded individuals attributions of perceived competence, locus of control and self-esteem. The dearth of research which has investigated the relationship between elderly retarded subjects, physical activity and psychological constructs resulted in the exploratory nature of this study.

The lack of supporting research also provided limited insight regarding what instrumentation was appropriate for the questions and

population of interest. Thus, a sub-problem in this investigation was to extend support for the utility of the Perceived Leisure Competence Scale (Witt & Ellis, 1987), the Perceived Leisure Control Scale (Witt & Ellis) and Rosenberg's (1965) Self-Esteem Scale as data collection devices with an elderly retarded population. The reliability estimates associated with both stability and internal consistency were calculated and reported for each of these dependent measures.

Operational Definitions

The following were used to clarify the parameters of this investigation:

Mental Retardation

Information regarding the clinical assessments of individuals with mental retardation was not accessible. Thus, in place of a clinical definition a functional definition of retardation was used for the purposes of this study. Subject's were considered mentally handicapped on the basis that they retained the status of "client" in a provincially funded workshop for the retarded; or were indentified as retarded by the Province of Manitoba's Health and Family Services department.

Elderly

Defining the term "elderly" as it applies to the mentally retarded population has been subject to much debate. Some employ guidelines based on chronological age while others prefer a definition based on an individual's functional ability (Seltzer, 1985). For example, evidence of earlier onset of Alzheimer's disease, especially in

individuals with Down's Syndrome, suggests that functional ability over chronological age may more accurately define "elderly" in this context (Dickerson, Hamilton, Huber, and Segal, 1979). Integrating elements from both arguments, non-Down's individuals 55 and up were considered elderly as were Down's individuals 40 and up.

Past Activity Experience

To control for the possibility of extraneous variance information regarding the subject's past activity experience was collected for use in the matching procedure. Past activity experience was, for the purposes of this investigation, defined as: the extent to which each individual participated in regular (once per week or more) physical activity during the past year.

Hypotheses

The hypotheses tested in this study were:

- H₁. Following the physical activity intervention, the elderly mentally retarded participants would score significantly higher on perceived competence than would those not involved in the program.
- H₂. Upon completion of the physical activity program, the elderly mentally retarded participants would have greater levels of locus of control than would their non-participant counterparts.
- H₃. The post-intervention self-esteem scores of the elderly mentally retarded program participants would be significantly higher than those of the non-participants.

Delimitations

Participation in this investigation was restricted to community residing individuals identified by Manitoba Health and Family Services as being mentally retarded. The sample was further delimited to include only those who; (a) volunteered to participate; (b) were non-Down's Syndrome aged 55 and over; (c) or were Down's Syndrome aged 40 and over; (d) able to offer verbal responses to orally administered questions; (e) and able to attend sessions in the evening.

Limitations

Generalization of the results of this study may have been limited by the inability to objectively quantify the subjects level of cognitive functioning. Utilizing a functional definition of mental retardation it was not possible to discount the notion that cognitive function may have differentially affected the impact physical activity had on psychological well-being. However, given the dearth of previous research in this area this investigation was, by necessity, exploratory in nature and as such the external validity may be suspect.

CHAPTER 2

Related Literature Review

Building on key areas, briefly discussed in the introduction, this chapter further developed the underlying rationale of this investigation. It should be noted that the following literature review was intended to be as inclusive as possible and thus was not limited to research specifically related to physical activity. This was precipitated by the relative dearth of research that has strictly examined the effect of physical activity in the psychological domain. Additionally, researchers have used a myriad of conceptualizations to define recreation, leisure and physical activity and as such the differences between these concepts has often become blurred. Thus, many studies have been included in this review that could be classified as leisure or recreation related research. Recognizing these subtle differences, whenever possible, the terminology employed by the researcher has been preserved.

This discussion is partitioned into five sub-sections. First to be addressed is the research pertaining to the role of activity as it relates to psychological well-being and successful aging. Second, the psychological constructs of perceived competence, locus of control and self-esteem are considered. Consideration of how each of these constructs are theoretically linked is discussed within the context of Attribution theory in the third section. The fourth section is intended to relate perceived competence, locus of control and self-esteem to leisure and psychological well-being in later-life. The fifth portion focuses on implications relevant to the proposed investigation.

Research on Active Participation and the Psychological Domain

Research on the role of activity as it relates to psychological well-being and successful aging has focused primarily on two themes. The first has viewed active participation among the elderly as an antecedent or causal condition associated with enhanced psychological well-being. The second has suggested improved well-being to be the result of the satisfaction derived from the activity. Paralleling the use of activity within the context of this investigation, literature related to the former perspective constitutes the basis of this review. Additionally, only those studies which have utilized physical activity, recreation or leisure programming as an independent variable with older adults in a community setting are included. The exclusion of investigations conducted within clinical settings is precipitated by their limited applicability to non-institutionalized older individuals (Iso-Ahola, 1980).

The examination of leisure activity and psychological well-being, within the community environment, has been evident in the literature for at least 30 years. These investigations have utilized a number of definitions of psychological well-being. Therefore, to facilitate discussion, the relevant literature has been sub-divided according to the respective researchers conceptualization of well-being. Based on this, the following categories are employed to present the role of leisure as it relates to older adults: adjustment; life satisfaction; psychological well-being.

Adjustment

Frequently, it has been claimed that active leisure participation contributes to older individuals ability to successfully adjust to changes inherent in the aging process (Iso-Ahola, 1980). This is important to the extent that previous research has utilized the concept of adjustment as an indication of psychological well-being in the elderly.

Havighurst (1957) conducted one of the earliest assessments of leisure among older adults. Adjustment, with some individual exceptions, was found to be positively correlated with leisure participation. In examining the exceptions, those who were well-adjusted but had low leisure roles were highly involved in work and family activities and had a good spousal relationship which seemed to indicate little time or need for leisure pursuits. The low-adjustment, high leisure role individuals were socially maladjusted, and used leisure to compensate for status loss and alienation in other settings. The author suggested that in these latter cases, leisure could make a significant contribution to their life and lend meaning where there was none.

Recent investigations utilizing adjustment as an indicator of psychological well-being further supports leisure as a means of assisting older adults to accommodate changes in their lives (Fly, Reinhart & Hamby, 1981; Keller, 1984; Kelly, Steinkamp & Kelly, 1986). However, the contention that well-adjusted individuals may not require leisure to the same extent as maladjusted individuals appears to be an inconclusive point.

Kelly et al. (1986) found leisure to be the most common context for maintaining or developing important relationships; which in turn

assisted older adults in accommodating changes in their lives. Thus, individuals highly involved with family and work related activities could also be expected to benefit from leisure activity. Leisure participation was also found to positively enhance adjustment at retirement age (Fly et al., 1981) as well as among the very old (Keller, 1984).

Life Satisfaction

Previous research has also utilized life satisfaction as an alternative term for psychological well-being. The suggestion is that individuals who are satisfied with their lives are also psychologically "healthy" individuals (Iso-Ahola, 1980). This contention is supported by Riddick (1986) who identified a number of studies (Campbell, Converse & Rodgers, 1976; Mancini & Orthner, 1980), which demonstrated satisfaction with leisure activity, rather than such things as job, family and health, to be the key determinant of mental well-being.

Recent research conducted with the elderly indicates that active leisure participation does contribute to life satisfaction (Markides & Martin, 1979; O'Brien, 1981; Peppers, 1976; Ray, 1979). However, leisure's impact on satisfaction has been found to vary according to the type of activity engaged in and the accessibility of an individual's preferred activity. Demonstrating this is Peppers' study on the effect of leisure activity on life satisfaction among a sample of retirees. The purpose was not only to discern the relationship between the two variables, but also to determine whether different activities had different effects. Analysis revealed that when activities were classified

according to four categories (active-social, active-isolate, sedentary-social, sedentary-isolate), different types of activities had different effects on life satisfaction; with active-social and active-isolate having the two highest mean scores. Peppers also found that retirees who had access to their preferred activities reported higher levels of life satisfaction. Ray (1979), in a subsequent investigation, offers further clarification of the relationship between leisure participation and life satisfaction. Ray found that although leisure participation and life satisfaction were related the level of satisfaction was independent of the size of the activity repertoire and the frequency of participation.

Amalgamating Peppers' (1976) and Ray's (1979) results suggests an important point regarding the development and implementation of activity interventions intended to influence life satisfaction or psychological well-being. Specifically, to have the intended effect the number of activity choices and the frequency of participation is not as important as the need to accommodate the activity preferences of the individuals in question.

Subsumed within the life satisfaction category is research that has considered leisure activity as a predictor of, or an antecedent to, successful aging (DeCarlo, 1974; McGuire, 1980; Palmore, 1979; Riddick & Daniel, 1984; Riddick, 1985). DeCarlo found a positive correlation between recreation participation patterns and a criteria associated with successful aging. However, the results also indicated that participation in all three domains (affective, motor and cognitive) were significantly and positively correlated with the successful aging criteria. The analysis also suggested that cognitive activity had a positive impact on successful aging from middle-age and beyond, while

motor and affective activities were correlated only later in life. Another interesting aspect of this study was the finding that those who participated regularly in recreation activity, throughout the life span, aged more successfully than those who participated on an intermittent basis. Finally, DeCarlo concluded that although cognitive activities ranked highest in terms of influence on successful aging, motor and affective activities were also significant correlates.

Palmore (1979), in a related study, found physical activity to be among the two strongest predictors of successful aging. Riddick (1985) also found leisure participation to be the strongest contributor to life satisfaction. Over and above supporting leisure participation as a determinant of life satisfaction the contributions of DeCarlo (1974) and Riddick provide important information regarding the potential mediating influence of such variables as age, past leisure experience and gender.

DeCarlo's (1974) finding indicate that cognitive, affective and motor activities differentially impact on successful aging at various points in the life span. It then seems reasonable to anticipate that an individuals psychological response to activity may be mediated by age. Furthermore, DeCarlo suggests that regular life-long participants in recreation age more successfully than non-participants. Thus, it seems likely that an individuals past activity experience could also mediate the effect of subsequent activity interventions on their mental well-being.

Riddick (1985), on the other hand, offered a similar scenario with respect to gender differences. The findings of this study, when compared to studies involving older males, underscores the fact that

the two groups have divergent psychological health determinants. In sum, these two studies lend support to the notion that age, past leisure experience and gender may influence the effect activity could have on measures of psychological well-being (DeCarlo, 1974; Riddick).

Psychological Well-Being

Included in this category is research which has examined the effect of leisure participation on a variety of terms which are best described as general psychological well-being. Regardless, of whether the term employed is morale (Maddox & Eisdorfer, 1962; Maddox, 1963), psychological health (Haber, 1983), psychological hardiness (Stones, Stones & Kozma, 1987), or general well-being (Harris, 1975; Lomranz, Bergman, Eyal & Shmotkin, 1988) the results all indicate that leisure activity positively contributes to the mental well-being of older adults. Also falling within this category is the limited amount of leisure research which has been conducted utilizing constructs such as self-concept (Netz, Tenenbaum & Sagiv, 1988; Perri & Templer, 1984), self-esteem (Beran, 1986; Parent & Whall, 1984) and locus of control (Perri & Templer) as dependent variables.

Perri and Templer (1984) sought to discern the relationships between aerobic exercise and depression, anxiety, self-concept, locus of control and short-term memory among adults aged 60 and over. The analysis of covariance, controlling for each of the pre-test scores, resulted in the experimental group showing significant gains on all variables. In other words, the experimental subjects reported lower depression, increased internal locus of control, reduced anxiety,

improved self-concept and improved short-term memory. With respect to the locus of control construct further support was provided by the work of Mannell, Zuzanek and Larson (1988). The findings of Mannell et al. point to the importance of freely chosen activity as being essential to the development of an internal locus of control. Further attempts to support Perri and Templer's findings of improved self-concept as a result of exercise were inconclusive (Netz, Tenenbaum & Sagiv 1988).

The limited amount of research conducted with respect to self-esteem suggests that activity has a positive impact on this construct (Beran, 1986; Parent & Whall, 1984). Beran's work, a qualitative report on the impact of an exercise program for elderly women, suggests that regular participation assists individuals in maintaining their independence and self-esteem.

Summary

Overall, the reviewed studies were theoretically and conceptually well executed. However, this is not to suggest that these investigations are without flaw. One concern relates to the absence of reported reliability and validity for the measures that are utilized, which leaves little insight regarding the future utility of the instrumentation. This deficit is particularly acute in areas which have not been extensively examined.

An additional concern involves the sampling procedures used in this research. Generally, sampling has been of high quality with most studies using random sampling. However, the problem is that the majority of samples have been drawn from populations that are rather

limited in scope (e.g. retirement communities, users of Senior Citizen's facilities etc.) or simply not specified. Also arising from the sampling issue, although more specific to data analysis, is the violation of the assumptions of statistical techniques by failing to use randomly selected subjects. The use of parametric statistics with non-parametric data is widespread and is defensible on the basis of the robust nature of the statistical techniques (Kerlinger, 1973). However, few researchers bother to discuss the possibility of assumption violations and, in some cases, do even less to defend against possible violations (Netz et al., 1988).

The preceding review of literature, relating to the community-based elderly, clearly indicates a positive relationship between leisure activity and the various conceptualizations used to define psychological well-being. Also emerging from this literature are three factors of particular importance to this investigation. First, is the contention that factors such as age, gender and past activity experience may moderate the effect activity involvement has on determinants of well-being (DeCarlo, 1974; Riddick, 1985). Second, is the significant impact that freely chosen activity has on life satisfaction and more specifically the development of an internal locus of control.

The third and perhaps most important factor arising from this literature is an indication of the limitations of current understanding. Particularly evident is the lack of information pertaining to the effects of leisure participation on individuals outside of what is considered the normal population. Additionally, among the numerous constructs utilized to assess the impact of activity on psychological well-being, relatively little attention has specifically focused on the constructs of

perceived competence, locus of control and self-esteem. The significance of the neglect of these areas is particularly apparent in light of what is currently known about the role of the aforementioned psychological constructs and the process of successful aging.

Psychological Constructs

Prior to discussing the relative importance of perceived competence, locus of control and self-esteem to the process of successful aging, it is necessary to briefly consider their conceptualization.

Perceived Competence

Perceived competence is the perception an individual holds about his or her ability to effectively interact with the environment and by so doing influence what happens within the course of an activity (Iso-Ahola, 1980). This construct has emerged from general attempts to explain the motives behind human behavior (DeCharms, 1968; Deci, 1975; Harter, 1978; Iso-Ahola, 1980; Weiner, 1980; White, 1959)

Robert White (1959) is, without doubt, the most influential of the early theorists in this area. The basis of White's work stemmed from what he viewed to be the incomplete or inefficient manner in which traditional drive and psychoanalytic theories explained human behavior. In what is now considered a classic article, White analyzed a plethora of motivation research to postulate "The Concept of Competence". This concept was defined in terms of "an organism's capacity to interact effectively with its environment" (White, p. 297).

The basic tenet of White's (1959) concept of competence is that

an individual, specifically a child, engages in behaviors to facilitate effective interaction with the environment. In essence this desire for competence and efficacy, which White coined effectance motivation, is the force which motivates behavior. Unfortunately, despite being thought provoking, White's competence and competence motivation constructs do not lend themselves to empirical testing.

Harter (1978), drawing on the advances made by White (1959), has attempted to operationalize the effectance motivation construct to a level suitable for testing. Included in Harter's extended conceptualization is the recognition of four specific domains of competence: cognitive, social, physical and general. Further suggested is that experiences of success and failure lead to differences in subsequent attempts at mastery within each of the domains. In general, successful mastery attempts facilitate feelings of competence, and thus the probability of future interaction. Conversely, repeated failure limits the possibility of future mastery attempts, as well as reduces perceptions of competence which may result in a generalized sense of helplessness (Garber & Seligman, 1980).

Research with respect to perceived competence is not extensive. This is particularly true with respect to older adults. However, what is known suggests perceived competence is an important determinant of overall psychological well-being (Garber & Seligman, 1980; Iso-Ahola, 1980; Weiner, 1980). Recognizing this and the potential impact leisure activity could have, Witt and Ellis (1987), developed a scale specifically to measure perceptions of competence within the leisure domain. Conceptually, this scale is similar to Harter's (1982) Perceived Competence Scale for Children.

Included in the leisure scale are the four domains of competence identified by Harter (1979): cognitive competence, social competence, physical competence, and general competence.

The advent of the Perceived Leisure Competence Scale (Witt & Ellis, 1987) addresses at least two concerns which have previously hampered leisure researchers in this area. One, the lack of instrumentation specific to the assessment of competence within the leisure domain is solved. Two, a scale is now available that is designed and suitably tested for use with individuals beyond childhood (Witt & Ellis).

Locus of Control

Rotter's (1966) expectancy-value theory of behavior characterizes an individual's potential as being both a function of the expectancy of a goal and the reinforcement value of that goal. Derived from this tenet it is suggested that man, in an attempt to lend order to life, categorizes situations according to their common dimensions (Rotter, Chance & Phares, 1972). One of the suggested dimensions of categorization concerns whether potential reinforcement can be attained through the actions of the individual, or follows from luck or other uncontrollable, external factors. In other words, a situation can be categorized according to the perceived cause of a reinforcement. Individual differences with respect to internal or external perceptions of control forms the basis of Rotter's conceptualization of locus of control.

Utilizing Rotter's (1966) Locus of Control Scale this construct has been widely examined by researchers from a variety of disciplines.

Evidenced by this research is the significant impact that internal or external perceptions of reinforcement have on such factors as depression, competence, self-worth and helplessness (Garber & Seligman, 1980; Harter, 1978; Iso-Ahola, 1980; Rotter et al., 1972; Leahy, 1985).

Also emerging from locus of control research is the importance of choice as an essential component in any attempt to modify an individual's perceived cause of reinforcement (Iso-Ahola, 1980; Lefcourt, 1976; Weiner, 1980). Although limited, the study of locus of control within the leisure context supports this contention (Mannell et al., 1988). Drawing on the preceding information, researchers interested in leisure have started to consider the nature of the relationship between activity and locus of control. One of the more significant contributions to this end has been the development of the Perceived Leisure Control Scale (Witt & Ellis, 1987).

Self-Esteem

After many years of confusion, caused by the use of a myriad of seemingly overlapping terms, there appears to be an emerging consensus regarding the definition of the primary self constructs. Self-concept has been assigned a descriptive capacity whereby statements such as "I am young", "I am a woman", "I am a student" are conglomerated to produce a multidimensional awareness of the self as an active object (Campbell, 1984). Self-esteem, on the other hand, carries the evaluative component. It may have as its basis a multitude of situation-specific evaluations such as "I am the best basketball player in my school", but the resultant global outcome has been defined by

Campbell (p. 9) as the "awareness of good (excellence, goods) possessed by oneself." It is important to note that an individual's feeling of "good", in this instance, does not necessarily carry a moral connotation.

In other words, feelings towards self are subjectively defined standards and thus pertain to whatever terms of reference the individual chooses (Campbell, 1984; Coopersmith, 1967; Leary, 1985). The global outcome of self-esteem, therefore, is that "I am a good person," depending upon each individual's determination of what constitutes good (Campbell, p. 12). This evaluative definition of global self-esteem satisfactorily reflects those utilized by other researchers (Coopersmith, 1967; Gergen, 1971; Harter, 1985; MacNeil & Teague, 1987; Rosenberg, 1965), although Harter used the term global self-worth.

Coopersmith (1967) suggests that judgements or evaluations of self-worth are developed according to the following concepts:

1. Significance - the extent to which one feels loved and valued by the significant others in one's life.
2. Competence - in performing tasks or activities one considers to be important.
3. Virtue - the achievement of ethical and moral standards.
4. Power - the degree of influence one has over self and other's lives. (p. 38)

MacNeil and Teague (1987) succinctly summarize the relative significance of these factors: "While people may draw favorable pictures of themselves if they rate high on some of these measures and

low on others, the higher they rate on all four, the more highly they will rate themselves" (p. 123). Furthermore, it has been suggested that self-esteem is perhaps the single best indicator of psychological adjustment (Fromm, 1956; Horney, 1950; Leahy, 1985; Weiner, 1980).

Summary

The preceding discussion of the psychological constructs points to three important factors. First, is the recognition that each of the constructs has a significant and positive impact on psychological adjustment. Positive perceptions of competence and (internal) locus of control have been associated with general well-being and correspondingly lower levels of depression and helplessness (Garber & Seligman, 1980; Harter, 1978; Iso-Ahola, 1980; Rotter et al., 1972; Leahy, 1985). Self-esteem, in turn, has been posited as the key determinate of mental health (Fromm, 1956; Horney, 1950; Leahy, 1985; Weiner, 1980).

The second point of importance relates to what is best described as "gaps" in the conceptualization or, at least, the application of research with respect to the three constructs. In general competence, locus of control and self-esteem have emerged from work which has a predominantly youth oriented perspective. Beyond recognizing the importance of these constructs to mental health, relatively little is understood about how positive levels of these determinants are developed or maintained later in life. Thus, not only is it relevant, it is important that future research examine the effect leisure activity has among the elderly with respect to perceived

competence, locus of control and self-esteem.

Finally, there is considerable overlap between the theoretical formulations of perceived competence, locus of control and self-esteem. However, as stated by Iso-Ahola (1980) these constructs are theoretically and conceptually distinct. Thus, to reiterate, perceived competence refers to the perception an individual holds about his or her ability to determine what transpires during the course of an activity (Witt & Ellis, 1987). Locus of control, on the other hand, pertains to the perception that behavior is the result of factors either controlled by the individual (internal) or controlled by the environment (Weiner, 1980). Thus, in essence competence refers to a sense of being "good at" specific tasks while control pertains to a sense of "I control" the situation (Witt & Ellis). Finally, self-esteem refers to the feelings an individual holds about his or her self-concept in comparison to a self-determined ideal (MacNeil & Teague, 1987).

These constructs have been subsumed within larger theoretical frameworks that recognize their distinct nature and their contributions to psychological functioning. Attribution theory is one example of an attempt to establish the linkage between perceived competence, locus of control and self-esteem. The following section examines this theoretical context, with particular interest in its application to older individuals.

Attribution Theory

No unified body of knowledge neatly fits into one specific formulation of attribution theory; there are many types of attribution theories and theorists. Nevertheless, common interests guide the

thoughts of all investigators within this field (Heider, 1958; Iso-Ahola, 1980; Jones, Kanouse, Kelley, Nisbett, Valins & Weiner, 1972; MacNeil & Teague, 1987; Weiner, 1980). Attribution theorists are concerned with perceptions of causality, or the perceived reasons for a particular event's occurrence.

Weiner (1980), in discussing the research which has emerged from the analysis of perceived causality suggests that attribution theorists are primarily concerned with such questions as:

- 1) What are the perceived causes of this event?
- 2) What information influenced this causal inference?
- 3) What are the consequences of the causal ascription? (p. 280)

The intent of this discussion is to focus on the literature which has sought to understand these questions from the gerontological perspective.

Attribution Theory of Aging

MacNeil and Teague (1987), drawing on the work of Iso-Ahola (1980), developed a theory that explores how self-perceptions affect the behavioral process in old age. Although not empirically tested, the intention of attribution theory of aging is to provide an indication of affective functioning in later life and to further understanding of the process of successful aging (MacNeil & Teague). It should also be noted, that in terms of future testing of the attribution theory of aging Witt and Ellis's (1987) scales may prove helpful. These scales, like MacNeil and Teague's theory, are grounded in the attribution theory of behavior. Additionally, the scales lack any bias associated with age and thus are applicable for assessment with older individuals (Witt & Ellis).

The attribution theory of behavior suggests that individuals constantly search for meaning in human behavior (Weiner, 1980). Individuals seek meaning by attempting to identify the causes of behavior. It is suggested that people assign causality, for successful and unsuccessful events, using two attributional styles - internal or external. The terms used in this dimension are distinct to the extent that cause can be associated with characteristics inherent to the individual or to forces beyond the individual's control (Weiner; Witt & Ellis, 1987). It is important to note that individual perception, not some property inherent to the event, dictates whether causation is attributed to either internal or external causes.

In addition to the internal/external dimension, causes may be classified according to a separate stable or unstable dimension. This dimension relates to the pervasiveness of the attribution of cause over a period of time (Iso-Ahola, 1980; Weiner, 1980). Ability for example is a stable cause. Generally, ability requires a considerable amount of time and effort before any great change can be enacted. Unstable causes, in contrast, are characterized by their dynamic and unpredictable nature. Examples of unstable causes include luck, fate and effort (Weiner, 1980). Figure 1 includes a summary of the internal/external and the stable/unstable dimensions.

Thus, it is posited that individuals utilize the internal/external and stable/unstable dimensions to explain the causal determinants of behavior. The theory further advances that the reason people seek to find the cause of behavior is to facilitate personal control over the environment (Iso-Ahola, 1980; MacNeil & Teague, 1987; Rotter et al., 1972). The extent to which an individual perceives control over the

Stability Type	Internal Locus of Control	External Locus of Control
Stable	Ability	Task difficulty
Unstable	Effort	Luck

Figure 1. The two dimensions of causal attribution determinants. Note. Adapted from Human Motivation (p. 346) by B. Weiner, 1980, New York: Holt, Rinehart, Winston.

environment is dependent on the causal ascription assigned for the behavior. In other words, when behavior is attributed to internal and stable factors (i.e. ability, skills, competence) individuals' perceptions of control are facilitated (Iso-Ahola, 1980; Weiner, 1980). Conversely, when behavior is believed to be dependent on external and unstable factors (i.e. fate, luck, effort) perceived control is diminished (Iso-Ahola, 1980; Weiner, 1980).

The relationship between internal and external attributional styles and their resultant effects on perceptions of control has been of interest to researchers concerned with overall psychological performance (Garber & Seligman, 1980; Iso-Ahola, 1980; Leahy, 1985; MacNeil & Teague, 1987; Rotter et al., 1972; Weiner, 1980). The general consensus appears to be that internally attributed behavior, implying personal causation, results in positive feelings of competence, self-worth and independence (Leahy, 1985; MacNeil & Teague; Rotter et al., 1972). Externally attributed behavior, on the other hand, may result in feelings of low personal competence and self-worth (Leary, 1985; MacNeil & Teague; Rotter et al., 1972).

Additionally, individuals who habitually attribute behavior to external factors may feel a generalized sense of helplessness, which is a key determinant of depression (Fromm, 1956; Garber & Seligman, 1980; Horney, 1950; Iso-Ahola, 1980; Weiner, 1980).

In conceptualizing the attribution theory of aging, MacNeil and Teague (1987) contend that older individuals are frequently confronted with situations that imply environmental rather than personal causation. It is anticipated that this may result in a generalized shift toward an external causation pattern. This shift is thought to be facilitated by societal expectations which condition the elderly to expect and thus to passively accept a loss of control (Binstock & Shanas, 1985; MacNeil & Teague). The result of a perceived lack of control and an external attributional style is a potentially serious threat to older individual's perceptions of competence and self-worth (MacNeil & Teague; Garber & Seligman, 1980). Implicit in MacNeil and Teague's postulations is that attributional style has the potential to significantly influence the elderly's psychological health and the success of the overall process of aging.

Summary

The discussion of attribution theory clarifies some important points. First, attribution theory links the constructs of perceived competence, locus of control and self-esteem without compromising their distinct qualities. Attribution theory, in concert with the locus of control construct, helps to show how an individual's inferences regarding causality may affect, among others, competence and self-

esteem (Garber & Seligman, 1980; Iso-Ahola, 1980; Leahy, 1985; MacNeil & Teague, 1987; Rotter et al., 1972; Weiner, 1980). In essence, individuals who attribute behavior to internal qualities feel a sense of control over the environment which results in a healthy psychological state. Conversely, individuals feel a lack of control when external factors are believed to govern behavior which may result in a diminished state of mental well-being.

MacNeil and Teague (1987), drawing on the basic tenets of attribution theory of behavior, offer an attribution theory of aging. The intention of this formulation is to provide an indication of affective functioning in later life and to further the understanding of the process of successful aging (MacNeil & Teague). It is posited that as individuals age there may be a propensity towards attributing behavior to external causes which, in turn, may present a serious threat to successful adjustment in later life.

Unfortunately, MacNeil and Teague's (1987) hypotheses have yet to be tested. However, recognizing the impact causal attributions have on the psychological state, is it possible that factors which influence general psychological well-being could also affect causal ascriptions? Specifically of interest is what impact, if any, does physical activity among the elderly have on the perceptions of competence, control and self-esteem? Addressing this question forms the basis of the following section.

Older Adults, Psychological Constructs and Activity

Within the earlier discussion of active leisure research in the psychological domain it was noted that research conducted in clinical

setting may have limited applicability to non-institutionalized older individuals (Iso-Ahola, 1980). However, there is a dearth of non-clinical research which investigates the relationship between active recreation participation, competence, locus of control and self-esteem. Thus, it is necessary to draw on clinical research, which despite its orientation, clearly suggests the potential utility of active participation as a means to influence psychological well-being and the process of aging.

Perhaps two of the best examples of studies involving leisure activity as a means to influence successful aging are provided by Langer and Rodin (1976) and Rodin and Langer (1977). Both studies involved ambulatory nursing home residents between the ages of 65 and 90. The first study (1976) assessed the effects of increased control and responsibility on the subjects physical and mental alertness, activity level, general satisfaction and sociability. In a meeting with the treatment group the nursing home administrator encouraged them to take responsibility for themselves, to give their opinion of the in-home complaints process, select a plant to be cared for by them and given the choice of their movie night. To the control group the administrator explained the same items but emphasized the staff's responsibility as opposed to the subject's (i.e., plants to be cared for by the staff, assigned a movie night).

The results indicated no difference between the experimental and control groups on the pre-test. On self-reported happiness and level of activity the experimental group showed significantly greater gains than did the control group. Similarly, the nurses assessments of alertness and level of activity favored the experimental condition

subjects. Medical assessment provided a further indicator of the treatment effect in that 71% of the control subjects experienced increased debilitation over the three week course of study, while 93% of the experimental subjects improved. Thus, the responsibility induced condition increased leisure participation which had positive health effects.

Eighteen months later Rodin and Langer (1977) conducted a follow-up study in which they re-tested 26 subjects from the experimental group and 9 from the control group. In addition to the original measures data also included physicians' ratings of the individual's health over the intervening period, mortality and participation in a question and answer lecture.

The results suggested that the experimental group declined less in health than the control when comparing the original pre-test data with the re-test data. Overall the results showed subjects in the experimental group to be significantly more active, more sociable, more likely to participate in self-initiated activities and more vigorous than control subjects. Original post-test scores also positively differed from re-test scores indicating a continuation of the intervention effects. Of the additional data collected in the follow-up study mortality rates provided the most striking results. The pre-treatment mortality rate in the nursing home had been 25%. The post-treatment mortality rate stood at a significantly different 7% for the experimental group verses 30% for the control group. These two studies show that increased responsibility has dramatic effects on locus of control, happiness, level of activity, alertness and mortality; and that leisure participation can be used as a vehicle through which

these factors can be improved.

Extending Rodin and Langer's work, Shary and Iso-Ahola (1989) examined the effects of enhanced personal control on perceived competence and self-esteem. The experimental group was encouraged to take on greater individual responsibility. Subjects were given choices through the recreation program and through the invitation to care for a plant. Subjects who chose the recreation program also had control over what occurred in the activity as well as what activity was chosen. The control group members were informed of the nursing home's responsibility for them and of the activities that were available to them at appointed times.

The results showed that subjects in the experimental group experienced increased self-esteem and feelings of perceived competence; which were significantly greater than those in the control group when controlling for pre-test scores.

Summary

The reviewed studies were well designed with each employing a number of control procedures to ensure the internal validity and thus the veracity of the findings. The intention of these studies was to determine the effect increased levels of responsibility and control would have on perceptions of competence, locus of control and self-esteem (Langer & Rodin, 1976; Rodin & Langer, 1977; Shary & Iso-Ahola, 1989). The findings clearly indicated that increased responsibility and control positively affected the dependent variables and had a direct bearing on the aging process. More importantly, at least within the context of this discussion, this research points to the

utility of active recreation as a means to positively influence competence, locus of control and self-esteem. Additionally, although not specifically concerned with causal attributions these investigations do suggest that attributed causation may influence the aging process (MacNeil & Teague, 1987).

Implications for Future Inquiry

Emerging from this chapter is an indication of the positive effect leisure, recreation and physical activity participation has among the elderly with respect to psychological well-being and the process of successful aging. However, as noted in the introduction and evidenced in the preceding review, at least two areas have not received sufficient attention from researchers (Searle, 1989).

Research with the elderly has not adequately addressed the utility of recreation as a means to influence specific psychological variables such as perceived competence, locus of control and self-esteem. Obvious, in light of these constructs significant contribution to psychological health and adjustment in later life, is the need for further understanding of how these constructs can be positively influenced. In addition, future research must be expanded so as to address the differential needs of a variety of elderly populations.

As noted by its absence, research on the psychological benefits older retarded individuals derive from activity, be it physical, recreation or leisure oriented, is nonexistent. The extent of knowledge with respect to retarded individuals psychological response to activity is confined to younger cohorts (Wright & Cowden, 1986; Gibbons & Bushakra 1989). This research, discussed in the

introduction, demonstrates the influence of leisure participation on perceptions of competence and self-concept. Beyond the specific constructs in question, the most important aspect of this research is that it demonstrates that retarded individuals do derive psychological benefits from active participation.

Thus, this investigation was an attempt to address these two "gaps" in current understanding. Focusing on the elderly retarded population the intention was to determine whether physical activity would have a positive impact on attributions of perceived competence, locus of control and self-esteem.

CHAPTER 3

Method

The following chapter details the methodology that was utilized in this investigation. To facilitate discussion this information has been partitioned into six major areas. The first and second sections pertain to the research design, the subjects and the activity portion of the study. Areas three through five present the instrumentation, the data collection process and the analyses procedures used.

Research Design

This study included one independent variable, the physical activity program, and three dependent variables, perceived competence, locus of control and self-esteem. The independent variable had two matched and randomly assigned levels: an activity participation group and a non-activity group. Both groups were assessed before and after the activity program on each of the dependent measures. Thus, this investigation utilized a two group, pre-test post-test, experimental design.

Sample

Subjects

Forty elderly individuals with mental retardation who met the following criteria were identified as potential subjects for this study: (a) non-Down's Syndrome aged 55 and over or Down's Syndrome aged 40 and over; (b) able to offer verbal responses to orally administered questions; (c) and able to attend evening sessions. Five of these

possible subjects, or more accurately their caregivers, were not interested in participating. Two additional individuals were considered, either by themselves or by their caregiver, unable to take part as a result of health concerns (i.e. heart condition, orthopedic impairment etc.) or scheduling problems (i.e. holiday plans, other commitments etc.). Thus of the 40 possible subjects, 32 volunteered to participate in the study.

During the course of the study six subjects (3 males and 3 females) were lost either to voluntary withdrawal, failure to fulfill the program attendance requirements or the inability to find a comparable match for the subject. One male subject with Down's Syndrome voluntarily withdrew from the control group because of a serious health problem. This subject's experimental condition equivalent was successfully rematched with another control group subject. One female participant with Down's Syndrome failed to fulfill the minimum program attendance requirements (four weeks); and as a result her scores were not included in the data analysis. Subsequently the data collected on this subject's control group counterpart also had to be eliminated as a comparable rematch was not possible. Finally, data for 2 males and 1 female also had to be excluded as no matchable equivalents were available. Thus, the final sample consisted of 26 subjects (Mean age = 55.4 years, standard deviation (S.D.) = 7.5).

These 26 subjects were matched on gender, age, past activity experience, type of residence, Down's Syndrome and employment status prior to being randomly assigned to either the activity program condition or the nonactivity control condition. As discussed in previous chapters, the above mentioned variables had the potential to mediate the effect of the independent variable on the three dependent variables. Thus, the matching procedure was implemented to counter this threat to internal validity (Graziano & Raulin, 1989). Random assignment, on the other hand, was done to ensure the two groups were comparable and relatively homogeneous (Kerlinger, 1973).

Subjects, from each matched pair, were randomly assigned to either the experimental ($n = 13$, Mean age = 55.6 yrs., standard deviation [S.D.] = 8.5) or control ($n = 13$, Mean age = 54.2 yrs., S.D. = 6.5) group. Each condition had seven males ($n = 7$) and six females ($n = 6$). Female subjects in the physical activity group ranged in age from 40 to 67 years (Mean age = 55.2 yrs., S.D. = 10.3); male ages ranged from 40 to 64 (Mean age = 56 yrs., S.D. = 7.5). The non-activity age range for females was 43 to 64 (Mean age = 54.5 yrs., S.D. = 8.1) and 44 to 60 for males (Mean age = 55.7 yrs., S.D. = 5.4). Eight of the 26 subjects had Down's Syndrome (4 females, 4 males) and ranged from age 40 to 58 years (Mean age = 47 yrs., S.D. = 7.2). Table 1 summarizes the number of Down's Syndrome and non-Down's subjects, the corresponding mean ages, standard deviations and provides a comparison of each condition in relation to the total sample. Evident from this table was the increase in standard deviation that was attributable to the inclusion of the Down's Syndrome subjects.

Table 1

Comparison of Down's Syndrome and non-Down's Syndrome subjects by mean age and standard deviation; and a nondifferentiated (combined) comparison of each group

Group	n	Mean Age	Standard Deviation
Down's Syndrome			
Experimental	4	46.00	8.48
Control	4	48.00	6.87
Non-Down's Syndrome			
Experimental	9	59.88	4.04
Control	9	58.33	3.00
Combined			
Experimental	13	55.60	8.56
Control	13	55.15	6.5

Classified by gender and Down's Syndrome versus non-Down's Syndrome Table 2 compares the age range, mean age, and standard deviation of the experimental and control conditions. From this comparison it was evident that the mean ages of the male and female non-Down's Syndrome subjects was greater than the all inclusive mean scores suggested; and as such the age ranges and standard deviations were conversely affected.

Table 2

Comparison of the age range, mean age, and standard deviation of the experimental and control conditions by gender, Down's Syndrome and non-Down's Syndrome

Condition	Gender	Age Range	Mean Age	Standard Deviation
Experimental				
Down's Syndrome	F(2)	40 - 46	43.00	4.24
Non-Downs Syndrome	F (4)	55 - 67	61.25	4.90
Down's Syndrome	M(2)	40 - 58	49.00	12.72
Non-Down's Syndrome	M(5)	55 - 64	58.80	3.40
Control				
Down's Syndrome	F(2)	43 - 47	45.00	2.83
Non-Down's Syndrome	F(4)	55 - 64	59.25	4.00
Down's Syndrome	M(2)	44 - 58	51.00	9.89
Non-Down's Syndrome	M(5)	55 - 60	57.60	2.07

Type of residential placement was relatively consistent across all subjects with the majority residing in group homes, eight females and 12 males. The remaining six subjects lived with either their biological families, two females and two Down's Syndrome males; or independently, two females. The subject's employment status

naturally resulted in three categories: retired, four males and two females; employed fulltime in workshops, six females and six males; and day programs, four females and four males. There was no apparent relationship between any of the other matching variables and the subject's work status. Rather, whether the subject worked, attended a day program or was retired appeared to be a decision made by the immediate caregiver with a varying degree of input from the individual. Table 3 provides a descriptive statistical summary of the sample by type of residential placement and employment status.

Table 3

Descriptive summary of the sample by type of residential placement and employment status

Work Status	Type of residence			n	Mean age	S. D.
	Biological Family	Group Home	Indep. Living			
Fulltime	2	10	0	12	51.9	9.3
Retired	0	4	2	6	59.0	5.1
Day Program	2	6	0	8	57.8	2.1
Total	4	20	2	26		
Mean age	48.5	55.7	65.5	55.4		
S. D.	7.8	6.5	2.1	7.5		

Note. Indep. = Independent; S.D. = standard deviation.

Four of the 26 subjects (2 males, Mean age = 55.75, S. D. = .95 and two females, Mean age = 65.5, S. D. = 2.12) did not meet the past

activity experience criteria of a minimum of one physical activity session per week during the immediate past year. These subjects were similar in that all were non-Down's, retired, in their late 50's to late 60's and lived independently or in group homes with predominantly older residents.

Identification of Sample

A meeting was scheduled with the Managing Director and the Director of Human Resources of a large sheltered workshop to discuss the research and to gain their assistance in identifying potential subjects. The workshop provided a list of subjects who were: (a) in accordance with the operational definition of "elderly" provided in Chapter 1, non-Down's Syndrome aged 55 and over or Down's Syndrome aged 40 and over; (b) able to offer verbal responses to orally administered questions; (c) and able to attend evening sessions. In addition, the workshop identified the social agency or social worker responsible for each of the potential subjects.

A series of meetings were conducted with the identified Manitoba Health and Family Services agencies and or the respective social workers detailing the purpose, content and extent of the commitment required by their clients to partake in the study. Furthermore, it was stressed that participation was to be voluntary, with individuals able to withdraw at any time; information would be strictly confidential; and that the results would be available to them following the completion of the study. Permission was sought and granted, by the agencies and social workers who expressed an interest in the project, to approach those clients under their proctorship who

had been identified by the workshop as potential subjects. Interested parties were also invited to include any additional individual(s) with mental retardation who might like to participate and met the previously discussed age, verbal and evening attendance criterion.

Forty individuals were identified as potential subjects through the above detailed process. The researcher then met each of these individuals, in their homes, to explain the purpose of the investigation and what was expected of them if they wished to take part. It was stressed that participation was voluntary; they could withdraw at any time; all information collected was strictly confidential; and that the results would be explained to them following the completion of the study. Interested individuals were asked to indicate their willingness to participate by completing a "Volunteer to Participate" form (see Appendix A). Also at this time, the interested individual was asked to provide some general background information (age, employment status etc.) and a brief description of his or her physical activity interests and previous activity involvements (see Appendix A). As this information was subsequently used to match the subjects its' veracity was assessed and substantiated by either the immediate caregiver, the group home staff, the workshop, or the records available to the investigator.

Although standard information was provided at each meeting it should be noted that the number of individuals at each session varied according to where the prospective client resided. For example, those living independently or in group homes where one person was identified as a potential subject were met with individually; those residing in group homes where more than one person was a potential

subject were met with as a group (no more than 3 at any one home). In the latter example only information pertaining to the purpose of the investigation was conducted in the group setting. Interest in participating was determined and the necessary background information was collected individually and privately. In all cases, the meetings that involved potential subjects from group homes included the attendance at least one member of the residences' staff.

Finally, subjects were verbally informed of their group assignment following the completion of the formal portion of the pre-data collection interview; which was conducted approximately two weeks prior to the start of the activity intervention. At this time the researcher stressed to the subject and, if available, the subject's caregiver the importance of both groups to the study. The subject and or caregiver also received written verification of the individual's group assignment; and logistical details concerning when and where the program was starting and the type of equipment/clothing required (see Appendix B).

Ethical Considerations

In research conducted with mentally retarded subjects the issue of informed consent is not only an ethical consideration but a legal one. Legally, those retarded individuals who are under orders of supervision, are unable to provide their own consent. Therefore, in addition to the subject's consent it was necessary, in five cases, to obtain the permission of the Public Trustee upon whom the concerned individuals participation was legally contingent. The social workers, for the five clients in question, submitted the documentation

necessary to gain the Public Trustee's consent (see Appendix C).

Over and above the ethics of informed consent, consideration was also given to the ethics pertaining to the treatment of non-experimental group subjects. The subjects in the control group maintained their normal daily routine and did not participate in any aspect of the intervention. However, an attempt was made to initiate further programs that the non-participant control subjects were free to access.

Activity Intervention

The physical activity intervention was conducted by five volunteers who were unaware of the objectives of the study. Each volunteer was, however, experienced in the provision of recreation services for retarded.

The program was run every Tuesday evening from 6:30 to 8:30 from August 14 to September 11, 1990 (five weeks). The location of the program and the number of subject's (and volunteers) at each site varied weekly according to the activities chosen by the individual. Fitness related activities (stationary cycling, weight training, low impact aerobics - "dancing") were conducted in a senior citizens' fitness facility. Walking routes were rather arbitrary, although they usually started and finished at the seniors fitness facility. Bowling and swimming were done in the appropriate community facilities.

Prior to beginning the first activity session, the volunteers met with the experimental group (n = 13) subjects and indicated that this was to be their program. Furthermore, it was emphasized that the subjects were responsible for choosing the activities they would be

participating in; as well as playing a leadership role in implementing the program. To facilitate the decision making process and to tap the locus of control construct a number of activity choices were provided (e.g. stationary cycling and fitness related activities, swimming, bowling, dancing, walking etc.). Determination of these activity choices was made by the researcher and were directed by the availability of facilities and the past activity preferences of the selected subjects. At the conclusion of the meeting the subjects were asked to choose an activity, from the options listed above, that they would like to do that evening and for the following week's program.

At the conclusion of each of the subsequent weekly sessions the subjects selected the activities they wanted to do on the following program night. As the program progressed the subjects were also given the option of selecting any physical activity that wasn't included in the original options that they wanted to try. Thus, individual choices regarding the type of activities participated in formed the basis of the five week program.

No costs were incurred by the subjects to attend the program and for those who required transportation it was provided either by the volunteers or by pre-paid taxi service. Subjects were required to attend a minimum of four sessions to be included in the data collection process. To ward against experimenter bias the researcher did not attend nor participate in any way in the program. However, information regarding program content, attendance, budget and other non-specific commentary was recorded in a journal maintained and updated weekly by the volunteers.

Instrumentation

As stated in the introduction, the dearth of research pertaining to the questions and population of interest provided limited insight as to what instrumentation was appropriate for use in this study. Thus, a sub-problem of the investigation was to extend support for the utility of the Perceived Leisure Competence Scale (Witt & Ellis, 1987), the Perceived Leisure Control Scale (Witt & Ellis) and Rosenberg's (1965) Self-Esteem Scale as data collection devices with an elderly retarded population. The following section details the rationale used to select the measures.

Developed by Witt and Ellis (1987) Version A of the Perceived Leisure Competence Scale and the Perceived Leisure Control Scale were specifically designed to assess competence and locus of control within the leisure context with adolescent and/or higher functioning retarded individuals. Witt and Ellis support the appropriateness of these scales for use with retarded individuals based on comprehensive discriminate validity testing in which they found "no significant differences between scores of normal, mentally retarded, learning disabled and emotionally disturbed subjects on the perceived competence and locus of control scales" (p. 45). Also supported is the conclusion that the scales lack a significant age related bias (Witt & Ellis). Therefore, although not extensively utilized with the elderly retarded population the perceived competence and locus of control instruments were expected to provide reliability ratings compatible with those reported for non-retarded individuals. Thus, was the rationale for the selection of the Perceived Leisure Competence Scale and the Perceived Leisure Control Scale used in this study (Witt &

Ellis).

Unfortunately, Rosenberg's (1965) Self-Esteem Scale lacks the benefit of supporting evidence as to its utility as an assessment tool with retarded subjects. The scale is, however, well documented as a valid and reliable measure of self-esteem and has been extensively used with large and diverse samples of children and adults of all ages (George & Bearon, 1980; Silber & Tippett, 1965). In fact, it has been suggested that Rosenberg's Self-Esteem Scale is "perhaps the classic measure of global self-esteem" (George & Bearon, p. 78). These notions, coupled with the scale's brevity and the simplicity of the language utilized suggested this scale was, potentially, of use with older retarded individuals and thus it was selected.

Beyond the above detailed selection rationale it should also be noted that the veracity of the selected instrumentation was further supported by the pilot test conducted in June, 1990. The Perceived Leisure Competence Scale, the Perceived Leisure Control Scale (Witt & Ellis, 1987) and Rosenberg's (1965) Self-Esteem Scale were tested with a sample ($n = 6$, 3 females, 3 males, Mean age = 58.4, standard deviation = 3.4) similar to the one employed in the investigation. The instrumentation was administered in the test subject's homes; in a pre and post standardized interview format separated by a two week interval. The pilot test and the main study reliability results are reported under the following measurement subheadings.

The Perceived Leisure Competence Scale

Version A of the Perceived Leisure Competence Scale was used to measure the subject's perceptions of their degree of personal

competence in leisure activities (Witt & Ellis, 1987). According to Harter's (1979) conceptualization the scale addresses the four areas of competence: cognitive, social, physical, and general. Responses to 20 brief statements were recorded on a three-point Likert scale; "Sounds like me", "Sounds a little like me", "Doesn't sound like me" (see Appendix D). Scoring for this scale was done using a simple additive procedure with a high score indicating a greater level of competence.

The convergent, predictive and discriminant validity of the scale has been reported, in detail, in the Leisure Diagnostic Battery Users Manual (Witt & Ellis, 1987). The following reliability ratings were also reported for this scale: test-retest reliability ranges from .82 to .88; internal consistency (Cronbach's Alpha, 1951) ranges from .83 to .93 (Witt and Ellis). The test-retest reliabilities calculated in this study ranged from .98 in the pilot test to .78 in the main study. The alpha reliability (Cronbach) for the main study was .84.

The Perceived Leisure Control Scale

Version A of the Perceived Leisure Control Scale (Witt & Ellis, 1987) was used to assess the degree of internality, or the extent to which the individual perceived control over the events and outcomes of his or her experiences. Subjects responses to 17 brief items were recorded using a three-point Likert scale format identical to the one used on the perceived competence scale (see Appendix E). This scale was also scored using a simple additive procedure with a higher score indicating a greater degree of internal control.

The convergent, predictive and discriminant validity of the Perceived Leisure Control Scale has been elaborately reported by Witt

and Ellis (1987). The following reliability ratings have also been reported for this scale: test-retest reliability ranges from .79 to .81; while the internal consistency measures (Cronbach's Alpha, 1951) range from .86 to .94 (Witt & Ellis). The retest method of determining reliability used in this study resulted in coefficients which ranged from .97 on the pilot test to .74 for the main study. The Cronbach alpha coefficient for the main study was .82.

Rosenberg's Self-Esteem Scale

Rosenberg's (1965) Self-Esteem Scale was used to determine how each subject felt about his or her self-concept in comparison to an ideal (see Appendix F). This scale consists of 10 items which were scored on a three-point Likert scale identical to the ones used with the preceding instruments. Once again, a simple additive scoring procedure was used with a greater score being indicative of a more positive self-esteem rating. As previously noted, the validity and reliability of this scale has been thoroughly reported by Rosenberg and substantiated by, among others, George and Bearon (1980), Silber and Tippett (1965). In a study which used recreational programming as an intervention with a sample of older adults, Shary and Iso-Ahola (1989) reported a Cronbach (1951) alpha coefficient of .89 for this scale. Although not as high as Shary and Iso-Ahola's the internal consistency (Cronbach's alpha) derived from the subject's responses in the main portion of this study was, nevertheless, an acceptable .72. The test-retest reliability ratings were also satisfactory with a pilot test coefficient of .81 and a main study coefficient of .68.

Caveats to the Retest Method of Estimating Reliability

Discrepancies were evident in the main study's alpha reliabilities (Cronbach, 1951), which were quite high and the stability (retest) coefficients which were generally lower. Although unavailable for Rosenberg's Self-Esteem Scale, these findings were consistent with those reported by Witt and Ellis (1987) for the Perceived Leisure Competence and the Perceived Leisure Control Scales. To explain these discrepancies requires consideration of the merit of the test-retest method of determining reliability. Generally, the retest method has not been recommended as an accurate estimate of reliability (Nunnally, 1970; Tuckman, 1975). A variety of reasons have been offered to support this recommendation; however, within the context of this investigation two issues were of particular importance.

The first issue, noted by Nunnally (1970) was that the obtained coefficient could be the result of carry over effects from the first administration of the test. In other words, memory could work to make two sets of scores correlate highly, and consequently the retest method would produce coefficients which over-estimate the reliability of the instrument. Thus, Nunnally suggests that the retest method should not be used if the possibility of memory effects exist. Within the context of this investigation, where the elderly retarded subjects were asked a total of 47 questions separated by a seven to nine week interval, it was very unlikely that any pre to post test memory effect existed.

The second issue relates to utilization of the retest method in investigations which employ interventions (Tuckman, 1975). Although Tuckman concurs with Nunnally (1970) regarding the

questionable value of test-retest methods, he argues that intervening conditions are more likely to under-estimate, as opposed to over-estimate the reliability estimate. In short, any intervention between the pre-test and post-test would differentially impact on each individual or group and as such the retest reliability coefficient would reflect this effect by under-estimating the reliability. Pursuing this argument, test-retest stability and internal consistency (Cronbach Alpha, 1951) coefficients were derived separately for the activity and non-activity conditions on each of the dependent measures employed in this study. Table 4 summarizes the resultant reliabilities of the instrumentation for the overall sample, the experimental and the control groups. The lower retest reliability ratings recorded for the experimental condition tentatively supported Tuckman's notion that the introduction of an intervention may result in an under-estimation of the test's overall reliability. Additionally, the discrepant stability and internal consistency reliabilities, found between the two conditions in the main study, was not replicated when the overall sample was considered. Rather the reverse was observed, with the retest reliabilities being consistently higher than the alpha coefficients. Explanation of the differences between the overall reliability scores and those recorded by the experimental and control conditions respectively was, quite possibly, the result of the intervention. Alternatively, these differences may have resulted from between group variations in cognitive ability.

In sum, the retest method of determining reliability estimates was conducted and interpreted with caution. Nevertheless the reliability estimates associated with both stability and internal

consistency, for each of the dependent measures, were well within the acceptable ranges (Nunnally, 1970). These findings provided support for the use of the leisure competence scale (Witt & Ellis, 1987), the leisure control scale (Witt & Ellis) and the self-esteem scale (Rosenberg, 1965) as data collection devices with an elderly retarded population.

Table 4

Comparison of the alpha and retest reliability coefficients for the overall sample, the experimental and the control groups on each of the dependent measures

Scale	Alpha Coefficient	Retest Coefficient
Percieved Leisure Competence		
Overall Sample	.84	.78
Experimental	.73	.80
Control	.81	.95
Percieved Leisure Control		
Overall Sample	.82	.74
Experimental	.76	.78
Control	.82	.98
Self-Esteem		
Overall Sample	.72	.68
Experimental	.68	.80
Control	.72	.88

Data Collection

Data was collected on the three main dependent measures, two weeks prior (July 30 to August 10, 1990) to the introduction of the

intervention and two weeks following (September 12 to 26) the cessation of the intervention. Pre-test and post-test administration of the instrumentation was done, by the researcher, in private interviews conducted in each subjects' home. The duration of these interviews ranged from 20 to 35 minutes; and where possible each individuals' pre and post data collection interview was held in the same location in the home.

Upon arrival at the home introductions were exchanged by the interviewer and the subject. The subjects were informed that the purpose of their meeting was to get to know a little about the individual and to find out how she or he felt about certain issues. Situated so that the interviewer and the subject could read (see) the same scale the interviewer explained the process by which the subject's responses were to be determined. The following instructions were given:

This is not a test. I just want to know how you feel about a few things. The questions I'm going to ask you have no wrong answers and nobody else will know how you answer them. Okay? As you can see we have some questions on this page. Over here are the answers, see where it says; "sounds like me", "sounds a little like me", "doesn't sound like me".

I'm going to read you the sentence. You're going to decide if what I read "sounds like me", "sounds a little like me", or "doesn't sound like me". Once you decide tell me and we'll mark it down on your paper. If you don't know a word or you don't understand what I mean stop me and I'll try to explain it - okay?

Let's try one. I'll read the sentence (read example). What do you think? Does it? - read possible responses. Which one fits you best? Let's mark it with a check mark.

Okay, you've got the idea? Anything you don't know? Let's start.

Had a subject been unable to respond according to the assigned categories their response(s) was to be recorded verbatim. A party,

independent of the study, would then have assigned the subject's response(s) to one of the appropriate categories; "Sounds like me", "Sounds a little like me", or "Doesn't sound like me". This contingency was not required as all subjects were able to indicate which categorical response they believed was most appropriate for them.

Over and above the dependent measures, data was also collected on two manipulation checks (see Appendix G). Subjects were asked, in the pre-intervention and post-intervention interviews, to assess their physical ability, their opportunity to influence how they spent their uncommitted free-time, and how they felt physical activity effected the way they saw themselves. Two questions were used to assess both perceived competence and locus of control; while one question pertained the perceived effect of physical participation on self-esteem. Responses were recorded on a three-point Likert scale, with higher scores considered to be better scores. The manipulation checks assisted in ascertaining the internal validity of the study and in confirming the results. In other words the manipulation checks, in addition to the matched random assignment, assisted in determining the homogeneity of the sample. Furthermore, the effectiveness of the independent variable and thus, the veracity of the results were also substantiated by these manipulation checks.

Finally, upon completion of the formal portion of the post intervention data collection interviews the experimental condition subjects were invited to offer their opinions of the program. This portion of the interview was conducted as an informal discussion and did not include the use of standardized questioning. The interviewer

anecdotally recorded each subject's commentary. The resultant qualitative data were used, in the discussion chapter, to help explain the statistical findings in concrete terms that were meaningful to the subjects involved.

Data Analysis

Data analysis for this study was done utilizing a Macintosh micro-computer and the Statview SE Plus Graphics and SuperAnova programs. Included in the reported information was the descriptive statistics providing the means and standard deviations for both subject groups on each of the measures collected. Parametric statistical techniques, analysis of variance (ANOVA) and analysis of covariance (ANCOVA), were also utilized for data analysis purposes. Each analyses required that a minimum alpha level of .05 be attained for the results to be considered statistically significant.

At this point it was necessary to consider the appropriateness of utilizing parametric statistical procedures with a non-probability sample. Some argue that failing to use a random sampling procedure seriously threatens the normality and homogeneity of variance assumptions upon which the validity of parametric tests depend (Graziano & Raulin, 1989). However, these two assumptions have been thoroughly studied and the evidence suggests the importance of normality and homogeneity to be overrated (Kerlinger, 1973). Furthermore, Kerlinger continues by stating that "unless there is good evidence to believe that they are seriously non-normal and that variances are heterogeneous, it is usually unwise to use a non-parametric statistical test in place of a parametric one" (p. 287). The rationale for this statement is derived from the notion that parametric tests are almost always more powerful than non-parametric tests. The robust nature of the tests used also suggests that they are appropriate for use with a non-probability sample, particularly when a random assignment procedure is utilized (Gravetter & Wallnau, 1988). On the

basis of these arguments parametric statistical tests were used in this study.

Data collected on the three main dependent measures was statistically treated using analysis of covariance. This procedure was used on the basis of its utility as a statistical means to control variance (Pedhazur, 1982). Three ANCOVA's, one for each of the psychological variables, were run independently. The need to conduct three discrete ANCOVA's was dictated by the fact that perceived competence, locus of control and self-esteem are conceptually and theoretically different constructs (Iso-Ahola, 1980; Shary & Iso-Ahola, 1989).

The purpose of utilizing analysis of covariance was to identify an important source of information pertaining to each of the psychological constructs. Specifically, to determine the between group differences on the post-test while controlling for the pre-test. This was significant for it served as a means to control possible pre-intervention groups differences. Thus, the discrepancy of the post-test scores were substantiated as being more than simply the extension of pre-test differences. In other words these findings, in conjunction with the results of the ANOVA's conducted on the manipulation check data, indicated the extent to which the physical activity program effected each of the dependent measures while controlling for the pre-test covariates.

The data derived from the manipulation checks was treated using two, one-way analysis of variance procedures. One ANOVA compared the experimental and control group on the pre-activity manipulation check; the second ANOVA compared the two groups

post-activity manipulation check. The purpose of this analysis was to determine the extent to which the experimental and the control groups did, or did not, differ following the activity condition. Thus, the homogeneity of the two groups prior to the intervention was, or was not, supported; as was the effectiveness of the independent variable.

CHAPTER 4

Results

The purpose of this exploratory investigation was to determine the effect of a physical activity program on older mentally handicapped individuals attributions of perceived competence, locus of control and self-esteem. Three hypotheses were developed to test the effect of physical activity on each of the psychological constructs. Analyses of the collected data revealed that each of the hypotheses was substantiated. The following chapter reports the finding derived from the analyses conducted on each of the dependent variables and the manipulation checks utilized in this study. It should be noted that each analyses was required to attain a minimum alpha level of .05 to be considered statistically significant.

Pre-test and post-test means (M), standard deviations (S.D.) and ranges of scores were calculated for the three dependent measures and the manipulation checks. To facilitate comparisons between the experimental and control conditions these statistics were tabulated and presented separately in Table 5. Based on the pre-test mean scores and the range of actual scores it appeared that the matched random assignment procedure resulted in two groups which were, prior to the intervention, somewhat similar on ratings of competence, control and self-esteem. To confirm this each of the pre-intervention manipulation check questions were statistically treated using analysis of variance (ANOVA). These results revealed no statistically significant differences on competence [$F(1, 24) = .234, p < .6331$], locus of control [$F(1, 24) = .698, p < .4118$] and self-esteem [$F(1, 24) = .585,$

Table 5

Pre and post test means, standard deviations and range of scores for the dependent variables and the manipulation checks

Measure		Mean Score	Standard Deviation	Range of Scores
Group				
Perceived Competence				
Experimental				
	Pre-test	44.76	6.31	35 - 51
	Post-test	53.69	2.56	50 - 57
Control				
	Pre-test	45.15	6.60	36 - 55
	Post-test	45.69	6.51	35 - 56
Perceived Control				
Experimental				
	Pre-test	36.07	5.20	29 - 44
	Post-test	44.53	2.36	41 - 48
Control				
	Pre-test	38.00	6.19	27 - 46
	Post-test	38.61	5.57	30 - 46
Self-Esteem				
Experimental				
	Pre-test	22.92	3.04	17 - 27
	Post-test	26.30	2.09	23 - 30
Control				
	Pre-test	22.23	2.42	17 - 26
	Post-test	22.69	2.68	19 - 28
Manipulation Check				
Experimental				
	Pre-test	10.45	2.25	7 - 13
	Post-test	14.30	1.10	12 - 15
Control				
	Pre-test	10.35	2.00	8 - 14
	Post-test	10.50	1.45	9 - 14

$p < .4517$]. Thus, it was concluded that the sample was relatively

homogeneous prior to the introduction of the physical activity program.

Also clear was that the experimental group's post intervention mean values and range of scores increased, while the degree of variability decreased. Although less obvious, the control group's post-test scores showed a similar pattern (see Table 5). To assess the significance of these differences three univariate analyses of covariance (ANCOVA'S) were used; one to test each of the psychological constructs and their related hypotheses.

Hypothesis one stated the expectation that subjects in the experimental condition would score significantly higher on the post-test measure of perceived leisure competence than would the control subjects. To test this prediction analysis of covariance (ANCOVA) was used with the perceived leisure competence pre-test mean score serving as the covariate. The results, reported in Table 6, revealed a statistically significant [$F(3, 22) = 98.200, p < .0001$] effect. In other words, the activity group ($M = 53.69, S. D. = 2.56$) scored significantly higher than the non-activity control group ($M = 45.69, S. D. = 6.51$) on the post-intervention measure of perceived competence. Therefore, hypothesis one was confirmed. Also confirmed was the need to control for the pre-test scores on the perceived leisure competence scale (see Table 6). Both the pre-test effect [$F(1, 25) = 108.913, p < .0001$] and the pre-test/independent variable interaction [$F(1, 25) = 25.371, p < .0001$] were significant. Thus, had the pre-test not been employed as the covariate the effect of physical activity on perceived leisure competence would have been masked.

Table 6

Summary of the analysis of covariance for the perceived leisure competence hypothesis test

Source of Variance	Sums of Squares	Degrees of Freedom	Mean Squares	F-value	P
Pre-test	362.915	1, 25	362.915	108.913	.0001
^a Interaction	84.541	1, 25	84.541	25.371	.0001
Main effect	137.624	1, 25	137.624	41.302	.0001
Explained	981.654	3	327.218	98.200	.0001
Residual	73.308	22	3.332		
Total	1054.962	25			

^aInteraction of pre-test and the independent variable.

The second discrete ANCOVA was done to assess the expectation that on the perceived leisure control variable, subjects in the physical activity group would have significantly higher post-test mean scores than their non-activity counterparts. The results, presented in Table 7, substantiated this prediction; finding the intervention to have had a statistically significant [$F(3, 22) = 126.264$, $p < .0001$] effect on perceived leisure control. Also evident was the intervening effect [$F(1, 25) = 177.107$, $p < .0001$] and interactive effect [$F(1, 25) = 31.898$, $p < .0001$] of the pre-test on the independent variable which verified the need to control this factor. In essence, by

adjusting for the pre-test mean scores it was possible to demonstrate that the experimental group ($M = 44.53$, $S. D. = 2.36$) scored significantly higher on the post-test measure of perceived control than did the control group ($M = 38.61$, $S. D. = 5.57$).

Table 7

Summary of the analysis of covariance for the perceived leisure control hypothesis test

Source of Variance	Sums of Squares	Degrees of Freedom	Mean Squares	F-value	P
Pre-test	295.337	1, 25	295.337	177.107	.0001
^a Interaction	53.192	1, 25	53.192	31.898	.0001
Main effect	97.648	1, 25	97.648	58.557	.0001
Explained	631.660	3	210.553	126.264	.0001
Residual	36.686	22	1.668		
Total	668.346	25			

^aInteraction of pre-test and the independent variable.

As with the preceding dependent measures, post-test self-esteem results were expected to be significantly greater for experimental condition. To test this contention a third univariate ANCOVA was done. These findings, shown in Table 8, indicated a statistically significant difference between the two groups when the pre-test scores were controlled [$F(3, 22) = 7.86$, $p < .01$]. In other words, self-esteem was found to be significantly higher for subjects who participated in the physical activity intervention ($M = 26.30$, $S. D.$

= 2.09) than for those who did not ($M = 22.69$, $S. D. = 2.68$). In addition to substantiating the hypothesis the ANCOVA procedure, once again, confirmed the importance of statistically controlling for the mediating effect of the pre-test variance (see Table 8). Consistent with the results reported for competence and control, the self-esteem pre-test was found to significantly effect [$F(1, 25) = 58.415$, $p < .0001$] and interact [$F(1, 25) = 4.545$, $p < .0444$] with the independent variable.

Table 8

Summary of the analysis of covariance for the self-esteem hypothesis test

Source of Variance	Sums of Squares	Degrees of Freedom	Mean Squares	F-value	P
Pre-test	101.131	1, 25	101.131	58.415	.0001
^a Interaction	7.868	1, 25	7.868	4.545	.0444
Main effect	13.613	1, 25	13.613	7.863	.0103
Explained	186.412	3	62.137	35.891	.0001
Residual	38.088	22	1.731		
Total	224.500	25			

^aInteraction of pre-test and the independent variable.

In sum, these significant effects were the result of greater increases by the experimental subjects than by the control subjects on the pre-test to post-test measures of competence, control and self-esteem. Specifically, the mean increase for the experimental group on perceived leisure competence was 8.93 as opposed to 1.54 for the

control group. Similarly, the mean change on perceived leisure control was greater for the experimental group (8.46) than for the control (.61). Finally, the experimental group recorded a mean change in self-esteem from pre to post-test of 3.38 versus a mean change of .46 for the control group. The statistical significance of these changes were, of course, indirectly tested by the previously reported analyses of covariance. Thus, the significance of these results indicated tentative support for the notion that physical activity positively influenced the elderly mentally retarded subjects' perceptions of competence, control and self-esteem.

Further testing this premise the data derived from the post-intervention manipulation check questions were statistically treated using three separate one-way analyses of variance (ANOVA). The intention of these analyses was to substantiate the effect of the intervention and to verify the post-test group differences found, by the analyses of covariance, on the formally assessed dependent measures. Consistent with the dependent variables analyses, the ANOVA determined that there were statistically significant differences between the post-manipulation check group means on each of the constructs examined (see Table 9). Overall, the experimental subjects ($M = 14.31$, $S.D. = 1.11$) perceived themselves as having greater competence in physical activity [$F(1, 24) = 16.333$, $p < .0005$]; greater control over their participation choices [$F(1, 24) = 27.835$, $p < .0001$]; and generally had a more positive opinion of themselves [$F(1, 24) = 96.333$, $p < .0001$] than did their control group counterparts ($M = 10.46$, $S.D. = 1.51$). These findings therefore, further support the contention that the manipulation of the independent variable was

successful and that the two conditions did significantly differ from one another, as hypothesized, on the three psychological constructs.

Table 9

Summary of the one-way analysis of variance for each of the post-intervention manipulation check questions

Question					
Source of Variance	Sums of Squares	Degrees of Freedom	Mean Squares	F-value	P
Perceived Competence					
Between Groups	1.885	1	1.885	16.333	.0005
Within Groups	2.769	24	.115		
Locus of Control					
Between Groups	8.654	1	8.654	27.835	.0001
Within Groups	7.462	24	.311		
Self-Esteem					
Between Groups	11.115	1	11.115	96.333	.0001
Within Groups	2.769	24	.115		

CHAPTER 5

Discussion and Conclusions

The objective of this study was to assess physical activity as a means to positively influence a sample of elderly retarded subjects psychological well-being. Specifically, the study examined attributes of competence, locus of control and self-esteem following the implementation of a five week physical activity intervention. In order to achieve the objective, a non-probability sample of 26 mentally retarded older adults were randomly assigned to either the experimental or control condition. Data was collected, by the researcher, on each subject and each dependent variable via a series of standardized interviews conducted before and after the physical activity program. Three hypotheses were specified as a basis for determining the effect the physical activity program had on the constructs of perceived competence, locus of control and self-esteem.

The rationale for this investigation was guided by two areas insufficiently addressed by previous research. Evident in previous research is an indication of the significant and positive impact that physical activity has on psychological well-being and the aging process in general. However, current research on the psychological effects of active recreation programming has been confined to "normal" elderly individuals and, to a lesser extent, elderly individuals with mental health problems (e. g. DeCarlo, 1974; Parent & Whall, 1984; Riddick, 1985). These studies have, with few exceptions (e. g. Langer & Rodin, 1976; Rodin & Langer, 1977; Shary & Iso-Ahola, 1989), not employed interventions; nor have they adequately addressed specific

psychological variables such as competence, locus of control or self-esteem.

Within the field of mental retardation related investigations have tentatively substantiated the positive effect active participation has on the psychological domain with samples of adolescents and young adults (Gibbons & Bushakra, 1989; Wright & Cowden, 1986). However, as noted by its absence in the preceding discussion, both bodies of inquiry have neglected to question the impact active recreation programming has on elderly people with mental handicaps. The underlying intention of this study was, therefore, to extend previous research findings to an elderly retarded sample.

Furthermore, the dearth of research in this area provided limited insight as to what instrumentation was appropriate for the questions and population of interest. Thus, a sub-problem in this study was to extend the utility of existing measures of perceived competence, perceived locus of control and self-esteem as data collection instruments with an elderly retarded sample.

In sum, previous research provided the expectation that older retarded individuals would manifest increased levels of competence, control and self-esteem as a by-product of physical activity, but beyond that provided no substantive evidence. Therefore, this investigation was an exploratory effort to provide that needed support and clarity.

Prior to discussing the findings specific to the main purpose of the study the appropriateness of the instrumentation used for the data collection must be considered. Although not extensively used with an elderly retarded population Version A of the Perceived Leisure Competence Scale (Witt & Ellis, 1987) and the Perceived Leisure

Control Scale (Witt & Ellis) lack any age related bias and were specifically designed for use with adolescent and/or higher functioning retarded individuals (Witt & Ellis). The validity of these scales, as sensitive indices of perceived competence and locus of control, has been established (Witt & Ellis). Rosenberg's (1965) Self-Esteem Scale, although not previously used with retarded subjects, has also been thoroughly tested and firmly established as a valid measure with a wide variety of populations and age groups (George & Bearon, 1980; Silber & Tippett, 1965).

Attempts to verify the validity of the perceived competence, locus of control and self-esteem instruments within the context of this study was impeded by two factors. One, the small sample size did not facilitate the use of factor analysis which was essential for the determination of the scales' construct validity. Two, the originators and subsequent users of the scales have not conducted or perhaps simply not reported the results of factor analyzed construct validity testing. Thus, had it been possible to factor analyze the data derived from this study it would have been rather meaningless without parameters for comparison. However, as the scales were relatively brief, employed simple language and were in no way altered for use in this study there was no logical reason to believe that the previously established validity was violated.

Reliability, while not a replacement for validity nor the most important facet of measurement, is extremely important. As such both stability (test-retest) and internal consistency (Cronbach's Alpha, 1951) reliabilities were calculated. The results, reported in Table 4, clearly indicated that the perceived leisure competence (Witt & Ellis,

1987), the perceived leisure control (Witt & Ellis) and the self-esteem (Rosenberg, 1965) scales were both stable and internally consistent measures. These findings provided support for the internal validity of the study. This was important for had the scales proved inaccurate the veracity of the overall results would have been rendered highly suspect.

The three hypotheses, specified as the basis for assessing the impact of the independent variable on the dependent variables, were substantiated by the results of this study. Specifically, participation in a physical activity program was found to have a statistically significant effect on the elderly retarded subjects attributions of perceived competence, locus of control and self-esteem. These findings tentatively support the notion that active recreation programming contributes as much to elderly retarded individuals psychological well-being as it does to younger retarded cohorts and non-handicapped elderly individuals.

The opportunities for comparing this study's perceived competence results was limited by the paucity of research that has examined this construct. Nevertheless, the increased levels of competence displayed by the experimental condition subjects (see Table 6) was consistent with previously reported findings. In a study of 24 nine to thirteen year-old retarded participants in a Special Olympics track and field meet Gibbons and Bushakra (1989) found significant changes in perceived competence. Similarly, with a sample of older nursing home residents Shary and Iso-Ahola (1989) found that perceptions of competence were significantly improved by encouraging increased control and choice through recreation

programming.

The anecdotal comments provided by the experimental subjects suggested the implications of their new found sense of competence. A number of individuals indicated that in the past they were reluctant to participate because they didn't believe themselves to be very good at physical activities. Following the activity intervention these subjects' clearly felt they had increased their ability to determine what transpired during the course of an activity. This was concretely demonstrated by a number of subjects ($n = 12$) who expressed interest in becoming involved in community based activity programs. Thus, in addition to improving perceptions of competence, exposure to active recreation programming seemed to enhance the elderly retarded subjects interest in continued participation.

Based on the information gathered regarding past activity experience the significant increase in perceptions of competence appeared rather curious. Of the 13 experimental subjects only 2 did not meet the past activity experience criteria of a minimum of one physical activity session per week during the year immediately preceding the study. Thus, it would have seemed logical that the subjects would have carried relatively sound levels of competence into the study; and as such the improvements on this variable would have been less substantial. Obviously, this was not the case. A plausible explanation is that the perceptions of competence the subjects derived from previous participation were influenced by other psychological constructs. Specifically, the perceived locus of control in past activity involvements may have been a factor. The majority of the subjects' prior experience was limited to activities which were,

with little input from the client, chosen by the caregivers. Attribution theory suggests that individuals who believe their behavior to be governed by external forces results, among other things, in a decreased sense of competence and self-esteem (MacNeil & Teague, 1987; Garber & Seligman, 1980). Therefore, as the experimental subjects were not previously responsible for initiating or choosing their activity involvements the possibility for developing competence was diminished.

As with perceived competence the experimental subjects displayed significantly greater levels of control than did their non-activity group counterparts. Specifically, the activity participants felt they, rather than some external source, controlled how they spent their time in the program intervention. Participation was directed by the individual and as such reflected each individual's choice and activity preferences. For many this represented a relatively rare opportunity to exercise any sense of control over their life experiences. Rather than being merely passive agents they had the opportunity to express their desires and were in their words "listened to for a change".

As conceptualized in MacNeil and Teague's (1987) attribution theory of aging, older individuals often must contend with situations that imply environmental as opposed to personal causation. This seems to hold true for elderly retarded individuals but in many cases may not simply be a reflection of growing older. Most of the volunteers in this study had been in some form of "sheltered" care for much of their lives and as such have had limited control throughout their life span. It would, therefore, seem likely that the elderly

retarded person has a greater propensity for experiencing low perceptions of competence and self-worth. Corresponding, these individuals overall psychological health and the process of successful aging may also be negatively influenced.

The results of this investigation suggested that physical activity may be a vehicle by which retarded individuals can exercise an element of personal control in their lives. However, to capitalize on this intended effect active recreation programming must be based on the activity preferences and choices of the individual participants. The veracity of this contention, viewed within the context of previously conducted research, was supported (Langer & Rodin, 1976; Mannell, Zuzanek & Larson, 1988; Perri & Templer, 1984; Rodin & Langer, 1977; Shary & Iso-Ahola, 1989). The findings reported from two examinations of the relationship between a variety of leisure activities and life satisfaction (Peppers, 1976; Ray, 1979) exemplified this point. As a brief aside, in these investigations life satisfaction was considered an indicator of psychological well-being and the process of successful aging (Peppers; Ray). Among other things Peppers discerned that retirees who had access to their preferred activities recorded higher ratings of life satisfaction. Ray, on the other hand, found that although life satisfaction and participation were related the level of satisfaction was independent of the size of the activity repertoire and the frequency of participation. Amalgamating these findings suggests that to have the intended effect choice is the key element; which can be further enhanced by offering choices that accommodate the activity preferences of the individuals involved. Thus, the internal locus of control demonstrated by the experimental

group in this investigation was possibly an artifact of increased responsibility and choice as opposed to the influence of physical activity alone. Nonetheless, the activity program provided an excellent and relatively rare medium through which the retarded subjects could exercise personal control over their environment.

Self-esteem, the final construct considered, was also positively and significantly influenced by the implementation of the physical activity intervention. Complimenting this finding, many of the subjects indicated that they had developed a more positive attitude about themselves since, in their words, "getting into shape". Although it was rather doubtful that any real physiological benefits were derived from participation, the subjects clearly felt better about themselves as a result of the activity.

A paucity of information is available regarding the impact of physical activity on self-esteem in older populations (Beran, 1986; Parent & Whall, 1984; Shary & Iso-Ahola, 1989). In a correlational study of a 30 individuals aged 60 and over Parent and Whall found that physical activity resulted in lower depression scores and higher self-esteem scores. Similarly, in a qualitative report Beran described the effects of regular exercise as being important in maintaining independence and thus, self-esteem in a sample of women aged 70-93. Shary and Iso-Ahola, in a study employing the same constructs used in this inquiry, found that by increasing elderly nursing home residents' responsibility and control via a recreation program resulted in greater levels of self-esteem. Thus, despite the limited parameters for comparison, the findings derived from this investigation were consistent with what is currently known about the non-retarded

elderly.

However, of the constructs examined self-esteem was the variable most susceptible to any possible bias associated with the Hawthorne effect (Kerlinger, 1973). The change in weekly routine, the extra attention, the experimental manipulation, or even the knowledge that the study was being done, could have been enough to cause the subjects to change. In short, the increased attention paid to the subjects possibly resulted in the improved ratings of self-esteem. "Possibly" is the operative word, for as noted by Homans' (1965) the Hawthorne threat can be greatly reduced through the use of experimental design. Specifically, by utilizing a control group and standard methodology researchers can be relatively confident that the Hawthorne effect will be minimized (Homans, 1965). A control group was used in this study; and the methodology was standardized. Therefore, the only known difference in attention received by the two groups was in the intervention implemented; and as such the potential influence of the Hawthorne effect was minimized.

Steps were taken to ensure that the experimental and control conditions were relatively homogeneous and comparable prior to the initiation of the activity program. The subjects were matched on age, gender, employment status and past activity experience; factors known to mediate the effect of physical activity on psychological variables (DeCarlo, 1974; Riddick, 1985). Furthermore, subjects were matched on the basis of their residential placement and whether or not retardation was attributable to Down's Syndrome. These elements have not, as yet, been substantiated as moderating influences but they were thought likely to have some effect.

Cognitive ability, on the other hand, was not included in the matching procedure and as such may explain the mediating effect of the three dependent measures pre-tests'. Clinical assessments of each subjects level of retardation was not available and as such a functional definition was employed in this investigation. It was, therefore, conceivable that one group had lower or at least more variable levels of intellectual functioning than the other. Within the confines of current understanding it is impossible to elaborate on how extensive the influence of cognitive ability might have been on the relationship between active participation and psychological well-being. Nevertheless, variable levels of cognitive functioning may have been enough to cause subtle pre-intervention group differences.

In addition to the matching procedure a pre-manipulation check was also conducted to informally assess the equivalence, of the two conditions on each of the dependent variables. Subjects were asked to rate their physical competence, the degree of control they had over how they spent their discretionary time and how they felt physical activity affected the way they saw themselves. The analyses of variance (ANOVA) conducted on this information seemed to confirm that the two groups were relatively homogeneous on the constructs in question. Perhaps they were; or perhaps the ANOVA simply wasn't powerful or sensitive enough to determine any substantive between group differences (Kerlinger, 1973; Pedhauzer, 1982).

In sum, despite these designed efforts of control, extraneous sources of variance were still evident. The inability to fully explain the interactive effect of the pre-test scores did not diminish the significance of what was found. It merely substantiated the need to

utilize the analyses of covariance (ANCOVA) procedures in this study. Clearly, the findings suggest that despite whatever mediating influence may have been present the subjects who participated in the activity intervention experienced increased perceptions of competence, locus of control and self-esteem.

Further substantiating this premise was the information derived from the analyses of the post-manipulation check data. In essence, these analyses supported the conclusion that the physical activity intervention did, as hypothesized, have a significant and positive impact on the elderly retarded subjects attributes of competence, control and self-esteem. These findings were consistent with the knowledge derived from research conducted with the non-retarded elderly and the younger retarded person. Additionally, the observed relationship between the locus of control, competence and self-esteem constructs suggested the importance of attributional style on psychological health. Viewed within the context of attribution theory this finding was also supported. For it parallels MacNeil and Teague's (1987) contention that the perception of control, facilitated through the provision of choice, has a significant impact on mental well-being and, in general, the process of successful aging.

Conclusion

The mentally retarded population, like the populace as a whole, is an aging one; but unlike the general population comparatively little is known about the aged retarded individual (Janicki & Wisniewski, 1985). Concerted investigation of this area has only really begun in the past 5 years (Sison & Cotten, 1989). Much of this recent interest

has focused on the service delivery needs of the older mentally handicapped individual. These inquiries have, for the most part, been limited to issues related to appropriate residential placement. One such factor, subsumed within the parameters of these discussions, has been the question of day programming. The preponderant concern has been the inappropriate developmental nature of currently available day placements (Sison & Cotten). Consideration of this issue has been cursory at best; predominantly critical without the benefit of constructive suggestions for improvement.

Dependent on further substantiation, the results of this exploratory study offered at least one possible resolution to this impasse. Specifically, physical activity programming, either alone or in tandem with other initiatives, may provide a positive alternative to developmental day placements. This contention was based on the significant gains registered by the activity group participants on perceptions of competence, locus of control and self-esteem. In short, active recreation programming appeared to enhance the elderly retarded subjects psychological well-being. Rather than simply being "placed" in a program that met administration requirements the elderly retarded individuals experienced the opportunity to fulfill their own personal needs.

Programs and or day placements that facilitate the realization of personal satisfaction in the older retarded person would be a vast improvement over what is currently available. The results of this investigation suggested that physical activity may be a vehicle by which retarded individuals can exercise an element of personal control in their lives, and as such enhance their psychological well-being.

However, physical activity or, for that matter, any other form of programming may not be the total solution. Choice and the opportunity to make decisions based on personal preferences is a notion central to developing an internalized sense of control (Ray, 1979). In turn, perceptions of control serve to maximize the realization of psychological benefits (Shary & Iso-Ahola, 1989). Thus, the extent of psychological enhancement witnessed in this study was, in large, determined by how successfully the program facilitated control through the decision making process. This does not diminish the potential utility of physical activity as a positive alternative or at least a necessary component in day program placements. Suggested, however, is that by design and implementation programming, whatever its form, must provide the older retarded individual the opportunity to exercise the fullest degree of control possible.

Over and above providing a potential solution to the issue of appropriate day programming this study also served another important purpose. Specifically, it addressed two recognized "gaps" in current knowledge (Searle, 1989). First, this study provided further information regarding the additive effect active participation has on the variables of perceived competence, locus of control and self-esteem. Second, the findings supported prior understanding of the psychological effect of physical activity; and extended them to a previously unstudied sub-group within the normal elderly population. Therefore, even with the interpretive cautions warranted results derived from an exploratory examination this study, nonetheless, fulfilled its purpose. In sum, the reported results suggested that a significant and positive relationship existed between physical activity

and the elderly retarded sample's perceptions of competence, locus of control and self-esteem. Obviously, these findings were not sufficient to prove causality; but at worst they provide considerations for program planning and the basis for future inquiry.

Suggestions for Future Inquiry

The paucity of research that has considered the older retarded person, let alone the questions posed in this investigation, leave many possible avenues for future researchers. This investigation has contributed, at least one, concrete suggestion to guide these future inquiries. Specifically, the need to replicate and confirm the results derived from this exploratory study. To facilitate this process two problems of particular concern in this investigation must be addressed. The question of how cognitive functioning may, or may not, influence responses to interventions designed to enact psychological change requires further understanding. Clarification of this point may be difficult in view of the limited accessibility, or non-existence, of clinical assessments of retardation for many older individuals. Perhaps the development of an objective and valid cognitive assessment scale, specifically for use with the retarded elderly, could help to rectify this problem.

A second, perhaps more easily resolved, concern pertained to the identification of the subjects activity preferences. Four of the 26 subjects in the sample did not have any prior experience with physical activity; and as a result few had problems isolating specific activities they liked to do. However, the nature of these previous involvements was usually dependent on the activities selected by the caregiver for

participation. As such it was impossible to discern whether or not the identified activity preferences were truly preferred activities or simply the reflection of familiarity. Although it did not prove to be a factor within this study, the latter of the two possibilities could have negated the benefits of providing participation choices. Thus, in subsequent investigations it may be prudent to increase the duration of the intervention. The first few weeks would be spent exposing subjects to a variety of activities; upon conclusion of which the opportunity for choice would then be implemented.

These suggestions represent but one option for future inquiry. The fact remains that little is known about the older individual with mental retardation. Thus, it is the responsibility of future researchers to expand their focus to consider this poorly understood and underserved segment of the population.

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Appendix A

Volunteer To Participate

My name, on this paper, shows I want to be in the study to:

"Find out the effects of an activity program on how I feel about myself."

Conducted by: Jennifer Mactavish, a graduate student in the Faculty of Physical Education and Recreation Studies at the University of Manitoba (ph. #)

Academic Advisor: Dr. M. Searle ph # 474-8770.

I have been told why this work is being done and I've been able to ask questions. I know that taking part is my own decision and I don't have to do this if I don't really want to. I can stop going anytime I want to and nothing will happen. I know that what I say in the interview, with Jennifer, will not be told to anyone else. When the study is written up nobody will know that I took part. I understand that I, along with the other people, get to pick the things we are going to do in the physical activity program. Also at the end of the study Jennifer will tell us what she found out.

Volunteer subject's signature: _____

Care giver's signature: _____

Date: _____

Pre-Program Background Information

Name: _____

Birthdate: _____

Gender: Female: _____ Male: _____

Type of residential placement: _____

(group home, foster family,
independent, nursing home,
biological family).

Employment status (do you work - if so where): _____

Are you able to travel by bus? (Note travel needs) _____

If your part in this project is to go to the program (& ques.) what night
is best for you? _____

Past activity experience: (what kind of activity have you done over the
past year? Do you do it at least one day per week?): _____

If you could pick the activities you wanted to do which one(s) would
you pick? _____

Appendix B

Information Update for Clients Participating in the Physical Activity
Study.

Conducted by: Jennifer Mactavish
Graduate Student at the University of Manitoba

Academic Advisor: Dr. Mark Searle 474-8770.

Group Assignment: As previously indicated the subjects in this study were to be randomly assigned to one of two groups; please note that both groups are equally important to the success of this project. Subjects assigned to the **experimental group** will participate in an **activity program** run by a group of volunteers experienced in the provision of programs for the mentally handicapped. Subjects will be asked, at the program, to choose the activities that they would like to participate in (e.g. bowling, exercises, dancing, low organized games, walking etc.). Subjects in the **control group will not participate in the physical activity program**. However, should the program prove successful, further programs will be initiated for participants and non-participants to access at the conclusion of the study.

Each subject, in each group (experimental and control) will be asked to respond to a series of questionnaires both before (mid Aug.) and after (early Sept.) the activity program. I will contact each of you to set up an appointment for this purpose.

_____ : Has been assigned to the

_____ **EXPERIMENTAL (ACTIVITY) GROUP.**

_____ : Has been assigned to the

_____ **CONTROL (NON-ACTIVITY) GROUP.**

Individuals assigned to the **ACTIVITY GROUP** will meet one evening per week for five weeks starting:

Tuesday August 14, 1990 (up to and including Sept. 11)

6:30 to 8:30 pm

Lion's Place 610 Portage Avenue.

**** SUBJECTS ARE ASKED TO DRESS IN ATTIRE APPROPRIATE FOR ACTIVITY** i.e. runners, t-shirt, shorts (or sweat pants) etc.

Please note that each individuals participation in this project is voluntary; thus should anyone wish to withdraw at anytime they are free to do so. However, should someone wish to withdraw please let me know.

If you have any questions or concerns regarding any aspect of this study please call.

Your time and assistance with this project is greatly appreciated.

THANK - YOU

JENNIFER'S ACTIVITY STUDY
(subject's version of the preceeding)

_____ : Is in the **ACTIVITY GROUP**.

The **ACTIVITY PROGRAM** will start:

Tuesday August 14, 1990 (every Tuesday to September 11)

6:30 to 8:30 pm

Lion's Place 610 Portage Avenue.

Please wear (or bring) runners, shorts (or sweat pants) and t-shirt.

Any questions or if you cannot go call Jennifer

THANK - YOU FOR YOUR HELP.

Appendix C

Information to the Public Trustee

Subject: Request consent for _____ (Subject's name) _____ to participate in a study.

Conducted by: Jennifer B. Mactavish (ph. # _____).

Graduate Student in the Faculty of Physical Education
and Recreation Studies - University of Manitoba.

Academic Advisor: Dr. M. Searle (ph. # 474-8770).

*** Note: Should you have questions regarding any aspect of this study please contact either of the parties indicated above.**

Title of study: "The effect of physical activity on perceived competence, locus of control and self-esteem in elderly individuals with mental retardation."

Purpose of the study: Will be to determine whether elderly mentally handicapped individuals participation in physical activity will result in positive attributions of perceived competence, locus of control and self-esteem.

Rationale: Results of general gerontological research suggests that participation in physical activity positively contributes to psychological well-being and to the process of successful aging. In short these findings indicate that participation in physical activity not only add years to life but lend quality to those additional years.

Research pertaining to the elderly mentally handicapped is in its infancy and has yet to address the role physical activity may play in the lives of these people. Thus, this investigation represents a pioneering attempt to extend current understanding of the general elderly population to the mentally handicapped. Clearly, if the results are as anticipated, it may be possible to enhance the quality of life enjoyed by older individuals with mental handicaps.

Physical Activity Program: The program will be run by a minimum of three volunteers experienced in the provision of programs for the

mentally handicapped. Subjects in the activity condition will choose the activities that will be participated in, 1 evening per week for the 5 weeks.

Subjects in the control group will not participate in the physical activity program. However, should the program prove successful, further programs will be initiated for participants and non-participants to access at the conclusion of the study.

Information to be Collected: A series of questionnaires will be administered in a private interview with each subject prior to initiation of the activity program and at the completion of the program. Each interview will require approximately 30 to 35 minutes to complete. The interviewer will read each question to the subject and ask the individual to indicate the response that they believe provides the best description of themselves. Three brief questionnaires will be used to assess perceived competence, locus of control and self-esteem. To determine the effectiveness of the program subjects will also be asked, in the pre/post activity interviews, to indicate how they feel about the opportunities they have to make decisions, take on responsibilities, and to influence how they spend their uncommitted free-time.

Included in the pre-activity interview only, subjects will be asked to provide information regarding their previous physical activity experience. The purpose of this information will be to provide the researcher with an indication of the activity preferences of the group. This information will be used to provide the physical activity options from which the experimental group subjects will choose their activity sessions.

Subject's Interest: A meeting was conducted with the potential subjects and their respective care givers. In this meeting the purpose of the study and the extent of the commitment required was thoroughly explained. Additionally, it was stressed that participation will be voluntary; individuals will be able to withdraw at any time; information will be strictly confidential; and that the results will be explained to them following the completion of the study. Interested

individuals, with the help of their care giver were then asked to completed a "Volunteer to Participate Form" indicating their willingness to take part in the study (see attached).

Final Report: Upon completion the resultant thesis will be the property of the researcher and the University of Manitoba. However, a summary of this study will be available to the subject, the care giver, and the consenting party. All information derived from the individual interviews will be destroyed following the completion of the written report.

Informed Consent Form

(to be retained by the researcher)

Re: Consent for participation in a study entitled:

"The effect of physical activity on perceived competence, locus of control and self-esteem in elderly individuals with mental retardation."

Conducted by: Jennifer B. Mactavish (ph. # 261-8450).

Graduate Student in the Faculty of Physical Education
and Recreation Studies - University of Manitoba.

Academic Advisor: Dr. M. Searle (ph. # 474-8770).

The purpose of this study is to determine whether elderly mentally handicapped individuals participation in physical activity will result in positive attributions of perceived competence, locus of control and self-esteem.

If you agree to allow _____ to participate in this study it is hoped that she/he will participate in program for approximately 2 hours once per week for a 5 week period. The physical activity program will be based on the activity preferences of the participants. The above named individual will also be asked to respond to a series of questionnaires on two occasions, which will help to identify how the individual feels about his or her self and the effectiveness of the program.

Please be assured that all of the collected information will be kept confidential among the subject, the researcher, and the University of Manitoba.

Thank-you for your cooperation.

Understanding the intention of the study and recognizing the individual of concern wishes to participate and can withdraw at any time, the undersigned hereby grants permission to _____(subject's name) to partake in the aforementioned study.

Signature: _____ Position: _____

Date: _____

I would like a summary of the final report: yes___ no___

Appendix D

Perceived Leisure Competence Scale

Instructions: As stated in Chapter 3 - Data Collection.

Sounds like Sounds a Doesn't sound
me little like me like me.

1. I'm good at almost all the recreation activities I do.
2. During competitive activities, if I try, I usually win.
3. I'm good enough to play sports.
4. When participating in group activities, I'm a good leader.
5. I'm good at thinking of new recreation activities to do.
6. I learn new activities fast.
7. I'm good at doing recreation activities with other people.
8. I'm good at thinking of things that are fun to do.
9. I'm better than most people at doing my favorite recreation activity.

Sounds like Sounds a Doesn't sound
me little like me like me.

10. It's easy for me to choose a recreation activity in which to participate.

11. I'm good at meeting people.

12. I'm good at most of the recreation activities I do.

13. I am able to do physical activities well.

14. I have the skills to do the recreation activities in which I want to participate.

15. I'm able to play outdoor sports as well as I want to.

16. I'm usually good at the new recreation activities I try.

17. I'm a better player than most people.

18. I know many recreation activities that are fun to do.

Sounds like Sounds a Doesn't sound
me little like me like me.

19. I'm satisfied with how well I
can do most recreation
activities.

20. I'm good at the recreation
activities I do with other
people.

Appendix E

Perceived Leisure Control Scale

Instructions: As stated in Chapter 2 - Data Collection.

Sounds like Sounds a Doesn't sound
me little like me like me.

1. I can do things during a recreation activity to enable other people to enjoy doing the activity with me.
2. I can be as good as I want to be at the recreation activities in which I participate.
3. I can usually convince other people to do the recreation activities I want to do.
4. If someone started an argument with me, I could make them stop.
5. I can do things during recreation activities that will help me make new friends.
6. I can do things during a recreation activity that will improve the skills of the participant.
7. I can make almost any activity fun for me to do.

Sounds like Sounds a Doesn't sound
me little like me like me.

8. I usually decide who I will participate with during recreation activities.
9. I can make good things happen when I do recreation activities.
10. I can do things during recreation activities that will make everyone have more fun.
11. I can usually persuade people to do recreation activities with me, even if they don't want to.
12. I can make a recreation activity as enjoyable as I want it to be.
13. When I'm doing recreation activities, I can keep bad things from happening.

Sounds like Sounds a Doesn't sound
me little like me like me.

14. During a recreation activity,
I can do things that will make
other people better players.

15. I can do things during
recreation activities that will
make other people like me more.

16. I can enable other people to
have fun during recreation
activities.

17. I can do things during recrea-
tion activities that will help
other people win more often.

Appendix F

Self-Esteem Scale

Sounds like Sounds a Doesn't sound
me little like me like me.

1. On the whole, I am satisfied with myself.
2. At times I think I am no good at all.
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I certainly feel useless at times.
7. I feel that I am a person of worth, at least on an equal plane with others.
8. I wish I could have more respect for myself.
9. All in all, I am inclined to feel that I am a failure.
10. I take a positive attitude toward myself.

Appendix G

Manipulation Check

I. Perceived Competence:

(a) I'm good at the physical activities I try.

_____ "Sounds like me"

_____ "Sounds a little like me"

_____ "Doesn't sound like me"

Comments: _____

(b) I like doing physical activities (like...) because I'm usually pretty good at them.

_____ "Sounds like me"

_____ "Sounds a little like me"

_____ "Doesn't sound like me"

Comments: _____

II. Locus of Control:

(a) When I do physical activity's I pick the one(s) I want to do.

_____ "Sounds like me"

_____ "Sounds a little like me"

_____ "Doesn't sound like me"

Comments: _____

(b) When I have free-time somebody else picks things for me to do.

_____ "Sounds like me"

_____ "Sounds a little like me"

_____ "Doesn't sound like me"

Comments: _____

III. Self-Esteem:

(a) Doing physical activities helps me feel good about myself.

_____ "Sounds like me"

_____ "Sounds a little like me"

_____ "Doesn't sound like me"

Comments: _____