

THE USE OF INTEGRATED MOTOR PATTERNS
WITH MEMORY-IMPAIRED ELDERLY

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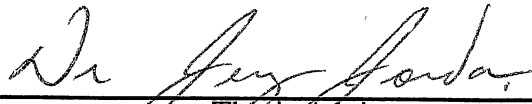
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CHAPTER I

INTRODUCTION

The elderly American population is ever growing as evidenced by the fact that by the year 2000 they will comprise 13 percent of the population. By the year 2030, they will represent 21.8 percent of the total population which is more than double that of 1980 (U.S. Department of Health and Human Services, 1989).

Brummel-Smith (1990) states that developing a disability is not part of the normal aging process. However, almost all conditions that cause disability are more frequently seen in the older population. One such condition, organic brain syndrome, results when there is physical damage to the brain which affects orientation and memory (Teaff, 1985).

One form of organic brain syndrome is dementia. Dementia in itself is not a disease, but rather a number of symptoms which mainly involve a deterioration in intellectual functioning which interferes with activities of daily living (ARDA, 1987). Studies have suggested that dementia is not a normal part of aging (ARDA, 1987; Mace & Rabins, 1981). Other studies, however, suggest there is little evidence to support the idea that senile dementia is different from the normal aging process (Brayne & Calloway, 1988). Alzheimer's disease is the most common form of dementia and is the fourth leading cause of death in adults in America.

There are five recognizable symptoms which indicate the presence of organic brain syndrome:

1. Impairment of memory which involves registration, retention, and recall;

2. Impairment of intellect which involves the ability to comprehend and to learn;
3. Impairment of judgment which involves the ability to make appropriate decisions;
4. Impairment of orientation which involves knowledge of time, place and person; and
5. Lability and shallowness of affect which involves excessive mood swings and display of inappropriate affect.

These signs or symptoms may range from barely noticeable to very severe, affecting overall functioning (Butler & Lewis, 1982).

As impairment of intellect hinders learning, the learning of new tasks becomes increasingly difficult. However, according to Cratty (1967), skills or tasks which have been practiced over a lengthy period do not seem to deteriorate. Retention of movements is influenced to a large degree by amount of original learning of the task.

Persons with Alzheimer's disease depend on "overlearned patterns of movement which do not require conscious thought or sequencing" (Zgola, 1987). Those activities which utilize "old remaining skills" are more successful than activities which require the acquisition of new skills no matter how simple (Mace, 1987). According to Carroll and Gray (1983), activities which are familiar and well learned will draw less attention to the impaired individual's inability to perform.

Due to the limited amount of literature related to learning theory and activity participation this study was designed to determine the effect of integrated motor patterns in memory recall of adult daycare clients diagnosed as having memory deficits.

Research Question

Does participation in an integrated motor pattern improve performance on a memory task for individuals suffering from memory deficits?

Extent of the Study

Delimitations

This study sample was drawn from individuals having memory impairment problems at the L.I.F.E. Adult Daycare Center in Stillwater, Oklahoma.

Limitations

Limitations of the study included: (1) a small sample size which was not randomly selected; and (2) integrated motor patterns, as utilized in this study, are not restricted to an individual's recreation and leisure activities.

Assumptions

1. The recreational activities participated in represent integrated motor patterns for each client.
2. Participants in the study exhibited a problem with memory impairment.

Definitions of Terms

Integrated motor pattern—A pattern which is performed repeatedly until it becomes automatic, not requiring conscious thought (Magill, 1983).

Cognitive functioning (cognition)—The mental faculty process by which knowledge is acquired (Webster 1984).

Alexia—The inability to comprehend what one is reading (Zgola, 1987).

Inertia—The inability to get started without the presence of a concrete stimulus (Zgola, 1987).

Aphasia—Inability to express oneself verbally or through writing (Zgola, 1987).

Apraxia—Loss of ability to perform motor skills previously learned which cannot be explained by physical impairments (Butler & Lewis, 1982).

Agnosia—Inability to recognize familiar objects in the absence of sensory impairment (Zgola, 1987).

Elderly—An individual reaching the age of 65, set by the Social Security Act of 1935 and subsequently adopted by society. (Cavanaugh, 1990).

Perseveration—Repetition of a particular response or activity with the inability to stop unless intervened by an outside force (Zgola, 1987).

Paraphasia—The inability to use the correct word although the person's intention is right. Interchanging words that sound similar or are in the same category (Zgola, 1987).

Visuo-spatial difficulty—The inability to perceive direction and distance (Zgola, 1987).

Acalculia—The loss of mathematical ability (Butler & Lewis, 1982).

Incontinence—Inability to control excretory functions (Webster's, 1984).

Psychological disorder—A decline in functioning of memory, perception, and emotional response (Teaff, 1985).

CHAPTER II

LITERATURE REVIEW

Literature Related to Aging and Dementia

The aging process often entails physiological changes that are generally feared because they indicate a decline. This decline, however, is frequently slow and does not significantly alter functioning. Physiological declines can often be reversed by a healthy lifestyle that encompasses healthy eating habits, exercise, and other healthful practices (Teaff, 1985).

As individuals age, nerve cells in the brain decrease as they are not replaced with new ones. Beginning at the age of 20, brain cells die at a rapid rate that reaches thousands per day. As a result of reduced brain cells, our brain diminishes in weight by approximately 1 gram per year (Bramwell et al., 1982). Reaction time, speed and accuracy, sight and hearing, sense of balance, and learning potential may be affected which can interfere with everyday activities (Teaff, 1985; Bramwell et al., 1982). It is important to remember, however, that the majority of people maintain normalcy even into extreme old age and it is not necessarily a time in which intelligence decreases (Bramwell et al., 1982). Results from a study concerning functional skill regression in late-stage dementia (Nolen, 1988) reveals that the loss of ability occurs in reverse order of its development.

According to Pfeiffer (1977), 15% of the elderly population have psychological disorders which fall into two categories: functional and organic. Functional disorders are classified as either neuroses or psychoses and have no physical cause. A neurosis

can alter or impair one's judgment, but does not cause the individual to be out of touch with reality. According to Butler and Lewis (1982) depression is the most commonly seen functional disorder and is a neurotic disorder which can cause insomnia, appetite decrease, fatigue, withdrawn behavior, sadness, and difficulty with decision-making. A person with a psychotic disorder such as schizophrenia (frequently called paraphrenia or senile schizophrenia in the elderly population) is characterized by a loss of contact with reality, decreased impulse control, delusions, hallucinations, and personality disintegration (Teaff, 1985).

Organic disorders, otherwise known as organic brain syndromes, are caused by some physical impairment or damage to the brain. The two major groups of organic disorders are reversible organic brain syndrome and irreversible organic brain syndrome. Both can create difficulties with memory, speech, reality orientation, depression, anxiety, euphoria, and hyperactivity (Teaff, 1985).

According to Butler and Lewis (1982), reversible organic brain syndrome is a temporary dysfunction that can result due to physical, psychological and social traumas such as head injuries, malnutrition, alcohol and drug abuse, congestive heart failure and metabolic malfunctioning. Irreversible organic brain syndrome is otherwise known as chronic brain syndrome and its prevalence increases with age. Mental deterioration is gradual and is a result of cerebral arteriosclerosis or brain deterioration. Changes in behavior are noticed and may include wandering, poor self care, insomnia, agitation and episodes of delirium (Teaff, 1985).

A disease which affects memory orientation and evidences signs of depression, delusions, jealousy, and apraxia was first described by Alois Alzheimer in 1907. This description was based on a 51 year old woman whose brain had appeared atrophic. Upon autopsy, tangles or clusters of cortical neurofibrils were found. This form of dementia became known as Alzheimer's disease. It involves rapid mental deterioration

due to progressive, diffuse brain damage and may include any or all of the following symptoms: depression, anxiety, denial, behavioral changes, apathy, insomnia, wandering, incontinence, apraxia, seizures, agitation, incoherence, language or perceptual problems (Butler & Lewis, 1982). Other problems include decreased attention span, impaired judgment, impaired sensory functioning, decreased understanding of abstract concepts, and inappropriate expression of feelings (Zgola, 1987; Zarit & Tager, 1980).

According to the National Institute on Aging, approximately four million Americans are afflicted with Alzheimer's disease (ARDA, 1987). Onset is gradual and the course of the disease generally runs between seven and ten years, with the exception of longer and shorter duration, before death occurs (Mace & Rabins, 1981). Those afflicted with Alzheimer's disease eventually cease to be able to speak, think, or take care of their personal needs. Pneumonia, urinary tract infections, as well as other infectious diseases often develop as a result of immobility and poor care and are considered the leading cause of death in those diagnosed with Alzheimer's disease (ARDA, 1987). The cause of the disease is undetermined, but several possibilities exist such as shortage of the enzyme acetylcholine, existence of trace metals in the brain, twisted nerve fibers in the brain, a defect in the body's immune system, or genetically induced in combination with environmental factors (Lindeman, 1984).

During the earliest stages of decreased cognitive functioning, prior to a diagnosis of dementia being made, cognitive impairment is evidenced by forgetfulness and possible difficulty with mathematical problems, reading, and writing. Generally in this stage the individual is capable of living independently and should be encouraged to remain as active as possible. In this early stage of decreased cognitive functioning the individual may recognize his/her mistakes. (Kemp et al., 1990).

After the diagnosis has been made, the individual has reached a stage in which routine activities become difficult. At this point, memory is significantly impaired, but the individual should be able to execute two to three step actions if they have a purpose or predictable outcome. Activities may not be organized and the need for simple, repetitive activities emerges. It is now more difficult to recognize and correct mistakes (Kemp et al., 1990).

During the middle stages of dementia, the individual will have greater difficulty performing self-care skills such as dressing and toileting. Agitation, wandering, and paranoia are common problems in this stage. Although self-care activities may be performed with less trouble by the caregiver, the individual should be encouraged to do as much as possible independently. As comprehension and memory are severely affected, simple instructions and much practice will be required. Disorganized and non-productive behavior may be present in this stage as evidenced by pacing and dressing and undressing which rely on the individual's "well-rehearsed body movements". Activities involving familiar actions can still be participated in, although not as well. Such activities include folding laundry, chopping, polishing, dancing and catching a ball (Kemp et al., 1990).

During the last stages, intellectual functioning is profoundly affected. Individuals in this stage are generally placed in institutions due to their marked deterioration. The inability to perform such tasks as ambulation, continence, and basic sustenance needs often places too much of a burden on the caregiver. Unresponsiveness is typical, but responses such as grasping, sucking, and chewing are primitive and may remain intact (Kemp et al., 1990).

The chances of developing senile dementia of the Alzheimer's type increases with age and it has been theorized that all persons might develop the disease if they did not die of other causes first. However, persons reaching their 80s and 90s have been

autopsied upon death and have little evidence of abnormalities such as senile plaques or neurofibrillary tangles (Zarit & Tager, 1980).

Literature Related to Memory

As intellectual functioning, specifically memory impairment, is a major deficit involved in dementia, a discussion of memory theories is essential. There are many theories regarding how the human memory works, but scientists are convinced that there are several components which make up memory. One theory supports that incoming stimuli from the senses enters a part of the memory called *immediate memory* which holds onto information for 1/2 second. The *short term memory* becomes involved as selected information from immediate memory passes and is held for 10-30 seconds. As new information enters short term memory, other information is forced out unless it has been rehearsed enough to travel to the *long term memory*. Long term memory recall is typically fast, as a retrieval system exists to aid in finding the information. Memory is not perfect, however, as different people may remember the same event differently. This is otherwise known as constructive error (Bramwell et al., 1982).

The majority of experts believe short term memory is based on an "electrical reverberating circuit." Theories on long term memory are not agreed upon. Some believe that certain memories are triggered when new pathways are created by nerve impulses. Others believe peptides or chains of molecules are created, possibly one for each memory. When memory fails or forgetting occurs, it is possible that new memories blot out others or that memory traces found in the brain decay (Bramwell et al., 1982).

According to Zgola (1987), memory is divided into three groups called immediate recall, recent memory, and remote memory. *Immediate recall* refers to the ability to

remember information immediately after exposure. *Recent memory* refers to the ability to remember material within a few minutes. *Remote memory* refers to the remembering of events or information from the past, ranging from months to years.

Memory loss is one of the first and most obvious symptoms of dementia and of the three, remote or long term memory appears to be affected the least. As immediate recall and recent or short term memory are affected the most, individuals with dementia will have difficulty learning new material or skills (Zgola,1987).

According to Gose and Levi (cited in Weiss, 1989), there are three stages of memory: registering, retaining, and retrieving. Retrieval is generally better in long term rather than short term memory in the elderly population, particularly in those with dementing illnesses. Some conclude that this means the longer a memory is held, the better it is remembered. However, Butler and Lewis (cited in Weiss, 1989) suggest that these elderly are experiencing the problem in registering rather than retaining the newer material.

Zgola (1987) identifies four stages of memory: registration, storage, retrieval, and retention. Zgola adds storage as a stage as the brain may not have the ability to store the information that was registered or it may not be able to store the information indefinitely. Visual or verbal hints may assist individuals with the retrieval process which may account for the popularity of "finish the proverb games."

Remembering things from the past, otherwise known as reminiscence, can be beneficial for an individual who feels uncomfortable or insecure in his present surroundings. Reminiscence can be a pleasurable experience that helps to connect one with happy times and increases self esteem as it enables the individual to remember events stored in the long term memory (Zgola, 1987).

Literature Related to Integrated Motor Patterns

As remembering things from the past or retrieving from long term memory is both beneficial and typically more accurate, use of integrated motor patterns in studies involving memory may prove to be a valuable tool.

According to Namikas in Magill's (1983) "Memory and Control of Action," "the best learned skills are those which we continually use in daily interactions with the situations we encounter." These actions become automatic. Schneider and Fisk state that many changes take place during the acquisition of a skill. For instance, learning to type, play an instrument, or play tennis requires much effort and attention initially as progress is slow and errors are many. However, with practice, performance improves and can be performed with little attention (Magill, 1983).

There are two types of information processing known as automatic and controlled which came from the studies of Schneider and Schiffrin in the 1970s (cited in Magill, 1983). Automatic processing does not rely on short term memory capacity, is fast and effortless, and allows for the performance of well-developed skills. Controlled processing is controlled by the individual, takes much effort, is slow, and the response will be different on each trial (Magill, 1983).

Eccles (1972) suggested that a well-learned act can be performed automatically by simply stating a command such as "place finger on nose" or "pick up glass." Other times, well-learned acts are performed subconsciously and generally the less one thinks about the performance of a particular act the better (cited in Stelmach, 1978).

According to Polayni (1958), we sometimes perform an act without knowledge of the rules governing that action. For example, when riding a bicycle, we do not know or follow the rule associated with bicycle riding and knowing the rule would not help us to ride the bicycle any better (cited in Stelmach, 1978).

According to Kilpatrick (cited in Cratty & Martin, 1969), infants make "motor copies" of objects with their hands. This learning, as well as other motor skills learning, is stored and triggers a series of movements. Upon much practice and repetition, these movements require less and less conscious thought to perform.

These overlearned patterns are an automatic response to a stimulus which are used in performing activities of daily living. These habitual skills may be lost in time, but certain remarkable abilities may still remain. An example of this is playing the piano, although skills which are much simpler are no longer intact. Other examples of activity skills that may be retained include dancing, sawing, and threading beads (Zgola, 1987).

Literature Related to Leisure and Aging

Leisure patterns can also be considered automatic or habitual as they are shaped and developed throughout the life cycle. During the childhood years, play is the main form of leisure. Play stimulates creativity and the ability to problem-solve, thus helping the child to develop cognitively (Teaff, 1985). According to Bruner (1975), this knowledge is transferred to real life situations. The socialization engaged in through play marks the beginning of leisure behavior as the child learns how to interact with others (Yoesting & Burkhead, 1973).

During early adolescence (ages 12-15), leisure presents itself as development of skills that will meet with peer expectations (Bishop, 1970; Witt, 1971). In later adolescence (ages 16-20), leisure is used as a means of seeking independence from parents by making close relationships with peers (Gordon, Gaitz & Scott, 1976).

According to Kelly (1974, 1975), leisure patterns in young adulthood (ages 21-29) are determined by occupational and marital status, both of which are further affected by income, time, and children. Leisure plays an important role in marriage as it involves

activities that promote interaction and family togetherness (Orthner, 1975, 1976; Carise, 1975).

In early maturity (ages 30-44), work and family continue to be important factors in determining leisure patterns. Activities are largely home or family centered as a means of promoting family growth and stability (Gordon, Gaitz, & Scott, 1976).

At full maturity (ages 45 to retirement), physical changes begin to take place. There are fewer family responsibilities and increased economic resources which are conducive to an increased amount of leisure outside the home (Teaff, 1985). It is also a time in which new leisure interests can be developed as the work career begins to come to an end, the children leave home, and retirement nears (Ward, 1979). Leisure in retirement promotes social interaction and decision making in an attempt to maintain social autonomy (Gordon, Gaitz, & Scott, 1976).

As age increases, participation in activities which are considered as highly active or away from the home tend to decrease (Gordon, Gaitz, & Scott, 1976). However, according to the National Council on the Aging (1975), activities such as organizational participation, gardening, volunteering, walking, sleeping, reading, sitting and doing nothing, contemplating and political participation do not significantly decline with age. Socio-economic status affects the leisure patterns of the elderly as the middle class tend to prefer community-oriented activities, clubs, parties, and traveling. The working lower class elderly spend time socializing with the family, watching television, and pursuing hobbies (Havighurst, 1973; Havighurst & Feigenbaum, 1959). According to the National Council on the Aging (1975) and Atchley (1980), lack of transportation and physical limitations can significantly hinder participation in leisure due to inconvenience.

According to Peppers (1976), in his article "Patterns of Leisure and Adjustment to Retirement," there is no specific activity that is designated as a retirement activity. In

his study the results showed that 8 of the 10 activities upon retirement were "isolate endeavors." However, these same activities were also engaged in prior to retirement, which suggests minimal change in the leisure activities participated in prior to and after retirement. The continuity theory of aging (Neugarten, 1964; Atchley, 1971; Atchley, 1977; as cited in Davis & Teaff, 1980) refers to the belief that as individuals age they are inclined to maintain habits and preferences that have been molded throughout their lives. According to Seleen (1982), the decision whether to participate or not to participate is not the issue; but, whatever the decision, it needs to be congruent with the individual's desired choices.

In Pepper's (1976) research, his final conclusion stressed "doing what you most enjoy." His study indicated that those retired individuals who were currently engaging in a favorite activity received much greater life satisfaction scores. A leisure satisfaction scale (LSS) was developed by Beard and Ragheb (1980) as a means of finding other variables which predict life satisfaction among the elderly. It was used in their study of 565 subjects who were 55 and older. The findings indicated that "gaining a sense of accomplishment from engaging in leisure activities, gaining self-confidence, utilizing one's skills and abilities, and doing interesting activity are important to one's life satisfaction."

According to Miller (1965), as one reaches the age of retirement, one's identity is threatened as society does not accept leisure as a legitimate replacement for the lost work identity. Individuals may feel inadequate and have feelings of decreased self worth if leisure is not accepted by society as a legitimate role replacement. Atchley (1971) found, however, after several studies that leisure can act as a legitimate source of identity after retirement as continuity can be maintained through family, friends, church, and community, thus creating retirement cohorts. The continued participation in

activities which involve interests prior to retirement should make the adjustment easier and provide a foundation for life satisfaction (Teaff, 1985).

Ekherdt (1986) suggested that the work ethic has now been replaced by the "busy ethic," meaning that the retired person stays active and involved. He wrote, "the busy ethic legitimates the leisure of retirement, it defends retired people against judgments of obsolescence, it gives definition to retirement roles, and it domesticates retirement by adapting retired life to prevailing social norms."

Literature Related to Activities and Dementia

While activities play an important role for those involved in the normal aging process, so do they play an important role in assisting individuals with dementing illnesses like Alzheimer's disease to achieve the best quality of life possible. Dementia affects intellectual functioning which can prevent one from independently pursuing interests. These experiences can be made possible through activity therapy which attempts to provide immediate pleasure, restore dignity and past roles, provide meaningful tasks, and provide the opportunity for friendships to develop. Due to the neurological damage to the brain, memory problems, motor problems, and language problems can cause a person to feel worthless and, consequently, he or she may respond in a defensive manner or may be angry or withdrawn. Activities designed for the mainstream population may not be appropriate; therefore, activities must be modified to minimize these impairments. The intervention used will depend upon the problem and each specific individual (Mace, 1987).

There are some basic principles involved when planning activities for persons with dementia which include:

1. The activities should have meaning for that person and they should know the meaning. Folding laundry as an activity is not meaningful unless it is the

individual's laundry. Making a simple craft and having no idea what will be done with it is not meaningful. However, if it is used for a gift, that establishes a goal. The meaning of the task may need to be repeated often.

2. Activities should re-establish old roles. Activities should help the individual develop a sense of self. Reviewing picture albums, providing opportunities for interaction with others, and performing simple jobs are a few examples.
3. Activities should reinforce dignity. Attempt to maintain dignity by providing activities that are not childish in nature and attending to private needs privately. Role play situations with other staff members as a check system.
4. Activities should provide pleasure. Provide a secure environment conducive to relaxation. Success-oriented tasks such as recognizing familiar music, successfully washing dishes, or dusting can provide pleasure. Getting a new hair style or interacting with small animals or babies is also pleasurable.
5. Activities should not emphasize inadequacies or increase anxiety. Motor skills which are repetitious in nature often remain intact. For instance, chopping vegetables may be accomplished easier than completing a craft project (Mace, 1987).

When engaging in activities, groups should be small and stable to promote a sense of belonging and encourage the development of friendships. The program should be structured as patients are reassured by repetitive programming. However, there is room for flexibility, particularly with the staff, and patients' spontaneity should not be discouraged. Tasks should be broken down into small steps and staff should be available to assist when the patient shows signs of stress. As repetition is beneficial, repeating an activity that is successful is quite acceptable. If old skills need to be modified or simplified, use caution. One's method should not reinforce the incompetence of the patient. Old skills can be used to teach new ones. For example,

when leading exercises, the leader might say "reach for a high shelf" as an instruction and utilizing music in the program daily is a source of enjoyment that remains well into the disease process (Mace, 1987).

Due to apraxia, gross motor skill activities may be more desirable than those which utilize fine motor skills. Pounding nails, sanding, chopping, vacuuming, and stirring are considered repetitive and rhythmic activities that prove successful and purposeful as the participant does not have to worry about learning a new task and remembering how to do it (Mace, 1987). Zgola (1987) also states that activities which are repetitive in nature and involve one simple step can be used positively as they provide a sense of comfort for the individual.

Craft activities may prove disappointing due to apraxia and cognitive difficulties. If crafts were not a part of one's past, it could be confusing and nonsupportive of former roles. When crafts are used, they should be simple, repetitive, and purposeful. Also, materials should only be in sight for the particular step that the patient is currently working on in order to avoid further confusion. Similarly, games should not be childish and should be carefully introduced, as many elderly persons may not have played games as an adult. After a few tries, it should be obvious to the leader whether the game is providing therapeutic benefits (Mace, 1987).

Deterioration will continue at a gradual pace for individuals with Alzheimer's disease or other irreversible dementias, and many individuals have additional disabilities which can create further impairment. The activity program, in addition to a supportive environment and treatment of these excess disabilities, can be significant in determining substantial gains in behavior (Mace, 1987).

CHAPTER III

METHODOLOGY

The purpose of this study was to determine if participation in an integrated motor pattern prior to testing facilitates memory recall. This chapter describes the methods and procedures utilized, to include human subject approval, subject selection, research design, instrumentation, and data analysis.

Human Subjects Research Approval

Application for exempt classification was submitted to the Oklahoma State University Institutional Review Board for Human Subject Research. It was approved on July 20, 1990. Participant consent forms (Appendix A) as well as consent forms signed by participant's significant other (Appendix B) were also obtained prior to testing.

Subject Selection

All clients (6) diagnosed as having memory impairment, by a physician, were considered for inclusion in the study. One of the six subjects was excluded from the study based upon the severity of his dementia and inability to understand the instructions as presented by this investigator. A second subject was unable to focus upon the task for a sufficient amount of time to complete the required task. The remaining four clients, three male and one female, were selected as participants in the study.

Research Design

The research design consisted of four case studies with repeated measurements to allow for more frequent testing over a longer period of time. The results, of course, cannot be generalized to the larger population of individuals with memory impairments. However, Gay (1987) states, "If a number of such studies obtained similar results, our confidence in the finding would generally be as high, if not higher than, for a single study based on very large samples." Replication is significant.

As individual performance was to be tested, each person was subjected to similar testing procedures. According to Alzheimer disease research conducted by McFie (cited in Winogron and Fisk, 1983), the testing procedures should be adapted to each individual's needs. Winogron and Fisk (1983) found that modification of the technique of test administration did not alter the value of the results when assessing functional status.

The four subjects were treated as four single subject studies or four replications, and results were not compared to the other subjects. A variation of the A-B-A withdrawal design known as the A-B-A-B design was used. This design consisted of a baseline phase (A), followed by a treatment phase (B), then a baseline phase (A), and finally another treatment phase (B). This design demonstrated the effects of the treatment phase twice, therefore strengthening the conclusions of the study (Gay, 1987).

Instrumentation

A pretest, called the Short Portable Mental Status Questionnaire or SPMSQ (Pfeiffer, 1975), was given to determine the degree of memory impairment for each individual (Appendix C). The SPMSQ was also given as a posttest. The SPMSQ is a 10-item instrument used to assess orientation, ability to recall sequential data, remote memory recall, ability to update information, and perform serial calculations. Scoring is adjusted

for educational levels of the subject. Mild impairment = 3-4 errors; moderate impairment = 5-7 errors; severe impairment = 8-10 errors.

A random word list test was the instrument used for data gathering (Appendix D). This test consisted of a list of five randomly chosen words. A pilot study was conducted prior to the research to determine the number of words to be given. A list of 50 one to two syllable commonly used words was developed with the base list used to randomly generate a word list for each test. The word list for each test was obtained by random selection in order to eliminate the "practice effect" (i.e., staff member prevented from seeing the list pointed to five different words on the base list for each testing session). Words were then printed in black or blue ink onto a 3X5 index card, leaving one blank line between each word. The card was shown to the subject and he read through the list aloud twice. The card was then removed from the subject's sight and the subject was asked to recall as many words as possible within a two-minute time frame. The index card was used to record the results.

Reliability and Validity of the Instruments

Kahn and Miller (1978) (cited in Zarit & Tager, 1980) state that when making the decision which assessment to use, the validity of the instrument must be considered in determining brain impairment as well as the errors in diagnosis that can occur. The two possible errors that can be made in the assessment for dementia are false positives and false negatives. False positives indicate an impaired score on the test with no apparent brain disease. Conversely, false negatives indicate normal test scores although brain damage is present. One must decide which error would be least harmful.

Neuropsychological tests tend to give positive results and therefore have limited value when assessing dementia. Such tests include the WAIS, the Halstead-Reitan, and the Graham-Kendall Memory for Designs test. These tests are associated with what one

has learned in the past, making it difficult to determine if the score indicated is a result of cerebral damage or past learning. Neuropsychological tests such as these are used quite commonly in clinical settings, but some have a limited use in distinguishing between functional or organic disorders (Zarit & Tager, 1980).

According to Kahn and Miller (1978) (cited in Zarit & Tager, 1980), these procedures are also time consuming, can typically only be used with individuals who are cooperative and motivated, and some have been validated only with highly educated individuals. There are a few tests which have proven useful with individuals who have senile dementia; however, motivation, education, and each specific testing situation could affect the scores.

Kahn and Miller (1978) and Gurland (1980) (cited in Zarit & Tager, 1980) suggest using mental status examinations as an alternative to neuropsychological testing when attempting to make a diagnosis of dementia. False negative results are more likely to occur; but as they are brief and easy to administer, the frequency of false positive results is decreased.

Similar procedures include tests developed by Pfeiffer (1975), Jacobs et al. (1977), and Folstein, Folstein, and McHugh (1975) (cited in Zarit & Tager, 1980). They have been found to have high validity, as repeated evidence indicates that the errors on these procedures coincide with a diagnosis made by the psychiatrist (Kahn et al., 1960; Irving, Robinson, and McAdam, 1970; Gurland, 1980) (cited in Zarit & Tager, 1980). According to Kane and Kane (1989), the SPMSQ is singled out for its universal usefulness. This is due to its simplicity, reliability, and availability of norms.

Intellectual impairment can be measured by the number of errors made on the test. If the person administering the test believes that answers were missed because the individual had not been exposed recently to the correct information, the administrator of the test can tell the individual the information prior to the testing to determine if the individual has the

cognitive ability to retain the information. Those individuals who have dementia will exhibit a memory deficit as evidenced by an inability to gain the information required to give the correct responses (Zarit & Tager, 1980).

Memory impairment is generally the most observable problem in the onset of dementia. This disturbance in short term and long term memory can be formally documented. Short term memory can be tested by asking the individual to recall a list of names of unrelated objects he just saw minutes before. Long term memory may be tested by asking the individual about events from the past such as place of birth or past presidents' names (DSM III-R). The word list test was selected over other cognitive tests due to the need to repeat the test in all sessions. In order to eliminate the "practice effect" and to avoid the "assumption of original learning," this test was selected (Kane and Kane, 1982).

Procedures

In the summer of 1990, four clients from the L.I.F.E. Adult Daycare Center in Stillwater, Oklahoma, participated in this study. Each person was first administered the pretest (SPMSQ) to determine degree of memory impairment. Baseline performance was established by administration of the random word list test, without prior participation in an integrated motor pattern, on the initial four consecutive trials. Next, the treatment (participation in an integrated motor pattern prior to engaging in a memory task) preceded the random word list test for four testing sessions, followed by a return to baseline testing procedures for four testing sessions. The final four testing sessions once again served as a treatment phase in which the individual participated in an integrated motor pattern prior to participation in the memory task (random word list test). The participation in the integrated motor pattern lasted a minimum of five minutes, depending on the participant's tolerance during that particular testing session. Each individual was given sufficient time

prior to all testing sessions to allow for adequate instruction to be given regarding the test. Testing in this order continued for eight weeks and consisted of two testing sessions per week per individual for a total of 16 testing sessions per individual. Tests were administered at a consistent time for each subject and within a distraction-free environment. The SPMSQ was administered again at the end of 16 testing sessions to assess for decompensation since pretesting.

CHAPTER IV

RESULTS AND DISCUSSION

Four clients diagnosed as having memory impairment were administered a series of word list tests to determine the effects of participation in activities involving integrated motor patterns on memory recall.

The findings are discussed using a case method approach consisting of discussion of the SPMSQ, case review, and performance on the random word list test for each case. A second section will be devoted to a generalization of findings across cases.

Case Study No. 1

Case study number one was a 69-year-old married white male who started the program at the L.I.F.E. Center in May 1989. He turned 70 before the last testing session. He was diagnosed with chronic organic brain syndrome. Client exhibited short term memory deficit, impaired judgment, wandering, alexia, confusion and anxiety regarding leaving the center, and over spouse's return. Client also exhibited kleptomaniac behavior as evidenced by taking items as he wandered throughout the center. When redirected that these items were not his, client could not comprehend. However, if "caught in the act," client would return the items at least 75% of the time. Client did decompensate at one point during the study, but did return to prior level of functioning before completion of the study. During this decompensation period, he displayed inability to sleep at night, poor appetite, lethargy, decreased alertness, and

lack of motivation to perform grooming skills. Client was also incontinent on a few occasions which had never been a problem previously.

During both the pretest and posttest, client exhibited poor reality orientation as he could not identify the month, date, day, year, or present location. He also failed to identify names of current and previous presidents. Client could state his phone number, address, birthdate, mother's maiden name, and performed a simple subtraction series correctly. His score on the pretest was 6, which equals moderate memory impairment; and 7 on the posttest, which also equals moderate memory impairment on the SPMSQ (short portable mental status questionnaire).

Activities participated in at the center included reading (although he could not remember what he had just read), unscrambling words, dancing, singing, spelling contests, dominoes, simple puzzles, cutting, matching, bingo, and geography games. He needed reminders how to play games while participating. He also became anxious to leave, particularly in the afternoon, but could usually be redirected to another activity. The integrated motor pattern used for this client was dancing.

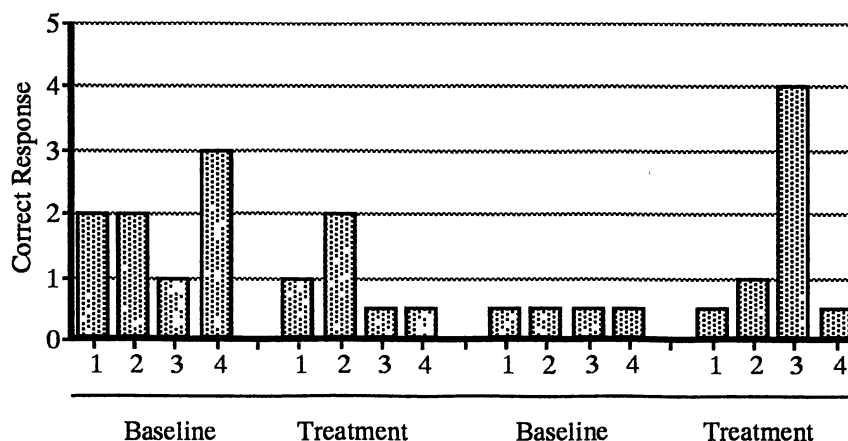


Figure 1. Case Study Number One

Discussion

Visual examination of the graph of the client's responses would suggest that there is very little correlation between the use of integrated motor patterns and memory recall. The client was able to respond successfully approximately 40% of the time during the initial baseline phase. He continued at approximately the same level during the initial treatment phase, but fell to 0% during the middle of the initial treatment phase. This dropoff in performance corresponded with a decrease in client cognitive functioning and energy level, which was observed at the center and the client's home. This information is documented in the client's chart. Examples of problem behaviors included unsteady gait, difficulty sleeping at night, incontinency, and drowsiness during daytime hours. These behaviors were not typical for this client and he did return to a more normal level of functioning during the last three weeks of testing. His return to a higher level of functioning corresponded with an increased success rate on the memory test during two of the last three trials. His last trial was 0% correct, however, it was noted that he was very alert on that particular day.

Case Study No. 2

Case study number two was a 79-year-old widowed white female who started the program at the center in May 1987. She turned 80 prior to the seventh testing session. She was diagnosed with Alzheimer's disease and arthritis. The client exhibited short term memory deficit, inappropriate verbal outbursts, poor self concept, poor reality orientation, perseveration, paraphasia, inertia, acalculia, impaired judgment, short attention span, and incontinency.

On both the pretest and posttest, client displayed poor reality orientation as evidenced by inability to identify the correct month, date, day, year, or place. She also failed to identify her phone number, presidents' names, and could not perform the

simple subtraction series. On the pretest she was able to state her correct birthdate and mother's maiden name; however, she could not on the posttest. Her score on the pretest was 9, which equals severe memory impairment; and 11 on the posttest, which also indicates severe memory impairment on the SPMSQ.

Activities participated in while at the center included playing the piano, singing, large ball games, spelling contests, proverb games, and trivia games. She did require some assistance and prompting when playing games. The integrated motor pattern used for this client was playing the piano.

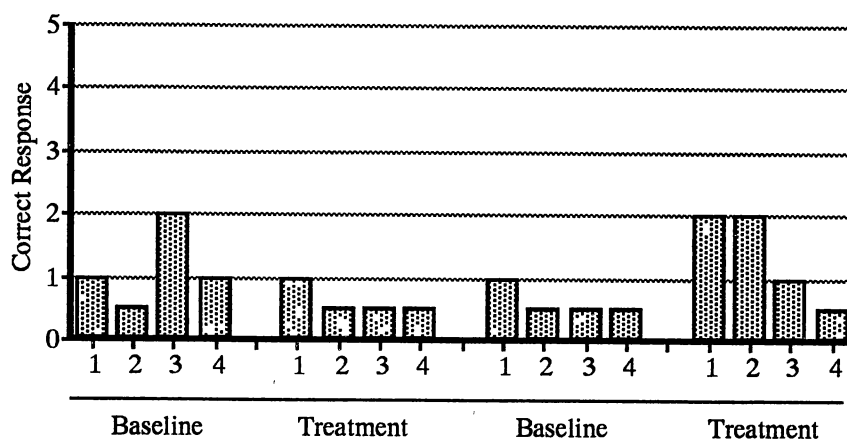


Figure 2. Case Study Number Two

Discussion

Visual examination of the above chart suggests no correlation between the use of integrated motor patterns and memory recall. The client started the study with minimal success (20%) during the first few trials but then fell to a 0% success rate during the first treatment phase. This pattern of no success continued through the second baseline period, at which time the client experienced some success during the final treatment

phase (approximately 20%). As a general rule, this client tended to be highly distractible and had problems focusing upon the memory task. The low levels of performance during the first treatment phase corresponded to changes in her medication which reportedly caused drowsiness and lethargy. The client continued at a low level of performance during the second baseline phase although the medication was discontinued and the client was reported as being more alert.

Case Study No. 3

Case study number three was an 82-year-old married white male who started the program in January 1990. He was diagnosed with organic brain syndrome, cancer of the prostate, arthritis, and an aortic aneurysm. The client exhibited short term memory deficit, incontinency, poor reality orientation, visuo-spatial difficulties, acalculia, apraxia, and need for reassurance of family member's whereabouts. Client needed assistance when walking and sometimes exhibited difficulty swallowing and needed to be reminded to do so. He also had a tendency to put beads in his mouth when stringing and needed constant supervision during this task.

On both the pretest and posttest, client was unable to state the month, date, year, day of the week, or place. He also failed to identify his phone number, age, birthdate, and presidents' names, and could not perform the simple subtraction series. Client was able to identify his mother's maiden name on both tests, however. His score on both tests was 9, which equals severe memory impairment.

Activities participated in while at the center included bingo, dominoes, checkers, ball games, riding restorator (similar to a stationary bicycle), music, matching, spelling contests, cutting, and stringing. He did require some assistance when participating in these activities. The integrated motor pattern used for this client was playing ball (catching, throwing, and kicking).

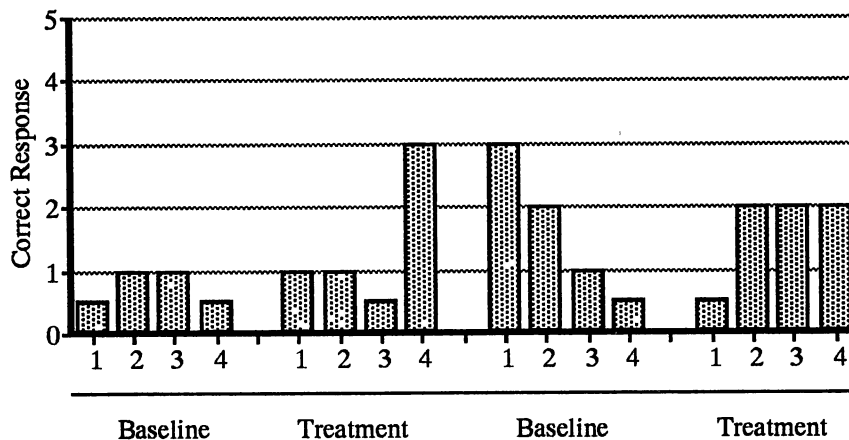


Figure 3. Case Study Number Three

Discussion

Visual examination of the graph of client's responses suggests no correlation between the use of integrated motor patterns and memory recall. The client was fairly alert while at the Center throughout the first baseline phase, first treatment phase, and first session of second baseline phase. However, the client possibly experienced some unusual brain activity on the day of the second session of the second baseline phase. Client suddenly became withdrawn as he would not respond verbally or with facial expression. He also experienced increased difficulty ambulating. Attempts were made to get the client to respond in his usual manner, but his responses were minimal. After 1 1/2 to 2 hours the client began visiting with staff, smiling and laughing. Client was given the memory test a short time later and correct responses decreased by one as compared to the two previous testing sessions. However, his score continued to be one to two units higher than scores recorded in the first seven sessions. No further incidents similar to the one mentioned above occurred during the testing period.

Case Study No. 4

Case study number four was a 78-year-old married white male who started the program in May 1990. In 1987, a shadow was discovered on his lung which resulted in an eventual removal of 30% of this lung. In November, 1989, another shadow was found and tuberculosis was suspected. Medication was given for same, but withdrawn due to mental confusion. All testing was then stopped. Alzheimer's disease was diagnosed approximately 6 months prior to this time. Client also had a diagnosis of pulmonary dysfunction and arthritis. The client exhibited short term memory deficit, inertia, incontinence, and inability to remember how to get from one place to the other in the center.

On the pretest, client was unable to state the correct date, year, day of the week, or his age. He was oriented to place, stated his correct birthdate, presidents' names, mother's maiden name, and was able to perform the simple subtraction series. On the posttest, client was only able to correctly state his birthdate and mother's maiden name. Due to contrasting scores, another test was performed approximately three weeks later in which the client was oriented to place, correctly stated his phone number, birthdate, and mother's maiden name. He was not oriented to month, date, year, or day of the week, was unable to correctly state his age, presidents' names, or perform the simple subtraction series. His score on the pretest was 4, which equals mild memory impairment; and 9 on the posttest, which equals severe memory impairment. His final test score was 7, which equals moderate memory impairment.

While at the center, client participated in reading, riding the restorator, crossword puzzles, trivia games, geography games, music, bingo, dominoes, and household tasks such as sweeping or wiping off tables. He did require encouragement to participate in activities, but enjoyed activities in which he felt he was helping. The integrated motor

pattern used for this client was riding the restorator. This client was diagnosed with a brain tumor during the latter part of 1990 and he passed away on December 21, 1990.

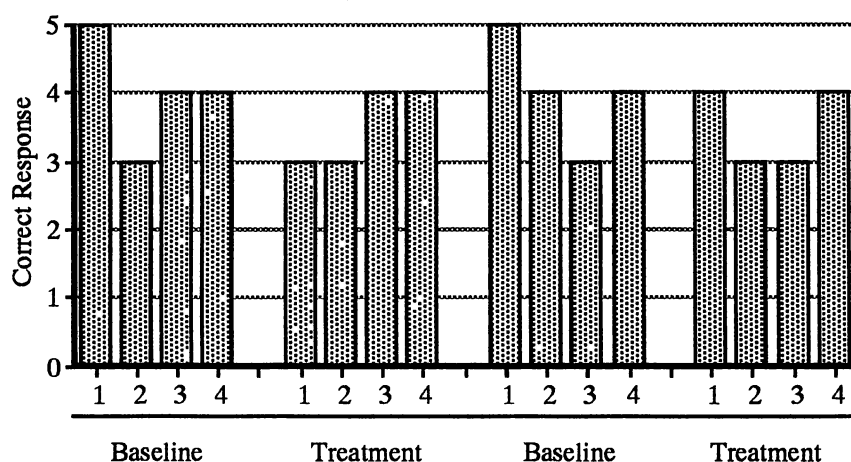


Figure 4. Case Study Number Four

Discussion

This client's scores on the random word list test were consistently higher than the other clients' scores. The increased success of this client over other clients was anticipated in as much as his SPMSQ pretest score was considerably better than other participants. Visual examination of the results suggests no correlation between the use of integrated motor patterns and memory recall. In fact, the client's two highest scores (5) were recorded in the baseline phase rather than the treatment phase. Throughout the course of the testing period, the client experienced increased difficulty with balance when ambulating and increased episodes of incontinency. He also began requiring assistance with toileting and dressing as he appeared to forget how to perform these tasks of daily living.

Of particular interest to this study was the observation that the client performed consistently on the random word list test throughout the study while decreasing in ability to perform activities of daily living skills which are, in themselves, integrated motor patterns. These findings are consistent with Zgola (1987) who stated that overlearned patterns are an automatic response to a stimulus which are used in performing activities of daily living. He further states that these habitual skills may be lost in time, but certain remarkable abilities may still remain intact. An example of this is playing the piano, although skills which are much simpler are no longer intact.

Summary of Results

In all four case studies, there appears to be no apparent correlation between the use of integrated motor patterns and memory recall in the memory impaired elderly. While the number of correct responses was higher in the treatment phases on some occasions, correct responses also occurred in the baseline phases. Episodes of decreased cognitive and functional skills were also possible variables for consideration, but did not always correspond with low scores. In case study no. 1, increased energy and cognitive functioning corresponded with increased performance, while in case study no. 2, the addition of a new medication (leading to drowsiness and lethargy) corresponded with decreased performance. However, in case study no. 1, the client performed with 0% correct for his last trial while being reported as being very alert, and in case study no. 3, the client was reported as being fairly alert during the first two phases of the research but performed at a minimal level.

Another variable for consideration would be the cause of the memory deficit observed. In case study no. 4, the client maintained his ability to respond to the random word list test while experiencing difficulty with activities of daily living (integrated motor patterns). The discovery of a brain tumor in this individual provides a possible

explanation for this observation and could be grounds for modifying the initial diagnosis of Alzheimer's disease.

CHAPTER V

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the relationship between the use of integrated motor patterns and memory recall in memory-impaired elderly. Four individuals, diagnosed with some type of organic brain syndrome, who attended an adult daycare center were selected to participate in the study. These four individuals displayed a degree of memory impairment as indicated by results of the Short Portable Mental Status Questionnaire (SPMSQ). The research design of the study consisted of an A-B-A-B model which included a baseline phase, a treatment phase, a second baseline phase and a final treatment phase. The study was conducted over an eight week period to provide data for this study.

The study was designed to examine the effects of participation in integrated motor patterns on memory recall. This study failed to demonstrate any real differences in memory recall related to participation in integrated motor patterns.

Conclusion

Based upon the findings of this research, the following conclusion was drawn: Participation in integrated motor patterns immediately prior to testing does not affect memory recall in memory-impaired elderly.

Implications

This study failed to demonstrate any correlation between the use of integrated motor patterns and memory recall, as no consistent pattern was observed in any of the four cases. As each individual's graph depicts, correct and incorrect responses occurred in both the baseline and treatment phases.

Failure to demonstrate a correlation does not, however, mean that an individual would not benefit from integrated motor patterns. This study allowed the investigator to identify other variables which may be intervening in nature and consequently masking the potential benefits of participation in integrated motor patterns. Other variables identified as possible intervening variables included decreased cognitive and functional skills, medication, and the identification of factors other than an organic brain syndrome resulting in impaired memory. For example:

1. As discussed in case study no. 1, the client dropoff in performance corresponded with his decrease in cognitive functioning during the eight week testing period. However, although the client returned to normal functioning prior to the end of testing, his responses were not consistently successful. In case study no. 3, the client decrease in cognitive and functional skills showed no significant decrease in correct responses during testing. In fact, his scores were one to two units higher than scores recorded earlier.
2. As discussed in case study no. 2, low levels of performance corresponded to changes in medication. However, once the medication was discontinued, performance continued to be poor.
3. Case study no. 4 illustrates the point of identifying causes other than organic brain syndrome as an explanation of memory deficit. The discovery of a brain tumor in this individual could have altered the results of the memory testing.

Recommendations for Further Study

1. Further studies should be conducted using a larger sample size of memory-impaired elderly in order to attempt to better control and account for intervening variables.
2. Studies which use memory tests other than a word list would be desirable to better examine the concept of short term memory and its effects on everyday functioning of the elderly individual.
3. Further studies which are designed to differentiate between routine integrated motor patterns such as walking and eating and integrated motor patterns which are a part of a structured activity program, based upon an elderly individuals needs and interests, would be desirable.
4. Finally, studies which examine the long term benefits of participation in integrated motor patterns when integrated patterns are used for programming throughout the individual's day should be explored.

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APPENDIX A

PARTICIPANT CONSENT FORM

PARTICIPANT CONSENT FORM

I, _____, give my permission to be a participant in the research study conducted by Andrea Peoples. I will be participating in a series of memory tests done as a requirement for completion of Andrea Peoples' master's degree program in therapeutic recreation.

I understand that participation is voluntary and that there is no penalty for refusal to participate in this project. Results will be confidential, meaning they will be available to L.I.F.E. Center staff only. I understand that I may request a copy of the results regarding myself and that a copy of this consent form will be given to me.

For further information regarding this study, I may contact either Dr. Lowell Caneday at 744-5510 or Terry Maciula at 744-5700.

Signed _____ Date _____
Participant

APPENDIX B

CONSENT FORM

CONSENT FORM

I, _____, hereby authorize or direct _____, or other staff from the L.I.F.E. Center to perform the following procedure:

_____ will be administered a pretest to determine current degree of memory impairment. The pretest will consist of a mental status questionnaire, a copy of which is attached. A random word list test will be the instrument used for data gathering which consists of one to six randomly chosen words. A list of 50 one to two syllable commonly used words will be developed with the base list used to randomly generate a word list for each test. After the individual sees and verbalizes each word, all words will be taken away and _____ will be asked to recall as many as possible within 60 seconds.

There will be four phases to the testing procedure. During the first four sessions, the test will be administered without any prior treatment in order to establish a baseline measurement. Next, the treatment, participation in an integrated motor skill, will precede the word list test for four testing sessions. An integrated motor skill is a skill that has been performed repeatedly in the pre-disease portion of life and no longer requires conscious thought to perform. Some possible examples include playing the piano, throwing and catching a ball, dancing, and writing one's name. The next four sessions will once again be conducted with no prior treatment, followed by the final four sessions which again require participation in an integrated motor skill preceding the testing. Participation in the integrated motor skill will last 15 minutes.

Each individual will be given sufficient time prior to all testing sessions to allow for adequate instruction to be given regarding the test. The word list for each session will be given to the individual twice in succession to better assure that the individual has understood the instructions and performs to the best of his capabilities. Testing in this order will continue for eight weeks and will consist of two testing sessions per week per individual for a total of 16 testing sessions per individual. All testing will be done in a consistent and stimulus free environment on an individual basis.

Results of the study will be available to staff at the Center involved in client care as this information could be very valuable in determining programming needs for the future for _____. Data will be kept in a locked file cabinet and will be accessible only to the staff at the Center. Data will be kept here

throughout the course of the study. After results have been analyzed and compiled, data will remain in the locked file cabinet to be used by staff only to aid in programming.

This procedure is done as part of an investigation entitled, The Effects of Integrated Motor Skills on Facilitation of Short Term Memory Recall in Individuals Diagnosed With Alzheimer's Disease or Alzheimer Related Symptoms. The results from this study could help in determining helpful programming ideas for the clients involved as well as give some valuable input as to what might be of assistance in aiding short term memory recall in the Alzheimer's population. It could also serve as a basis for further studies in this area.

I, _____, understand that participation is voluntary, that there is no penalty for refusal to participate, and that I am free to withdraw my consent and participation in this project at any time without penalty after notifying _____, the project director.

I may contact Dr. Lowell Caneday at 744-5510 should I wish further information about the research. I may also contact Terry Maciula, University Research Services, 001 Life Sciences East, Oklahoma State University, Stillwater, OK 74078; Telephone: (405) 744-5700.

I have read and fully understand the consent form. I sign it freely and voluntarily and a copy has been given to me. I also understand that I have the right to a copy of the results regarding _____ when the project is completed.

Date _____ Time _____

Signed _____
(Representative)

I, Andrea Peoples, certify that I have personally explained all elements of this form to the subject's representative before requesting the representative to sign it.

Signed _____ Date _____

APPENDIX C

SPMSQ FORM

SPMSQ	PATIENT IDENTIFICATION				
	Initials	Date of Birth			Code Number
	[][]	month	day	year	[][][][]
PFEIFFER SHORT PORTABLE MENTAL STATUS QUESTIONNAIRE (SPMSQ)		month	day	year	
	VISIT DATE	[][]	[][]	[][]	

INSTRUCTIONS. Ask the subject questions 1-10, record answer, and enter as "1" under appropriate column (correct/error). All responses, to be scored correct, must be given by subject without reference to calendar, newspaper, birth certificate or other memory aid.

		CORRECT	ERROR
1. WHAT IS THE DATE TODAY? MONTH _____ DAY _____ YEAR _____ (Score correct only when the exact month, day and year are given correctly.)			
2. WHAT DAY OF THE WEEK IS IT? DAY _____			
3. WHAT IS THE NAME OF THIS PLACE? (Score correct if any correct description of the location is given. "My home", accurate name of town, city, or name of residence, hospital, or institution (if subject is institutionalized) are all acceptable.)			
4. WHAT IS YOUR TELEPHONE NUMBER? (If none, see 4A below) (Score correct when the correct number can be verified or when subject can repeat the same number at another point in questions.) _____			
4A. WHAT IS YOUR STREET ADDRESS? (Ask only if subject does not have telephone.) _____			
5. HOW OLD ARE YOU? AGE: _____ (Score correct when stated age corresponds to date of birth.)			
6. WHEN WERE YOU BORN? MONTH _____ DAY _____ YEAR _____ (Score correct only when exact month, date and year are all given.)			
7. WHO IS THE PRESIDENT OF THE UNITED STATES NOW? (Only the last name of the President is required.) _____			
8. WHO WAS THE PRESIDENT BEFORE HIM? (Only last name of previous President required.) _____			
9. WHAT WAS YOUR MOTHER'S MAIDEN NAME? (Does not need to be verified. Score correct if a female name plus last name other than subject's last name is given.) _____			
10. SUBTRACT 3 FROM 20 AND KEEP SUBTRACTING 3 FROM EACH NEW NUMBER ALL THE WAY DOWN. (The entire series must be performed correctly in order to be scored correct. Any error in series or unwillingness to attempt series is scored as incorrect.) _____			

*ADJUSTMENT FACTORS:

TOTAL NUMBER ERRORS	[]
1) <u>SUBTRACT 1 FROM ERROR SCORE</u> IF SUBJECT HAS HAD ONLY A GRADE SCHOOL EDUCATION.....	[-]
2) <u>ADD 1 TO ERROR SCORE</u> IF SUBJECT HAS HAD EDUCATION BEYOND HIGH SCHOOL.....	[+]
3) <u>SUBTRACT 1 FROM ERROR SCORE</u> FOR BLACK SUBJECTS (REGARDLESS OF EDUCATIONAL CRITERIA).....	[-]
TOTAL ADJUSTED ERRORS	[]

INFORMATION OBTAINED BY:	DATE:
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APPENDIX D

RANDOM WORD LIST

PICTURE
DOG
SHOE
PURSE
SALT
CHAIR
GAME
MAP
HAT
PENCIL
FRUIT
COFFEE
WALL
PEOPLE
CLOTHES
DOOR
CUP
BED
BOOK
BALL
FLOWER
RING
PHONE
GAS
LAMP
CLOCK
BRUSH
COUCH
SOAP
CAR
EGG
FACE
BABY
TREE
BIKE
CANE
BOX
EYE
RAKE
SUN
BALLOON
RUG
HILL
NEWS
KNIFE
NAIL
ROCK
PORCH
BROOM
FISH

VITA

Andrea E. Peoples

Candidate for the Degree of

Master of Science

**Thesis: THE USE OF INTEGRATED MOTOR PATTERNS WITH MEMORY-
IMPAIRED ELDERLY**

Major Field: Health, Physical Education and Leisure

Biography:

Personal Data: Born in Fredericktown, Missouri, February 18, 1959 to Earl and Carleda Bollinger; married to Alan Peoples; children, Jacob and Sarah.

Education: Graduated from Fredericktown High School, Fredericktown, Missouri, in 1977; received the Bachelor of Science degree in Recreation from Southeast Missouri State University, Cape Girardeau, Missouri, in July, 1981; completed requirements for the Master of Science degree at Oklahoma State University in July, 1992.

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