

An Abstract of the Thesis of

Lynn L. Hall for the degree of Master of Science in Human Development and Family Sciences presented on April 8, 1996. Title: Video Respite™ for Cognitively Impaired Persons in Nursing Homes: Behavioral Changes.

Abstract approved: Signature redacted for privacy.



Jan Hare

Video Respite (VR) is a series of videotapes designed to capture long-term memory and maintain the attention of patients with Alzheimer's Disease. The purpose of this study was to determine whether VR viewing significantly affects the behavior of cognitively impaired nursing home residents. Specifically, repeated measures ANOVA and paired t-tests were used to examine change in agitated and positive social behaviors over three time periods: pre-VR, during-VR, and post-VR. In addition, differences in behavioral effects were examined by facility, shift, and level of dementia.

Only one VR video tape "Remembering When" was utilized in this study. Thirty-six cognitively impaired nursing home residents were observed for 21 minutes before VR, 21 minutes during VR, and 21 minutes after VR viewing. Residents' behaviors were recorded on a 15-item behavioral checklist developed from Corrigan's Agitated Behavior Checklist.

Positive behaviors were found to increase during-VR for all conditions. Cognitively impaired residents, regardless of nursing home, shift, and level of dementia, responded to VR with increased positive behaviors. These results indicate that VR is a positive and meaningful activity for cognitively impaired residents in nursing homes, albeit the effect may be short-lived.

Agitated behaviors, on the other hand, decreased for moderate to severely demented residents on day shift, and in certain nursing homes. On day shift agitation levels dropped during-VR viewing. The VR tape appeared to be most beneficial in reducing agitation for moderately demented residents. Finally, agitation decreased during-VR viewing at the nursing home without a special care unit for cognitively impaired nursing home residents.

Limitations of the current study and implications for future research are also addressed.

Video Respite™ for Cognitively Impaired Persons in Nursing Homes: Behavioral Changes

by

Lynn L. Hall

A THESIS

Submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Master of Science

Completed April 8, 1996
Commencement June 1996

Acknowledgment

I would like to thank Jan Hare, Ph.D. and Melissa Doherty for assisting me with the observations of nursing home residents. Without their help this study would not have been possible. Thanks to Sam Vuchinich, Ph.D., Clara Pratt Ph.D., and Alan Sugawara, Ph.D. for their assistance with this research project. A special thanks to Jan Hare for her unending help and encouragement, Dale Lund, Ph.D. for his guidance from afar, Leslie Richards, Ph.D., Becky Donatelle, Ph.D., and Judy Bowker, Ph.D. for their helpful suggestions. I especially appreciate Jan for her responsiveness and professionalism throughout this process.

Finally, I would like to thank my family. Thanks to my children for understanding and supporting my studies. Thanks to my husband, Jeff, for knowing when to offer wise counsel, a friendly ear, or an opposing viewpoint. He faithfully kept the family running smoothly while I pursued my graduate degree.

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Video Respite™ For Cognitively Impaired Persons In Nursing Homes: Behavioral Implications

I. Introduction

Video Respite (VR) is a series of videotapes specifically designed to capture long-term memory and maintain the attention of patients with Alzheimer's Disease (AD) or other related dementias. Additionally, VR offers caregivers of cognitively impaired patients strategic respite breaks. The difficult and troublesome behaviors associated with cognitive impairment tax the ability of family and professional caregivers to provide care. These behaviors can include wandering, hitting, biting, and screaming (Aronson, Post, & Guastadiesegni, 1993; Cox, 1993; Drachman, Swearer, O'Donnell, Mitchell, & Maloon, 1992; Everitt, Fields, Soumerai & Avorn, 1991).

Preliminary evidence indicates VR also has therapeutic value for cognitively impaired patients and for their caregivers. Several studies have evaluated the effectiveness of VR with family and professional caregivers (Lund, Hill Caserta, & Wright, 1995). An extensive research project, funded by a grant from the national Alzheimer's Association, evaluated the effectiveness of VR in the family caregiving context and compared a VR tape with an existing television program (Lund, et. al., 1995).

Early evaluations of VR indicate it may be an effective behavioral management activity in special care units (SCUs) (Angelelli, 1994). SCUs provide an alternative setting that attempts to meet the needs and problems of cognitively impaired patients through environmental design, as well as programs of medical and behavioral management. Specific programs of activities are provided to maintain optimal stimulation and reduce problems of agitation (Zarit, Zarit, & Rosenberg-Thompson, 1990). Because VR shows promise for use in nursing homes,

observational data is needed to confirm VR's effectiveness. Anecdotal information from early studies of VR indicates that many impaired viewers were calmed by the video tapes. They smiled, laughed, and made comments such as "Yes, I've enjoyed this visit very much." (Lund, et. al., 1995; Schmall & Lund, 1994).

Development and Description of Video Respite (VR)

In-home caregivers for cognitively impaired elderly have expressed a great need for respite which can provide increased personal time that reduces their involvement with the cognitively impaired patient. Seeking to fill that need, researchers at the University of Utah began work on Video Respite in 1991. Because the researchers felt that the content of the video needed to be familiar to the impaired viewer and relate to their long-term memory, the first videotapes developed were unique to each cognitively impaired patient's life. The researchers, Drs. Lund, Hill, Caserta, and Wright (1995), believed that the videotapes should be slow-paced and interactive in nature in order to sustain the viewer's attention. Family caregivers provided information about the cognitively impaired adult's childhood which was then used to write scripts for the individualized video tapes. To ensure familiarity, the caregivers were also videotaped reading their script. Questions were asked throughout the video that were designed to simulate conversation and encourage response from the cognitively impaired patient.

A pilot study of the individualized tapes suggested that the cognitively impaired adult was engaged by the VR tapes and that caregivers seemed to regard VR as a helpful aid (Lund, et. al., 1995). The following limitations, however, were recognized: (a) Creating the individualized tapes required too much time and effort from the already overburdened caregiver; (b) Many caregivers were unskilled and uncomfortable with the filming process; (c)

Distribution to thousands of caregivers was limited by this inefficient and labor intensive process.

These investigators shifted their focus to generic rather than individual-specific videotapes so that family and professional caregivers could do less instead of more. The generic VR tapes do not require more work or energy from the caregivers who are already overly burdened. The first generic videotape was tested through a grant from the National Alzheimer's Association. This study compared the effectiveness of the first tape "Favorite Things" with an already existing television program Lawrence Welk. Benefits to the caregivers were also examined in the study. "Favorite Things" is 30 minutes long and simulates a friendly visit with Marilyn. Marilyn talks and asks simple questions about such things as babies, vegetable gardens, animals, and holidays. She pauses after asking questions to allow the impaired viewer to respond. Marilyn asks the cognitively impaired adult to sing along with several well-known songs such as "Happy Birthday," "Daisy," and "Let me call you Sweetheart."

The second VR tape, "Gonna Do a Little Music," is 53 minutes. It has a similar format to the first videotape but is primarily focused on music. The friendly visitor is Marianne, a professional music therapist, who engages the cognitively impaired adult with her conversational style. She asks questions about music, early life experiences and invites the viewer to sing-a-long with her while she plays the guitar and the autoharp. Both of these first two tapes were used in the study by Angelelli (1994) which is discussed in Chapter 2.

The early pilot studies indicate that "Favorite Things" effectively engaged the interest of most of the 41 impaired viewers throughout the tape (Lund, et. al., 1995). Many cognitively impaired viewers appear to respond to the friendly visitor as they would with an actual person.

Furthermore, some cognitively impaired adults who were nonverbal and upset become happy, smiled, and sang along as they watched the tape.

A total of ten VR tapes have now been completed. Each videotape has a different theme to capture a variety of specific interests of cognitively impaired adults. One tape is designed specifically for men and another for women. Other tapes stimulate cognitively impaired adults' memories with an ethnic, racial, or religious focus. There also is a Spanish-speaking tape, a Jewish tape and another for African Americans. Future plans include development of tapes aimed at other specific segments of the population, such as those with interests in farm life and sports.

Currently, several thousand VR tapes are in use and about one-half of these are being used by persons who work in or with nursing homes, daycare centers, physicians' offices, Alzheimer's Association Chapters, home health agencies, among others (Lund, personal communication, March 28, 1996).

Purpose

This study builds on earlier research by Joe Angelleli (1994) which relied upon nurses' perceptions of nursing home residents' behaviors during VR and for five minutes after viewing VR. This present study will examine the actual behaviors of AD residents rather than rely on the perceptions of the nursing staff. In addition, the observation period will be 21 minutes before VR, 21 minutes during VR, and 21 minutes following VR in order to discover if behavior changes occur. Also, this study will use the third VR tape, "Remembering When" which is approximately 21 minutes long. The actress, Molly, talks about early childhood memories at school, teachers, children, and music of the "Roaring Twenty's." The viewer is encouraged to sing-along to several songs, such as "When Irish Eyes are Smiling," and "School

Days,” and join in reciting the “Pledge of Allegiance.” Molly also introduces a young toddler named Kyle and she sings “Twinkle Twinkle Little Star” to him.

The goals of this study are to evaluate VR’s potential ability to: (a) reduce problematic behaviors and (b) increase positive behaviors among cognitively impaired residents in nursing homes. Cognitive impairment will include a variety of diagnoses and is not limited to Alzheimer’s Disease. Assessment of residents’ behavioral responses will inform future therapeutic usage of VR and contribute to the understanding of VR’s effectiveness for cognitively impaired residents of long-term care facilities.

Two unique research features include: (a) observing and recording positive and agitated behaviors of nursing home residents before, during, and after VR use and (b) assessing the effects of the facility, shift, and level of dementia on the resident’s behavior.

2. Literature Review

This chapter reviews the literature on dementia, ecological theory and various interventions used to manage difficult behaviors associated with cognitive impairment. The first section describes the characteristics, etiology, and severity of dementia. The second section discusses Lawton's Ecological Theory of Adaptive Behavior and Aging. The third section reviews the literature related to the specific behavioral symptoms of agitation, as well as potential positive behaviors for the cognitively impaired. Finally, the fourth section reviews the literature related to interventions including alterations to the physical environment, reminiscence therapy, music therapy, and television.

Dealing with the troublesome behaviors associated with the cognitively impaired residents of nursing homes is one of the most difficult tasks performed by the staff (Aronson, et. al., 1993; Lukovits & McDaniel, 1992; Teri, Larson, & Reifler, 1988; Zarit, et. al., 1990). Until recently, the medical model dominated care of nursing home residents. Medications and physical restraints were the frequent response to difficult residents (Cox, 1993; Ryden & Feldt, 1992). This approach stressed the internal and physical processes as being primarily responsible for behavior and did not take into account the effects of the environment. Furthermore, there is evidence that this approach increased the cognitively impaired resident's agitation by creating a cycle of increasing control through medication and restraint. Medication and restraint were used initially to provide immediate control over the resident's agitated behaviors. Unfortunately, they provided only temporary relief and did not permanently resolve the agitated behavior. Instead, there was a risk that these controls may contribute to the resident's agitation and resistance resulting in an increasing cycle of use in which these

interventions became permanent parts of the treatment, the result being that the resident was habitually restrained or medicated (Cariaga, Burgio, Flynn & Martin, 1991; Cox, 1993; Werner, Cohen-Mansfield, Braun, & Marx, 1989).

An alternative to the medical model is the use of behavioral and environmental modifications used in conjunction with pharmacological interventions (Hart, 1991; Mintzer, Lewis, Pennypaker, Simpson, Bachman, Wohlreich, Meeks, Hunt, & Sampson, 1993). The goal of providing a therapeutic interpersonal and physical environment is to improve positive affect and functioning of the individual (Cox, 1993; Ryden & Feldt, 1992), while reducing and possibly eliminating intensity, frequency, and duration of troublesome behaviors (Cox, 1993; Zarit, et. al., 1990).

Dementia

Associated characteristics. Cognitive impairment, dementia, and Alzheimer's Disease are terms often used synonymously; their distinctions are often blurred. Dementia is one of the "organic mental syndromes" which also include delirium and organic anxiety syndrome among others. Alzheimer's Disease is one of the "organic mental disorders." "Organic mental syndromes" refer to a group of psychological or behavioral signs or symptoms with no reference to etiology. "Organic mental disorders," on-the-other-hand, are diagnosed by demonstrating the presence of an organic etiology related to an abnormal mental state and by recognizing the presence of one of the organic mental syndromes.

Cognitive impairment, a diminished capacity to know the world, is a characteristic of various syndromes and disorders such as Alzheimer's Disease, dementia, mental retardation, aphasia, amnesia, and delirium (American Psychiatric Association, 1987). Cognitive impairment differs according to the specific syndrome or disorder. For example, in mental

retardation cognitive impairment is life-long; in aphasia and amnesia, language and recent memory are specifically and disproportionately affected; in delirium cognitive impairment occurs in the setting of clouded consciousness (Folstein, Anthony, Parhad, Duffy, & Gruenberg, 1985).

With dementia, cognition is impaired for short and long term memory such that daily functions are impaired. Deficits must be apparent in at least one of the following cognitive functions: abstract thinking, judgment, language (e.g., aphasia and abnormal language), comprehension, constructional abilities, and personality changes. Dementia may be progressive, static, or reversible. The reversibility of dementia depends upon the underlying pathology, as well as the availability and timely application of effective treatment (American Psychiatric Association, 1987).

A non-organic diagnosis, such as Major Depression, may also account for the cognitive impairment associated with dementia. People with a major depressive episode may complain of memory impairment, difficulty thinking and concentrating, and an overall reduction in intellectual abilities. They may also perform poorly on mental-status examination and neuropsychological testing. Although these features suggest a possible diagnosis of dementia, there is no underlying etiology. This phenomena is called "pseudodementia" or "the dementia syndrome of depression" (American Psychiatric Association, 1987).

A wide variety of different emotional, motivational, and behavioral abnormalities are associated with dementia (Aronson, et. al., 1993) including: psychological disturbances (anxiety, depression, fears, paranoia, delusions, hallucinations and apathy), activity disturbances (agitation), and vegetative disturbances (dietary change, sleep disturbance and incontinence) (Lukovits & McDaniel, 1992). People with dementia are especially vulnerable to

physical and psychosocial stressors. For example, minor surgery or bereavement may considerably aggravate intellectual deficits (American Psychiatric Association, 1987).

The presence of behavioral disturbances and functional impairments are the greatest predictors of nursing home placement. Excessive irritability or disruptive nocturnal behavior significantly increase the risk of institutionalization (Knopman, Kitto, Deinard, & Heiring, 1988). While all nursing home residents are capable of functional and behavioral problems, the cognitively impaired residents exhibit those problem behaviors in greater frequency and require more staff intervention than do cognitively intact residents (Aronson, et. al., 1993).

Although dementia is not synonymous with aging, the age at onset of dementia is usually above age 65 and becomes increasingly more common among older cohorts. There is remarkable individual variability in the age of onset of dementia, rate of cognitive decline, and particular behavioral abnormalities that emerge (American Psychiatric Association, 1987).

Etiology. "Organic mental disorders" refers to the particular organic mental syndrome in which the etiology is known or presumed. Organic mental disorders include: Primary Degenerative Dementia of the Alzheimer Type, Multi-infarct dementia, central nervous system infections, (e.g., tertiary neurosyphilis, tuberculous, human immunodeficiency virus (HIV)-related disorders), brain trauma, toxic-metabolic disturbances (e.g., pernicious anemia, folic-acid deficiency, hypothyroidism), normal-pressure hydrocephalus, neurologic diseases (e.g., Huntington's chorea, multiple sclerosis, Pick's disease, cerebellar degeneration, progressive supranuclear palsy, and Parkinson's disease), and postanoxic or posthypoglycemic states (American Psychiatric Association, 1987).

The most common cause of progressive cognitive deficit in older persons is Degenerative Dementia of the Alzheimer Type. Alzheimer's Disease involves a multifaceted

loss of intellectual abilities, such as memory, judgment, abstract thought, and other higher cortical functions. The criteria for a probable diagnosis of Alzheimer's Disease are the following: (a) Global and gradual intellectual deterioration for six months or longer, (b) Exclusion of reversible dementias and other medical disorders (including medication) that cause mental impairment, (c) Exclusion of other psychiatric disorders (including alcohol abuse, major depression, pseudo-dementia), and (d) Exclusion of other neurologic diseases, such as Parkinson's, Huntington's disease, communicating hydrocephalus, multi-infarct dementia, stroke and seizure disorders (Hughes, Berg, Danziger, Coben, & Martin, 1982). Unfortunately, there is no known means of preventing Alzheimer's Disease and no effective treatment for ameliorating the symptoms of cognitive impairment or slowing their progression (Zubenko, Rosen, Sweet, Mulsant, & Rifai, 1992).

Less common than Alzheimer's Disease, multi-infarct dementia is characterized by a stepwise deterioration in intellectual functioning. The criteria for a diagnosis of multi-infarct dementia are: (a) "Patchy" intellectual deterioration because some intellectual functions are left relatively intact and (b) Abrupt onset of the disease with rapid changes as opposed the uniformly progressive onset of Alzheimer's Disease (American Psychiatric Association, 1987).

Severity of dementia. It is possible to quantitatively estimate the severity of cognitive impairment by using scores on dementia rating scales such as the Folstein Mini-Mental-Status Exam (MMSE). It is then possible to serially document the cognitive change that takes place as the disease progresses. The MMSE is a brief measure of cognitive mental status and taps a range of cognitive tasks including: orientation, verbal reasoning, visual perceptual skills, language, and memory. The MMSE concentrates only on the cognitive aspects of mental functions and excludes questions concerning mood, abnormal mental experiences and the form

of thinking. MMSE scores range from 0 to 30. Scores of 27 to 30 are considered normal and scores equal to or less than 23 indicate dementia (Folstein, Folstein, & McHugh, 1975). Scores can be categorized as mild (23 - 20), moderate (19 - 11), and severe (10 - 0).

Mild dementia is characterized by moderate memory loss which is more marked for recent events such as forgetting names, telephone numbers, directions, and conversations. These individuals have some difficulty with time relationships and may have geographic disorientation; however, they are oriented for place and person. They have the capacity to live independently and they are able to continue with community activities. To a casual observer these individuals may appear normal. There is mild but definite impairment of function. More difficult chores, hobbies, and interests are discontinued. These individuals may need occasional prompting for personal care (Hughes, et. al., 1982).

Moderate dementia is characterized by severe memory loss. Some highly learned material is retained, but new material is rapidly forgotten. Tasks are often not completed because the person forgets to return to a task following an interruption. For example, an individual interrupted while washing dishes may leave the water running. For the moderately demented independent living is hazardous, and some degree of supervision is necessary. At this stage, disorientation to time and place is common. Judgment and problem solving abilities are severely impaired. Abstract thinking is impaired which is indicated by an inability to find similarities and differences between related words, difficulty in defining words and concepts, and other similar tasks. Social judgment also is usually impaired. Moderately impaired individuals are no longer capable of independent functioning outside the home. Although they are still able to perform simple chores, their interests are restricted and are poorly sustained. Assistance is required for dressing, hygiene, and taking care of their personal effects (Hughes, et. al., 1982).

Characteristics of severe dementia include severe memory loss with only fragments remaining. These individuals may have retained their orientation to persons; however, they are unable to make judgments or solve problems. Generally, they can no longer function outside of their own room and require much help with personal care. Incontinence is frequently a problem (Hughes, et. al., 1982).

Needs. Zgola and Coulter (1988) emphasized that persons with dementia have the same emotional and social needs as other human beings. Unfortunately, these needs are often frustrated by the combined effects of cognitive impairment and institutionalization. Cognitively impaired individuals need to perceive themselves as valued and mature adults. They need to be useful, to exert control and to have mastery over their immediate affairs. They need to be part of a group that values their membership. Finally, they need to experience some significant social role (Zgola & Coulter, 1988).

Strengths. Cognitively impaired persons are usually described in terms of their incapacities; yet many retain some skills including: long term memory, performance of over-learned tasks, and a sense of humor. Even severely impaired individuals may be able to recall events from the distant past, recounting with detail significant events from their childhood or young adulthood. These long term memories tend to be personal rather than historical information. Over-learned tasks are often recalled in response to structured circumstances. For example, a housewife may recall how to hold a crochet hook or a former draftsman may recall the proper way to use a compass. Finally, a sense of humor is usually a key resource that has helped this older generation survive the adversities of a lifetime. This sense of humor is usually preserved and may even be heightened by the disinhibition resulting from the impairment. Most

cognitively impaired individuals receive a great deal of pleasure from laughter and making others laugh with them (Zgola & Coulter, 1988).

Theoretical Perspective: Ecological Theory of Adaptive Behavior and Aging

Lawton's Ecological Theory of Adaptive Behavior and Aging (Lawton & Nahemow, 1973) provides a useful theoretical framework for responding to difficult behaviors in cognitively impaired residents. The concepts which are important in this theory include individual competence which is fluid, demands of the environment, and responsive behavior. Lawton proposes that cognitively impaired residents need their environmental conditions modified as their cognitive and functional abilities decline and their inability to adapt to stressors increases. Because VR is adjusted to fit the needs of individuals with decreased levels of competency, it is potentially a useful intervention for nursing home staff.

Lawton theorizes that as individuals' competence decrease, environmental forces have a greater impact on their behavior than do their intrapersonal coping mechanisms. Seeking to conserve their resources, individuals with reduced competence will utilize more primitive cognitive styles such as field leveling, repression, external control, homeostasis seeking, and preference for simplicity. For example, a cognitively impaired individual who perceives an external locus of control does not need to search for appropriate internal behavioral modes. Similarly, routinizing, leveling, repression, and simplistic cognition serve to reduce the number of external cues to be discriminated. Thus, cognitive styles that reduce the internal and external demands on individuals for complex responses help them to maintain stability.

Seeking stability and reduced tensions, cognitively impaired individuals often take the path of least resistance. This works well when the internal and external cues for action are minimized. They are able to adapt and are prevented from becoming involved in problems that

are too complex to handle. However, the behavior becomes maladaptive when individuals' docile responses cause them to lose control over the impinging environmental forces.

Vulnerability is increased by both their inability to discriminate adequately among environmental cues and by the tendency to minimize those cues they do perceive.

Unfortunately, too often the coping mechanisms of incompetent individuals are insufficient to meet the environmental challenges. Their tension-reducing response patterns become tension increasing.

Lawton further theorizes that as competence decreases, behavior becomes increasingly attributable to environmental demand rather than to personal characteristics. Consequently, the environment of less competent individuals has greater influence on their behavior than do their intrapersonal characteristics.

Lawton suggests that the affective responses and adaptive behavior of lower competence individuals can be influenced by adjusting their physical and interpersonal environment. For cognitively impaired persons, positive affect and adaptive behavior results when environmental demand is low. Yet, too little or excessively strong environmental press is likely to produce negative outcomes. Lawton further theorizes that as competence diminishes, the potential for positive affect and adaptive behavior also decreases. Conversely, the potential for maladaptive behavior and negative affect increases as competence decreases. Low competence individuals are very sensitive to even small changes in the environment which can evoke gross changes in the quality of affective or adaptive behavior (Lawton & Nahenow, 1973).

Therefore, this theory implies that interventions, such as VR, which are adjusted to the decreased level of competence of cognitively impaired residents could potentially increase positive affect and decrease maladaptive behavior. Such interventions could be used by nursing home staff to create a therapeutic environment.

Specific Behavioral Symptoms

Agitation. Agitation, to the extent that it presents barriers to adaptation and positive affect, can be interpreted as negative affect and a maladaptive response by nursing home residents (Cox, 1993). Cohen-Mansfield, Marx, and Rosenthal (1989) studied nurses' ratings of agitated behaviors in 408 nursing home residents, reporting that 93 percent of the residents in their study manifested one or more agitated behaviors at least once a week. General restlessness and pacing were the most common agitated behaviors among nursing home residents at all times of the day. Other frequently occurring behaviors (e.g., exhibited at least once a week by at least 20 percent of residents on one of the three shifts) were as follows: cursing, constant requests for attention, repetitive sentences or questions, complaining, and negativism (Cohen-Mansfield, et. al., 1989). Cohen-Mansfield and colleagues observed that some behaviors are manifested at an almost constant rate such as pacing, requests for attention, trying to remove restraints, repetitious mannerisms, strange noises, rigidity of the body, inappropriate disrobing, and exposing oneself (Cohen-Mansfield, Watson, Meade, Gordon, Leatherman, & Emor, 1989; Cohen-Mansfield, et. al., 1989). Aggressive behaviors were observed less frequently than other agitated behaviors and were not manifested constantly (Cohen-Mansfield, et. al., 1989) Although infrequent among the general nursing home population, 86 percent of 124 cognitively impaired nursing home residents were found to manifest some form of aggressive behaviors during a one week observation (Ryden, Bossenmaier, & McLachlan, 1991).

Cohen-Mansfield, Marx, and Rosenthal (1990) reported that agitation in cognitively impaired residents is very strongly associated with aggressive behaviors (e.g., hitting or cursing) and physically nonaggressive behaviors (e.g., aimless pacing and inappropriate robing,

or disrobing). In comparison, verbally agitated (e.g., complaining, negativism, and constant requests for attention) or hiding and hoarding behaviors are not strongly associated with diminished cognitive functioning but are somewhat more prevalent among cognitively intact residents. The agitated behaviors of the cognitively intact appear to represent functional or dysfunctional coping mechanisms as they respond to physical pain, or to real or perceived problems in their environment. In contrast, cognitively impaired residents manifest a wider range of inappropriate behaviors and they exhibit more agitated behaviors at greater frequency than do the cognitively intact residents.

In 1986, Cohen-Mansfield and Billig defined agitated behaviors as inappropriate verbal, vocal, or motor activity that is not an obvious expression of a specific need. They noted that the underlying need or confusion driving the agitated behavior may not be apparent. An agitated person may exhibit a behavior in a number of ways: (a) Behavior is exhibited at an abnormally high frequency (constantly asking questions), (b) Behavior is exhibited under inappropriate circumstances (removing clothes during a meal in the dining room), or (c) Behavior is socially inappropriate (biting or cursing) (Cohen-Mansfield, Werner, & Marx, 1988). The inappropriateness of the behavior is judged from the viewpoint of the observer, rather than that of the elderly person (Cohen-Mansfield & Billig, 1986).

Factor analysis identified three dimensions of agitation: (a) aggressive behavior (hitting, kicking, pushing, scratching, tearing, cursing, grabbing), (b) physically nonaggressive behavior (pacing, inappropriate disrobing, repetitious questioning, handling things inappropriately, general restlessness), (c) verbally agitated behavior (complaining, constant requests for attention, negativism, screaming). These behaviors were found to be highly related across all three nursing shifts (Cohen-Mansfield, et. al., 1989).

In 1990, Cohen-Mansfield, Werner, and Marx refined their definition of agitation. The earlier definition emphasized the unpredictability and randomness of agitated behaviors stating that there may not be an apparent underlying need associated with the agitated behaviors. However, ensuing research indicated that although the specific underlying need driving the agitated behavior may not be apparent, some types of agitated behaviors are associated with unmet needs. Behavioral disorders may arise for many different reasons and a problem solving approach may facilitate behavior management (Zarit, et. al., 1990). Caregivers should monitor the behavior to identify possible antecedents or other reasons for the disruptive behaviors generating possible strategies and evaluating their effects (Deutsch & Rovner, 1991; Zarit, et. al., 1990). For example, verbal agitation can frequently be interpreted as a call for help from physical and emotional suffering (Cohen-Mansfield, Marx, & Werner, 1992). Specifically, screaming was studied in 408 nursing home residents of whom over half were cognitively impaired (Cohen-Mansfield, et. al., 1990). The researchers reported that screaming occurred most frequently among cognitively impaired residents who were left alone and in their rooms during the evening hours when there are no structured activities and few social opportunities. Cohen-Mansfield and colleagues concluded that screaming may be a response to social isolation. Furthermore, identifying the unmet need associated with agitated behaviors could enable caregivers to plan interventions to help control the behavior. For example, data gathered by the researchers indicated that residents screamed less when music was in the environment. Additional research may indicate that music therapy is effective in reducing screaming when residents are alone in their room during the evening (Cohen-Mansfield, et. al., 1990).

Aggressive behavior is hostile action directed toward other persons or objects or towards self which includes physically aggressive behavior (PAB), verbally aggressive behavior (VAB), and sexually aggressive behavior (SAB) (Ryden, et. al., 1991). These hostile actions

are threatening both to the individual and to others, frequently prompting nursing home staff to respond with restraints, social isolation, or removal of the resident from familiar surroundings (Marx, Cohen-Mansfield, & Werner, 1990). Bridges-Parlet, Knopman, & Thompson (1994) observed 20 residents who were identified as aggressive. They reported that PAB was usually manifested as an abrupt change in behavior, less than 20 minutes in duration, and sensitive to environmental factors. Conversely, VAB was reported to be extensive and long lasting, frequently continuing for two hours or more. PAB seemed to be defensive; usually occurring in response to an intrusion into the resident's personal space by staff or other residents (Bridges-Parlet, et. al., 1994; Ryden et al., 1991).

Researchers studying nurses' perceptions of problematic behavior reported that while physical abusiveness was the least prevalent behavior, it caused the most distress among the nurses (Everitt, et. al., 1991). Another round-the-clock study of 124 cognitively impaired nursing home residents reported that 86 percent of the residents showed some form of aggressive behavior within the 7-day study period. Well over half the residents took psychotropic medications and/or were physically restrained during the study week. Those receiving medications manifested significantly more VAB than the group not on such medications. Aggressive behavior occurred most frequently on the day shift, dropping off in the evening (Ryden, et. al., 1991). To improve the quality of life of dementia patients research is needed to determine alternatives to restraints and to identify interventions that prevent or reduce aggressive behavior (Bridges-Parlet, et. al., 1994; Malone, Thompson, & Goodwin, 1993; Marx, et. al., 1990; Ryden, et. al., 1991).

Wandering or pacing, identified as the most common agitated behavior in nursing homes, involves inefficient travel patterns which are aimless, disoriented, and hazardous ambulation (Algase, 1992). Algase describes wandering as rhythmic cycles of locomoting

and nonlocomotoring phases that are manifested as unique patterns for each resident. On the average, wanderers spend more than 110 minutes per day locomotoring. Four travel patterns were identified including: (a) Direct travel from one location to another without diversion, (b) Random travel to many locations without interruption, (c) Pacing back and forth within a limited area, and (d) Lapping large areas.

Management of wandering is a controversial issue because wandering is often misunderstood. Boredom, increased cognitive impairment, and agitation are probable sources of wandering behavior. Yet none of these sources adequately explains wandering which makes development of interventions difficult. Individualized assessment is a necessity (Algase, 1992). Other researchers suggest that wandering may be a natural stress reduction strategy, in which case it should be encouraged (Cohen-Mansfield, et. al., 1991). Conversely, wandering may be hazardous if the cognitively impaired resident wanders away from the facility or into a dangerous area. Injuries are likely if the resident wanders to the point of exhaustion and falls. Once physical restraints were a common procedure to control wandering, but research indicates that restraining agitated nursing home residents does not decrease agitation rather the act of restraining may contribute to manifestations of agitation. Other methods of intervention and/or prevention for wandering are indicated (Werner, et. al., 1989), including music therapy and special care units which are environmentally designed to secure residents while allowing them the freedom to walk (Fitzgerald-Coultier, 1993; Zarit, et. al., 1990).

Level of dementia, time of day, and agitated behaviors. Researchers have studied the relationship between level of dementia and agitated behaviors in AD residents. The severity of the cognitive impairment is significantly related to the presence and severity of behavioral problems. Teri, Larson, and Reifler (1988) studied physicians' evaluations of behaviors for 127

patients with AD. The researchers reported that the frequency of incontinence, poor hygiene, agitation, and wandering increased significantly with increased cognitive impairment. They also reported that the average number of these problem behaviors also increased with level of cognitive impairment. However, Teri and colleagues reported that restlessness was common to all levels of impairment. Residents with higher cognitive functioning, ranging from mild to moderate stages of dementia, were more likely to be verbally agitated and depressed. As cognitive functioning decreases, verbal skills also deteriorate (Cohen-Mansfield, et. al., 1992; Cooper, Mungas, & Weiler, 1990; Cummings, Benson, Hill, & Read, 1985). As verbal ability deteriorates, screaming is found to increase. Screammers are found to have severe cognitive impairment compared to verbally agitated non-screamers (Cohen-Mansfield, Wemer, & Marx 1990).

Physically nonaggressive behaviors also seem to occur more frequently in the advanced stages of dementia particularly if the individual has some activities of daily living (ADLs) still intact. ADLs may be necessary for the individual to perform the agitated behavior. For example, in order to wander, it is necessary to be mobile. It is important to note that in the last stage of life when all functioning decreases, agitation then declines (Cohen-Mansfield, et. al., 1992).

Temporal characteristics, such as time of day, are also related to frequency of certain agitated behaviors. In general, the frequency of agitated behaviors are reported to decrease from day to evening to night shift (Cohen-Mansfield et. al., 1989). Aggressive behaviors follow this pattern with the highest incidents of aggressive behaviors manifested on day shift followed by evening and then night shift (Ryden, et. al., 1991). However, screaming has a different pattern. Cohen-Mansfield, and colleagues (1990) reported that significantly more nursing home residents scream during the evening than at other times of the day and night. This is the time of

the day when residents are more likely to be alone and there are no structured or social activities. The researchers concluded that screaming may be a response to social isolation.

Clinicians refer to the recurring confusion and increasing agitation that can occur during the late afternoon or early evening as the sundown syndrome (Satlin, Volicer, Ross, Herz, & Campbell, 1992). Sundowners may manifest a variety of behaviors such as restlessness, escape behaviors, expression of feelings, verbal agitation, searching behavior (Evans, 1987), and spitting inappropriately during the evening. While demented residents are more likely than non-demented to display the sundown pattern, only a minority of demented residents exhibit the phenomena (Cohen-Mansfield, et. al., 1989; Evans, 1987). Research data are unclear as to why agitation may increase for some residents during the evening. Evans reported that sundowners were significantly more impaired cognitively than non-sundowners and were more recently admitted to the facility leading to the conclusion that relocation stress may lead to sundowning (Evans, 1987). Other research indicates that abnormalities of the circadian timekeeping system may lead to sundowning (Satlin, et. al., 1992).

Understanding the relationship between temporal characteristics and agitated behaviors is important for planning the placement of residents in specific units of the nursing home, staff education, and treatment. For example, a resident's screaming in the early evening hours may be due to loneliness and should not be dismissed as "agitation" that cannot be managed. Instead, the staff should be encouraged to tolerate, accommodate, or redirect the agitation into acceptable channels. A separate treatment for each type of agitation should be planned (Cohen-Mansfield, et. al., 1992).

Positive behaviors. Lawton's theory that the cognitively impaired experience a range of feelings including positive affect is supported by observational research (Mace, 1989). Mace

(1989) used the Facial Action Coding System to determine that, for at least part of the disease, facial expressions of patients with AD are appropriate to situations and appear to accurately reflect their mood. Mace further suggests that caregivers can learn to accurately read the patient's facial expressions and body language. For example, some caregivers report that they can tell when a patient is upset, needs to use the toilet, is experiencing pleasure or pain. The ability to accurately assess the patient's affect can improve the caregiver's ability to enhance the patient's quality of life.

Some cognitively impaired residents are typically non-responsive throughout the day. These individuals are often unaware of events or their environment and are unresponsive to people. Therefore, it is particularly noteworthy when a planned intervention is able to produce smiles and other evidence of positive social behavior (Newman & Ward, 1993).

The most commonly reported improvements for cognitively impaired residents fall into two categories: (a) removal of excess physical disabilities, often a response to medication, and (b) improvement in social function. Improved social function may include more socially appropriate behavior and formation of peer friendships (Mace, 1987). Fostering social relationships and interactions may be crucial interventions which can deter unwanted behaviors (Cox, 1993). Social behavior is described as relating to others with direct or indirect interactions. Direct behaviors can be verbal (talking, vocalizing) or they can be non verbal (positive gesturing, smiling, touching, humming, singing, or whistling). Indirect behaviors include sitting, standing, or walking with others and entering another's room to interact.

Positive behaviors can also be nonsocial in which the individual relates to self rather than to others. Nonsocial behaviors can be active (reading, watching TV, listening to music, looking at or touching objects) or passive (sitting, dozing, standing, looking out the window, and talking to oneself) (Pollack & Namazi, 1992).

Attending to an intervention such as music therapy can be an accurate indication of pleasure and therefore a positive behavior. Attending behavior includes appropriate clapping of hands, singing, humming, smiling, nodding, and maintaining eye contact. Individuals respond differently to stimulation. When listening to music, one resident may open her eyes and tap her finger while another may close his eyes and remain silent. The range or intensity of attending behavior may vary according to the cognitive or physical capabilities or health of the resident (Christie, 1992; Gaebler & Hemsely, 1991). For example, a resident may be attentive but unable to talk because of an enlarged tongue limiting responses to nodding "yes" or "no" when questioned (Christie, 1992).

Interventions

Lawton's theory suggests that too much or too little stimulation can contribute to maladaptive behavior for the cognitively impaired. Therefore, a therapeutic interpersonal and physical environment offers optimal stress rather than minimal stress. Ideally, a therapeutic environment offers stimuli that challenge residents to retain their cognitive and physical abilities without creating excessive demands that lead to frustration (Ryden & Feldt, 1992). The overriding goal of all interventions should be to enhance the overall psychological well-being of the cognitively impaired residents (Hart, 1991). Caregivers are challenged to offer experiences that bring pleasure to the cognitively impaired resident because the frequency of undesirable behavior may be decreased by substituting a harmless or desirable activity (Ryden & Feldt, 1992). Mace (1987) describes a model of specialized care that is preferred for people with dementia which includes the provision of activities which are meaningful to the participant, are enjoyable, give satisfaction, promote success, sustain old roles, and significantly reduce the number of empty hours the patient experiences.

Given the potential benefits of intervention activities, it is important to understand why residents may not participate. Using data from a Health Care Financing Administration project, Voelkl, Fries, and Galecki (1995) reported that level of dementia is a one of several significant predictors of activity involvement. Among the 2,672 nursing home residents in the week-long study, those with very severe cognitive impairment were least likely to participate in activity programs. Voelkl and colleagues reported that 13% of those with very severe cognitive loss were comatose and could not participate in activities. However, the remaining 87% were able to participate in specialized group activities depending on their ability to leave their room. The researchers concluded that specialized activity interventions for residents with very severe cognitive loss should be implemented on an individual level in residents' rooms or on a group level in activity areas.

Many psychological interventions have been developed to manage and treat dementia. Among these are alterations to the physical environment, reminiscence therapy, and music therapy (Hart, 1991). The choice among the possible interventions leading to optimal functioning of the AD resident should be based on multidimensional individualized assessments of the AD resident's behavior. Evaluations of the physical, cognitive, and ecological causes of aberrant behavior provide the basis for designing individualized interventions aimed at altering the behavior (Cox, 1993; Zgola & Coulter, 1988).

Physical environment alterations. Research indicates that altering the physical environment is an effective intervention for cognitively impaired residents. Such alterations can facilitate social interaction and engagement. The environment may be altered in response to specific needs of residents who have lost certain cognitive abilities. Finally, changes made to the environment may decrease the primary source of stress for some residents. For example, a

nursing home may rearrange furniture to facilitate social interaction (Hart, 1991). Nursing homes often respond to the needs of residents who wander by providing an environment with minimal restraints, secured units, open garden areas for walking, and elimination of distractions (Zarit, et. al., 1990). These provisions allow residents to wander freely while remaining safe from harm. At the same time they minimize the disruptive effects of wandering upon other patients or caregivers. Another example of changes to the physical environment are labels and signs on doors and walls to enhance orientation (Hart, 1991). An environment that offers optimal stimulation is considered ideal. Simplified activities that preserve as much functioning as possible by incorporating well-learned behaviors can minimize stressful changes and uncertainties and continue social integration with others (Clair, & Berstein, 1990).

An environment with too little stimulation can be a primary source of stress for the cognitively impaired resident. Such stress can lead to agitation, including aggression and self-stimulating activities, such as screaming (Cariage, et. al., 1991; Cohen-Mansfield, et. al., 1990; Hallberg, Norberg, & Erikson, 1990). Research indicates that providing music in the environment can significantly decrease screaming (Cohen-Mansfield, et. al., 1990). Similarly, when television is present there are fewer strange noises and requests for attention than when television is not present in the environment (Cohen-Mansfield, et. al., 1988). However, neither music nor television playing in the environment reduced pacing or repetitious mannerisms. The researchers concluded that a resident who paces is participating in a high energy activity; such a resident would not be attracted to a sedentary activity such as listening to music or watching television (Cohen-Mansfield, et. al, 1988).

Reminiscence therapy. Reminiscence therapy has roots in Butler's (1963) proposal that life review is a normal and necessary task of old age. Butler described the life review as a

mental process characterized by a progressive return to consciousness of past experiences and particularly the reassessment of unresolved conflicts. It is through this process that the older individual maintains self-esteem, reaffirms a sense of identity, and works through personal losses. Reminiscence therapy groups differ from the life review as suggested by Butler in four ways: (a) Reminiscence therapy groups are usually focused upon nostalgia with story-telling and relaying of information as opposed to critical, and more personal reappraisal of the past (Hart, 1991); (b) The focus of reminiscence therapy is on positive memories; (c) Group facilitators are present to assist the participants' retrieval of positive remembrances (Lowenthal & Marrazzo, 1990); (d) Group reminiscing offers the cognitively impaired resident opportunities to share memories with others of the same cohort who experienced the same historical events and the same space in time (Kiernat, 1979). The reminiscence can be focused on a specific era, locale, or subject (Lowenthal & Marrazzo, 1990).

Zgola and Coulter (1988) emphasized that success of a reminiscence therapy program depends largely upon the facilitator's skill and insight. The facilitator protects each participant from failure or embarrassment and promotes a sense of competence for each one. Silence is valued during the sessions because it offers participants time to reflect and an opportunity for spontaneous contributions. Too much chatter from the facilitator may overwhelm participants and inhibit participation. Open-ended questions are avoided because they are likely to expose a participant's memory deficit. Facilitators for other reminiscence therapy sessions also regulate the amount of time each participant shares his/her memories, offer positive closure statements, and offer cognitive interpretations to enhance within-session as well as across-group continuity (Goldwasser, Auerbach, & Harkins, 1987).

Memories are shared, discussed, and elaborated upon by soliciting contributions of the participants through sensory stimulation. Sensory stimulation of the tactile, aural, olfactory, or

visual senses activates cognitive functioning and/or prompts retrieval of specific memories (Lowenthal & Marrazzo, 1990; Namazi, & Haynes, 1994; Smith, 1986) through the use of music, enlarged reproductions of photographs, artwork (Lowenthal & Marrazzo, 1990), artifacts or objects from the past. For example, a bottle of stove blacking reminded a severely cognitively impaired older man of how his mother kept her stove shining, prompting him to share a detailed reminiscence (Zgola & Coulter, 1988). Similarly, family photos or videos may activate memories about long forgotten family events.

Two common explanations for how music stimulates memories are: (a) Music stimulates associative/environmental cues that activate recall and (b) Music relaxes and calms a person thereby maximizing retrieval capabilities (Smith, 1986). The brain uses sensory cues such as these to retrieve stored memories. Memories are stored along many pathways in the brain. Some pathways become dominant as retrieval routes for the stored memories. Anxiety and disorientation may occur when a pathway becomes blocked, restricting retrieval of memories. Associative or environmental cues, such as music, may activate other pathways to those memories (Smith, 1986).

A variety of benefits from reminiscence therapy for the cognitively impaired resident have been suggested, including the caregiver's increased understanding about the history of the resident (Hart, 1991; Lowenthal & Marrazzo, 1990), improved cognitive functioning (Smith, 1986), improved communication, and improved social interaction which precludes isolation (Baker, 1985). Reminiscence can allow elderly individuals a sense of security through recall of comforting memories, and increased self-esteem through confirmation of uniqueness (Lappe, 1987) and competent expressions at a time when lack of competency is most evident (Zgola & Coulter, 1988). Possibly the most important benefit of reminiscence therapy is the increased pleasure and enjoyment that cognitively impaired residents feel as a result of the group

participation (Baker, 1985; Hart, 1991; Lowenthal & Marrazzo, 1990; Namazi & Haynes, 1994). Through reminiscence, group members are able to find common interests and give a sense of self to themselves and others (Baker, 1985).

Research indicates that reminiscence therapy can bring about improvements in language scores, behavior, socialization, depression, and self-esteem. Some anxiety may also result from reminiscence. The results are unclear about the benefits of using sensory stimuli such as photographs and audio tapes to enhance the ability of dementia patients to participate in reminiscence groups (Namazi & Haynes, 1994).

Smith (1986) studied verbally cued group reminiscence, musically cued group reminiscence, and music activity with cognitively impaired residents. Both verbally cued and musically cued reminiscence were combined with discussion sessions involving direct questioning. Music activity involved rote singing and simple recall without questioning. Smith reported that verbally cued group reminiscence sessions seemed to cause anxiety. The anxiety occurred when the subjects began their remarks appropriate to the discussion only to forget their ideas in mid-sentence. Both verbally cued and musically cued reminiscence improved language scores. While music activity alone did not cause anxiety, it also did not produce significant improvements in language (Smith, 1986).

Kiernat (1979) reported that behavior improved for more than half of the cognitively impaired residents who attended a series of 20 reminiscence group discussion sessions using multisensory materials. Behaviors monitored were those manifested during the session and nurses' perceptions of behaviors after the session including: facial expression, extent of conversation, attentiveness to group activity, presence of nonpurposeful behavior, session attendance, and use of restraints. The greatest change in behavior occurred for individuals who attended most frequently. Recall was generally greatest for childhood experiences and nearly

all the participants had the most difficulty recalling the adult years. Anecdotal records of each session provided the clearest picture of the changes that took place over the total project period.

Lowenthal and Marrazzo (1990) used a form of reminiscence therapy, "milestoning," for nine years at a psychiatric center for geriatric residents. Milestoning facilitators redirect reminiscence toward positive feelings of the past, avoiding negative self-evaluation. The facilitators modeled reminiscence by sharing their own memories at the beginning of each session. Lowenthal and Marrazzo compared milestoning to Butler's life review process reporting anecdotal information that patients who participated in the milestoning manifested more frequent retrieval of positive memories, more frequent use of latent communication skills (both listening and speaking with peers and staff), and more frequent and less hostile social interaction with peers and staff. Lowenthal and Marrazzo emphasized that although these improvements to communication were short term, occurring only during milestoning, they were still of the greatest importance to their elderly clients' socialization. In another study demented residents participated in ten bi-weekly group reminiscence therapy sessions and showed significantly less depression at the end of the sessions (Goldwasser, et. al., 1987).

Namazi and Haynes (1994) examined the pre and post behavioral effects of reminiscence with sensory stimulation on residents with AD and compared the results to a control group that discussed only current events without sensory stimulation. There were 12 sessions with one topic per session. The experimental group viewed 8 x 9" color photographs and listened to a tape recording of a sound related to the photograph. Photographs included an old fashioned telephone, a hammer and nail, a sewing machine, a traffic jam, a man working with a jackhammer, an infant smiling, a dog, a hen, ect. An instructor talked for two minutes about the photograph and then encouraged discussion for 30 minutes with prompting questions. The control group relied only on verbal prompting by the instructor to facilitate

discussion. The topics for the control group included fashion, planning a picnic, a party, a dinner, decorating a room, vegetable gardening, and the Olympics.

Researchers reported that for both groups patients with higher MMSE scores were more expressive, elaborated more about their thoughts and feelings, and discussed more about the topic of conversation. Those with moderate to severe AD remained inactive throughout the discussion. The researchers suggested that mixing higher and lower functioning individuals in a reminiscence group may be problematic because higher functioning individuals may become irritated with the slow, inappropriate response or behavior of a lower functioning person. This conflict may detract from the potential benefits to participants during the session and the affects may carry over to the post session as well (Namazi & Haynes, 1994).

The most frequently observed behaviors prior to both the reminiscence and control sessions were combative behaviors followed by complaining/whining, destroying property, and eating or drinking inappropriate substances. Combative behavior increased after the sessions for the reminiscence group while the control group showed fewer incidents of combativeness. The number of agitated behaviors (combative behaviors, complaining/whining, destroying property, and eating or drinking inappropriate substances, negative gestures, taking others things, screaming, and throwing objects) increased for the reminiscence group while decreasing for the control group. The researchers suggested that agitation may have increased during the post session for the reminiscence group because the photos and audio sounds were unfamiliar to the subjects. When pressed into discussion, the subjects then felt anxious and stressed and that stress remained with these subjects for 30 minutes after the session. The number of passive behaviors (sleeping, eating, positive gesturing, singing, and alone in room) increased for both groups after the reminiscence sessions. (Namazi & Haynes, 1994).

Music therapy. Music is increasingly recognized as a therapeutic resource for the elderly and for the cognitively impaired (Fitzgerald-Cloutier, 1993). Evidence indicates that music therapy may stimulate memories, optimize cognitive functioning (Smith, 1986), improve social interactions (Clair & Bernstein, 1990; Pollack & Namazi, 1992), decrease agitated behaviors (Gerdner & Swanson, 1993), and improve quality of life by offering enjoyable activities for relaxation, and increasing self-esteem and self-worth (Christie, 1992; Needler & Baer, 1982).

Music can be used as a bridge to discussion of a topic. For example, patriotic songs such as "Yankee Doodle," lead into a discussion about the Fourth of July. Patriotic songs usually bring about an excellent response. They are commonly known and sung unabashedly with hands clapping, feet tapping, and bodies moving. Another way that therapists use music to generate responses is by asking questions regarding the meaning of words to songs. For example, the therapist may ask "What does it mean to let your hair down?" Older women may remember having long hair held up with pins. They also may recall having it bobbed in the 1940's. Similarly, melody and other more subtle aspects of music -- tonality, timbre, rhythm, and meter, tempo, dynamics, and harmony -- create the musical imagery that also triggers thoughts and feelings (Needler & Baer, 1982). Finally, music may enable a patient to express those feelings subconsciously through singing songs (Kaser, 1993).

Music, as a form of nonverbal communication, reduces stress for people who cannot express their feelings verbally. Despite cognitive impairment, individuals who feel the pressure to communicate effectively may find a release in musical expression of the subconscious feelings (Kaser, 1993). People breathe more deeply when they vocalize and move, resulting in an increased intake of oxygen and improved blood circulation which stimulates mental processes which in turn generate greater alertness (Needler & Baer, 1982).

Training of music therapists usually includes an understanding of the organic basis for dementia, the associated difficult behaviors, and the psychosocial aspects of dementia. They also learn techniques for displacing anger and restlessness through appropriate music techniques. Both group and individual work in music therapy are necessary for full effectiveness. Group sessions do not meet the needs of the withdrawn and isolated, the depressed, those with aphasia, nor the visually and/or hearing impaired patients. The size of the group is critical and generally as the degree of cognitive impairment increases the group size should decrease. With highly disturbed individuals, a one-to-one interaction may be necessary in order to establish a relationship. In the long run the hope of the music therapist should be to establish a group interaction. It is critical that the therapist maintain eye contact with the patient therefore the therapist should play a portable instrument such as the accordion. The music must be played at a pitch and speed which is easily sung by the participants.

Research supports the benefits claimed by music therapists. Music therapy sessions have been reported to be superior to other nonmusic sessions. Benefits from music therapy sessions include increased social behaviors, decreased nonsocial behavior, engaged wanderers, and increased attending skills. Millard and Smith (1989) observed ten AD patients participating in both music therapy sessions and discussion sessions. Twice weekly the subjects alternated between the music and discussion sessions. The researchers reported that, compared to discussion sessions, the subjects manifested significantly more verbal participation during the music sessions and sitting and walking with others increased after the music sessions. Furthermore, observers reported an increase in social behaviors that were not included in the data. For example, during the music sessions residents smiled more and seemed calmer. Patients were seen giving up their chairs for others and holding hands more often than during discussion sessions. Finally, many of the more regressed patients who rarely spoke engaged in

singing (Millard & Smith, 1989). Eight moderately to severely demented residents who were treated individually to music therapy sessions manifested a significant increase in social behavior and a significant decrease in nonsocial behavior for up to 15 minutes following the sessions. The greatest increases were among nonverbal behaviors relating to others including gesturing, smiling, touching, humming and singing. The greatest decreases involved behaviors relating to the self including reading, watching TV, listening to music, looking at or touching objects, sitting, dozing, looking out the window, and talking to self. Anecdotal information indicated that the subjects were generally cooperative and attentive during music sessions. Instances of distraction or apathy were infrequent. Instead, there was usually continuous participation, displays of affection, positive affect, increased verbalization, and positive verbal feedback indicating involvement and pleasure (Pollack & Namazi, 1992). Two small groups of cognitively impaired residents attending music therapy sessions manifested improvement in attending skills (active participation) consistently across 20 sessions. In other studies patients prone to wandering remained seated or in close proximity to the music session area for a longer time for music sessions than for reading sessions (Fitzgerald-Cloutier, 1993; Groene, 1993).

Television. Television is potentially an effective intervention for cognitively impaired residents. Television is desirable because of its convenience, simplicity of use, and low cost. Watching television is a routine or procedural behavior involving long term memory which may momentarily capture the attention of cognitively impaired individuals (Lund, et al., 1995). Watching television was identified by Teri and Logsdon (1991) as one of a list of 53 pleasant activities for AD patients.

Research on television as an effective intervention for agitated behavior among cognitively impaired nursing home residents is rare. A recent study examined the effect of three

interventions on verbally disruptive behavior (VDB) among 26 nursing home residents: (a) a videotape of a resident's family, (b) social interaction, and (c) music. The researchers observed the residents for 15 minutes before the intervention, during the intervention, and for 15 minutes after. Preliminary results indicate significant decreases in VDB during all the interventions. VDB decreased 39% during social interaction, 33% during the videotape, 24% during the music. VDB was decreased for the control group, which had no intervention, by 8% (Werner, Cohen-Mansfield, Segal, Holdridge, and Wheeler, 1994).

Television programs such as Lawrence Welk offer music, provide friendly and positive messages with simple content. However, preliminary research by Lund and colleagues (1995) indicates that Lawrence Welk is not as effective at sustaining the attention of cognitively impaired individuals for approximately one-half hour when compared to a Video Respite tape. Eighty-four percent of the impaired viewers remained seated during the viewing of "Favorite Things" and only 54% of the impaired viewers were still seated at the end of a Lawrence Welk show. The impaired viewers also responded differently to the two different tapes. Over 50% of cognitively impaired individuals watching VR videotapes received the highest possible subjective ratings of enjoyment from and interest in the videotape. High ratings were described as follows: "almost complete involvement," "frequently smiles or nods," "rarely appears distracted or bored," and "very positive affect." Lawrence Welk did not stimulate such high ratings among the viewers. In addition, 17 of the 53 pleasant activities for AD patients identified by Teri and Logsdon (1991) are possible for viewers of the first ten VR videotapes (Lund, et. al., 1995).

A study of VR at Oregon State University (Angelelli, 1995) examined how direct care staff would use VR in 10 SCU's. The majority of the 55 nurses and nurses aides in the study used VR primarily when individual residents presented behavioral problems. Furthermore,

staff reported that after watching a VR videotape ("Favorite Things" or "Gonna Do a Little Music") AD residents engaged in fewer agitated behaviors such as wandering and complaining, and repetitive questions.

Summary

Music therapy and reminiscence therapy have been shown to be effective interventions for cognitively impaired residents of nursing homes. VR incorporates both therapies through the medium of video. Because television is an identified pleasant activity, it is possible that videos are easier for cognitively impaired individuals to identify and comprehend than photographs and will prove to be more effective. Also, VR does not require as much on-going time commitment from professionals or others to sustain the activity relative to live reminiscence or music therapy. Furthermore, VR can be used either in an activity area for a groups of residents or in a resident's room as a private activity. Therefore, it is important to investigate the effectiveness of VR.

Purpose of this Study

Because VR tapes contain many of the positive features of music therapy and reminiscence therapy it is appropriate to test the effects of VR on persons with dementia. Therefore, the purpose of this study is to determine if VR viewing significantly affects the behavior of cognitively impaired nursing home residents. Specifically, do agitated behaviors significantly decrease and do positive behaviors significantly increase during and after viewing VR compared to pre-VR? In addition, are there differences in the behavioral effects by facility, shift, and level of dementia?

3. Methods

A quasi-experimental design was used to investigate the behavioral effects of Video Respite viewing on cognitively impaired residents of three nursing homes. Thirty-six subjects were observed for 63 minutes, e.g., 21 minutes before VR, during the subject's viewing of VR, and 21 minutes after VR. Observations were conducted between April and June, 1995. Appendix A includes approval for this study obtained from the Oregon State University Institutional Review Board for the Protection of Human Subjects (IRB).

Recruitment

Facility. All three of the nursing homes in Corvallis were recruited to participate in this study: (a) Corvallis Care Center, (b) Heart of the Valley Care Center, (c) Corvallis Manor. These same nursing homes participated in an earlier study of VR by Angelleli (1994).

Both Heart of the Valley and Corvallis Manor have special care units (SCUs) for cognitively impaired residents. Heart of the Valley Care Center has two SCU's for different resident needs: (a) Residents who wander and require a secure environment to ensure their safety, and (b) Residents who have displayed aggressive behaviors. Corvallis Manor has one SCU for residents who wander. This SCU is a low stimulus environment for very frail residents with cognitive impairment; consequently, combative or aggressive residents are not admitted. Corvallis Care Center is a mixed population facility that does not separate the cognitively impaired residents into an SCU. According to C. Nyquist (personal communication, November 18, 1994), Social Services Director at Corvallis Care Center, residents who become dangerous to themselves or others are moved to an SCU at another facility (1994).

Residents. Cognitively impaired residents with a diagnosis of dementia were identified at each facility by the nursing home staff. Cognitive impairment included a variety of diagnoses and was not limited to Alzheimer's Disease. Those residents with severe hearing or visual impairment were excluded from the study. A cover letter written by the nursing home's administrator accompanied a description of the research project and informed consent forms. Appendix B includes a copy of the consent letter which was mailed to each responsible family member or legal guardian. In response to the administrator's request, the researcher demonstrated VR and explained the research project at a monthly support meeting for residents' relatives at the Corvallis Care Center.

A total of 60 recruitment letters were mailed to family members, e.g., 20 letters per facility. Initially, nine signed consent forms were returned to the Corvallis Care Center. Four more letters were received after a prompting phone call by the researcher to encourage the family members to participate from which 12 were randomly selected. At Heart of the Valley 15 letters of consent were returned from which 12 were randomly selected. Eight consent forms were returned from Corvallis Manor families. Prompting phone calls to family members resulted in another seven consent letters of which 12 were randomly selected. Thus, the sample included 36 residents, 12 from each of the three nursing homes.

Six of the 12 residents in each nursing home were randomly assigned to day shift (8:00 am to 3:00 p.m.) and six to evening shift (3:00 p.m. to 8:00 p.m.). At those facilities with SCU's, an equal number of residents were selected from the SCU as from the general floor. At Heart of the Valley 3 residents from each SCU were selected.

At the completion of this study all family members who returned the consent forms were mailed thank you letters accompanied by a copy of the abstract. Similarly, each participating nursing home was mailed a thank you letter accompanied by a copy of the abstract.

Intervention

The VR videotape, "Remembering When," was used for this study. This 21 minute videotape combines reminiscence and music to engage the viewer in a pleasant visit with "Molly." Songs such as "Twinkle, Twinkle Little Star" and "When Irish Eyes are Smiling" and memories of "School Days," the Roaring Twenties, and summertime games and picnics assist viewers to use their long term memory. Molly asks viewers if they remember the song. She sings the song then asks them to sing along with her. Molly engages viewers in conversation by asking them to recall things such as visits with grandparents in the country. She then talks about what it is like to visit the country. She describes chores, interjecting questions, and pausing for answers. Molly continues the conversation mentioning such things as summer picnics and swimming in the swimming hole. The video includes a visit with a red-haired young boy named Kyle. Molly invites viewers to join her in singing "Twinkle, Twinkle, Little Star" for Kyle. Molly continues to use a conversational style as she discusses topics that jog long term memory.

Procedure

Observational approach. Data were gathered through direct observation and chart review. The units of analysis were 36 residents of three nursing homes. Each subject was observed once for a total of 63 minutes: 21 minutes pre-VR, 21 minutes during-VR, and 21 minutes post-VR. The observer/s wore headphones and a tape player that signaled one minute.

At the signal the observer/s looked up to watch for five seconds and recorded on the index all the behaviors that were manifested by the subject (see Appendix C for a copy of the behavioral index). Then the observers did not look at the subject until the next signal.

After observing and recording the subject's behaviors in the natural environment, the subject was invited by the researcher to view VR. Whenever possible, each subject watched VR in privacy; however, this was not always possible due to the location of a VCR unit in each nursing home. Fifty-six percent of the residents in this study watched VR in privacy and 44% watched VR in a group situation. Interruptions and unique circumstances were recorded on the index, noting the effects upon the subject. For example, one subject refused to watch VR. This subject became very agitated by the observer's presence during pre-VR. When invited, she refused to enter the room where the video was to be shown. The subject's agitation increased and consequently she was dropped from the study.

To maintain individual privacy, the observer did not enter a subject's room if the door was closed. Subjects who remained in their room with the door closed for more than five minutes were observed on another day.

VR was scheduled at times convenient for each nursing home. Procedures for the observations were thoroughly explained to the Social Services Director at each facility. At the completion of the study, each facility received a complimentary copy of "Remembering When."

Observers. Three observers participated in this study: Lynn Hall (graduate student), Jan Hare, Ph.D.(professor-in-charge), and Melissa Doherty (undergraduate student). To ensure common definitions of behaviors and establish reliability the observers participated in three training sessions. Several video tapes of nursing home residents were used to assist in establishing definitions of various agitated behaviors. To maintain reliability, every third

observation was recorded by two observers. During data collection there was a high degree of interrater reliability for the three observers for all agitated and positive behaviors: agitated behaviors $r = .98$ and for positive behaviors $r = .99$. Because interrater reliability was so high, the scores of the primary investigator (Lynn Hall) were used as the final score.

Instruments

The subject's agitated behaviors and positive interactive social behaviors were recorded on a behavioral index as they occurred. A copy of the index is in Appendix C. The index included 14 specific agitated behaviors and one item for positive interactive social behaviors. The index of agitated behaviors was adapted from the Agitated Behavior Scale developed by Corrigan (1989). Corrigan's scale was modified to make it more appropriate for this population. For example, the four-point Likert-type rating method was not included in the behavioral index.

At the tape recorded signal, the observers recorded whether each behavior on the index was present or absent (1 indicated the behavior was present and 0 indicated the behavior was absent). Corrigan reported strong internal reliability for the full Agitated Behavior Scale ($r = .91$) and good concurrent validity as compared with the Braintree Agitation Scale (Corrigan, 1989).

Operational Definition and Scoring of Dependent Variables

Two dependent variables were examined: agitated behavior and positive interactive social behavior.

Agitated behaviors. Agitated behaviors included the following: 1) short attention span; 2) easy distractibility, impulsive, impatience or low tolerance of frustration; 3) sudden changes of

mood; 4) excessive crying; 5) rocking, rubbing, self-stimulating behavior; 6) pulling at tubes; 7) restlessness, pacing; 8) repetitive behaviors; 9) rapid, loud talking; 10) uncooperative; 11) self-abusiveness; 12) explosive and/or unpredictable anger; 13) violent and/or threatening violence toward people/property; 14) wandering from treatment areas (See Appendix C for a copy of the behavioral index).

Positive behaviors. One item on the behavioral index represented positive interactive social behaviors which included the following social behaviors: sitting/walking/standing with others, talking with others, smiling, singing, positive gesturing, and verbal responses to VR questions or statements. Other positive behaviors were also described and recorded.

Scoring Dependent Variables

Each 21 minute time period was divided into 21 one-minute segments (boxes) to facilitate recording behaviors. Behaviors were recorded every 60 seconds. At the signal the observers looked at the subject to watch for 5 seconds and recorded all the agitated and positive behaviors that were manifested. Then the observers looked down and did not look at the person until the next signal.

Observations were conducted for three 21 minute time periods (pre, during, or post-VR). Twenty-one minute intervals was selected because the VR tape, "Remembering When" is 21 minutes long. Scores were calculated for each time period. The 14 items for agitated behavior were totaled for each time period. Agitation scores could range from 0 - 294. The one item for positive social interactions was totaled for each time period. Positive behavior scores could range from 0 - 21

Operational Definition and Scoring of Independent Variables

This study examined three independent variables expected to influence the effectiveness of the VR tape: facility (3), shift (2), and level of dementia (3).

The facility and shift on which VR was viewed was recorded by the observers on the behavioral index. Shift was divided into two categories: day (7:00 a.m. to 3:00 p.m.) and evening (3:00 p.m. to 11:00 p.m.). The observations took place on each shift, between 8:00 am to 10:00 am on day shift and 3:00 p.m. to 5:00 p.m. on evening shift.

Level of dementia was assessed using the Folstein Mini Mental State exam (MMSE, see Appendix D.) (Folstein, Folstein & McHugh, 1975). Twenty four to 72 hours before the observation, the MMSE was administered by the researchers for each subject. The MMSE is a brief measure of cognitive mental status and taps a range of cognitive tasks including: orientation, verbal reasoning, visual perceptual skills, language, and memory. MMSE scores range from 0 to 30. Scores of 27 to 30 were considered normal and scores equal to or less than 23 indicate dementia. Scores were categorized as mild (23 - 20), moderate (19 - 11), and severe (10 - 0).

The validity and reliability of the MMSE is well documented by Folstein, Folstein and McHugh (1975): (a) MMSE scores for dementia agreed with the clinical opinion of the presence of cognitive difficulty; (b) Test scores were dispersed in a fashion agreeing with the severity of the difficulty; (c) MMSE scores were highly correlated with the Wechsler Adult Intelligence Scale; (d) The correlation was high ($r = .89$) for multiple examiners 24 hours apart as well as for different examiners on a 28 day retest. Furthermore, MMSE is valuable to this study because it is a quantified assessment of cognitive state requiring only a few minutes to

complete (Folstein, Folstein & McHugh, 1975). The internal consistency for MMSE in this study was acceptable (Cronbach's alpha = .77).

4. Results

The purpose of this study was to determine whether VR viewing significantly affects the behavior of cognitively impaired nursing home residents. Were there significant increases in positive behaviors and significant decreases in agitated behaviors during-VR and post-VR when compared to pre-VR? In addition, do changes in behavior attributed to VR vary by facility, shift, and level of dementia?

Sample

Thirty-six residents from three facilities participated in this study. Residents' ages ranged from 65 to 98 years with a mean age of 76.3 years ($sd = 9.1$) and a median age of 84.5 years. Seventy-eight percent of the residents were female and 22% were male. MMSE scores indicated that 72% of the residents were severely demented ($M = 6.9$, $sd = 7.1$). Diagnoses of dementia included the following: dementia and senile dementia, organic brain syndrome (OBS), Alzheimer's disease (AD), multi-infarct dementia, depressive dementia, periods of anoxia, carbon monoxide poisoning, and cerebral vascular accident. The most common diagnoses were dementia and senile dementia (42%), AD (22%), and OBS (14%).

Forty-seven percent of the residents in this study were taking psychotropic medications at the time of the study. Psychotropic medications for management of dementia are designed to act directly on the neurons thus changing the neurotransmitter systems. This results in symptomatic relief including changes in cognition, emotion and behavior (Hart, 1991).

Behaviors

Table 1 displays the frequency and percentage of time that the agitated behaviors were present. Four agitated behaviors were observed to occur more frequently than others when

summed across all 3 time periods: Item #8, repetitive behaviors, motor and/or verbal of all the observations (10%), Item #7, restlessness, pacing, excessive movement (9%), Item #5, rocking, rubbing, moaning or other self-stimulating behavior (5%), Item #1, short attention span, easy distractibility (3%). Item #11, self-abusiveness, physical and/or verbal, was not observed during this study.

Positive interactive social behaviors, which occurred more frequently than agitated behaviors, were present in 16% of the observations when summed across all three time periods. However, they are present in 26% of the observations during-VR. Behavior scores for each subject are reported in Appendix E.

In order to examine whether behavior changed over the three observation periods, paired t-tests were utilized as well as Repeated Measures Analysis of Variance. Two 3-way ANOVAs were conducted with time treated as a repeated measure. One ANOVA examined changes in agitated behavior; the other examined for changes in positive behavior. Specifically, three-way ANOVA factorial designs, Facility (3), Shift (2), and MMSE (3) with repeated measures of Time, were formulated.

Research Question 1

Are there significant differences in agitated behavior over time (pre, during, post) by facility, shift, and level of dementia?

Three paired t-tests were conducted examining agitation pre-VR and post-VR, pre-VR and during-VR, and during-VR and post-VR. Table 2 illustrates that no significant differences were found.

Table 3 illustrates that no significant main effect for Time was found using Repeated Measures ANOVA ($F = 1.1, p = 0.34$). Table 4 illustrates the significant interaction effects that were found for Time by Nursing Home ($F = 4.5, p < .05$) and Time by MMSE ($F = 4.3, p < .05$). No significant interaction was found for Time by Shift ($F = 2.0, p = 0.16$). Significance was found for the two interaction effects only using Roy's Greatest Root. Quadratic effects are illustrated on Table 5. In testing for quadratic effects, significant changes were found in agitation over time by Nursing Home ($F = 4.1, p < .05$), MMSE ($F = 3.7, p < .05$) and Shift at the trend level ($F = 2.9, p < .10$). Univariate Analysis of Variance tests were conducted to examine these quadratic effects. Table 6 reports means and standard deviations for facility, dementia and shift for each observation time. One nursing home (Heart of the Valley) had significantly less change in agitated behavior over the three observation times compared to the other two nursing homes. During day shift, agitation showed a noticeable decrease during-VR and then again post-VR. Conversely, agitation on evening shift showed a slight increase during-VR.

Table 1
Frequencies and Percentages of Time Behaviors Were Observed

Variable	Frequency (%)	Frequency (%)	Frequency (%)
	Pre-VR	During-VR	Post-VR
Agitated Behavior			
Item #1	7 (0.9)	46 (6.1)	5 (0.7)
Item #2	10 (1.3)	4 (0.5)	0 (0.0)
Item #3	0 (0.0)	0 (0.0)	2 (0.3)
Item #4	1 (0.1)	3 (0.4)	3 (0.4)
Item #5	30 (4.0)	42 (5.6)	41 (5.4)
Item #6	7 (0.9)	4 (0.5)	18 (2.4)
Item #7	91 (12.0)	43 (5.7)	79 (10.4)
Item #8	89 (11.8)	68 (9.0)	84 (11.1)
Item #9	23 (3.0)	1 (0.1)	25 (3.3)
Item #10	3 (0.4)	10 (1.3)	0 (0.0)
Item #11	0 (0.0)	0 (0.0)	0 (0.0)
Item #12	1 (0.1)	1 (0.1)	3 (0.4)
Item #13	2 (0.3)	0 (0.0)	0 (0.0)
Item #14	0 (0.0)	7 (0.9)	0 (0.0)
Positive Behavior			
Item #1	71 (9.4)	197 (26.1)	84 (11.1)

Table 2

Paired t-tests for Differences in Agitated Behaviors

Variable	Mean Difference (SD)		
	(n = 36)	t statistic	p
<u>Agitated Behavior</u>			
Pre - During	.97 (8.03)	.73	.4722
Pre - Post	.11 (5.70)	.12	.9075
During - Post	-.86 (7.82)	-.66	.5133

Note. Total mean agitation (sd) for Pre = 7.3 (9.8), During = 6.4 (8.2) and Post = 7.2 (11.4).

Range = 0-294.

Table 3

Multivariate Tests of Significance for AgitationEffect of Time

Test Name	Value	F	Num df	Den df	p
Wilks' Lambda	0.9287588	1.1	2	29	0.34
Pillai's Trace	0.0712412	1.1	2	29	0.34
Hotelling-Lawley Trace	0.07670582	1.1	2	29	0.34
Roy's Greatest Root	0.07670582	1.1	2	29	0.34

Table 4

Multivariate Analysis for Within-subject Related Interaction Effects for Nursing Home, MMSE, and Shift for Agitated Behavior

Test Name	Value	F	Num df	Den df
Time*Nursing Home				
Wilks' Lambda	0.76906641	2.0*	4	58
Pillai's Trace	0.23122521	2.0	4	60
Hotelling-Lawley Trace	0.29989863	2.1*	4	56
Roy's Greatest Root	0.29862885	4.5**	2	30
Time*Shift				
Wilks' Lambda	0.88134125	2.0	2	29
Pillai's Trace	0.11865875	2.0	2	29
Hotelling-Lawley Trace	0.13463429	2.0	2	29
Roy's Greatest Root	0.13463429	2.0	2	29
Time*MMSE				
Wilks' Lambda	0.77709923	2.0	4	58
Pillai's Trace	0.22331396	2.0	4	60
Hotelling-Lawley Trace	0.28639524	2.0	4	56
Roy's Greatest Root	0.28443589	4.3**	2	30

* $p < .10$. ** $p < .05$

Table 5

Quadratic Effect for Agitated BehaviorContrast Variable: Time

Source	df	Type III SS	F Value
Mean	1	54.44366462	1.8
Nursing Home	2	245.761782119	4.1**
MMSE	2	219.52346942	3.7**
Shift	1	86.02419548	2.9*

* $p < .10$. ** $p < .05$

Table 6

Means and Standard Deviations for Agitated Behaviors (Pre, During and Post-VR) by Nursing Home, MMSE Score and Shift

	Pre-VR (n = 36) Range = 0-294	During-VR (n = 36) Range = 0-294	Post-VR (n = 36) Range = 0-294
Variable	Mean (sd)	Mean (sd)	Mean (sd)
Nursing Home			
CCC ^a (n = 12)	8.1 (11.6)	3.5 (4.4)	6.4 (10.5)
HV ^b (n = 12)	9.1 (11.7)	8.6 (11.1)	9.0 (13.7)
CM ^c (n = 12)	4.8 (4.6)	7.0 (7.7)	6.3 (10.4)
MMSE Score			
Mild (n = 2)	4.0 (5.7)	7.5 (2.1)	1.5 (0.7)
Moderate (n = 8)	3.3 (5.2)	2.9 (3.5)	0.5 (0.9)
Severe (n = 26)	8.9 (10.8)	7.4 (9.3)	9.7(12.5)
Shift			
Day (n = 18)	7.7 (9.7)	4.8 (7.0)	6.4 (11.3)
Evening (n = 18)	7.0 (10.1)	7.9 (9.2)	8.0 (11.7)
Agitation Mean Scores Across All Conditions			
	7.3 (9.8)	6.4 (8.2)	7.2 (11.4)

Note. ^a CCC = Corvallis Care Center. ^b HV = Heart of the Valley. ^c CM = Corvallis Manor.

Research Question 2

Are there significant differences in positive interactive behavior over time (pre, during, post) by facility, shift, and level of dementia?

Table 7 reports the mean differences from the three paired t-tests which examined positive behaviors pre-VR and post-VR, pre-VR and during-VR, and during-VR and post-VR. Paired t-tests confirmed the informal observations that there was a significant increase in positive behaviors during-VR. Specifically, significant change was found between pre-VR and during-VR ($t = -4.0, p < 0.0001$) as well as during-VR and post-VR ($t = 2.62, p < .01$). No significance was found between pre-VR and post-VR ($t = -0.44, p = 0.66$).

Using Repeated Measures ANOVA, Table 8 illustrates that no main effect for Time was found ($F = 2.1, p > 0.13$). In addition, no significant interaction effects or quadratic effects are indicated in Table 9 and Table 10. Table 11 reports means and standard deviations for facility, dementia and shift for each observation time. Because no interaction effects were found it means that the facility, shift, and level of dementia did not influence the likelihood of VR creating positive behavior.

Table 7

Paired t-tests for Differences in Positive Behaviors

Variable	Mean Difference (SD)	
	(n = 36)	t statistic
<u>Positive Behavior</u>		
Pre - During	-3.50 (5.30)	-4.00****
Pre - Post	-0.36 (4.89)	-0.44
During - Post	3.14 (7.20)	2.62***

Note. Total mean positive behavior scores (sd) for Pre = 2.0 (2.6), During = 5.5 (5.9) and Post = 2.3 (4.0). Range = 0-21.

*** $p < .01$. **** $p < .001$

Table 8

Multivariate Tests of Significance for Positive BehaviorEffect of Time

Test Name	Value	F	Num df	Den df	p
Wilks' Lambda	0.87107613	2.2	2	29	0.14
Pillai's Trace	0.12892387	2.2	2	29	0.14
Hotelling-Lawley Trace	0.14800528	2.2	2	29	0.14
Roy's Greatest Root	0.14800528	2.2	2	29	0.14

Table 9

Multivariate Analysis for Within-subject Related Interaction Effects for Nursing Home, MMSE, and Shift for Positive Behavior

Test Name	Value	F	df	df	p
Time*Nursing Home					
Wilks' Lambda	0.96335202	0.3	4	58	0.89
Pillai's Trace	0.2892387	0.3	4	60	0.89
Hotelling-Lawley Trace	0.14800528	0.3	4	56	0.90
Roy's Greatest Root	0.14800528	0.6	2	30	0.58
Time*Shift					
Wilks' Lambda	0.98888748	0.2	2	29	0.85
Pillai's Trace	0.01111252	0.2	2	29	0.85
Hotelling-Lawley Trace	0.01123739	0.2	2	29	0.85
Roy's Greatest Root	0.01123739	0.2	2	29	0.85
Time*MMSE					
Wilks' Lambda	0.9932657	0.5	4	58	0.99
Pillai's Trace	0.00674052	0.1	4	60	0.99
Hotelling-Lawley Trace	0.0067737	0.1	4	56	0.99
Roy's Greatest Root	0.00566958	0.0	2	30	0.92

Table 10

Quadratic Effect for Positive BehaviorContrast Variable: Time

Source	df	Type III SS	F Value	p
Nursing Home	2	26.55232948	0.53	0.60
MMSE	1	1.74105119	0.07	0.79
Shift	2	3.13558611	0.06	0.94

Table 11

Means and Standard Deviations for Positive Behaviors (Pre, During and Post-VR) by Nursing Home, MMSE Score and Shift

	Pre-VR (n = 36) Range = 0 - 21	During-VR (n = 36) Range = 0 - 21	Post-VR (n = 36) Range = 0 - 21
Variable	Mean (sd)	Mean (sd)	Mean (sd)
Nursing Home			
CCC ^a (n = 12)	1.7 (3.0)	4.3 (5.0)	2.1 (3.3)
HV ^b (n = 12)	1.8 (2.0)	6.8 (6.7)	1.8 (1.8)
CM ^c (n = 12)	2.4 (3.0)	5.3 (6.1)	3.1 (6.0)
MMSE Score			
Mild (n = 2)	2.5 (3.5)	6.0 (2.8)	2.0 (0.0)
Moderate (n = 8)	1.9 (3.3)	4.8 (6.0)	2.9 (3.8)
Severe (n = 26)	2.0 (2.4)	5.7 (6.2)	2.2(4.3)
Shift			
Day (n = 18)	1.3 (1.3)	4.7 (5.5)	2.3 (3.1)
Evening (n = 18)	2.6 (3.4)	6.3 (6.6)	2.4 (4.9)
Positive Mean Scores Across All Conditions			
	2.0 (2.6)	5.5 (5.9)	2.3 (4.0)

Note. ^a CCC = Corvallis Care Center. ^b HV = Heart of the Valley. ^c CM = Corvallis Manor.

5. Discussion

This study utilized a sample of 36 cognitively impaired residents in nursing homes to examine the behavioral effects of Video Respite viewing. Specifically, Repeated Measures ANOVA and paired t-tests were used to examine change in agitated and positive social behaviors over three time periods: pre-VR, during-VR, and post-VR.

These data make a unique contribution to the field of behavior management for cognitively impaired residents in nursing homes. Lawton's Ecological Theory of Adaptive Behavior and Aging (Lawton & Dahemow, 1973) proved to be a useful framework for evaluating Video Respite.

Paired t-tests and repeated measures were used to analyze these data. Paired t-tests are usually used to analyze simple repeated measures designs in which two measurements are obtained for each subject. Repeated measures was the most appropriate analysis because this approach controls for the variance between subjects thus reducing the error term in the analysis of variance (Cody & Smith, 1991). This means that the repeated measures approach is a more powerful measure than the t-test because it considers the variances due to testing time while the t-test does not.

Overall, this study found that VR is an effective therapeutic intervention for increasing positive interactive behaviors for cognitively impaired nursing home residents. However, VR has some limitations in reducing agitation among some subjects, particularly those who are mildly impaired. This chapter will review and discuss significant results of the study. In addition, limitations of the study will be clarified and recommendations for practice and future research will be offered.

Lawton's Theory

Support was provided for Lawton's Ecological Theory of Adaptive Behavior and Aging. As implied by the theory, this study confirmed that VR is able to increase positive social behaviors and decrease agitated behaviors. However, across all the conditions which were examined positive behaviors were more responsive to VR than were agitated behaviors.

Lawton posits that the potential for positive affect decreases and the potential for negative affect increases as an individual's competence declines. Lawton also theorized that small changes to the environment can evoke gross changes in positive behaviors. However, excessive stimulation could increase agitated behaviors for some individuals with insufficient coping skills.

In accordance with the theory, before viewing VR participants in this study displayed more agitated behaviors than they did positive affective behaviors. Also as suggested by the theory, a significant increase in positive behaviors occurred. On the other hand, VR appeared to decrease agitation for some residents and increased it for others. Thus, as Lawton suggests, VR can potentially optimize the environment in nursing homes for cognitively impaired residents. However, the coping skills of some individuals are insufficient to deal with the increased adaptive challenge presented by VR.

This study indicates that VR creates a therapeutic environment when used under certain conditions. Agitation may be reduced for moderate to severely demented residents on day shift, and in nursing homes with certain characteristics. In addition, positive interactive behaviors may be increased during VR viewing.

Agitated Behaviors. In general, agitation was low pre-VR. Mean pre-VR agitation scores were 7.3 on an index which ranged from 0 to 294. Initially, VR does not seem impressive in

terms of reducing agitation. However, significant interaction and quadratic effects for nursing home, level of dementia, and shift indicate that for some groups of cognitively impaired nursing home residents VR viewing is effective for reducing agitation.

Agitation and shift. Participants in this study experienced different responses to VR by shift. On day shift agitation levels dropped during-VR viewing and began to increase again post-VR; however, agitation increased during-VR and remained elevated post-VR during evening shift. This finding was not surprising, because during the late afternoon and early evening change of shift activities and general fatigue may increase confusion and agitation.

Agitation and level of dementia. Residents' response to VR varied by level of dementia. For the mild and severely demented residents there were mixed benefits from viewing VR. Participants with moderate dementia experienced the most benefit.

For mildly demented residents agitation increased during-VR and then declined dramatically post-VR. This finding must be interpreted cautiously since this study included only two mildly demented participants. If the response pattern identified in this study were to hold for a larger group of mildly demented residents, the benefits of VR for them should be questioned. Anecdotally, the mildly demented residents in this study appeared to enjoy singing and conversing with Molly on the video. However, they seemed to be conflicted and agitated when they realized they were conversing with a television set.

Similarly, severely demented residents in the present study experienced mixed benefits as agitation dropped during-VR and then increased beyond initial levels post-VR. These findings may indicate that VR simply interrupts agitation for severely demented residents. Agitation may then increase post-VR because these residents may not have adequate coping skills to adapt to the changing environmental demands.

VR was most beneficial in reducing agitation for moderately demented residents. These residents experienced a drop in agitation during-VR that continued for up to 20 minutes after viewing VR. This residual effect makes VR a potentially valuable tool particularly for use with this group of impaired residents.

Agitation and facility. The response to VR by agitation varied at all three nursing homes. At Corvallis Care Center agitation decreased during-VR and then rose slightly post-VR. At Heart of the Valley agitation levels remained flat over the three time periods (pre, during, and post) and at Corvallis Manor agitation was low initially, rose during-VR viewing and dropped only slightly post-VR.

Corvallis Care Center has distinctive characteristics which may be related to the reduction of agitation during VR. Unlike the other two participating nursing homes, Corvallis Care Center has no SCU. In addition, it has greater use of psychotropic medications. Because SCUs are designed to provide an optimal environment for cognitively impaired residents, it is possible that agitation is already reduced as much as possible in the nursing homes with SCUs. Therefore, VR was more effective at reducing agitation in the Corvallis Care Center which may not have been already providing an optimal environment for reducing agitation.

According to C. Nyquist (personal communication, November 18, 1994), Social Services Director at Corvallis Care Center, residents who become dangerous to themselves or others are moved to an SCU at another facility (1994). Therefore it is possible that these residents have more potential for improvement than do the residents at nursing homes with SCUs. A ceiling effect may limit the potential for decreased agitation for residents in SCUs.

In addition, VR may have been more effective at reducing agitation for participants at the Corvallis Care Center because they were more likely to view VR individually. Ideally, residents

in this study were to view VR individually so they would be free from distractions by other residents. However, only Corvallis Care Center provided participants with a small private room in which to watch VR. Residents also had an opportunity to view VR alone in their rooms when they were unable to be moved. A group situation was recorded if roommates were present. Group viewing was more common at the nursing homes with SCUs because the VCRs were located in activity rooms where many other cognitively impaired residents were also present. At these nursing homes individual viewing only occurred when residents were alone in their rooms.

Consequently, 66% of the Corvallis Care Center residents viewed VR individually in contrast to 33% at Corvallis Manor and 42% at Heart of the Valley. In Corvallis Manor agitation increased during-VR; however, agitation neither increased nor decreased during-VR in Heart of the Valley.

This is potentially an important finding for nursing home application because residents with severe dementia are reported to be least likely to participate in activity programs (Voelkl, et. al., 1995). A resident's inability to leave her/his room is an inhibiting factor to program participation. VR offers residents who are confined to their room opportunities for social activity. Being free from the distractions of other residents may, in fact, increase the benefit of VR.

Agitation and psychotropic medication. Psychotropic medication usage may be related to reduced agitation. Whether use of these medications played a role in residents' response to VR will need to be explored in future research.

Positive Interactive Behaviors

This study supports anecdotal information indicating that VR increases positive interactive behaviors. Cognitively impaired residents, regardless of nursing home, shift, and level of dementia responded to VR with increased positive behaviors. The pattern across time for all three factors (nursing home, level of dementia, and shift) was the same: few positive behaviors existed pre-VR, were increased during-VR, and dropped post-VR. These results indicate that VR is a positive and meaningful activity for cognitively impaired residents in nursing homes, albeit the effect may be short-lived.

As posited by Mace (1987), nursing home care should include activities that are satisfying, enjoyable, and meaningful to participants thus reducing the number of empty hours they must endure. This current study indicates that VR can be used for this purpose on both day or evening shifts, viewed individually or in a group setting, for residents at all levels of dementia, and in nursing homes with or without SCUs.

Recommendations for Practice

As a result of this research, the following recommendations for practice are offered to maximize VR's effectiveness as a therapeutic intervention for cognitively impaired residents in nursing homes. VR increased positive behaviors under most conditions examined in this study. However, agitated behaviors were found to decrease under certain conditions related to shift and level of dementia. As with all activities, nursing home staff should monitor VR use to determine the optimal use for each resident.

1. Invite residents to view VR by describing the video in a way that will appeal to each individual. For example, encourage a resident of Irish heritage to view "Remembering When" by mentioning the opportunity to join "Molly" as she sings "When Irish Eyes are Smiling."

Other residents may be interested in reminiscing about "school days" or visiting with a young boy named Kyle.

2. Be sure that residents are able to see and hear VR. For example, some residents may need their hearing aides or glasses. Other residents may need to sit close to the television to facilitate viewing. In addition, as the video begins it may be necessary to direct the resident's attention to the television screen. Finally, a staff member may encourage a resident to watch VR by watching the video along with the cognitively impaired resident.

3. If a resident refuses to watch VR, do not insist. This will reinforce a sense of internal control over the environment. However, offer VR again at another time.

4. If the goal is to reduce a resident's agitation, VR should be used on day shift, whenever possible. During the day residents may have more coping ability than on evening shift when fatigue, change of shift or sundowning effect may increase agitation and confusion. Associated behaviors such as restlessness, escape behaviors, verbal agitation, and searching behaviors (Evans, 1987) may make it difficult for residents to focus on VR in the early afternoon and evening hours.

5. Some cognitively impaired residents may be able to adapt to VR better when they are free from interruption by other viewers. In addition, if a resident is unable to be moved from her/his room, the VCR can be brought directly to the resident's room in order to view VR.

6. Do not discount the potential effectiveness of VR with difficult or continuously agitated residents. VR may be a good way to interrupt the agitation for a short time.

7. Again, if the goal is to reduce agitation, VR may be most effective for moderately demented residents. These residents may also benefit from a residual effect that can last up to 20 minutes post-VR viewing. Residents may be more likely to engage in interactive social behavior with other residents or visit with relatives after watching VR.

8. Avoid waking up cognitively impaired residents to view VR. Being awakened may increase agitation and limit the resident's ability to cope with the increased environmental demands presented by VR-viewing.

9. Positive interactive behaviors can be increased in either group or individual viewing. Staff, however, should monitor these situations to see if agitation increases. In some cases, the opportunity for positive interaction will outweigh the potential for increased agitation.

10. For residents who enjoy singing, reminiscence, or talking, VR may be especially effective. Residents who are inclined to socialize seem to enjoy the interaction with the "friendly visitor" on the video tape.

11. VR may offer support for residents who are experiencing social rejection, social isolation, or emotional distress as a result of institutionalization. For example, staff can use VR to provide a stimulating environment for a normally social resident who has become withdrawn or who does not have regular visitors.

12. VR can be used by family members who desire meaningful activities to share with their cognitively impaired loved one. Nursing homes can facilitate family use of VR by providing a variety of VR tapes and a portable VCR. VR video tapes can be introduced to family members at support group meetings.

13. After VR, impaired residents may enjoy briefly discussing their reactions with staff or family members. For example, ask them if they enjoyed the visit with Kyle, or singing with Molly. Respond to their reactions. Resident benefits from such discussions may include: increased enjoyment, recall of pleasurable memories, expressed emotions, improved social interaction, improved relationships with staff or family, and improved self esteem.

14. Activity directors for SCUs may consider using VR as a pleasant activity in a group situation, despite an increase in agitation for some residents. Staff should carefully select a

small group of participants who enjoy singing and social interaction. Residents should be placed close to the television. A staff member should watch the video with the group to carefully monitor each individual.

15. VR can substitute for television as a planned activity in nursing homes. Many nursing homes regularly offer video taped movies or television shows such as Lawrence Welk to their cognitively impaired residents. VR may have greater value as such an activity because residents can respond, sing-along, and laugh.

Limitations

Limitations exist in all studies of human behavior and this study is no exception. For the present study, the single group design, the behavior index, the difficulties of quantification, the lack of a control group, effects of observers, and the limited generalizability of the study have been identified as limitations.

The single group design. The single group design of this study makes it impossible to tell if VR is the cause of the behavior changes that were observed. A number of factors could lead to a change in the dependent variables (positive and agitated behaviors), including the effects of time or events. The best way to deal with this problem is to utilize a two- (or more) group design including a control group.

The agitated behavior index. The agitated behavior index was previously developed as part of a study for brain damaged patients and could, therefore, have excluded some important agitated behaviors related to dementia patients. However, it seems more likely that the index included behaviors that may be less common for patients with dementia. Furthermore, there

was only one item for positive behaviors and therefore did not differentiate among the various positive interactive behaviors.

The difficulties of quantification. Behaviors in observational studies are difficult to quantify. For this study, behaviors that occurred at the one minute interval were recorded on the behavior index. This method captured most of the continuous behaviors. However, some behaviors which occur sporadically were not captured using this method.

The lack of a control. Participants were observed for 63 minutes; during that time the behavior change may have been due to extraneous variables. In the natural setting of the nursing home the researcher did not have control over potential influences that were not related to VR viewing. For example, a resident may have been agitated pre-VR because she was being fed. During-VR, the agitation may have decreased because she was no longer in close contact with the caretaker. Possibly change was not related to VR viewing.

The effects of the observers. The presence of the one or two observers could cause increased agitation for the cognitively impaired residents. While the observers tried to remain unobtrusive, their presence may have been disturbing for some residents.

Generalizability. For reliable statistical data analysis the sample size needs to be large enough to ensure that the subpopulations studied will have an adequate number of cases. For example, the small sample size ($n = 36$) in the present study resulted in only two mildly demented residents.

Another threat to the generalizability of this study includes the limited representation of nursing homes. The nursing homes in this study were small facilities located in a community of

well educated, upper middle income residents. As such, the results may only generalize to similar nursing homes in similar communities.

Recommendations for Future Research

The development of effective behavior management activities for use in nursing homes is important for both the caregivers and for the cognitively impaired residents. To adequately understand the therapeutic value of VR for nursing home use, future studies should: (a) include a control group, (b) focus on factors related to decreasing agitation, and (c) identify the specific positive behaviors that are related to VR.

As mentioned, the present study did not have a control group so it is impossible to say whether the behavior changes that were reported are a result of VR. Future researchers may want to explore differences between cognitive impaired residents' responses to VR and a television program such as Lawrence Welk. Due to the nature of dementia, the control group and the experimental group may be the same cognitively impaired nursing home residents.

Future research should further investigate the relationship between decreased agitation and the characteristics of nursing homes and other factors related to cognitively impaired residents. Results from the present study clearly indicate that residents' responses to VR vary by nursing home. Regression analysis could help to indicate which characteristics are related to decreased agitation. This study suggests that the following nursing home characteristics may be important: use of psychotropic medications, staffing ratios, and presence of SCUs. Other factors which may also be related to the effectiveness of VR include the level of dementia, the time of day VR is used, group or individual viewing, and use of VR as a planned or unplanned activity.

Finally, future studies should investigate specific positive interactive behaviors which may be encouraged by VR viewing. This could be important to activity directors and nursing staff who consider the specific needs of their patients when they plan activities. If VR increases a cognitively impaired resident's positive behavior, it may have greater value as an activity than television.

Summary

This study examined the behavioral effects of VR viewing on 36 cognitively impaired nursing home residents. Based on these data, VR appears to have limited use in decreasing agitated behaviors. However, VR shows great promise as a meaningful activity which increases positive social behaviors for cognitively impaired nursing home residents.

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Appendices

Appendix A

Oregon State University Institutional Review Board Approval for Human Subjects

INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS



OREGON STATE UNIVERSITY

Report of Review

TITLE: Video Respite™ for persons with dementia in nursing homes: Behavioral implications

PRINCIPAL INVESTIGATOR: Jan Hare

STUDENT: Lynn Hall

COMMITTEE DECISION: Provisionally Approved

PROVISIONS:

1. The principal investigator should resubmit the application with the necessary corrections within one month. Two corrected copies should be sent to the committee chair.
2. The following are suggested changes to the **protocol**:

It is my understanding from the telephone conversation with Lynn Hall (3/7/95) that the survey instrument included in the application will be replaced with another questionnaire. Furthermore, subjects will not be videotaped. The protocol and informed consent form should be revised accordingly, and two copies of the application should be provided as indicated in item 1, above.

3. The following are suggested changes to the **informed consent form**:
 - a. The readability of the informed consent form and the transmitting letter should be appropriate for the expected audience. As an example, "cognitively impairment" and "therapeutic value" are terms which may not be readily understood by potential family members or legal guardians.
 - b. Subjects should be allowed to provide their informed assent if not consent if they are able to do so. Furthermore, subjects or their family

Hare/Hall, 93/07/95, page 2 of 2 pages

members/guardians should be informed that withdrawal from the study will not result in any penalty or loss of benefits the subjects are normally entitled to in addition to the existing statement that they may withdraw or be withdrawn at any time.

- c. The family members and guardians should direct their questions about the research or their rights to Dr. Hare or Ms. Hall.
- d. The subjects' name should be provided on the consent form since family members or legal guardians may have different surnames than the subjects. Furthermore, you may wish to provide spaces for family members or legal guardians to print their names and indicate their relationships to the subjects.



Warren N. Suzuki, Chair
Committee for the Protection of Human Subjects
(Education, 7-6393, suzukiw@ccmail.orst.edu)

Date: March 7, 1995

INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS



OREGON STATE UNIVERSITY

Report of Review

TITLE: *Video Respite™* for persons with dementia in nursing homes: Behavioral implications

PRINCIPAL INVESTIGATOR: Jan Hare

STUDENT: Lynn Hall ✓

COMMITTEE DECISION: Approved

COMMENTS:

1. The informed consent form obtained from each subject should be retained in program/project's files for three years beyond the end date of the project.
2. On page 12, paragraph 3, line 1, of the informed consent form, delete "questions or"; questions about the project should be directed to the major professor or student/candidate as noted in the next paragraph. You may wish to consider moving the entire sentence about "complaints" to a position between the two sentences in the next paragraph.

A handwritten signature in cursive script, appearing to read "Warren N. Suzuki", written over a horizontal line.

Warren N. Suzuki, Chair
Committee for the Protection of Human Subjects
(Education, 7-6393, suzukiw@ccmail.orst.edu)

Date: March 17, 1995

Appendix B

Consent Letter and Informed Consent Form

DEPARTMENT OF HUMAN DEVELOPMENT
AND FAMILY SCIENCES



OREGON STATE UNIVERSITY
Milam Hall 322 · Corvallis, Oregon 97331-5102 USA
Telephone 503-737-4765

3/29/95

Dear Family Member/Responsible Party,

As a graduate student at Oregon State University, I am particularly interested in ways to increase the quality of daily life for nursing home residents. Under the guidance of Jan Hare, Ph.D. and Carrie Nelson, M.D., I'm preparing to conduct a study of nursing home residents' response to a 20-minute video entitled "Remembering When". This video, which was developed at University of Utah, discusses early childhood memories at school, children, and songs from the "Roaring Twenties." Early studies observed residents expressing a great deal of pleasure as they watch the video. They smile, sing along, and recall happy events from the past.

Your family member/resident has the opportunity to participate in this research project. Such participation contributes to our understanding of persons with dementia and what activities may be most helpful and pleasurable in their daily lives.

With your permission, we would like to enroll your family member/resident in our research study. During this study, we would observe your family member/resident for a few minutes before the video begins, during the viewing of the video, and for a few minutes after the video ends. Your family member/resident will also be given a brief mental status exam to assess her/his level of dementia.

You are, of course, welcome to preview Remembering When and to be present at any time during the observations.

I am requesting your permission to enroll your family member/resident in the OSU study. You can give your permission by signing the Consent Form and returning it to me in the enclosed, stamped envelope by Friday April 7, 1995. If you have any questions regarding this research project or your rights, you may call Jan Hare, Ph.D. at 737-1011 or me at 753-6440. Thank you for your help.

Sincerely,


Lynn Hall


Carrie Nelson, M. D., Internist/Geriatrics
Philomath Family Medical Clinic

Enclosures: Informed Consent Form, stamped return envelope

Video Respite Research Project
Oregon State University
Principal Investigator: Jan Hare, Ph.D.

CONSENT FORM:

This research project intends to assess nursing home residents' behavioral responses to a 20 minute video entitled, Remembering When, a part of the Video Respite series, developed at the University of Utah. A nursing home staff member familiar with the resident will invite him/her to watch the video. A Research Assistant will observe and record on a behavioral index the resident's behavior for 21 minutes before, for 21 minutes during, and for 21 minutes after watching Remembering When. Two or three days before the observation a Research Assistant will assess the resident's cognitive functioning by using the Folstein Mini Mental Status Exam (MMSE). This exam includes 11 questions, requiring only 5-10 minutes to administer. The Research Assistant will take care before the exam to make the resident feel comfortable.

There are minimal foreseeable risks from participating in this study. Video Respite is designed to invoke pleasant memories. A possible risk is that some participants may become frustrated if they do not recall the events under discussion or lose their train of thought while talking.

There are many possible benefits from viewing Video Respite including increased positive behaviors, enjoyment, and improved communication. For example, individuals viewing Video Respite have been observed smiling, laughing, and singing along with the video. Most agitated patients become calm within a few minutes as they listen and respond to Video Respite. Family and professional caregivers report that their patients enjoy the videotapes each time they watch them. Preliminary evidence indicates that for some patients agitated behaviors decrease.

Confidentiality of records will be maintained as follows: Each resident was randomly selected for this study from a list of the nursing home residents. The names were seen only by the Research Assistant and a representative of the nursing home, all of whom are bound by professional confidentiality. Each subject was assigned a code number and all the observational data and the MMSE scores generated by this study will be identified only by this code. The privacy of each resident will be respected. For example, the research assistant will not enter the resident's room if the door is closed. All data recorded will be anonymous. Names will in no way be associated with the data. All names and addresses will always be kept in a locked file and will always be kept separate from actual interview data.

The information resulting from the observations and the exams will be published in the form of a Master's thesis and journal articles and in oral presentations at professional meetings. Neither the resident's names or your name will in any way be associated with the data. Evaluation studies of Video Respite will help us determine how useful these videos are in reducing agitated behaviors and engaging residents in pleasurable, meaningful interactions.

You are, of course, welcome to preview Remembering When and to be present during all observations.

The resident's participation in this study is entirely voluntary and you are free to withdraw the resident from the study at any time by calling the Principal Investigator, Jan Hare, Ph.D., at 737-1011 or Lynn Hall, at 753-6440. Withdrawal from the study will not result in any penalty or loss of benefits that are normally entitled to the resident.

If you have any complaints regarding the research project you may contact Oregon State University Research Office at 737-3437. If you have any questions regarding this research project or your rights, you may call Jan Hare, Ph.D., at 737-1011 or Lynn Hall, at 753-6440. Thank you for your help.

(Please print your family member/resident's name)

(Resident's signature of assent, if able)

(Date)

(Legal guardian or family member)
(Please *sign* your name)

(Date)

(Please *print* your name)

(Please indicate your relationship to the resident)

Appendix C
Behavioral Index

Agitated Behavior Index

Gender _____

Resident # _____ Participant in VR Y ___ N ___ Group ___ or Individual ___ viewing?

Time _____ Shift: Day ___ Evening ___ Date _____

Facility _____ Observer _____

Diagnosis _____ Psychotropic Medications _____

At the one minute tone look to see which of the following behaviors is present. Use the following numerical values for every behavior listed. **0 = absent 1 = present DO NOT LEAVE BLANKS.** Pre ___ During ___ Post ___

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		
																						1. Short attention span, easy distractibility, inability to concentrate.
																						2. Impulsive, impatient, low tolerance for pain or frustration.
																						3. Sudden changes of mood.
																						4. Easily initiated or excessive crying and or laughter.
																						5. Rocking rubbing, moaning or other self-stimulating behavior.
																						6. Pulling at tubes, restraints, etc.
																						7. Restlessness, pacing, excessive movement.
																						8. Repetitive behaviors, motor and/or verbal.
																						9. Rapid, loud or excessive talking.
																						10. Uncooperative, resistant to care, demanding.
																						11. Self-abusiveness, physical and/or verbal.
																						12. Explosive and/or unpredictable anger.
																						13. Violent and/or threatening violence toward people/property.
																						14. Wandering from treatment areas.
Total																						
																						1. Positive interactive social behavior.

Appendix D

Mini-Mental State Exam

Cognex[®]

TACRINE HCl CAPSULES

10mg, 20mg, 30mg, and 40mg

MINI-MENTAL STATE EXAM

I. ORIENTATION (Ask the following questions; correct=) (Maximum score=10)

What is today's date?	Date (eg, May 21)	<input type="checkbox"/>
What is today's year?	Year	<input type="checkbox"/>
What is the month?	Month	<input type="checkbox"/>
What day is today?	Day (eg, Monday)	<input type="checkbox"/>
Can you also tell me what season it is?	Season	<input type="checkbox"/>
Can you also tell me the name of this hospital/clinic?	Hospital/Clinic	<input type="checkbox"/>
What floor are we on?	Floor	<input type="checkbox"/>
What town/city are we in?	Town/City	<input type="checkbox"/>
What county are we in?	County	<input type="checkbox"/>
What state are we in?	State	<input type="checkbox"/>

II. IMMEDIATE RECALL (correct=) (Maximum score=3)

Ask the subject if you may test his/her memory. Say "ball," "flag," "tree" clearly and slowly, about one second for each. Then ask the subject to repeat them. Check the box at right for each correct response. The first repetition determines the score. If he/she does not repeat all three correctly, keep saying them up to six tries until he/she can repeat them.

Ball	<input type="checkbox"/>
Flag	<input type="checkbox"/>
Tree	<input type="checkbox"/>

NUMBER OF TRIALS:

III. ATTENTION AND CALCULATION (Record each response; correct=) (Maximum final score=5)

A. Counting Backwards Test
Ask the subject to begin with 100 and count backwards by 7. Record each response. Check one box at right for each correct response. Any response 7 less than the previous response is a correct response. The score is the number of correct subtractions. For example, 93, 87, 80, 73, 66 is a score of 4; 93, 86, 78, 70, 62 is 2; 92, 87, 78, 70, 65 is 0.

B. Spelling Backwards Test
Ask the subject to spell the word "WORLD" backwards. Record each response. Use the instructions to determine which are correct responses, and check one box at right for each correct response.

C. Final Score
Compare the scores of the Counting Backwards and Spelling Backwards tests. Write the greater of the two scores in the box labeled FINAL SCORE at right, and use it in deriving the TOTAL SCORE.

RESPONSES	
93	<input type="checkbox"/>
86	<input type="checkbox"/>
79	<input type="checkbox"/>
72	<input type="checkbox"/>
65	<input type="checkbox"/>
D	<input type="checkbox"/>
L	<input type="checkbox"/>
R	<input type="checkbox"/>
O	<input type="checkbox"/>
W	<input type="checkbox"/>
FINAL SCORE	<input type="checkbox"/>

IV. RECALL (correct=) (Maximum score=3)

Ask the subject to recall the three words you previously asked him/her to remember. Check the box at right for each correct response.

Ball	<input type="checkbox"/>
Flag	<input type="checkbox"/>
Tree	<input type="checkbox"/>

V. LANGUAGE (correct=) (Maximum score=9)

Naming
Show the subject a wrist watch and ask him/her what it is. Repeat for a pencil.

Watch	<input type="checkbox"/>
Pencil	<input type="checkbox"/>

Repetition
Ask the subject to repeat "No ifs, ands, or buts."

Repetition	<input type="checkbox"/>
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Three-Stage Command
Establish the subject's dominant hand. Give the subject a sheet of blank paper and say, "Take the paper in your right/left hand, fold it in half and put it on the floor."

Takes paper in hand	<input type="checkbox"/>
Folds paper in half	<input type="checkbox"/>
Puts paper on floor	<input type="checkbox"/>

Reading
Hold up the card that reads, "Close your eyes." so the subject can see it clearly. Ask him/her to read it and do what it says. Check the box at right only if he/she actually closes his/her eyes.

Closes eyes	<input type="checkbox"/>
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Writing
Give the subject the sheet of blank paper provided and ask him/her to write a sentence. It is to be written spontaneously. If the sentence contains a subject and a verb, and is sensible, check the box at right. Correct grammar and punctuation are not necessary.

Writes sentence	<input type="checkbox"/>
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Copying
Show the subject the drawing of the intersecting pentagons. Ask him/her to draw the pentagons (about one inch each side) on the paper provided. If ten angles are present and two intersect, check the box at right. Ignore tremor and rotation.

Copies pentagons	<input type="checkbox"/>
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DERIVING THE TOTAL SCORE

Add the number of correct responses. The maximum score is 30.

TOTAL SCORE

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PARKE-DAVIS
People Who Care

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PD-102-PD-7416-A4(113)
409053

Appendix E

Frequencies by Subject for Agitated and Positive Behaviors

Appendix E.1

Frequencies by Subject for Agitated and Positive Behaviors (Pre, During and Post-VR)

Subject	MMSE	Nhome	AGITATED BEHAVIOR			POSITIVE BEHAVIOR		
			Pre	During	Post	Pre	During	Post
1	16	a ^a	0	0	2	10	17	3
2	0	a	30	2	27	0	6	0
3	0	a	33	14	30	1	5	3
4	15	a	0	1	0	0	5	2
5	8	a	0	0	3	0	8	2
6	0	a	7	6	7	1	0	0
7	3	a	3	0	2	1	0	0
8 ^d	-	b ^b	--	--	--	--	--	--
9	2	b	11	12	13	2	1	0
10	18	b	0	0	0	2	0	1
11	2	b	1	0	1	1	7	4
12	0	b	0	0	0	20	0	0
13 ^e	-	b	--	--	--	--	--	--
14	4	b	5	1	1	2	0	4
15	4	b	11	5	5	6	18	1

(Table continued)

Appendix E.1 (continued)

Frequencies by Subject for Agitated and Positive Behaviors (Pre, During and Post-VR)

Subject	MMSE	Nhome	AGITATED BEHAVIOR			POSITIVE BEHAVIOR		
			Pre	During	Post	Pre	During	Post
16	1	b	15	4	19	3	5	3
17	2	b	19	13	19	0	5	1
18	21	b	0	9	2	0	8	2
19	1	b	7	22	2	0	0	0
20	15	b	0	1	0	1	8	1
21	23	a	8	6	1	5	4	2
22	16	a	12	7	2	1	7	12
23	15	a	3	6	0	0	0	0
24	16	a	0	0	0	1	0	1
25	0	a	1	0	3	0	0	0
26	6	c ^e	4	2	2	3	9	0
27	10	c	0	9	0	9	1	0
28	9	c	0	5	2	1	6	2
29	0	c	11	28	34	0	7	0

(Table continued)

Appendix E.1 (continued)

Frequencies by Subject for Agitated and Positive Behaviors (Pre, During and Post-VR)

Subject	MMSE	Nhome	AGITATED BEHAVIOR			POSITIVE BEHAVIOR		
			Pre	During	Post	Pre	During	Post
30	2	c	8	0	9	3	11	7
31	0	c	0	0	0	7	21	1
32	4	c	7	8	4	3	1	1
33	9	c	8	13	19	0	0	21
34	0	c	0	6	0	0	0	0
35	7	c	0	1	0	1	4	2
36	6	c	9	4	5	2	3	0
37	16	c	11	8	0	0	1	3
38	1	b	40	36	46	5	9	5

Note. ^a a = Corvallis Care Center. ^b b = Heart of the Valley. ^c c = Corvallis Manor. ^d Resident

#8 was dropped from the study due to an injury. ^e Resident #13 was dropped from the study

because the observers' presence increased her agitation dramatically. When asked to

participate in VR she refused, becoming increasingly loud and disruptive.