A Mixed Method Assessment of Horticulture Therapy Programming for Persons with Dementia: An Exploration and Analysis of Processes and Outcomes

Christina M. Gigliotti

Dissertation submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy

In Department of Human Development

Shannon E. Jarrott, Ph.D., Chair
Karen A. Roberto, Ph.D.
Paula D. Relf, Ph.D.
Michelle L. Stevenson, Ph.D.
Jay A. Mancini, Ph.D.

February 6, 2006
Blacksburg, Virginia

Keywords: Horticulture Therapy, dementia care, engagement, affect, Theory of Environmental Press, physical and social environment

Copyright 2006, Christina M. Gigliotti
ABSTRACT

Engaging persons with dementia in meaningful activities supports well-being; however care staff are challenged to identify activities that are developmentally and generationally appropriate in a group setting. In this study, I compared a randomly assigned treatment group (HT) to a comparison group (traditional activities) on outcome variables, including engagement, affect, and problem behaviors. HT programming was implemented twice weekly at four treatment sites for six weeks, while traditional activities were observed at four comparison sites during that time period.

A mixed method assessment was undertaken to examine the processes and outcomes that influenced the observed outcomes and the interrelationships between these dependent variables. Data was gathered from a variety of sources using a range of methods, including structured observational assessments, semi-structured interviews, and a focus group session. Informants included persons with dementia, traditional activity facilitators from the comparison sites, and observational research team members. Nonparametric Mann Whitney-U analyses were used to compare the treatment and comparison groups on behavioral and affective domains, while multiple correspondence analysis (MCA) was used to examine the interrelationships between these outcome variables. Analytic induction and constant comparison enabled the researchers to identify factors that affected the implementation of the intervention and its subsequent impact on the participants.
Mann Whitney-U results revealed no statistical differences between the HT and traditional groups on the three affective domains; however, levels of adaptive behavior did differ between the two groups, with the treatment group demonstrating significantly higher levels of active, passive, and other engagement, and the comparison group demonstrating significantly higher levels of self-engagement. MCA analyses indicated that individuals who exhibited high level of active engagement were also likely to display high levels of pleasure and low levels of non-engagement, further supporting the value of active engagement in activities to optimize well-being. Qualitative findings highlighted the importance of simultaneously capturing the participants' responses as well as indicators of the social and physical environment to gain a holistic understanding of the intervention and associated outcomes. Results demonstrated that while HT programming results in positive outcomes for participants, facilitation of therapeutic activities for persons with dementia is a critical element influencing the targeted outcomes.
Grant Information

This research was only possible in its current form thanks to a grant funded by the Virginia Center on Aging (VCOA). VCOA administers the Alzheimer's and Related Diseases Research Award Fund (ARDRAF), which provides seed money to stimulate innovative research into biomedical and psychosocial aspects of dementia. Drs. Jarrott and Relf received the 2003-2004 ARDRAF award to fund the current investigation.
Dedication

I would like to dedicate this dissertation to the millions of individuals who are living with dementia as well as their loved ones and caregivers. My hope is that they will continue to seek out alternatives that will enhance their quality of life.
Author’s Acknowledgments

I have been very fortunate throughout this dissertation process in that I have received the support, guidance, encouragement, and expertise of many generous and talented individuals. My chair, Dr. Shannon Jarrott has played an enormous role in my success in the graduate realm and her innovation and vision both brought me to the Gerontology program and sustained me throughout my many trials and triumphs as a graduate student. Her mentorship has guided me both in the professional and personal domains of life and her friendship will extend well beyond the graduate school experience.

I am also very grateful for the other four scholars that have served as such a valuable resource to me during the past five years. Drs. Relf, Roberto, Stevenson, and Mancini have comprised a just and challenging panel of advisors, who have been willing to think outside the box to stimulate my intellect and provide me with unique requirements that have prepared me for the professional realm. Their individualized approach and ongoing supervision has enabled me to find a healthy balance between academic and personal goals. Their expectations have forced me to stay the course and demonstrate the necessary self-discipline to complete this project in its current form.

I cannot possibly find the words to express my gratitude to my beloved family who have patiently and selflessly provided me with the resources that have made this process feasible and enjoyable. Their generosity, empathy, encouragement, thoughtfulness, and willingness to provide infinite support has given me the strength and stamina to achieve this goal. I am greatly appreciative of their sacrifices and their unconditional willingness to go the extra mile on my behalf. I would also like to thank Seth for his much needed empathy, emotional support, and practical assistance over the course of the last several years. In addition to my family, several true friends have stood by my side during this process and their loyalty and kindness will never be forgotten.
I would also like to thank the eight dementia-care programs that welcomed us into their facilities to collect data, as well as the HT and traditional activity facilitators who worked very hard to provide meaningful programming to this very special population of elders. I am also thankful to the observational research team members for their commitment to this project and their anecdotal insights, which ultimately enhanced the quality of this project.
<table>
<thead>
<tr>
<th>Chapter #</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td></td>
</tr>
<tr>
<td>Chapter I:</td>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Chapter II:</td>
<td>Literature Review</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Prevalence and Characteristics of Dementia</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Challenges of Designing Activities for Persons with Dementia</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Criticisms of Current Programs</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Theory of Environmental Press</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Enhancing Competence Through Therapeutic Activities</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Meeting Higher Order Needs Through Therapeutic Activities</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Enhancing Competence Through HT</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Summary of HT and the Environmental Press Model</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Limitations of Previous Research</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Challenge of Conducting Research in Dementia-Care Programs</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Study Hypotheses</td>
<td>45</td>
</tr>
<tr>
<td>Chapter III:</td>
<td>Methods</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Participants</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Instrumentation</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Procedures</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Analysis</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Wilcoxon- Mann-Whitney U Test</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Multiple Correspondence Analysis</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Qualitative analysis</td>
<td>78</td>
</tr>
<tr>
<td>Chapter IV:</td>
<td>Results</td>
<td>82</td>
</tr>
<tr>
<td>Manuscript A</td>
<td>Comparing Horticulture Therapy to Traditional Activities in Dementia Care Programs: Assessing Differences in Engagement and Affect</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abstract</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Theory of Environmental Press</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Study Hypotheses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Design &amp; Methods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Results</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>References</td>
<td></td>
</tr>
<tr>
<td>Manuscript B</td>
<td>Contextual Factors Impacting Persons with Dementia in an Intervention Study of Activity Programming</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abstract</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Introduction &amp; Review of Literature</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Methods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Findings &amp; Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>References</td>
<td></td>
</tr>
<tr>
<td>Manuscript C</td>
<td>Utilization of Multiple Correspondence Analyses to Examine the Relationships Between Engagement and Affect in a Study of Activity Interventions for Persons with Dementia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abstract</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Introduction &amp; Literature Review</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Methods</td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>Results</td>
<td>188</td>
<td></td>
</tr>
<tr>
<td>Discussion</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td>195</td>
<td></td>
</tr>
<tr>
<td>References</td>
<td>197</td>
<td></td>
</tr>
<tr>
<td>Chapter V: Conclusions</td>
<td>205</td>
<td></td>
</tr>
<tr>
<td>References Synthesized List</td>
<td>211</td>
<td></td>
</tr>
<tr>
<td>Appendix 1B Interview Guide for the Activity Facilitator Interviews</td>
<td>167</td>
<td></td>
</tr>
<tr>
<td>Appendix A Facility Characteristics</td>
<td>227</td>
<td></td>
</tr>
<tr>
<td>Appendix B Interview Guide for the HT Facilitator Interviews</td>
<td>228</td>
<td></td>
</tr>
<tr>
<td>Appendix C Interview Guide for the Traditional Activity Facilitator Interviews</td>
<td>229</td>
<td></td>
</tr>
<tr>
<td>Appendix D Focus Group Interview</td>
<td>230</td>
<td></td>
</tr>
<tr>
<td>Appendix E Mini-Mental State Exam</td>
<td>231</td>
<td></td>
</tr>
<tr>
<td>Appendix F Barthel Index</td>
<td>232</td>
<td></td>
</tr>
<tr>
<td>Appendix G Apparent Affect Rating Scale</td>
<td>233</td>
<td></td>
</tr>
<tr>
<td>Appendix H Menorah Park Engagement Scale</td>
<td>235</td>
<td></td>
</tr>
<tr>
<td>Appendix I Revised Memory Behavior Problem Checklist (RMBPC)</td>
<td>238</td>
<td></td>
</tr>
<tr>
<td>Appendix J Operationalization of the RMBPC</td>
<td>239</td>
<td></td>
</tr>
<tr>
<td>Appendix K Revised Quality of Life-AD</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>Appendix L IRB Synopsis, Informed Consent Forms, and IRB Approval Letters</td>
<td>244</td>
<td></td>
</tr>
<tr>
<td>Appendix M HT and Traditional Activities Observation Schedule</td>
<td>252</td>
<td></td>
</tr>
<tr>
<td>Appendix N Qualitative Coding Scheme</td>
<td>253</td>
<td></td>
</tr>
<tr>
<td>Appendix O Qualitative Data Comparison Charts</td>
<td>256</td>
<td></td>
</tr>
<tr>
<td>Curriculum Vitae for Christina M. Gigliotti</td>
<td>266</td>
<td></td>
</tr>
</tbody>
</table>
### List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD</td>
<td>Alzheimer’s Disease</td>
</tr>
<tr>
<td>ADL</td>
<td>Activities of Daily Living</td>
</tr>
<tr>
<td>ADRD</td>
<td>Alzheimer’s Disease and Related Dementias</td>
</tr>
<tr>
<td>ADS</td>
<td>Adult Day Service</td>
</tr>
<tr>
<td>AE</td>
<td>Active Engagement</td>
</tr>
<tr>
<td>AL</td>
<td>Adaptation Level</td>
</tr>
<tr>
<td>AARS</td>
<td>Apparent Affect Rating Scale</td>
</tr>
<tr>
<td>CNA</td>
<td>Certified Nursing Assistants</td>
</tr>
<tr>
<td>HT</td>
<td>Horticulture Therapy</td>
</tr>
<tr>
<td>IRB</td>
<td>Institutional Review Board</td>
</tr>
<tr>
<td>M</td>
<td>Monday</td>
</tr>
<tr>
<td>MCA</td>
<td>Multiple Correspondence Analysis</td>
</tr>
<tr>
<td>MMSE</td>
<td>Mini Mental State Exam</td>
</tr>
<tr>
<td>MPES</td>
<td>Menorah Park Engagement Scale</td>
</tr>
<tr>
<td>MT</td>
<td>Music Therapy</td>
</tr>
<tr>
<td>NDB</td>
<td>Need Driven Behaviors</td>
</tr>
<tr>
<td>OBRA</td>
<td>Omnibus Reconciliation Act</td>
</tr>
<tr>
<td>NDSP</td>
<td>Neurodevelopmental Sequencing Program</td>
</tr>
<tr>
<td>NE</td>
<td>Non Engagement</td>
</tr>
<tr>
<td>NH</td>
<td>Nursing Homes</td>
</tr>
<tr>
<td>OBRA</td>
<td>Omnibus Reconciliation Act of 1987</td>
</tr>
<tr>
<td>OE</td>
<td>Other Engagement</td>
</tr>
<tr>
<td>PC</td>
<td>Project Coordinator</td>
</tr>
<tr>
<td>PE</td>
<td>Passive Engagement</td>
</tr>
</tbody>
</table>
PM  Project Manager
PWD  Persons with Dementia
QOL  Quality of Life
QOL-AD  Quality of Life-Alzheimer’s disease
RA  Research Assistant
RI  Recreational Interventions
RMBPC  Revised Memory and Behavior Problem Checklist
SE  Self Engagement
T  Tuesday
TA  Traditional Activities
Th  Thursday
W  Wednesday
CHAPTER I

Introduction

The United States is currently experiencing simultaneous demographic and epidemiological shifts in which longevity is increasing and people are experiencing more chronic illnesses. The 2000 progress report on Alzheimer’s disease (AD) (National Institute on Aging, 2000) reports that approximately 360,000 new cases of AD will occur each year, and that this number will continue to grow. It is also estimated that of those aged 85 and over, nearly half suffer from some form of dementia. AD is the most common form of dementia and accounts for about four of the eight million Americans suffering from this characteristic set of behavioral, cognitive, and functional symptoms. These trends in dementia prevalence are related to the increasing numbers of persons affected by diseases associated with aging, including Alzheimer’s disease and related dementias (ADRD) (National Alzheimer’s Disease and Related Dementias Association, 2003).

Four million people in the United States have some form of dementia, which manifests itself in a variety of domains, including loss of short-term memory and inability in processing sensory information, using language (aphasia), performing previously learned motor tasks (apraxia), and properly addressing people and objects (anomia). Damage in the brain, resulting from the disease process, can cause delusions, hallucinations, personality changes, losses in physical coordination, and mood shifts (Mace, 1987; Mace & Rabins, 1999). A number of behavioral changes can occur in persons with dementia, including changes in affect, changes in activity, psychotic disturbances (hallucinations, delusions, paranoia), changes of basic drives (hyper and
hyposexuality, hyperphagia, appetite loss), and sleep disturbances. Each person will exhibit differing degrees of changes in cognition, behavior, and personality.

Following the onset of symptoms, persons with dementia can live up to 20 years or more. As the disease progresses and impairment increases, formal respite options, including nursing homes and adult day service (ADS) programs, become more important (National Institute on Aging, 2000). Despite legislative attempts to guide formal service providers in maintaining biopsychosocial well-being for persons with dementia, such as the Omnibus Budget Reconciliation Act of 1987 (OBRA), criticisms of current programs continue (National Institute on Aging, 2001). One common criticism includes a lack of planned activity; one study reported that most clients spend the majority of their time inactive (Nolan, Grant, & Nolan, 1995). Others emphasize the pervasiveness of developmentally and generationally inappropriate activity programs (Bowlby Sifton, 2000; Salari & Rich, 2001). Inactivity or inappropriate activities can lead to boredom (Buettner, 1999) and problematic behavior, including agitation and aggression (Buettner, Lundegren, Lago, Farrell & Smith, 1996).

Because individuals with dementia exhibit a wide range of variability in symptomology and functioning, planning appropriate activities for groups of persons with dementia is a challenging task. Persons with dementia often lose the ability to plan or initiate activities that are meaningful and enjoyable on their own; therefore, the lack of appropriately planned programming is an issue that demands attention (Teri & Logsdon, 1991). Identifying meaningful activities that support autonomy, dignity, and unique personal histories of each individual is an acknowledged critical aspect of well-being, yet this task has proven difficult for staff in dementia-care programs.

One therapeutic activity for persons with cognitive impairment that has demonstrated its utility as an inclusive programming option for a wide range of cognitive and skill levels is Horticulture Therapy (HT) (Gigliotti & Jarrott, in press; Gigliotti, Jarrott,
& Yorgason, 2002; Jarrott, Kwack, & Relf, 2002). HT is the use of plant materials and gardening activities that have been adapted to meet individualized needs and reach targeted treatment goals (AHTA, 2003). Horticulture therapists can either modify the environment or the activity in order to enhance the person’s competence level and assist them in reaching the desired Adaptation Level (AL), which is characterized by a person-environment fit. Attainment HT and of the AL is demonstrated by positive affect and adaptive behavior. According to Lawton, the notion of fit should be considered at two levels. Needs associated with activities of daily living (ADLs) must be met first; however, higher order needs (privacy, social contact) are also crucial. Addressing these two levels of needs supports attainment of and maintenance in the AL as a result of engaging in the HT activities. Research grounded in theory that documents the effects of HT on persons with ADRD is still in its infancy and many questions remain unanswered regarding the multitude of outcomes that can be expected from this intervention. Additionally, a systematic examination of the processes by which these outcomes are achieved is needed to more completely understand the contextual factors that influence the outcomes of interest.

Therefore, guided by the theory of Environmental Press, the purpose of the current study is to compare the behavioral and affective responses of persons with ADRD during HT and traditional activity programming at eight dementia-care programs. HT programming will be introduced at one ADS program and three NHs for six weeks to collect observational data designed to capture the outcomes elicited by each type of program. In addition, procedural and contextual information will be elicited from program facilitators and staff as well as observational research team members to gain an understanding of the processes inherent in the program’s implementation. Triangulating the data from these multiple informants will highlight the processes by which each of these approaches influenced the observed outcomes. This mixed method, multiple
informant investigation will enhance the rigor and generalizability of previous HT studies and address the confounding extraneous factors that may interact with the intended intervention to influence outcomes.
CHAPTER II
Literature Review

In this review of the literature, I will first focus on the multifaceted challenges that a dementing illness presents to individuals and their caregivers through the cognitive, functional, and behavioral changes that result from the disease progression. Then I will present the environmental press model as the theoretical basis for achieving positive behavioral and affectual outcomes in persons with ADRD. I will present the research that documents the value of activities and the principles of activities for older adults in dementia care settings. Next, I will apply the practice of HT to the environmental press model and describe the research that has documented the effectiveness of this approach. Finally, I will discuss the limitations to previous research and difficulties encountered when conducting research on persons with ADRD. An emphasis will be made on implementing horticulture activities for persons with dementia and the contribution that the proposed study will make to the fields of therapeutic recreation and HT in dementia-care settings.

Prevalence and Characteristics of Dementia

Of persons aged 65 years and older in the United States, 6-8% have diagnosable dementia, which is characterized by progressive and irreversible losses in multiple domains of functioning severe enough to interfere with daily functioning in a person who is otherwise awake and alert. Characteristic symptoms include short-term memory loss, as well as deficits in processing sensory information, using language (aphasia), performing previously learned motor tasks (apraxia), and properly addressing people and objects (anomia). In addition, a number of behavioral and personality changes are quite commonly exhibited by persons with dementia, as damage to the brain becomes more pervasive. As longevity increases, the prevalence of dementia will multiply since rates of dementia increase with age. In fact, the risk for dementia doubles in 5-year
increments, suggesting that approximately 50% of individuals 85-years of age and older have diagnosable dementia (National Institute on Aging, 2001).

Dementia is caused by a number of diseases; however, AD accounts for 50-70% of the current cases. In fact, 4.5 million Americans are estimated to have AD, and that number is projected to grow in conjunction with the current demographic shifts, ultimately affecting up to 16 million individuals by the year 2050 (National Institute on Aging, 2001). There are two abnormal structures in brains affected by AD, beta-amyloid plaques and neurofibrillary tangles; these hallmark structures first disrupt processes that keep neurons healthy and ultimately destroy nerve cells in the brain. In addition, affected regions of the brain progressively atrophy and ventricles become increasingly enlarged. These processes lead to behavioral changes as well as losses in memory, cognitive and functional abilities, and the ability to carry out daily activities.

Although distinct and unique stages do not universally occur in the progression of a dementing illness, the stage model can be used to illustrate the general pattern of decline. This pattern is based on a developmental model that emphasizes the first-in/last-out theory which posits that those abilities acquired first in childhood remain for a longer time than those learned later in life in the developmental sequence (Matteson, Linton, & Barnes, 1995; Reisberg, 1984). In the preclinical stage of the disease, the entorhinal cortex becomes host to the abnormal levels of plaques and tangles. From there, the disease proceeds to the adjacently located hippocampus, which is the structure responsible for the formation of short-term and long-term memories. As these regions of the brain are affected, they begin to deteriorate until the first overt sign of the disease, memory loss, becomes salient.

In the mild stage of AD, the disease begins to affect the cerebral cortex, which is responsible for many of the elements involved in higher reasoning. The areas of the brain that control memory, language, and reasoning are the first to be impacted by the
multiplication of the plaques and tangles. Memory loss, disorientation to time and place, and difficulty performing higher-level tasks that require the use of judgment also begin to occur as well as some visible changes in the individual’s mood and personality.

As the person approaches the moderate stage of AD, the damage has spread further to the areas of the cerebral cortex that control language, reasoning, sensory processing, and conscious thought. Symptoms of the disease become more visible and prolific and a variety of characteristic behaviors, often characterized as problematic by caregivers, begin to necessitate higher levels of supervision and care. Common symptoms at this stage include increasing levels of memory loss and confusion, difficulties paying attention, recognizing significant others, using and understanding language, and organizing thoughts in a logical sequence. At this stage persons become increasingly restless, agitated, and anxious, which may result in tearfulness, wandering, and repetitive self-stimulating behaviors and statements. Difficulties controlling impulses and performing perceptual-motor activities are also experienced at this stage in the disease progression.

It is not until the most severe, final stage of the disease that persons with AD are completely dependent on others for care; at this stage they have lost the ability to recognize family and loved ones and communicate effectively. At this final stage individuals spend a significant portion of their time in bed, have a complete lack of bladder and bowel control, lose weight, and become increasingly susceptible to other illness, which typically results in death.

*Remaining Abilities in Persons with ADRD.*

Despite the multifaceted and progressive losses experienced by persons with ADRD in cognitive and functional domains, a number of abilities remain intact well into the late stages of the disease process. Continued use of these existing abilities can impede the rate of decline and may enhance functional performance and well-being if
success is supported through careful planning and facilitation (Buettner, 2001; Beutner, et al., 1996; Bowlby Sifton, 2000).

Neuropsychological researchers have determined that implicit memory, which is characterized by a lack of conscious awareness of recollection, can survive in persons with ADRD late into the disease process (Eldridge, Masterman, & Knowlton, 2002; Poe & Seifert, 1997). Procedural memory, a type of implicit memory, enables individuals to engage in over learned skills or motor processes such as brushing one’s teeth. This basic memory can be triggered through the use of environmental props or cues that are associated with the targeted activities. Procedural memory is most easily accessible for those tasks that were part of an individual’s daily routine. For example, in order to facilitate the memory of brushing one’s teeth, a caregiver could provide a person with ADRD with a paste-applied toothbrush at the bathroom sink. These environmental cues will facilitate the procedural memory of brushing one’s teeth.

Engagement in sensorimotor activities can facilitate the preservation of intact abilities among persons with ADRD. Because sensory awareness is minimally impacted in the early stages of the disease, sensory stimulation can result in enjoyment as well as behavioral benefits. Several studies that have examined the impact of aromatherapy have found positive outcomes, including significant reductions in levels of agitation (in 60% patients) and improvements in motor behavior (34% reduction) (Holms, Hopkins, Hensford, MacLaughlin, Wilkinson, & Rosenvinge, 2002; Smallwood, Brown, Coulter, Irvine, & Copland, 2001). Motor function also remains comparatively intact in the first stages of the disease, and motor activities that enhance movement and physical health are extremely desirable.

The ability of persons with ADRD to experience a variety of emotions is also unaffected by the disease progression. Although they may not be able to communicate these feelings through verbal language, they are often able to express themselves
through non-verbal emotional skills (Lawton, VanHaitsma & Klapper, 1996; Lawton, VanHaitsma, & Perkinson, 2000; Son, Therrien & Whall, 2002). Emotional memories, which trigger feelings associated with an event, are also maintained in persons with ADRD longer than semantic (knowledge and facts) or episodic (specific events) memories. Therefore, individuals affected by ADRD may not remember a specific trip to the beach with their family, but they may be able to describe the enjoyment they experienced.

Social skills, which include non-verbal communication efforts such as waving and shaking hands, are relatively automatic responses and are preserved into the moderate stages of the disease. The ability to relate to other humans through social skills that draw on procedural and emotional capabilities can compensate for memory and language declines. Even in situations in which persons with ADRD are unable to remember a specific individual, they can still engage in a positive interaction that preserves dignity and provides a sense of connection with other human beings.

In contrast to short-term memory, long-term memory is typically preserved into the later stages of a dementing illness (Alzheimer’s Disease and Related Disorders Association, 2004; Fleischman & Gabrieli, 1999; National Institute of Aging, 2001). The use of external cues, such as music, photographs, and everyday materials can compensate for the initiation and retrieval of information. This process gives the person with ADRD the opportunity to regain a sense of identity and continuity with their past. The opportunity to exercise these remaining abilities and achieve the associated benefits will enhance the well-being and support the personhood of persons with ADRD; however, the lack of opportunities to meet these needs by utilizing intact abilities, may result in disruptive behaviors that express that need (Algase, Beck, Kolanowski, et al., 1996).
**Behavioral Manifestations of ADRD**

Persons with ADRD often exhibit behavioral outbursts, as well as withdrawal and apathy, which are often linked to the progression of the disease processes in the variable regions of the brain. A number of behavioral changes can occur in persons with dementia, including changes in affect, changes in activity, psychotic disturbances (hallucinations, delusions, paranoia), changes of basic drives (hyper and hyposexuality, hyperphagia, appetite loss), and changes of diurnal rhythm and sleep (sleep disturbances). Behavioral alterations can be severe and pervasive; in fact, many manifestations of the disease, such as anxiety, agitation, anger, aggression, wandering, depression, and sleeplessness, develop in 70-90% of persons with ADRD (Fromholt & Bruhn, 1998). The behavioral symptoms exhibited by persons with ADRD are one of the most difficult aspects of coping with the disease that caregivers must endure.

The pervasive view that disturbing behaviors are simply part of the disease process, has been challenged by Algase and colleagues (1996) who purported that dementia-related behaviors should be viewed, as those that express an understandable need in response to the interaction of relatively stable individual characteristics (background factors) and current situational variables (proximal factors). Therefore, inappropriate levels of stimulation or support in the physical and social environments may induce overwhelming feelings of frustration, agitation, and embarrassment that are instigated by the cognitive, functional, and social deficits inherent in the disease progression. This perspective highlights the interplay of these factors to produce disruptive behaviors that arise from an unmet need state (Algase et al., 1996).

A wide variety of interventions targeted at alleviating behavioral manifestations of the disease have been examined. Common techniques used for controlling agitation include the administration of psychotropic medications, restraints, and environmental manipulations (Buettner, 1999; Cohen-Mansfield, 2001). The use of these traditional
interventions raises a number of concerns including side effects to drugs, ethical and legal issues concerning the use of restraints, and the expense associated with environmental manipulation. Therapeutic activities can be utilized in lieu of these traditional approaches to minimize behavioral issues exhibited by persons with ADRD (Bowlby Sifton, 2000; Teri, Logsdon, McCurry, 2002).

_Care Options for Persons with ADRD_

Persons diagnosed with ADRD often live an average of eight years beyond the onset of symptoms (Alzheimer’s Disease and Related Disorders Association, 2004). The rate of progression is variable however, and some individuals may live as long as 20 years or more following diagnosis. According to the Alzheimer’s Association (2004), more than seven of ten people with AD live at home with familial caregivers. As impairment and subsequent dependency increase over time and behavioral manifestations of the disease become increasingly salient, formal respite options, including ADS programs and nursing homes, become increasingly important to familial caregivers (National Institute on Aging, 2000).

ADS programs enable people with ADRD and other physical impairments to continue to live in the community while receiving professional services in a group setting. ADS programs offer care, assistance, and social opportunities to a wide range of seniors, while providing respite to their families and caregivers. Approximately half of all adult day care clients are cognitively impaired (National Adult Day Service Association (NADSA), 2004). The popularity of adult day programs has escalated since they were first introduced in the 1970s. In fact, the number of centers offering such services has doubled since 1989 (NADSA, 2004).

In situations where persons with ADRD are unable to remain in the community setting, formal care settings, such as nursing homes, become increasingly important. In 2002, the total number of nursing homes in the United States was 16,491. Currently half
of all nursing home residents have ADRD; in fact, cognitive disorders have been consistently ranked as one of the top two conditions present in older adults at the time of nursing home admission over the last 20 years (Alzheimer’s Disease and Related Disorders Association, 2004; Centers for Disease Control, 2001). These individuals are often in the moderate to late stages of the disease process and require significantly more help with activities of daily living (ADL) and typically exhibit greater levels of challenging behaviors than persons in ADS programs (Centers for Disease Control, 2001).

Although dementia-care programs operate under a variety of models, ranging in focus and philosophy from social to medical, legislative guidelines such as OBRA of 1987 have mandated that Nursing homes attend to each resident’s physical, mental, and psychosocial well-being through an array of services. OBRA specifically requires that nursing homes provide an on-going program of activities, directed by a qualified professional, designed to meet the interests of each individual, while attending to their biopsychosocial well-being (U.S Department of Health and Human Services, 2003).

**Challenges of Designing Activities for Persons with Dementia**

Activity professionals working towards achieving the mandates specified by OBRA face a number of challenges. A combination of factors contributes to these challenges, ranging from the wide variability represented by the residents to the shortage of adequately trained professionals. Meeting individual needs in a group setting with limited support is a difficult task, especially when the group is highly heterogeneous.

Despite the fact that each person with ADRD is unique in terms of their personality, rate of progression, and level of cognitive and physical functioning, facilitators attempt to provide activities designed to enhance well-being, typically in a group setting. The group’s diverse interests and abilities contribute to the difficulty
involved in identifying activities that are meaningful as well as developmentally and
generationally appropriate. Facilitation of activities that meet these criteria is necessary
in order to uphold each individual’s dignity and autonomy, which greatly impact
psychosocial well-being. Changes in the brain that lead to deficits in sensory perception,
language, executive functions, and behavior, limit the individual’s capability to perform
complex tasks independently, which may necessitate the need for high staff to resident
ratios.

In order to adequately meet each resident’s unique biopsychosocial needs,
individualized attention may be necessary; however, many dementia care programs,
including nursing homes, have limited resources. Identifying adequate numbers of staff
persons who are qualified and willing to effectively facilitate activities is often an obstacle
to optimal levels of quality programming, especially since nursing home regulations do
not support adequate staff to client ratios to support person-centered care and
individualized planning. These obstacles often result in a paucity of appropriate activities
designed to facilitate positive outcomes for persons with ADRD.

Criticisms of Current Programs

Research demonstrates that a void in planned activities in many dementia-care
facilities is the norm. In fact, one study found that most elderly patients in long-term care
were sedentary 95% of the time (Armstrong-Ether, Browne, & McAfee, 1994). When
persons with ADRD did engage in activities, they spent 45% of their time engaged in
solitary pursuits, isolated from human contact (Armstrong-Ether, et al., 1994; Nolan, et
al., 1995). A more recent investigation found that even at a nursing home with a high
level of care and a creative activities department, residents spent the majority of their
time (65%) sitting along in their rooms (Harper Ice, 2002). Voelkl and colleagues (1995)
also attempted to examine the level of nursing home residents’ involvement in activity
programs. They focused specifically on the association between the person’s
background characteristic of cognitive impairment and activity participation patterns. They found that the most cognitively impaired individuals were the least engaged in the presented program of activities. Their findings indicated that the nursing home residents who were cognitively intact, borderline intact, or severely limited were not as actively engaged in activities as those in the mild to moderate stages of the disease. The authors hypothesized that these differences resulted from the fact that the highest functioning residents were able to occupy their time independently of a facilitator’s assistance and that the lowest functioning participants were not able to engage in the presented activities without high levels of staff assistance (Voelkl et al., 1995). Another study conducted by Buettner and Fitzsimmons (2003) assessed activity participation in dementia-care settings and revealed that during baseline observations, almost 45% of the individuals received little or no facility activities, 20% received only occasional activities, and 12% of individuals received daily activities that were deemed inappropriate based on the individual’s interest or level of functioning.

Collectively, studies of activities suggest that many dementia-care programs are unable to provide appropriate activity interventions that engage the full range of cognitive and functional abilities represented in the group setting. This deficit highlights the need for specialized activity intervention that is capable of attending to the interests, needs, and abilities of the group members. Findings that reveal the large percentage of time that participants spend unoccupied demonstrate the importance of offering structured scheduled activities for persons who are likely to participate when invited to join activities, but who are unlikely to engage in meaningful activity without prompting and support due to limitations associated with each level of cognitive impairment.

Researchers have demonstrated that low to nonexistent levels of stimulating activities in formal dementia-care programs often result in increased levels of behavioral disturbances, triggered by unmet psychosocial needs (Acello, 1997). These behavioral
exhibitions are described as *need-driven behaviors* and are often displayed when persons with ADRD attempt to express a need for stimulation, movement, or comfort (Buettner, 1999). Need-driven behaviors include self-stimulating activities that are described in terms of three main categories, disruptive (yelling and screaming), agitated (wandering and repetitive movement), and aggressive (fighting and hostility towards others). These behaviors are difficult for staff to manage and are also distracting and disturbing to the other program participants; therefore, these individuals are often prematurely removed from activity sessions or simply not included in the first place.

Although very low levels of activity programming tend to evoke need-driven behaviors, the opposite approach to programming may also result in problematic outcomes. In some settings, programs rely on rigid and structured agendas that do not allow for flexibility. According to Fazio and colleagues, programs of this nature often encourage staff to, “rush individuals with dementia through activities of daily living (ADLs), so they can participate or wait to participate in other planned scheduled activities” (Fazio, Chavin, & Clair, 1999, p. 149). Many of these programs embrace the routine approach to care rather than a client-centered approach that emphasizes the unique aspects of the individual and the person’s stage in the disease.

Staff persons who adopt this routine approach often do daily care *to or for* the individual rather than *with* the individual. Consequently, persons may internalize the belief that they are incompetent. Researchers have also demonstrated that many staff in formal programs for the aged actually encourage and reinforce learned helplessness and excess disability by granting more time and attention to those individuals “needing” greater assistance (Baltes, 1995; Baltes & Reisenzein, 1986). This trend results in a premature loss of abilities and subsequent dignity due to limited opportunities to maintain those abilities through practice and routine. Research has also demonstrated that residents who are given the opportunity to exercise a sense of control improve in
both functional and cognitive domains of functioning, in addition to reports of subjective well-being (Voelkl et al., 1985).

Another commonly observed problem with the programming in dementia-care settings is the pervasive use of inappropriate activities by facilitators. Inappropriate activities include those that are generationally and developmentally mismatched to the individuals’ interests and abilities (Mahoney, 2003). In a study conducted by Salari and Rich (2001) findings revealed that program staff provided group activities that targeted the abilities of the program participants who were functioning at the lowest cognitive level. As a result, individuals functioning at higher levels often felt insulted, understimulated, and infantilized, which can lead to increased levels of withdrawal and non-participation.

At the opposite end of the spectrum, there are situations in which the presented activities are too difficult for the program participants. These programs highlight the program participants’ deficits and therefore elicit feelings of frustration and confusion. These feelings may also lead to the expression of need-driven behaviors, including wandering, yelling, aggression, and withdrawal. Therefore, matching the presented activities to the developmental capabilities of the program participants is critical in order to ensure favorable outcomes.

Regardless of the level of difficulty, activity facilitators may also make mistakes in regards to the generational appropriateness of the presented activities. Some programs treat elders in a childlike manner and infantilize them by providing activities that are juvenile in nature, such as teddy bear picnics, coloring cartoon characters, and childish dances and music (Mahoney, 2003; Salari & Rich, 2001). Salari and Rich examined the environments, activities, and interactions of clients at two ADS programs. Their findings concluded that when the ADS provided privacy, autonomy, and social contact with age appropriate activities, more friendships were facilitated among clients. They also found
that the adults began to internalize the staff’s views of them, which subsequently led to a lower sense of self identity and independent motivation.

Addressing Criticisms Using a Theory Based Approach

The norm of inadequate programming for persons with cognitive impairment underlies the importance of seeking out treatment alternatives guided by a person-centered philosophy, that instills a sense of competence by maximizing intact abilities while minimizing disabilities (Kitwood & Bredin, 1992). Person-centered planning involves obtaining knowledge of each participant’s interests, abilities, and social history to guide the choice of activities that will be meaningful and support success. Program professionals should embrace a strengths perspective to guide person-centered planning and the attainment of positive outcomes, including positive affect and adaptive behavior characterized by meaningful engagement and the absence of need-driven behaviors (Bowlby Sifton, 2000).

The Theory of Environmental Press

The theory of environmental press emphasizes the importance of finding a balance between persons’ competence levels and environments to influence subsequent behavioral adaptation and attainment of positive mood as well as higher order benefits, such as social affiliation and self-esteem (Lawton & Nahemow, 1973). In their theory, Lawton and Nahemow (1973) proposed the idea that competence is not only a characteristic of an individual but also reflects the congruence between the individuals’ abilities and the demands and resources in their environments. For competence to be achieved, there must be congruence between the environmental demands (environmental press) and the resources of the individual.

In their model, Lawton and Nahemow asserted that the result of achieving a balance between competence and environmental press is a zone termed the adaptation level (AL) (Lawton & Nahemow, 1973, p. 44) (see Figure 1). The AL is characterized by
neutral press, which results in adaptive behavior and positive affect. Affect is hypothesized to be relatively neutral, slightly to the right or left of the AL in the zones of *maximum performance potential* and *maximum comfort*, although the type of behaviors exhibited in these two zones varies. In the zone of maximum performance potential, persons experience a mild-to-moderate environmental demand resulting in increased interest, active engagement, and social behavior. In this situation, the press is stronger than that experienced in the AL, but individuals are challenged to increase their competence to achieve congruence and can therefore achieve adaptive behavior even though their affect is tolerable rather than positive. In the zone of maximum comfort, individuals are slightly underchallenged and bored, resulting in slightly lower levels of positive affect in spite of adaptive behavior, such as passive and active engagement and low levels of behavior problems. If press is unbalanced with competence and individuals become bored (*weak press*) or overstimulated (*strong press*), they will engage in maladaptive behavior and negative affect. These environmental press concepts have not been systematically operationalized and measured; however, they can be viewed as latent constructs that can be indirectly observed via observable manifest constructs, behavior and affect.
Lawton & Nahemow (1973) also describe the process by which environmental press can be weakened through routine. This theoretical proposition builds on the functions inherent in implicit memory. As individuals with ADRD engage in a routine and gain practice by engaging in an activity on a continuous basis, they are able to trigger their procedural memory and weaken the level of press. Additionally, according to these scholars, a change in the intensity of the stimulation may also impact the degree of awareness that the stimulus elicits.

The idea of fit between environmental press and competence level needs to be considered at two levels, which must be met in hierarchical fashion. The lower level encompasses basic life maintenance needs, including the ability to perform ADLs such as eating, bathing, and dressing. Once these needs are met, higher order needs and desires can be targeted, including level of social contact, the need for privacy and autonomy, and the opportunity to assert one’s daily preferences. Therefore, once
persons with dementia have fulfilled their lower level needs, caregivers should shift their attention to the attainment of higher order needs by providing meaningful occupation that results in benefits encompassed by biopsychosocial domains.

Lawton and Nahemow (1973) proposed that for less competent individuals, the impact of environmental factors is greater; they referred to this phenomenon as *environmental docility*. Persons with dementia have compromised abilities to proactively reduce environmental press through exertion of individual competencies. A person-centered approach would guide significant others, who comprise the social milieu of the person’s life and often perform caregiving duties, to adapt the environment to better suit the competence level of persons with cognitive impairment or help them to increase their competencies through continued use of skills and abilities. Upon considering the need to adapt the environment for persons unable to do so for themselves, it is also important to recognize that the environment is multifaceted in nature and encompasses both social and physical elements; this will be covered in detail in subsequent sections of this paper.

*Enhancing Competence through Therapeutic Activities*

Helping persons with dementia achieve a person-environment fit through activities that result in success and maintenance of intact functioning is one way that therapists can support the personhood of individuals with dementia. Therapists planning and implementing activities for persons with dementia will need to adapt the activities to the varied interests and abilities of each person in order to achieve these outcomes. In addition, the environmental context housing the activities may also need to be adapted to achieve balance.

*Adapting activities.* A number of researchers from a variety of disciplines have utilized a strengths perspective to inform the creation and implementation of dementia-care program activities. This perspective focuses on the assets of each individual and
the importance of exercising and maintaining intact functioning to increase and maintain autonomy and subsequent well-being (Bowlby Sifton, 2000; Mace & Rabins, 1999).

A strengths perspective encourages caregivers to support persons with dementia to continue to engage in activities that they can perform utilizing the abilities that often remain intact well into the disease process (Bowlby Sifton, 2000). Bowlby Sifton has recognized that in persons with ADRD, there is often a disability gap between what they currently do and what they are capable of doing with support and encouragement from more competent individuals who can adapt the activities or environment to enhance the likelihood of achieving a person environment fit.

Camp and colleagues (1997) were also interested in engaging persons with dementia in meaningful activities to exercise intact abilities and improve the likelihood of appropriate behavioral responses and positive affect. Their approach to developing activities for this population entailed recognition of the environment and individuals’ competence levels. In this approach, pre-planned adaptations, termed extensions, are created for each presented activity in order to enable all interested persons to participate and succeed despite ability level.

An emphasis on minimizing risks of failure and maximizing the chances of success is a fundamental reason to employ the use of extensions, which can be horizontal or vertical in nature. Activity modifications that use similar skills, processes, and levels of difficulty in order to sustain interest and engagement in the presented activity are termed horizontal extensions. After gauging the extent to which the presented activity is either too difficult or too easy, vertical extensions can be employed to either increase (upward) or decrease (downward) the difficulty of the task.

Adapting the physical and social environment. Researchers have also emphasized the importance of recognizing the role that the environment plays in facilitating greater competence and well-being in persons with dementia. When the focus
of activity engagement is on the present moment, the importance of the social and physical environments creating the participant's atmosphere is emphasized (Bowlby Sifton, 2000). Because of the deficits inherent in persons with dementia, including the inability to remember the recent past and anticipate the future, the moment-to-moment aspects of daily life become paramount.

Creating environmental cues and prompts to assist persons in tapping into remaining procedural memories can assist individuals to improve success and function more independently, resulting in feelings of competence and higher self-esteem. Regarding the social environment, dementia-care researchers have emphasized the importance of offering stimulation and activities that provided opportunities for interaction. Morgan and Stewart (1997) found that activities redirected restless and irritable persons from worrying and redirected their focus to more positive thoughts and pursuits. A variety of researchers have also highlighted the importance of avoiding activities that are infantilizing and insulting to an adult population (Camp, et al.1997; Salari & Rich, 2001).

Kitwood’s theory of personhood in dementia also embraces this recognition of the fundamental nature of the social environment, proposing that personhood is created, maintained, and diminished through social relationships (Kitwood & Bredin, 1992). Kitwood and Bredin define personhood as a status characterized by respect and dignity, that human beings are entitled to experience, even in the face of impairment. This theory provides theoretical insight into the practicalities of care and shifts the emphasis from the disease to the unique human being. This theory of appropriate practice guides practitioners in implementing the process of care for persons with dementia to support their sense of agency, social confidence, and sense of hope. In fact, Kitwood describes situations in which persons with severe dementia demonstrated reversal in their symptomology or ‘rementia’ when their social relationships were enhanced (Kitwood,
Although empirical data documenting this phenomenon is not documented, positive changes were noted through anecdotal staff reports included improvements in social skill, independence, and continence (Kitwood & Bredin, 1992).

Therefore, personhood can be supported through meaningful activities that are age and ability appropriate resulting in success and helping persons engage in social interactions that focus on positive events. A number of dementia-care researchers have emphasized the need to preserve dignity and autonomy in persons with dementia by offering activities that are personally meaningful based on past experiences as well as previous and current roles in life (Camp, 1997; Kitwood, 1997; Salari & Rich, 2001).

Therefore, identifying activities that are popular amongst older adults and that encourage them to utilize intact abilities is an essential aspect of meeting higher order needs for persons unable to do so for themselves.

**Meeting Higher Order Needs through Therapeutic Activities**

In order for persons with dementia to retain or regain quality of life while experiencing a multitude of losses, treatment must move away from the medical model that emphasizes the disease and towards holistic health models that view the individual as a multidimensional organism with complex needs spanning biopsychosocial domains. The acceptance of holistic health represents the understanding that all factors, including physical, mental, emotional, social, and spiritual affect health, well-being, and quality of life (Kitwood, 1997). Involvement in suitable activities can provide individuals with dementia an essential sense of structure, security and feeling of belonging (Buettner & Ferrario, 1997).

**Psychosocial benefits.** Involvement in activities can address psychosocial needs by helping individuals to establish meaning in their lives, define roles, maintain autonomy, and create and maintain dignity and identity. Because progression of the disease is associated with prolific loss and an increased reliance on others, creating
opportunities for individuals to be active participants in their own lives is crucial to overall well-being and a sense of competence.

Providing opportunities for restoring these fundamental human experiences may significantly increase well-being and quality of life. Langer and Rodin (1976) researched the effects of enhanced personal responsibility and choice in two groups of nursing home residents. The treatment group was given a choice of whether or not they wanted to care for a plant and which type of plant they preferred, and the control group was handed a plant, rather than given a choice, and was told the nurses would care for the plant for them. In comparing two groups of nursing home residents, the group that was encouraged to make choices and take responsibility for plant care, among other things, showed significant gains in well-being and participation in comparison to the control group. In addition, upon follow up, eighteen months after the study, the researchers found that the group who had been given the opportunity to make choices, had a lower mortality rate (15% compared to 30% in the control group) (Langer, 1989).

The effects of social relationships on psychological health are well known. The higher order need for social affiliation can be facilitated through therapeutic activity programming. Familiar activities often evoke long-term memories and allow individuals to engage in positive reminiscence with peers and caregivers. Relationships help individuals to develop a sense of self and worth and have also been associated with a number of health outcomes. Involvement with activities in group settings can provide opportunities for individuals to obtain closeness with others by integrating them within a group that shares a common interest. Group activities that foster success and group participation can help persons with dementia engage in socially appropriate behaviors and maintain interpersonal skills. One study found that those individuals with ADRD who had friends on the special care unit were less likely to demonstrate agitated behaviors than individuals who did not have friend relationships (Kutner, Brown,
In addition, researchers have found that small group activities can elicit increased verbal socialization and engagement and decreased aggression and anger (Cohen-Mansfield, 2001; Rentz, 2002). Therefore, by offering group activities that foster these friendships in order to meet the basic human need for social interaction and a sense of belonging, need-driven behaviors can be minimized.

Activities and recreation interventions can also facilitate enhanced relationship status with persons outside of the peer group. In addition to increasing the quality and quantity of peer relationships, therapeutic activities increased family involvement and improved visit satisfaction for families of persons with dementia (Buettner, 2001). Through the use of activities, visiting families were better able to recognize the intact abilities remaining in their family members, and they found communicating with and praising their afflicted family members easier and more genuine. In a study conducted by Schneider and Camp (2002), visiting family members and their relatives residing in long-term care who performed Montessori activities during the visits had better outcomes than during traditional visits. In this study, family members were trained to use the Montessori method to successfully engage and interact with their relative with ADRD. When the Montessori activities were used during the visits, the residents demonstrated higher levels of active engagement, lower levels of passive engagement among the residents, and lower levels of self-reported burden as reported by the caregiver. Therefore, using a systematic approach to illicit active and social engagement in a shared activity can be an important intervention to enhance visit quality and well-being among families impacted by ADRD.

Another potential opportunity for increased socialization from recreational intervention is between staff (Nursing Assistants) and patients in long-term care facilities. Findings from a 1996 study (Aronstein, Olsen & Schulman, 1996) found that using Recreational Interventions (RI) (specifically the use of 16 different recreational products
that offered a variety of sensory, auditory and visual stimuli) to diffuse agitated behaviors resulted in the unexpected benefit of increased quality and quantity of interaction between staff and patients. Staff reported that the RIs gave them the opportunity to ask meaningful and substantial questions beyond the typical greetings; in essence they were able to ask more questions of sustenance and make supportive comments about the RI chosen by the patient.

In another study, nursing home residents were given a biographical memory book, which was used in conjunction with training, to enhance the quality of staff to client interactions. The biographical memory book contained images and brief, simple sentences that tapped into the preserved automatic processing abilities of frail older adults in order to improve the structure and quality of communication with others. For example, the books contained social history information such as wedding and family photographs as well as current logistical information regarding the attending Certified Nursing Assistant (CNA) and the day’s schedule. Results indicated that the staff improved their communication with the nursing home residents through increased use of positive statements, single, one-step directions, and the overall amount of speech directed toward the residents during care routines (Burgio, Allen-Burge, Roth, Bourgeois, Dijkstra, Gerstle, Jackson, & Bankester, 2000). Therefore, the addition of the memory books and related training enabled the nursing staff members to care for the residents in a person-centered manner by drawing on the biographical information in the book and engaging in conversation with the resident during ADL care. The acquisition of knowledge about the residents’ social histories facilitated more positive and meaningful interactions. The memory books also contained information that the staff could use to modify activities in an individualized manner in order to facilitate more positive outcomes. These studies both highlight the beneficial outcomes that can result from specialized training in conjunction with a shared activity.
Physical benefits. Mobility limitations can lead to loss of control over activities of daily living (ADLs), which can lead to subsequent conditions including incontinence, pressure sores, pneumonia, constipation, and fatigue. (Wallace Williams, et al., 2005). Certain activities can help the individual with dementia maintain and exercise intact physical functioning. Furthermore, activities can enhance mobility, endurance, coordination, and balance. Maintenance of these physical abilities can help the individual maintain increased autonomy and sense of self. Additionally, physical exercise helps confused people sleep at night, keep their bowel movements regular, and retain motor skills longer (Mace & Rabins, 1999). Designing a daily exercise program can improve strength and mobility and help maintain these entities longer (Francese, Sorrell, & Butler, 1997).

Buettner, Lundegen, and Lago (1996) found that staff implementing the Neurodevelopmental Sequencing Program (NDSP), which is a developmental approach to exercising motor skills, enables them plan activities to match functional abilities of the participants in a small group setting. Persons with dementia were able to increase grip strength and flexibility and decrease agitation after four weeks of the intervention (Buettner, Lundegen, & Lago, 1996). The NDSP taps into the area of the brain that controls sensory and motor functions because it is based on the idea that functional losses in persons with dementia occur in the reverse order of their development. Since this area of the brain is not usually affected in most ADRD patients until the terminal stages of the disease, the ability to learn new motor skills and relearn old motor skills remains intact (Buettner & Ferrario, 1997).

In summary, a variety of studies have demonstrated that activities can offer potential psychological, social, and physical benefits to the person with ADRD. Providing activities for persons with ADRD to address higher order needs encompassed
by physical, psychological, and social domains can result in an increased quality of life in a population of individuals who are otherwise experiencing devastating loss.

**Enhancing Competence Through HT**

HT is one therapeutic activity alternative that uses practices and approaches and embraces the tenets set forth by the theory of environmental press. The practice of HT requires that the therapist employ techniques that enhance the competencies of their clients through adaptation of the horticulture activities and the contextual environment to facilitate success in the presented activities.

**Adapting HT activities.** Horticulture therapists actively modify the social and physical environment as well as the presented gardening activities to help their clients achieve specified treatment goals and objectives unique to each program participant. Therapeutic goals for HT programs are consonant with a multidisciplinary approach and target outcomes in physical, social, cognitive, and psychological domains of functioning (Relf & Dorn, 1995).

HT programs work towards increasing competence levels in persons with special needs by exercising intact physical, social, and cognitive abilities, teaching them new skills, and empowering them through increased responsibility and autonomy. Also, as emphasized by the Montessori method and Bowlby Sifton’s work, the use of activities that utilize everyday materials and familiar techniques represents an attempt to maximize the person’s remaining procedural memory, or their memory for how things are done (Bowlby Sifton, 2000; Camp, 1999).

HT activities provide an outlet for individuals to exercise a wide range of physical and cognitive skills performed throughout one’s life. Activities that are goal-directed such as watering, planting, harvesting, and flower arranging can be used to build self-confidence and provide staff and family members with an opportunity to provide positive reinforcement (Ebel, 1991; Sarno & Chambers, 1997). Gardeners have many
opportunities to engage in various activities that utilize gross and fine motor skills, balance and coordination, as well as muscle strength. Sustaining functional abilities in these domains of functioning will help persons with dementia retain greater levels of independence during other activities, including ADLs. In a study conducted by Rappe and Linden (2002), findings indicated that the elders who had the opportunity to engage in physical movement and spend time outdoors enjoyed increased sleep quality and maintenance of functional abilities as reported by program staff.

Additional support for the use of HT activities in dementia-care programs stems from their adaptability to varying levels of cognitive and functional abilities (Gigliotti, et al., 2002, Jarrott, et al., 2002; Mooney & Milstein, 1994). Identifying activities that are modifiable is a difficult task, especially when facilitators are concerned about minimizing disability in persons with dementia. Providing extensions, or variations, to one activity may highlight an individual’s disability as they and their peers become aware of the fact that each person is getting a different version of the same task. Horticulture, on the other hand, encompasses a wide range of tasks that must be accomplished to complete the process from beginning to end and therefore persons can be assigned various tasks that are integral to the process depending on their unique interests and abilities. For example, persons who have difficulty sitting still to complete an activity, or those persons who can no longer follow two-part directions, can still engage in the process of watering a garden with minimal assistance.

Powell and colleagues (1979) found that participating in an indoor gardening program resulted in participants demonstrating significantly higher levels of active engagement among nursing home residents on gardening days than non-gardening days (Powell, Felce, Jenkins, & Lunt, 1979). In addition, persons who did not join the gardening activities continued to engage in activities and in interactions with others at low levels, while gardeners engaged in these activities at significantly higher levels.
These researchers concluded that when given the opportunity, frail elders were able to engage at much higher levels than previously demonstrated or anticipated by caregivers.

Three pilot investigations implemented by the authors studied the effects of a dementia-specific HT program and found that HT resulted in varied outcomes in engagement and affect levels (Gigliotti, et al., 2002; Gigliotti & Jarrott, 2003, Jarrott, et al., 2002). Two of the studies (Gigliotti & Jarrott, 2003, Jarrott, et al., 2002) found significantly higher levels of active engagement during HT than during traditional activities, and all three studies (Gigliotti, et al., 2002; Gigliotti & Jarrott, in press, Jarrott, et al., 2002) found that participants spent significantly less time non-engaged during HT than during traditional activities. Two of the three studies also resulted in higher levels of positive affect during HT than during traditional ADS activities (Gigliotti, et al., 2002; Jarrott, et al., 2002). Therefore, HT activities are a good fit for therapists who utilize task analysis to break down activities into fundamental steps, in order to facilitate the selection and modification of tasks that can meet the individualized needs of persons with compromised competencies (Ebel, 1991). Providing activities that can be modified will result in persons spending greater proportions of their time engaged in purposeful activity and less time engaged in self-stimulating and sedentary behaviors.

The combination of adaptive behavior, characterized by high levels of engagement in the presented activity and high levels of positive affect support the conclusion that HT activities could be used to achieve the desirable zone of maximum performance within the environmental press model (Lawton & Nahemow, 1973).

Adapting the social and physical environments to match program participants’ skills and interests is essential to effective HT programming. Because gardening is among one of the most commonly cited active leisure pursuits of older adults, the use of gardening activities and plant materials addresses the social histories and procedural memories essential to person-centered, dementia-care activities (Hill & Relf, 1983). Continuity in
activities and interests throughout adulthood is an adaptive strategy to the processes of aging (Atchley, 1982). Although continuity theory emphasized normative aging experiences, research has demonstrated that persons with ADRD also seek to maintain continuity as well (Menne, Kinney & Morhardt, 2002). In a study that assessed the meanings that institutionalized elderly persons associated with growing plants, findings indicated that the plants stimulated the participants’ memories of pleasant past events and also provided them with a reason to track time and anticipate the future. For example, some of the participants had brought potted plants from their own homes to the institutional care facilities, while others looked forward to the flowering and harvest seasons affiliated with the plants’ life cycles (Rappe & Evers, 2001). Expanding the repertoire of activities offered in dementia-care programs to include meaningful pursuits that are continuous with individuals’ pasts can stimulate competent behavior and facilitate subsequent positive affect.

HT programming is also consonant with the environmental press model in that an inherent aspect of the profession is the adaptation and manipulation of the environment to reduce environmental press levels imposed on persons with disabilities, including dementia. Horticulture therapists minimize barriers to gardening using a number of strategies, including adaptive tools and equipment, raised beds and container gardening, indoor gardening, and specific design techniques that facilitate wayfinding, as well as careful plant selection, using only those that are non-poisonous, safe, and tolerant of less than desirable growing conditions.

One growing area of research has concentrated on design considerations that must be attended to when designing gardens for persons with AD (Ebel, 1991; Kavanagh, 1995; Mooney & Nicell, 1992). The specific design suggestions reviewed in these publications span beyond the scope of this paper; however, the finding that the use of the exterior environments reduced aggressive behavior in persons with AD
supports incorporation of gardening programs into dementia-care programming (Mooney & Nicell, 1992). Cohen-Mansfield and Werner (1998) found that nursing home residents with dementia who were known to pace excessively, exhibited reductions in pacing behavior as well as more positive affect when an outdoor garden visit was introduced. Another study that examined the effect of a walled garden on persons with Alzheimer’s disease did not find a significant change in disruptive behaviors, but persons who utilized the garden demonstrated less sleep disruption and less overall disruptive behaviors in comparison to persons who infrequently utilized the garden (Mather, Nemecek, & Oliver, 1997). Mather and colleagues hypothesized that lack of significant differences in disruptive behaviors may have been due to limited use of the garden by residents in the cold Canadian climate where the study took place. This finding has implications for the needed dosage of exposure to gardening areas and activities. At this time there is no prescribed amount of HT activity supported by empirical research.

Stimulation of the senses and the creation of a more home-like, familiar environment are additional reasons to incorporate horticulture materials and activities into programs aimed at achieving a person-environment fit for persons with dementia. Plant materials can be used to stimulate visual, auditory, tactile, and olfactory senses to create a soothing environment that can reduce overstimulation of elders with dementia (Rappe & Linden, 2004; Ulrich, 1979; Ulrich, 1999). Environmental cues, including sundials, signs, and landmarks such as sitting areas or plantings that are characteristic of specific seasons, may help participants regain a sense of reality orientation and direction in way finding. These environmental cues provide persons with memory impairment a sense of security and familiarity that increases the mastery with which they can exercise their autonomy as they utilize the space that was created with their special needs in mind.
In summary, HT activities support the environmental press model in that they can be used to elicit adaptive behavior as well as positive affect by enhancing individual competence and modifying the environment to reduce press levels. Supporting competence through the use of a strengths perspective and the continued use of intact abilities, along with an environment that has been tailored to minimize disability and support personhood through adaptive equipment, HT can elicit positive outcomes for a wide range of persons with varying abilities and interests.

Meeting Higher Order Needs through HT

One component of the environmental press theory is the assertion that the person environment fit must be considered at two levels comprised of lower life maintenance needs and higher order needs, including benefits encompassed by biopsychosocial domains (see Figure 2). HT has been demonstrated to provide benefits in social, psychological, physical, and cognitive domains of functioning to a wide range of elderly populations, including cognitively intact elders and various institutionalized elderly persons exhibiting a range of symptoms (Midden & Barnicle, 2002; Mooney & Milstein, 1994; Powell, et al., 1979; Rappe & Linden, 2002). Benefits to well being include increased socialization and reminiscence as well as self-esteem and life satisfaction. Other outcomes attributed to participation in HT programs for various groups of older adults include increased motivation, initiation, and physical functioning resulting in greater levels of independence and autonomy (Burgess, 1990; Mooney & Milstein, 1994).
Researchers have recorded some of the social benefits obtained through gardening (Relf, 1981; Sarno & Chambers, 1997). A variety of studies have documented that gardening in groups increases social interaction and provides a non-threatening means for engaging in new relationships (Rappe & Evers, 2001; Relf, 1992). Relf (1992) reported that group gardening increased communication, socialization, and a sense of commitment and responsibility to the group, thus creating an overall sense of community. In a qualitative study conducted by Rappe and Evers (2001), growing plants had social meaning for the residents of a long-term care facility. More specifically, the residents reported that the plants enabled the residents to perform significant acts for other people such as giving advice and services as well as plants and seeds. Rappe and Evers (2001) also found that the participants began to form a collective identity and were able to share common experiences from earlier in their lives.

Institutionalization and the decline of cognitive skills are often accompanied by decreased contact with the larger community. Because humans are social by nature, the prolonged lack of social contact often results in ill-being and even subsequent dysfunction (Hansson & Carpenter, 1994). Relationships affect psychological well-being, help individuals to develop a sense of self and worth, and also have been found to be

<table>
<thead>
<tr>
<th>Higher Order Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>socialization, meaningful engagement,</td>
</tr>
<tr>
<td>need for privacy, ability to exercise</td>
</tr>
<tr>
<td>preferences</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lower Life Maintenance Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>bathing, feeding, dressing, toileting,</td>
</tr>
<tr>
<td>transferring</td>
</tr>
</tbody>
</table>
associated with a number of health outcomes. One study found that in a sample of older adults living in a long-term care setting in Finland, visiting the outdoors was associated with higher levels of self-rated health as measured by the Nottingham Health Profile (NHP) (Rappe, Kivela, & Rita, 2004). The same team of researchers also found that older institutionalized elderly persons indicated that they were more cheerful and alert outdoors than indoors and that visiting the garden may affect the subjective well-being (Rappe & Kivela, 2004).

Although benefits of HT programs have been documented with a wide range of populations, very few researchers have examined the effects of HT programming on persons with dementia. Jarrott and Gigliotti (2002) reported that ADS participants experienced a wide range of benefits in social, psychological, physical, and cognitive domains of functioning ranging from fine motor skills to socialization to nurturing another living entity. Evaluation of the benefits presented in that study was limited to the HT researchers and participants; staff were not asked to assess the activities. Additionally, although the benefits were operationalized and clearly defined to promote reliability and internal validity, the use of unstandardized measures limit the utility of the findings.

A study conducted by Rappe and Linden (2002) interviewed staff working in a dementia-care facility about the responses of the residents to plants and horticulture activities. A number of benefits were reported, including increased self-esteem and elicitation of positive emotions. Additionally, it was reported that agitated and anxious persons could be soothed with familiar plants and stimulation of the senses. Sensory stimulation has been found to reduce agitation and need-driven behaviors in previous research (Witucki & Twibell, 1997). This knowledge has been applied in the most practical clinical setting; in fact, a research study that modified the shower room to embrace aspects of the natural environment, such as plants, pictures of animals, and
tapes with birdcalls, resulted in decreased agitation and aggression compared to a treatment group (Whall, Black, Yankou, Kupferschmid, Foster, & Little, 1997).

Another benefit of HT activities is that they provide an outlet for creative expression that empowers the individual to exert control over some aspect of his/her environment. HT activities offer the added benefit of creating a valuable end-product. Although the focus of HT is on the process of horticulture, consistent with Bowlby Sifton’s (2000) emphasis, the creation of a tangible end product of value that can be utilized and shared with others is an important component to the principles of HT. The acquisition of resources harvested from the garden may enable the older adult with limited functional abilities to engage in reciprocal exchanges with others, thus working to offset some of the inequities inherent in the power status in the relationship between caregivers and care recipients. This higher order need for independence and equity in social relationships can be achieved through the use of HT programming.

Summary of HT and the Environmental Press Model

As the number of persons diagnosed with dementia continues to rise, the importance of understanding how to provide adequate and holistic approaches to treatment becomes paramount. HT activities have demonstrated promise for dementia care programmers seeking treatment alternatives that can successfully engage groups of participants and elicit positive affectual and behavioral responses. The practice of HT embraces the explanatory mechanisms proposed by the environmental press model by working to facilitate a harmonious balance between the environmental demands and the competence levels of the targeted population, thus resulting in appropriate behavior and positive affect. HT practices adopt a strengths perspective and trigger procedural memories to enhance competencies. Breaking activities down into more simplistic components and introducing adaptations may be applied to HT activities, in order to
successfully include persons representing a wide range of functional and cognitive abilities.

Concerning the environmental component of the environmental press model, HT embraces and recognizes the importance of adapting the physical environment to induce competencies in persons with reduced capabilities. The use of design techniques, adaptive equipment, and familiar plants and activities contributes to the ability of persons with dementia to achieve greater levels of independence and mastery over their environments. Additionally, HT activities’ generational and developmental appropriateness help preserve the dignity, social history, and autonomy of this group of older adults.

Finally, the psychosocial benefits that can be obtained from participation in HT programming represent the higher order needs that can be attended to through an effort to sustain a person-environment fit. As persons exercise intact abilities and achieve improvements in biopsychosocial domains of functioning, levels of mastery and independence are enhanced for greater periods of time allowing persons impaired by this progressive disorder to sustain quality of life well into the disease progress.

HT can support competencies in persons with dementia by providing a means in which therapists can help individuals achieve an appropriate person-environment fit. HT embraces a strengths approach guided by a person-centered philosophy of care to elicit positive outcomes for persons with dementia, who are vulnerable to environmental docility due to their diminished competencies in the cognitive realm. Horticulture therapists actively modify the gardening activities in addition to the social and physical environments to help persons achieve active engagement and positive affect. These outcomes are indicative of persons in the AL and the zone just to the right of that zone, the maximum performance potential.
Limitations of Previous Research

Continued research in the fields of HT and dementia-care programming are needed to provide sufficient empirical data to warrant the integration of HT into the treatment efforts directed at persons with dementia. The few studies that have explored the effects of HT on persons with ADRD has been limited by a variety of empirical factors due to resource limitations and the exploratory nature of studies.

The research on the effects of HT on persons with ADRD has been limited by relatively small sample sizes with demographically homogenous participants. The use of a larger sample will increase the statistical power with which findings can be interpreted (Howell, 2002). Obtaining sufficient statistical power is an important aspect of minimizing stochastic effects, which are observable changes in outcome measures produced by chance. Power calculations can give researchers information about how large their experimental and control groups must be to detect outcomes consistently (Rossi, Freeman, & Lipsey, 2004). This will enhance the external validity of the study and enable the researchers to generalize their findings to the broader population of persons with ADRD in dementia-care settings.

To date, the research that has examined the effects of HT on persons with dementia has compared a group’s responses during traditional activities to their own responses during HT activities. The use of experimental and quasi-experimental designs that include treatment and comparison groups, who have been randomly assigned to each condition, will strengthen the internal validity of the design by reducing the impact of carry-over effects that must be considered when using reflexive controls (Howell, 2002; Rossi, Freeman, & Lipsey, 2004).

Comparing HT activities to other therapeutic activities that utilize a similar strengths approach will help researchers to more definitively conclude the effect of the HT programming content on outcomes. At this time, it could be argued that other
therapeutic approaches utilizing similar approaches with differing medium could be just as effective at eliciting positive outcomes. Similarly, comparisons should only be made between HT and active presentations of a traditional activity. For example, in a study conducted by Gigliotti and Jarrott (in press), some of the observations included in the analyses included transitional and rest periods that ran into the time designated for the scheduled activity, resulting in comparison data that did not always capture the intended intervention. Therefore, a careful examination of the events occurring during all data collection periods is important to enhance internal validity.

In addition, previous HT research on persons with ADRD has been limited by missing data that provides important information about functional and cognitive characteristics of the program participants. Given that these variables are known to impact the outcomes experienced by the program participants, the importance of statistically controlling for these variables to minimize confounding effects is paramount. The ability to control for other confounding effects such as the time of day will also enhance the internal validity of the design. It is problematic to compare activities facilitated in the morning to those facilitated in the evening hours because many persons with ADRD exhibit sundowning. Sundowning is a state of increased agitation, activity and negative behaviors that happens late in the day through the evening hours and is hypothesized to be caused by a range of environmental and physiological factors (Mace & Rabins, 1999).

Measurement issues have also limited previous research examining the impact of HT on persons with ADRD. The use of standardized measures with good to excellent psychometric properties is necessary to ensure measurement reliability and validity. In addition, the mixture of qualitative and quantitative approaches should be integrated to strengthen the design and gain a more holistic picture of the interventions and their effects. Capturing the perspectives of multiple informants through a variety of methods

39
can enable the researcher to triangulate the data and enhance the credibility of the research findings.

Other avenues for overcoming previous limitations in HT research include expanding the level of analysis beyond the individual level and incorporating multiple perspectives from family and staff in order to incorporate a more holistic perspective from a variety of stakeholders. Although multiple perspectives should be sought out, the sole use of proxy informants to represent the experiences of this population of older adults is not adequate. It is important for researchers, embracing a person-centered approach and supporting a strengths perspective, to integrate the perspective of persons with dementia and empower them to inform the research process. Research has indicated that persons with mild to moderate cognitive impairment are able to engage in a reliable and valid assessment of their quality of life (Logsdon & Teri, 1996). Feinberg and Whitlatch (2001) also found that persons with mild to moderate cognitive impairment are able to consistently state their everyday care preferences and information about their demographic information. It is still unknown at what point in the disease progression that reliable reports cease to occur (Albert & Logsdon, 2000). This is further complicated by the fact that there is currently no valid, standardized method to determine decisional capacity and Mini Mental State Exam (MMSE) is not a sensitive measure of ability to state preferences (Feinburg & Whitlatch, 2001). These findings have contributed to an increased acceptance of including the perspective of the person with dementia.

By attending to both process and contextual variables, in addition to outcome variables, results can be interpreted more effectively and practical recommendations can be generated and shared with facilitators. This process evaluation (assessment of the intervention delivery), coupled with a formative evaluation (assessment of outcomes), can make significant contributions to the field by enhancing future programming through systematic improvements to the implementation of the program.
Challenge of Conducting Research in Dementia-care Programs.

Conducting research on persons with ADRD presents some unique challenges in addition to those faced by most social science researchers who conduct their work in naturalistic settings with complex human behaviors and environments. The program theory or intended benefits and outcomes can only be realized if the program activities and interventions are performed in accordance with the processes dictated by the process theory. This challenge is especially evident in programs for persons with dementia relating to several reasons surrounding resource limitations and the cognitive and behavioral deficits experienced by persons affected by ADRD. A variety of factors can interfere with adherence to the intervention protocol, even when it has been specified by an explicit program theory.

Program staff. A variety of programs fall short of implementing the intervention according to the program theory. Even in situations where the program theory and implementation plan have been explicitly articulated, it may not be carried out according to protocol. One of the key factors related to adherence to the intervention protocol is the program staff. In fact, researchers have found that the lack of cooperation from staff oftentimes interfered with the intervention protocol. (Snyder et al., 2001).

Staff persons who are overworked, underpaid, and unaware of the benefits expected from the proposed intervention may passively or actively resist working with researchers (Bonner & Cousins, 1996; Harris-Kojetin, Lipson, Fielding, Kiefer, & Stone, 2004). In fact, according to Bonner and Cousins (1996) one of the main barriers to persons with dementia participating in activities is mobilizing caregivers. The types and level of activities, if provided at all, are inexplicitly tied to the staff persons’ values, beliefs, and attitudes (Pulsford, 1997). Often frontline staff view added responsibility, including transporting persons to the intervention sessions, as burdensome and beyond their job responsibilities. One staff value that has been identified in dementia-care units
is self-preservation through tactics such as getting work finished early in the shift, and avoiding the added responsibility of implementing activities (Pulsford, 1997).

Although the town-gown divide, or the educational and cultural disconnect between scholars and lay persons from a community, may remain a tension in the interface between front-line staff and researchers, the need for open communication and mutual collaboration is essential to ensure the success of implementing psychosocial interventions for persons with dementia. Without the help of staff persons, intervention research in dementia-care facilities can be sabotaged and subjected to increased bias and confounding effects (Bonner & Cousins, 1996). Therefore, researchers must make every effort to achieve the support and trust of the front-line staff by keeping them informed and taking the necessary steps towards creating a sustainable partnership (Gray, Woodward, & Carter, 2001). Staff participation is coupled with the challenges associated with including persons with ADRD in intervention programs and evaluation.

Program Participants. The manifestations of dementia symptomology may also complicate the ability of researchers to implement the intervention protocol as dictated by the program theory. In persons with ADRD, the multiple losses in function, coupled with the high levels of behavioral issues, can result in the inability of an intervention protocol to be carried out effectively. Often persons with dementia do not understand the protocol or it may even induce aggressive and agitated behaviors at times. Ethical considerations about supporting the person’s needs must override any intervention protocol or research project. The personhood of this vulnerable population of elders must be protected and upheld irrespective of desired outcomes.

Lawton and colleagues highlighted some of the problem areas associated with observing affect in persons with dementia (2000). They cautioned observers not to confuse withdrawal and losses of abilities and personality traits with the absence of emotion in persons with ADRD (Lawton, et al., 2000). In addition, persons assessing
affect must make a certain degree of interpretation when their task is to compare observed affect to baseline levels. In order to make this comparison, it is essential that the researchers have a base level of knowledge about older adults with dementia, their strengths and limitations, and their means for expressing themselves. Another potential factor that could mask affectual changes evident to observers are changes in facial expression or body movement due to aging and comorbid diseases or conditions, including Parkinson’s disease and strokes (Lawton, et al., 2000). In order to ensure inter-rater reliability, observers should undergo extensive training and trial observation periods to achieve high levels of agreement in coding.

Even when observers have been trained extensively, the presence of researchers in any applied setting does not go unnoticed. Becoming a “fly on the wall” in a dementia-care setting often proves to be a difficult task, especially when it is essential to have a clear and unobtrusive view of participants. Program participants are usually eager to meet fresh new faces and approach researchers during observational periods resulting in missing data. Additionally, the presence of the researchers may very well produce a Hawthorne effect, in which observed outcomes are modified as a result of being watched. The introduction of researchers into a program may encourage the staff to more closely attend to participants and engage in best practices because they know that they are being watched. This can have enormous implications regarding the psychosocial effects measured.

Staff to client ratios may be low in many formal care settings, resulting in many persons with dementia receiving less than optimal attention and stimulation during the day. Therefore, even one, brief, positive, conversation with an observer or interviewer may result in a spike in positive psychosocial outcomes; resulting from a floor effect. The carryover effects from gross influences, including intervention effects, are unknown
in most studies of psychosocial interventions. Therefore, the field of dementia-care is still developing with regard to methodological rigor and attention to confounding effects.

Conclusions

Therefore, the current study was designed to fill a gap in the research literature regarding the effects of HT on levels of engagement, behavior problems, and affect in persons with dementia. Building on previous research and its associated limitations, the current study is grounded in theory, includes a sample size that is adequate to achieve a desired statistical power and a separate comparison group, and utilizes established measures. In addition, the use of mixed methods and the inclusion of multiple perspectives to capture both process and outcome variables impacting the activity sessions at both HT and comparison sites will enhance the extent to which the analyses can be interpreted and applied to future practice and theory development.

Grounded in the theory of environmental press, the current study seeks to examine the differences in levels of engagement, behavior problems, quality of life and affect in persons with dementia during participation in a HT activity intervention offered at four treatment sites compared to traditional activities at four comparison sites. In addition, contextual factors and processes associated with the implementation of the programming at both HT and traditional activities sites will impact the outcomes observed. Many of these contextual factors will also support the value of the environmental press model but may shed more light on other theoretical models and perspectives that can be integrated into the current framework guiding this study. Based on the empirical literature and the principles and procedures inherent in the practices of HT that support the theory of environmental press, I have several hypotheses concerning the differences between the HT and traditional groups during the activity sessions and the factors that influenced these hypothesized relationships.
Study Hypotheses

1. Participants in HT will exhibit higher levels of adaptive behavior (a greater percentage of time exhibiting high levels of active engagement and a lesser percentage of time exhibiting passive engagement) than participants in traditional ADS activities.

2. Participants in HT activities will exhibit a smaller percentage of time exhibiting behavior problems than participants in the traditional ADS activities.

3. Participants in HT activities will experience more positive affect (a greater percentage of time exhibiting higher levels of pleasure and interest and a lesser percentage of time exhibiting higher levels of anxiety/sadness) than participants in the traditional ADS activities.

4. Contextual and procedural factors will influence the implementation of the activities as well as the outcomes exhibited by the program participants.

5. High levels of productive engagement will be associated with high levels of pleasure and low levels of non-engagement and self-engagement.

If the hypotheses for this study are confirmed through empirical data, then HT could be utilized as an effective treatment modality for persons with dementia in dementia care programs. Support for the hypotheses would indicate that HT activities can be incorporated into the holistic model guiding person-centered approaches because it is successful at engaging individuals with dementia in meaningful and purposeful activity, which will promote overall well-being and quality of life by instilling a feeling of competence. Additionally, the exploration of these hypotheses will identify some of the contextual and procedural factors that impact observed outcomes and should therefore be systematically defined, operationalized, and measured to enhance future dementia-care intervention research endeavors.
CHAPTER III

Methods

Participants

A range of participants, representing a variety of roles, were included in the current investigation in order to assess both process and outcome variables on multiple levels. The investigation primarily focused on the experiences of older adults with dementia during HT programming. Therefore, a non-random sample of older adults with a diagnosis of dementia were selected from eight dementia-care programs in the Roanoke and New River Valley areas. Five nursing homes (NH) and three adult day service (ADS) programs within one-hour of the University agreed to participate in the study. The sites were selected on the basis of their proximity to the university, their willingness to host the research team and HT facilitators, and the explicit agreement that traditional programming would be provided during the observational periods. A table summarizing each site’s characteristics is presented in Appendix A.

Participants as a Source of Outcome Data

Treatment sites. Four of the sites (one ADS program and three NH) were randomly assigned to be treatment sites and receive HT programming for six weeks. The PC and PI wrote the sites’ names on pieces of paper and selected them from a small box. Every other site name chosen from the box was assigned to the treatment condition. The first participating ADS program was located in a university setting and also served as the pilot test group for related preliminary HT research. This not-for-profit university program typically served between 8-12 participants daily. The second treatment site was a for-profit nursing home and rehabilitation center that also housed persons with dementia. This 90-bed facility integrated residents with dementia onto the unit with the cognitively intact residents. The third treatment site was a 60-bed, for-profit nursing home located in the New River Valley and was divided into two wings, one of
which was a locked dementia care unit. The fourth treatment site was a state-run veterans care facility that served approximately 98 residents with varying levels of cognitive capacity.

*Comparison sites.* The other four sites (two nursing homes and 2 adult day programs) were selected to be comparison sites and agreed to have the researchers observe regularly scheduled activity programming at two data points over a period of six weeks per site. The first comparison site was a not-for-profit ADS program that served 10-16 participants each day. The second comparison site was a not-for-profit ADS program that served approximately 30 participants each day. The third comparison site was a not-for-profit, veterans care facility that provided care to end-stage dementia patients on a locked unit with 29 beds. The fourth comparison site was a not-for-profit nursing home with a mixed population of residents that housed 226 beds.

*Individual participants with dementia.* Inclusion criteria for individual participants required a documented diagnosis of dementia in the medical chart, the ability to leave the private bedroom to attend activities in the common area, and a signed consent form from the legal guardian or family caregiver, indicating that they approved of their relative’s participation in the project. Program administrators worked with the PC and PI to generate a list of individuals who met this criteria and this list was distributed to the observational research team.

To be included in the analyses, participants must have attended at least half (3 of the 6 possible frames) of one HT or traditional activity session. This decision was made in order to enhance the sample size because a variety of factors resulted in a limited number of participants who were in attendance at the majority of the observed sessions. At several sites staff support was lacking and the facilitators had difficulty identifying and transporting the desired participants to the activity area. In some situations, desired participants were unavailable because they were receiving physical care or were
otherwise engaged in other endeavors such as beauty parlor appointments. Additionally, during the course of the six-week intervention, participants moved, became ill, and even died in some instances. In other cases, participants joined the program once the study intervention had begun.

In an attempt to account for the range in observed timeframes, correlations were calculated between the number of timeframes observed and the ten outcome variables used in the analyses. Correlations were only significant between the number of observed time frames observed and two of the engagement categories, AE ($r = -0.25$) and OE ($r = -0.28$); these negative correlations indicated that the shorter period of time that the participant was observed, the more likely that they were to spend more than half of their time exhibiting active engagement and other engagement. Interestingly, both of these categories require active involvement in an activity. Consistent with the economic principle of diminishing returns, the longer the participant was in attendance at the activity session, the lower the levels of productive engagement. This could indicate that the participants who were in attendance for a smaller percentage of the total observed timeframes completed the presented activity and then left the session. Likewise, it could indicate that the participants who were in attendance at the sessions for a longer period of time lost momentum, ran out of materials, or simply paced themselves at a different rate. Correlations were also run between the number of observed timeframes and level of impairment. Correlations were not significant between total time frames and score on the MMSE or Barthel Index, indicating that the participants who were in attendance at the activities for a shorter period of time were not significantly more or less impaired in terms of cognitive and functional status, respectively.

Participants as a Source of Process Data

In order to gain a greater understanding of the process and contextual variables that contributed to the quantitative outcomes assessed in the participants with dementia,
additional participants were included in the study sample. Qualitative interviews were conducted with both activity facilitators and HT facilitators from each of the study sites (see table 1 for a description of the interviewees). A focus group session was also conducted with the research team members who collected the observational data.
### Interviewee Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>HT facilitator 1</th>
<th>HT facilitator 2</th>
<th>Traditional Facilitator</th>
<th>Traditional Facilitator</th>
<th>Traditional Facilitator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>Sites: T1-T4</td>
<td>Betty</td>
<td>Site: C1</td>
<td>Dana</td>
<td>Emma</td>
</tr>
<tr>
<td>Betty</td>
<td>Sites: T1-T4</td>
<td>Cara</td>
<td>Site: C2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cara</td>
<td>Site: C1</td>
<td>Dana</td>
<td>Site: C2</td>
<td>Emma</td>
<td></td>
</tr>
<tr>
<td>Dana</td>
<td>Site: C2</td>
<td>Emma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emma</td>
<td>Site: C3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Age**
- Amy: 23
- Betty: 22
- Cara: 43
- Dana: 57
- Emma: 48

**Gender**
- Amy, Betty, Cara, Dana, Emma: Female

**Race**
- Amy, Betty, Cara, Dana, Emma: Caucasian

**Education/Training**
- Amy: B.S. in HT, experience in psychiatric hospital; limited experience working with persons with dementia; limited Horticulture training
- Betty: B.S. in HD training and experience with persons with dementia; limited Horticulture training
- Cara: M.S. in progress, board certified in music therapy, experience with all populations, many CEUs
- Dana: B.A. certified in activities for 15 years, 24 years in healthcare, working with persons with dementia, 500 hrs in CEUs
- Emma: 4 years experience with activities, 3 yrs with persons with dementia; no formal education; on the job training and CEUs

*Note:* CEUs is an abbreviation for continuing education units
HT facilitators. Two Virginia Tech students responsible for planning and facilitating the HT activities were interviewed (see Appendix B) to gain a greater understanding of the processes inherent in their facilitation techniques and the contextual factors that had an impact on the HT sessions at the various sites. Both of the students were Caucasian females in their early 20s (22 and 23 years old). While one of the facilitators had a bachelor’s degree in HT, the second facilitator had a degree in Human Development and more extensive experience working with older adults with dementia. The two HT facilitators worked together at all four treatment sites. Both facilitators signed informed consent forms prior to participating in the study. Pseudonyms were assigned to these HT facilitators to protect their identities. Amy and Betty are the HT facilitators, who implemented programming in one adult day service (ADS) program and three nursing homes (NH).

Traditional activity programming facilitators. Activity facilitators from the four comparison sites were interviewed (see Appendix C) to learn more about their facilitation techniques and programmatic environments. Each of the facilitators were asked to sign an informed consent form prior to the interview. All three of the traditional facilitators were also Caucasian women, and each had a different educational background ranging from a community college training course to specialized training in the field of dementia care. Each of the three traditional programming facilitators worked full-time at one of the three comparison sites. While the comparison site facilitators may have led the activities alone at times, they were often accompanied by nursing assistants, interns, and other facility staff during activities programming. Pseudonyms were assigned to the traditional activity professionals; Cara, and Emma worked in a NH and Dana worked in an ADS program facilitating the comparison groups.

Research team members. Six research team members responsible for collecting observational data during the traditional and HT activity sessions were invited to participate in a focus group session (see Appendix D) designed to assess contextual information that impacted the outcome data collected. All six female participants were students in the department of
Human Development gaining credit for their work on the project. All six participants were asked to sign an informed consent form prior to participating in the focus group sessions.

**Instrumentation**

The study utilized multiple methods of assessment on a variety of participants to capture both outcome and process variables. Data was collected that provided descriptive information about the participants’ characteristics (gender, race, age) as well as their current level of cognitive and functional capacity. Outcome measures designed to understand the effects of HT on persons with dementia included: (a) participant interviews, and observational assessment of participants’ (b) engagement, (c) affect, and (d) problem behaviors during the sessions. Program staff were also be asked to provide their perceptions of the effectiveness and appropriateness of the program in a brief survey at the culmination of the HT program. To assess the process and other contextual variables that contributed to the effects of the programming on the participants, activity and horticulture facilitators were interviewed. Research team members, responsible for collecting the observational data, were invited to participate in a focus group at the culmination of the study to provide rich contextual information and feedback that could not be assessed using the chosen quantitative instruments.

**Participant Characteristics**

**Demographics.** Participant characteristics include basic demographic information and functional impairment status. Demographic information was obtained from facility staff using the participants’ files to gather data regarding gender, age/birth date, race, and diagnosis. A survey inquiring about each treatment participant’s gardening social history was distributed with the informed consent forms.

**MMSE.** Level of cognitive impairment was assessed using the MMSE (Folstein, Folstein & McHugh, 1975) (see Appendix E). The observational research team members administered this instrument in order to assess whether participants were operating at mild, moderate, or severe levels of impairment due to the effects of dementia. MMSE assessments were all
conducted within 6 months of the study to ensure more accurate scores. The MMSE contains eleven questions that are designed to assess seven different dimensions of cognitive functioning. On a scale ranging from zero to thirty, low scores (10 and below) indicate the greatest impairment, middle range scores (from 11-19) indicate moderate levels of impairment, and higher scores (from 20-26) indicate mild cognitive impairment, with those individuals scoring 24 and higher representing individuals who are cognitively intact, despite the fact that they have a diagnosis of dementia. The MMSE has been widely used and recognized as a valid, reliable, and sensitive aid to examine individuals for ADRD (Brayne, 1998; Pangman, Sloan, Guse, 2000).

Barthel Index. Level of functional impairment was assessed using the Barthel Index (see Appendix F). The Barthel Index is one of the most widely used scales to assess functional levels of self-care and mobility in the physically impaired (Mahoney & Barthel, 1965). The index is comprised of ten items that pertain to activities of daily living (ADLs) and are scored according to whether the person can perform the task independently or whether they need help. The individual subscale ratings are aggregated into a single “output” rating, which is computed with the simple addition of the item scores, with a score of 100 indicating independence in all ADLs (Mahoney & Barthel, 1965). The Barthel Index has demonstrated adequate observer and test-retest reliability, validity, and sensitivity (Wade & Collin, 1988). Research team members worked with program staff at each site to obtain scores for each of the participants.

Observational Data

Measure of affect. In the current investigation, affect was assessed using a modified version of the Apparent Affect Rating Scale (AARS) (Lawton, et al., 1996). The AARS is an observational tool designed to assess affect in persons with moderate to severe dementia, who are often unable to self-report on their own affect. The original instrument assesses five affective states (3 negative emotions and 2 positive emotions) over a 5-minute period. Observers indicate the range of time that participants display each of the emotions at five-
minute intervals. Psychometric testing of this instrument has demonstrated good to excellent inter-rater reliability and validity (Lawton, et al., 2000). In addition, the AARS has demonstrated adequate sensitivity in capturing differences in affect as individuals experience varying environments. It is suggested that this instrument represents a reliable and valid tool for measuring outcomes of various interventions targeting individuals or groups of individuals (Lawton, et al., 2000).

A streamlined version of the scale (see Appendix G) was utilized to assess three affective domains: pleasure, anxiety/sadness, and interest. This decision was justified by previous research, which demonstrated that anger was rarely observed, and that inter-rater reliability could be enhanced if anxiety and sadness were collapsed into one code (Gozali, 2001; Judge, Camp, & Orsulic-Jeras, 2000). Each affective state was coded using a set of guidelines that included examples of facial and vocal expressions as well as hand and eye movements that indicated the emotions exhibited by each participant (see Table 2). Each observer rated the length of time (0=not at all, 1=up to ½ of the observation, 2= More than ½ of the observation and 9=sleeping or can’t tell) that the emotion was exhibited by each participant at the culmination of five-minute increments over a total time frame of 30 minutes. Following extensive training and practice, each observer reached 95% coding agreement with the project coordinator (PC).
Table 2

The Apparent Affect Rating Scale (AARS) Coding Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleasure</td>
<td>Laughing, singing, smiling, kissing, clapping, sparkling of the eyes,</td>
</tr>
<tr>
<td></td>
<td>stroking or gently touching other, reaching out warmly to other</td>
</tr>
<tr>
<td>Interest</td>
<td>Participating in task, maintaining eye contact, looking around, eyes</td>
</tr>
<tr>
<td></td>
<td>following object or person, responding to cues, turning body or moving</td>
</tr>
<tr>
<td></td>
<td>towards person or object without obvious signs of pleasure or anxiety/sadness</td>
</tr>
<tr>
<td>Anxiety/</td>
<td>Repetitive calling out, restlessness, repeated or agitated movement,</td>
</tr>
<tr>
<td>Sadness</td>
<td>crying, moaning, head in hand, overt statements of anxiety or sadness,</td>
</tr>
<tr>
<td></td>
<td>hand wringing, rapid breathing, tight facial muscles, sighing. Statements</td>
</tr>
<tr>
<td></td>
<td>of anxiety of sadness</td>
</tr>
</tbody>
</table>

Measure of engagement. The Menorah Park Engagement Scale (MPES) was used to capture five types of engagement commonly displayed by persons with dementia when presented with activity options (see Appendix H). The categories (see Table 3) reflect the level and type of involvement with the activity, and the codes reflect the amount of time spent in a certain category of engagement (0 = not at all, 1 = up to ½ of the observation, 2 = more than ½ of the observation). The observer recorded the duration of time each participant spent in each type of engagement at the culmination of five-minute time frames over a total period of 30 minutes. If two or more of the behaviors took place at the same time, the observers were trained to make coding decisions based on a hierarchical ladder of the behaviors (see Figure 3). This scale has not yet been assessed for validity in large-scale studies; however, the scale developers report a 95% inter-rater agreement and high content validity (Orsulic-Jeras, Judge & Camp, 2000). Prior to observations, inter-rater reliability of 95% was achieved between the observers and the PC.
Table 3

The Menorah Park Engagement Scale (MPES) Coding Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description of Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active (AE)</td>
<td>Active Engagement in presented activity: motor or verbal response to the activity</td>
</tr>
<tr>
<td>Passive (PE)</td>
<td>Passive engagement in presented activity: listening to or observing the activity</td>
</tr>
<tr>
<td>Self (SE)</td>
<td>Repetitive or self-stimulating behaviors: excessive rubbing, wringing hands, wandering</td>
</tr>
<tr>
<td>Non (NE)</td>
<td>Asleep or disengaged from an activity: “zoned out” or blank stare</td>
</tr>
<tr>
<td>Other (OE)</td>
<td>Doing or attending to an activity other than the target activity presented</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did/Commented on target Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did/Commented on target Activity</td>
</tr>
<tr>
<td>Listened/Watched target activity</td>
</tr>
<tr>
<td>Did something productive other than the activity</td>
</tr>
<tr>
<td>Repetitive Behavior</td>
</tr>
<tr>
<td>Slept/kept eyes closed stared into space</td>
</tr>
</tbody>
</table>

Figure 3. MPES Hierarchy Ladder

Measure of Behavior Problems. The Revised Memory and Behavior Problem Checklist (RMBPC) (Teri, Traux, Logsdon, Uomoto, Zarit & Vitaliano, 1992) captures information on characteristics of dementia strongly associated with caregiver stress and well being. These
characteristics may also be indicative of the well-being of the person with dementia, as they are often interpreted as need-driven behaviors (Algase, et al., 1996) and an approach by which the individual expresses his/her needs. The 20 behaviors included in the instrument are commonly exhibited by persons with dementia and are often described as those that are most frustrating, embarrassing, and challenging for caregivers to manage. The scale is comprised of three factors, including depression, disruption, and memory-related problems and the Chronbach’s alpha coefficient reliabilities of the subscale indexes range from .67 to .89. Concurrent and discriminant validity of the RMBPC were confirmed through examination of the relationship between the RMBPC and the Hamilton Depression Rating Scale, the Mini-Mental State Exam, the diagnosis of depression and dementia and the Center for Epidemiological Study-Depression Scale.

The original scale has demonstrated good to excellent reliability and validity, and is recommended for use in both clinical and empirical assessments of behavior problems in persons with dementia (Truax, Logsdon, Uomoto, Zarit, and Vitaliano, 1992). Although the original version of the instrument is administered in an interview format, in which caregivers are asked to retrospectively report on the person with dementia’s behavior, in the current investigation a trained observer coded the participants’ behaviors over the course of the 30-minute activity (see Appendix I). Each item on the scale was operationalized with a descriptor and example of what that item would look like in this population in the context of the activity environment by the PC (see Appendix J). Observers first noted those behaviors exhibited by the participants and then indicated the number of times and duration that each instance of the behavior lasted. This information enabled the researchers to determine the total amount of time that each problem behavior occurred over the course of each activity for each observed individual. The observer and PC achieved 95% coding agreement prior to data collection in order to enhance inter-rater reliability.
Quality of life measure. The Quality of Life-Alzheimer’s disease (QOL-AD) (Logsdon, Gibbons, McCurry, & Teri, 1999) is a measure of subjective quality of life in persons with dementia. The self-report measure has demonstrated good reliability ($\alpha = .83$ to .90). The instrument was validated through psychometric testing with measures of depression, day to day functioning and pleasant events frequency. Research has demonstrated that persons with mild to moderate dementia can reliably report on their preferences, choices, and involvement in decision-making. Therefore, researchers can and should enhance their autonomy and quality of life by including their perspective (Feinberg & Whitlatch, 1999). The scale is recommended as a reliable and valid instrument for assessing quality of life in persons scoring 10 or higher on the MMSE (Logsdon, Gibbons, McCurry, & Teri, 2002).

In the current study, the scale was slightly modified from its original version to specifically capture the adults’ perspectives on the questions that were relevant to participation in the activity that was just presented to them (see Appendix K). Seven questions were asked of the participants by a trained research assistant (RA) during a brief interview. Using a cue card with images of faces displaying varying levels of sadness to happiness, the interviewers asked the participants to rate (poor, fair, good, and excellent) their mood, energy level, ability to participate in the presented activities, ability to help others during the activity, and life as a whole. In addition, the participants were asked to choose their favorite activity from four choices commonly offered in dementia care programs using a visual cue card. Following each question, interviewers recorded any open-ended responses that were given by the respondents in addition to their structured response.

Staff Assessment

Interviews with program facilitators. An eleven-item open-ended interview was developed for the current study in order to capture some contextual and procedural variables that may have enhanced the outcomes of the HT and traditional activity programming on the participants (see Appendices A and B). Information regarding the social and physical
environment of the facilities, facilitation techniques implemented to elicit optimal outcomes, and philosophical underpinnings and goals guiding the sessions was gathered. Both HT facilitators and the traditional activity facilitators from the four control sites were asked to qualitatively share this information during a tape-recorded, 30-45 minute interview with the PC.

**HT facilitator journaling.** Following each session, both of the HT facilitators recorded an entry into a journal using a semi-structured format. Journal entries addressed information about facilitating the activities, including challenges as well as noted benefits obtained by the participants. Facilitators also addressed how they supported the participants by modifying the activity or the environment to balance the varied competence levels displayed by the participants. Information about interaction with the program staff and other persons other than the targeted participants was also recorded when relevant. Facilitators were also asked to provide anecdotal evidence about the success of the activities, based on verbal and non-verbal feedback from the participants and nursing staff. The journals were not systematically assessed in the current investigation; the data was inconsistently submitted and lacked rich information that provided insightful details.

**Focus group with the research team.** To document valuable contextual information regarding the observed programming and facilitators, as well as the perceived limitations of the instrumentation, the observational research team was invited to participate in an hour-long focus group session (see Appendix D) after the observational data collection was complete. Participants were asked to discuss process variables and other salient contextual factors that appeared to impact the outcomes observed during the HT and traditional programming. Participants were asked to describe the interaction patterns and facilitation techniques of the various facilitators and program support staff. Additionally, participating research staff were asked to discuss the perceived limitations of the instruments utilized in data collection and to describe information that appeared to be critical in terms of understanding the outcome variables of interest. A focus group was utilized in order to give the RAs the opportunity to
share their ideas and perceptions in a setting that facilitated enhanced data quality since the participants serve as a check and balance on one another, hence filtering out false or extreme views (Krueger & Casey, 2000). The focused nature of the exploration, mainly an interest in those factors that impacted the quantitative outcomes, further supported the use of a focus group.

**Procedures**

**Prior to Data Collection**

Eight dementia-care program administrators (from 5 nursing homes and 3 adult day care programs) were invited to participate in the study. The primary investigator (PI) and project PC scheduled an appointment to meet with both the program administrator and activity facilitator from each site to outline expectations and come to consensus regarding research protocol. Each program administrator received a packet of information that contained: (a) a description of the project, (b) the IRB synopsis and approval number (see Appendix L), (c) observation schedule, (d) data collection procedures and instruments, and (e) blank table that outlined the necessary demographic data that each facility agreed to supply the research team for the study.

Each site made a commitment to host the observational research team during traditional activities, provide demographic data on the participants, and aid in the distribution and collection of informed consent forms in exchange for HT programming for six weeks at the treatment sites and a cash donation to the facility and a manual of HT activities developed by the PI and PC at every site. Informed consent forms were accompanied by a cover letter that was endorsed by the program administrator and sent to family caregivers or otherwise specified legal guardians of the target participants in a self-addressed, stamped envelope. In some instances the facilities agreed to provide the research team with the address list and in other situations, the facility staff assumed responsibility for sending out the informed consent forms.

Eleven undergraduate and graduate RAs were selected and trained to collect observational and interview data from the program participants. In addition, the RAs were
trained to collect MMSE and Barthel Index data. Six RAs were trained at the onset of each academic semester using a training booklet developed by the PI and PC. The RAs were divided into two teams, those that were collecting data at the control sites (T,Th team) and those that were collecting data at the treatment sites (M,W team). RAs were told that the study was an investigation of activity programming in dementia care facilities in an attempt to keep them blind to the two conditions.

A training manual was developed by the PC and PI that included an explanation of the project, coding schedule and methods, instruments, and observation and communication strategies useful when studying older adults with dementia. During a series of bi-weekly meetings prior to data collection, the PC and PI provided the RAs with thorough training on each of the instruments, including the extensive coding procedures specific to each instrument. RAs were trained to remain as unobtrusive as possible and to respectfully explain that they would be happy to share any additional information after they were done working, when questioned by staff and participants. In addition, at the culmination of the training period, the RAs received practice administering the MMSE with the target population under the supervision of the PC. The RAs were also required to complete IRB training and certification procedures at some sites to supplement the training they received on characteristics and etiologies of dementia as well as effective communication strategies with this population. Prior to data collection and following the training sessions and practice data collection sessions, each RA obtained 95% coding agreement with the PC, who provided the training and who had used the instruments during prior studies.

Two HT facilitators were also selected and trained prior to the onset of the study. Both facilitators had experience facilitating activities with groups of participants; however, one of the HT facilitators had a degree in horticulture with limited experience working with the older adults with dementia and the second facilitator had more experience with the target population but was lacking extensive horticulture skills or training. Therefore, both the facilitators received training
on the characteristics and etiologies of dementia, proper communication and facilitation
techniques with this population and were also provided with a sample activity calendar and step-
by-step directions to facilitating a variety of HT activities. These directions included an
explanation of incorporating extensions into the presented activity to facilitate sustained
engagement and optimal levels of affect. Both of the HT facilitators remained blind to the
research questions guiding the study and the instruments utilized in data collection.

The HT facilitators then developed a schedule of activities that could be facilitated at the
four treatment sites. All of the activities were selected for anticipated therapeutic benefits within
social, physical, psychological, and cognitive domains. In addition, chosen activities included
those that were simple, cost-effective, and versatile enough for modification in order to be
inclusive of individuals representing a wide range of ability and interest levels. All of the plant
materials were researched to ensure safety and to avoid toxic or poisonous species, due to the
tendency of many individuals with dementia to place objects in their mouths indiscriminately.

**HT Facilitation**

HT programming was offered at each of the four treatment facilities twice weekly for six
weeks, for approximately 30 minutes in a group setting. Participants were given the choice to
join the HT sessions a total of twelve times. The group sizes ranged from 4-16 participants on
any given day; however, the average number of participants was eight at any given session.
When the group size was large, the two HT facilitators divided the participants into smaller sub
groups. This enabled each leader to work more intimately with a smaller group of individuals so
step-by-step instructions, physical and verbal assistance, and a steady supply of materials could
all be provided to each participant in need.

The HT activities represented a range of opportunities from sowing seeds and training
topiaries to craft activities that incorporated horticulture materials or themes. While some of the
activities were designed to facilitate teamwork or cooperative group activity, others were
designed to engage the participants individually in the same activity as one another, defined as
parallel group activity. During the activities, the HT facilitators engaged the participants in social interaction and reminiscence by asking questions about the social histories of the participants and their past involvement with gardening, farming, cooking, and other related topics. No data was collected on the frequency with which these questions were asked or on the responses provided by the participants. The emphasis on this component of the HT session recognized the importance of social interaction and helped the group to identify the meaning inherent in engaging in the horticulture activity.

Program staff were asked to join the sessions each week, to provide assistance getting participants out to the activity area, and to attend to ADL needs of the participants during the HT sessions. The environment for the sessions varied per facility although each group participated in an area designated by program staff, and several of the sites had outdoor patio areas that were accessible when the weather conditions were amenable. This data was not systematically used in the current investigation due to the variable nature of each session and the inability to consistently capture this information. The HT facilitators recorded observations and reflections through weekly journaling following a semi-structured format provided by the PC. Both facilitators sent an electronic journal entry to the PC every Friday, so she could monitor their progress, provide feedback, and have a log of the sessions during the times that the observers did not collect data.

Data Collection

A team of three RAs attended each of the eight sites, and each team member was responsible for utilizing a different observational scale on the same set of participants. All of the RAs were equally responsible for the administration of MMSE and QOL-AD interviews before (MMSE) and after the observed programming (QOL-AD). RAs received assistance from program nursing and activity staff to complete the Barthel index on each participant. Each team collected data over a period of six weeks at two data points; observations took place twice a week during weeks one and two for time one data and again at time two, twice weekly during
weeks five and six (see Appendix M). Each RA could observe up to six participants at once, enabling the team to collect data on a maximum number of 24 participants at each site during each data point. RAs positioned themselves to have a full view of the residents’ faces and body language while attempting to remain as unobtrusive as possible.

The RAs utilizing the AARS and MPES scales coded the occurrence of the different categories of affect and engagement at five-minute intervals over a 30-minute time frame, while the behavior and memory problems were recorded continuously for the same participants by the third observer. Observers used digital timers with a second counter to accurately determine the level of engagement and affect for each time frame. In instances where participants engaged in conversation with the RAs, procedures dictated that the time frames impacted by that conversation be excluded from analyses. The observers also recorded information about the ratio of participants to facilitators and nature of the activities, such as the location where it took place, and the starting and ending time of the activity.

Following the activity, all three RAs approached those participants who were identified by program staff as capable of answering interview questions to determine if they were willing to complete the QOL-AD interviews and offer feedback on the programming and their well-being. Each RA read the questions aloud to the participants, giving them four answer choices that corresponded to a cue card that contained representative faces. When participants were unable to provide appropriate responses to the questions or that resulted in any emotional distress, RAs were instructed to politely thank the participant for their time and terminate the interview process.

All of the participants in both groups were observed during activities programming. At each of the participating sites, observers collected data during the traditional activities, led by the on-staff activity director, for thirty minutes in the morning during regularly scheduled activity programming. Following the traditional activities, observers completed the QOL-AD. At the treatment sites, the RAs observed the HT activities, facilitated by the HT facilitators for thirty
minutes, and conducted the QOL-AD interviews at the culmination of the traditional activities at the three of the four comparison sites. At one of the sites, the small group of participants was too cognitively impaired to answer the questions coherently. HT programming typically followed the traditional programming in order to avoid carryover effects from the treatment; however, at one program there was no scheduled programming prior to the HT due to the unavailability of the activity director, so the HT activities were facilitated before the traditional activities at that site. Following the HT observations, the QOL-AD was administered a second time to reflect the participants’ sentiments following the HT programming. Within groups of participants, HT activities were administered during the same time and day each week; however between groups there were differences in the days and times that HT activities took place.

Following the observed activities, the RAs conducted interviews with the participants. The interviews were conducted individually so that one participant’s answers would not influence the participants’ responses. The interview was conducted in the location where the HT activity had just taken place in order to provide prompts and environmental cues about the nature of the activity for participants that may have needed such cues to answer the questions more accurately.

At the culmination of the study, each of the HT facilitators and the four activity facilitators from the comparison sites were invited to participate in an interview to explore contextual issues believed to impact the effectiveness of programming with persons with dementia. Each open-ended guided interview lasted between 30 and 45 minutes and was recorded with an audiocassette player.

Finally, the PC moderated a focus group involving the observational research team members in order to document their perceptions of the facilitators, programming, and contextual and procedural factors impacting the participants’ outcomes. The focus group lasted an hour and a half and included six of the RAs from the project. Only those six RAs that had observed during the second semester were invited to participate, so the information provided was not as
subject to threats to reliability such as recall effects. The questions were introduced to the group as a whole, and participants were provided with opportunity to contribute to the conversation when they had something that they wished to share. This approach also enabled them to build off of the comments voiced by other participants in the group. All interviewees reviewed and signed an informed consent form prior to participating in the audio taped focus-group session.

Data Processing

All of the collected data were stored in a locked file cabinet in the research office. Each of the RAs was trained to code, enter, and check the observational data and QOL-AD data in SPSS using a codebook and dataset prepared by the PC. Coding and second coding were completed by different RAs. Two RAs checked all of the data once it was entered into SPSS to catch any data entry errors prior to statistical analysis. In addition the RAs generated a list of the open-ended responses provided by the participants during the QOL-AD interviews. The list was consolidated into themes and sub themes.

The PC transcribed each of the tapes from the interviews and focus group sessions verbatim into Microsoft Word. Respondents were assigned a pseudonym at the time of transcription, and a descriptor file of names and pseudonyms was saved on a password-protected computer. The transcripts were printed for coding and analysis once all of the identifying information had been removed from them.

Analysis

The multiple purposes of this study were (a) to examine the differences in outcomes exhibited during HT activities in a treatment group and during traditional activities in a comparison group and (b) to gain an understanding of the process and context variables that impacted the various activity sessions and hence influenced the outcomes observed and (c) to examine the interrelationships between the categories of the outcomes variables, engagement and affect. Both quantitative and qualitative analyses were performed on the data collected.
Quantitative Analyses

Testing for pre-existing differences. In the current investigation, I randomly assigned each of the eight facilities to a treatment (HT) or comparison (traditional activities) group. The feasibility that the groups differed in terms of several pre-existing qualities was assessed. Characteristics, such as age, gender, functional ability, cognitive capacity, and type of facility, may have differed between the two groups prior to the intervention. To systematically test for such pre-existing statistical differences between the treatment and comparison groups on these characteristics independent sample t-tests were run on the continuous variables (MMSE, Barthel, age) and Chi-square analyses were run on the categorical variables (gender, type of facility). Results indicated that the two groups were comprised of similar sub samples. In fact, the only characteristic that was statistically different between the comparison and treatment groups was age, with the treatment group being significantly younger than the traditional group. These findings indicated that the two groups were comparable in terms of pre-existing characteristics. This finding enables the researcher to make more meaningful comparisons between the groups on outcome variables. Even if these characteristics impacted the observed outcomes, it would not contribute to group differences because of their similarity prior to data collection (see table 4).
Table 4

Pre-existing Participant Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total Sample</th>
<th>HT Group</th>
<th>Traditional Group</th>
<th>t-test</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Female</td>
<td>53.10%</td>
<td>56.80%</td>
<td>49.10%</td>
<td>-</td>
<td>0.08</td>
</tr>
<tr>
<td>Mean Age</td>
<td>80.09</td>
<td>81.34</td>
<td>78.36</td>
<td>-2.01*</td>
<td>-</td>
</tr>
<tr>
<td>S.D. (Range)</td>
<td>8.05 (47-100)</td>
<td>7.17 (57-100)</td>
<td>8.92 (47-94)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Percent White</td>
<td>93.00%</td>
<td>94.60%</td>
<td>90.60</td>
<td>-</td>
<td>0.08</td>
</tr>
<tr>
<td>Mean Barthel</td>
<td>62.41</td>
<td>63.50</td>
<td>61.06</td>
<td>-0.64</td>
<td>-</td>
</tr>
<tr>
<td>S.D. (Range)</td>
<td>20.51 (0-100)</td>
<td>19.26 (0-100)</td>
<td>22.08 (0-100)</td>
<td>-1.66</td>
<td>-</td>
</tr>
<tr>
<td>Mean MMSE</td>
<td>9.62</td>
<td>10.77</td>
<td>8.12</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>S.D. (Range)</td>
<td>7.76 (0-30)</td>
<td>7.08 (0-30)</td>
<td>8.41 (0-30)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. * indicates p < 0.05

Re-coding the data. The AARS and MPES provided categorical data that indicated the actual amount of time that the participants displayed any given affective and behavioral state during a five minute time period. Because the raw data for each affective and behavior state were captured over 12 possible (5 minute) timeframes (or two, 30-minute observation points) the data had to be converted into one score for analysis. This conversion could either be conducted by generating an average of the twelve timeframes, based on the categorical scores (0 = not at all, 1= up to ½ the observation, and 2 = more than ½ the observation) or by generating a percentage score that assessed the actual amount of time that each participant was observed exhibiting each of the eight behavioral and affective states in each categorical values (i.e. the percentage of time that the participant was passively engaged more than half of the observation period = 2). Both types of conversions (averages and percentages for each category) were calculated and used in varying analyses designed to address separate research questions.
For participants who were in attendance at only one of the two observation periods, the data from the observed session was used if they were present for at least one half of the observation period (they must have been present for a total of 3 of the possible 12 frames). This decision was made to preserve sample size and subsequent statistical power; however, this also results in a wide range of variability. Including data from participants who gained less exposure and comfort with the observed programming may have influenced the distribution of the scores; however because data was not collected during two full weeks of the study period, it is unknown what each participant's rate of attendance was overall. Of the total 129 participants, 34 (24 (27%) from the treatment group and 10 (17%) from the comparison group) individuals only had data for one of the two data collection periods. This occurred for a variety of reasons, including factors such as participants who arrived after the study began or those who were unavailable during the first weeks of the study. Also, some participants did not return during the final weeks due to factors such as illness, scheduling conflicts, and even death and difficulties soliciting help from program staff persons compounded the complexity of identifying and inviting the desired participants to the observed programming.

*Calculation of percentage scores for group comparisons.* Percentage score conversions were calculated for use in the analyses that compared the treatment and comparison groups on the behavioral and affective outcomes. This method of converting the categorical data into continuous values was selected over the alternative of averaging the data across the 12 possible time frames because an average of a categorical value makes interpretation fuzzy (an average of 1.5 interest does cannot be interpreted with clarity based on the scoring conventions of the scale). On the other hand, presenting the percentage of time that the participants spent exhibiting each value retains the original intent of the scale which links percentage of time with a descriptive value. In addition, the calculation of percentages increases the variability of the distribution (i.e. from 0-100%) whereas the calculation of averages limits the distribution of scores (from 0-2).
With eight possible behavioral and affective states (passive, active, self, none, other, pleasure, anxiety/sadness, and interest) and three possible values recorded for each time in each state (0 = not at all, 1 = up to ½, 2 = more than ½), a total of 24 coding categories were generated. The calculation of the percentage of time that the participants were observed in each of the 24 possible engagement and affect coding categories was undertaken during a series of steps that involved recoding data (observed = 1 vs. not observed = 0), computing a total of these recoded values across the 12 possible frames for each category of each variable, and ultimately calculating percentage scores for each of these categories by dividing by the total number of timeframes that each individual was observed. For example, a participant who was observed exhibiting pleasure up to half of the observation (score of 2) for eight of the 12 observed frames generated a percentage score of 67%, which is interpreted to mean that the participant exhibited pleasure more than half of the observation, 67% of the time.

Analysis of 24 outcome variables would significantly decrease total degrees of freedom, given the sample size of 129 participants. Therefore, only those eight variables that represented the percentage of time that the participant spent engaging in the eight affective and behavioral categories “more than half of the observation period =2” were used in the analyses. This decision also minimized redundancy in analysis; participants from the two groups were simply compared on the behavioral and affective outcomes that they spent the majority of their time engaged in during the observation period.

Calculation of average scores. Analysis of the behavior problem data did involve the calculation of averages for the treatment and comparison group analyses because these scores were continuous in their original form. Average scores were calculated for both the number of behavior problems exhibited during the observation period and the amount of time that the participants were observed exhibiting these maladaptive behaviors. For example, a participant that exhibited five behavior problems during the first observation period and seven behavior problems during the second observation period received an average score of 6 behavior
problems. For participants who were only observed during one of the two observation periods, the available data was utilized to preserve sample size.

The twelve frames of raw behavioral and affective data were also used to generate an average score (0-2) across the observed timeframes. This average score was created independent of the percentage scores, discussed above for the group comparison paper, for the analyses that were conducted in the second paper which assessed the interrelationships between the various behavioral and affective categories. Sum scores were calculated for each of the engagement (AE, PE, SE, NE, and OE) and affect (pleasure, anxiety, and interest) variables by totaling the data across all of the observed time frames. The averages were calculated by dividing the total for each of the engagement and affect category by the total number of time frames (12 possible, five-minute observation frames) that the participant was in attendance at each observed session.

This continuous average score was then recoded into dichotomous values based on the distribution of the averages (see Table 5). Dichotomous values (high, low) were calculated rather than nominal values (high, medium, low) because the distribution of scores was limited (0-2) and a large number of total variables comprised the outcome variables of interest. Limiting the number of categories for each of these eight variables also decreased the likelihood of having empty cells in the contingency tables used to conduct the subsequent MCA analyses and simultaneously facilitated the ease with which the plots could be interpreted.
Table 5

Descriptive Statistics for Engagement and Affect Average Variables

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
<th>Variance</th>
<th>Categories</th>
<th>Frequency</th>
<th>%</th>
<th>Continuous Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Anxiety/Sadness</td>
<td>1.10</td>
<td>1.0</td>
<td>0.304</td>
<td>0.093</td>
<td>High</td>
<td>13</td>
<td>10.1</td>
<td>.08-1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>114</td>
<td>88.4</td>
<td>.00-.07</td>
</tr>
<tr>
<td>Average Pleasure</td>
<td>1.50</td>
<td>2.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>64</td>
<td>49.6</td>
<td>.22-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>63</td>
<td>48.8</td>
<td>.00-.20</td>
</tr>
<tr>
<td>Average Interest</td>
<td>1.51</td>
<td>2.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>65</td>
<td>51.2</td>
<td>1.67-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>62</td>
<td>48.8</td>
<td>.00-1.58</td>
</tr>
<tr>
<td>Average Non-Engagement</td>
<td>1.50</td>
<td>2.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>65</td>
<td>50.4</td>
<td>.11-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>62</td>
<td>49.6</td>
<td>.00-.10</td>
</tr>
<tr>
<td>Average Self-engagement</td>
<td>1.32</td>
<td>1.0</td>
<td>0.467</td>
<td>0.219</td>
<td>High</td>
<td>41</td>
<td>31.8</td>
<td>.08-1.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>88</td>
<td>68.2</td>
<td>.00</td>
</tr>
<tr>
<td>Average Other-engagement</td>
<td>1.48</td>
<td>1.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>62</td>
<td>48.1</td>
<td>.18-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>67</td>
<td>51.9</td>
<td>.00-.17</td>
</tr>
<tr>
<td>Average Passive-engagement</td>
<td>1.49</td>
<td>1.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>63</td>
<td>48.8</td>
<td>1.08-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>66</td>
<td>51.2</td>
<td>.00-1.0</td>
</tr>
<tr>
<td>Average Active-engagement</td>
<td>1.50</td>
<td>2.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>65</td>
<td>50.4</td>
<td>1.22-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>64</td>
<td>49.6</td>
<td>.00-1.20</td>
</tr>
</tbody>
</table>

Descriptive and preliminary analyses. Preliminary analyses, including descriptive statistics and frequencies, were run on each of the variables to look for values that were out of range or skewed. All of the calculated percentage and average data for the behavioral and affective variables were positively skewed (>1). Attempts to transform the data using both logarithmic transformations and square root transformations in SPSS did not remedy this situation. These descriptive statistics for the computed averages are displayed above in table 5 and the descriptive statistics for the computed percentages are displayed below in table 6.
Table 6. **Descriptive Statistics for Engagement and Affect Percentage Variables**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Deviation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of time exhibited pleasure “not at all”</td>
<td>129</td>
<td>57.2</td>
<td>66.7</td>
<td>.35</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited pleasure “up to ½ the observation”</td>
<td>129</td>
<td>21.5</td>
<td>16.7</td>
<td>.25</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited pleasure “&gt; ½ the observation”</td>
<td>129</td>
<td>9.1</td>
<td>0.0</td>
<td>.20</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited anxiety “not at all”</td>
<td>129</td>
<td>87.3</td>
<td>100.0</td>
<td>.27</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited anxiety “up to ½ the observation”</td>
<td>129</td>
<td>3.3</td>
<td>0.0</td>
<td>.14</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited anxiety “&gt; ½ the observation”</td>
<td>129</td>
<td>1.1</td>
<td>0.0</td>
<td>.06</td>
<td>0-50%</td>
</tr>
<tr>
<td>% of time exhibited interest “not at all”</td>
<td>129</td>
<td>11.6</td>
<td>0.0</td>
<td>.21</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited interest “up to ½ the observation”</td>
<td>129</td>
<td>17.7</td>
<td>8.3</td>
<td>.23</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited interest “&gt; ½ the observation”</td>
<td>129</td>
<td>61.1</td>
<td>72.7</td>
<td>.36</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited active engagement (AE) “not at all”</td>
<td>129</td>
<td>28.1</td>
<td>16.7</td>
<td>.32</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited AE “up to ½ the observation”</td>
<td>129</td>
<td>29.4</td>
<td>25.0</td>
<td>.26</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited AE “&gt; ½ the observation”</td>
<td>129</td>
<td>29.4</td>
<td>25.0</td>
<td>.26</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited self engagement (SE) “not at all”</td>
<td>129</td>
<td>85.1</td>
<td>1.0</td>
<td>.30</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited SE “up to ½ the observation”</td>
<td>129</td>
<td>6.6</td>
<td>0.0</td>
<td>.13</td>
<td>0-75%</td>
</tr>
<tr>
<td>% of time exhibited SE “&gt; ½ the observation”</td>
<td>129</td>
<td>6.3</td>
<td>0.0</td>
<td>.13</td>
<td>0-75%</td>
</tr>
<tr>
<td>% of time exhibited non engagement (NE) “not at all”</td>
<td>129</td>
<td>75.0</td>
<td>91.7</td>
<td>.33</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited NE “up to ½ the observation”</td>
<td>129</td>
<td>12.1</td>
<td>0.0</td>
<td>.17</td>
<td>0-83%</td>
</tr>
<tr>
<td>% of time exhibited NE “&gt; ½ the observation”</td>
<td>129</td>
<td>12.1</td>
<td>0.0</td>
<td>.17</td>
<td>0-83%</td>
</tr>
<tr>
<td>% of time exhibited passive engagement (PE) “not at all”</td>
<td>129</td>
<td>29.1</td>
<td>20.0</td>
<td>.27</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited PE “up to ½ the observation”</td>
<td>129</td>
<td>36.2</td>
<td>33.3</td>
<td>.24</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited PE “&gt; ½ the observation”</td>
<td>129</td>
<td>36.2</td>
<td>33.3</td>
<td>.24</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited other engagement (OE) “not at all”</td>
<td>129</td>
<td>73.5</td>
<td>83.0</td>
<td>.29</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited OE “up to ½ the observation”</td>
<td>129</td>
<td>19.1</td>
<td>9.1</td>
<td>.22</td>
<td>0-100%</td>
</tr>
<tr>
<td>% of time exhibited OE “&gt; ½ the observation”</td>
<td>129</td>
<td>19.1</td>
<td>9.1</td>
<td>.22</td>
<td>0-100%</td>
</tr>
</tbody>
</table>
Wilcoxon Mann-Whitney-U test. Because the logarithmic and square root transformations did not correct the distribution of the data, a non-parametric test for non-normal data was used to test the study hypotheses focused on comparing the HT group to the comparison group on the behavioral and affective variables. The Wilcoxon-Mann-Whitney-U test is a powerful nonparametric test that is used for two independent samples when the dependent variables are continuous but do not meet the assumptions of a parametric test. Unlike its parametric counterpart, the independent t-test, the Mann-Whitney test uses medians for comparison of central tendency between the two independent groups (Pett, 1997). This test is utilized to compare two groups (treatment and comparison) on dependent variables that are continuous or at least ordinal.

In this study, the hypotheses were tested using a total of ten variables, including the eight coding categories that represented the greatest percentage of time (2=more than ½ of the observation) spent exhibiting each of the affective and behavioral states and the two average scores that were calculated to capture both the number of behavior problems exhibited as well as the amount of time that the participants exhibited problematic behaviors for the observational period. Because the only pre-existing characteristic that significantly differed between the treatment and comparison groups was age, correlations were computed with each of the ten outcome variables. These analyses demonstrated that age was only significantly correlated with the percentage of time that interest was exhibited more than half of the observation period (see table 7 below).

Power analyses. The decision to only use eight of the 24 calculated percentage values, representing more than half of the observation period (score of 2), enabled the researchers to understand how the participants were spending the majority of their time during the observational period while simultaneously minimizing the number of variables utilized in the analysis in order to avoid compromising statistical power. Retrospective power analyses were conducted for all ten outcome variables. Because power calculations with nonparametric
statistics cannot be calculated without specialized software packages, statisticians have suggested using power calculations using the corresponding independent samples t-test (Singer, Lovie, & Lovie, 1986). Therefore, using the online UCLA power calculator (Bond, 2005), the statistical power for was computed for each of the ten outcome variables (see table 7). The majority of power levels were acceptable, ranging from 0.53 to 1.0. The exception was the percentage of time exhibiting pleasure more than half of the observation, which had a low power of 0.175, indicating the increased likelihood of committing a type II error.

*Effect sizes.* Effect sizes were calculated as a way of assessing the effectiveness of the intervention. This assessment of the clinical significance, or practical importance, of the results factors in the influence of sample size and informs the interpretation of the findings. Calculation of effect sizes enables the researcher to examine the likelihood that the results found in the study sample would also occur in the population. With the total sample size of 129 participants, 75 in the treatment group and 54 in the comparison group, effect size calculations required the use of each sub group’s means and standard deviations for each of the ten outcome variables (AE more than ½ observation, PE more than ½ observation, SE more than ½ observation, NE more than ½ observation, OE more than ½ observation, interest more than ½ observation, anxiety/sadness more than ½ observation, pleasure, total time engaged in behavior problems, total number of behavior problems).

The effect sizes were calculated for each variable using the equation Effect size = Mean of experimental group – Mean of comparison group / standard deviation. Results of these calculations are presented in table 5. Positive effect size values are interpreted to mean that the treatment group was more likely to exhibit the behavioral or affective state, while negative values are interpreted to mean that the comparison group was more likely to exhibit the observed states. For example, the effect size value of 0.60 for active engagement is interpreted to mean that the treatment group exhibited active engagement more than 59% of the comparison group. Conversely, the effect size for self-engagement of -0.78 indicates that the
comparison group was self-engaged more than 77% of the treatment group during the observed activities.

Table 7

*Power, Effect Size, and Correlations Between Engagement, Affect and Age*

<table>
<thead>
<tr>
<th>Observed outcome variables</th>
<th>Effect Sizes</th>
<th>Power Estimate</th>
<th>Correlation with Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>% time exhibited pleasure “&gt; 1/2 of the observation”</td>
<td>-0.04</td>
<td>0.175</td>
<td>-0.04</td>
</tr>
<tr>
<td>% time exhibited anxiety “&gt; 1/2 half of the observation”</td>
<td>0.05</td>
<td>0.963</td>
<td>0.169</td>
</tr>
<tr>
<td>% time exhibited interest “&gt;1/2 of the observation”</td>
<td>-0.19</td>
<td>0.612</td>
<td>-0.188* (r=.034)</td>
</tr>
<tr>
<td>% time exhibited AE “&gt;1/2 of the observation”</td>
<td>0.60</td>
<td>0.813</td>
<td>0.02</td>
</tr>
<tr>
<td>% time exhibited SE “&gt;1/2 of the observation”</td>
<td>-0.78</td>
<td>0.738</td>
<td>0.147</td>
</tr>
<tr>
<td>% time exhibited NE “&gt;1/2 the observation”</td>
<td>0.24</td>
<td>0.632</td>
<td>-0.021</td>
</tr>
<tr>
<td>% time exhibited PE “&gt;1/2 of the observation”</td>
<td>0.56</td>
<td>0.529</td>
<td>0.088</td>
</tr>
<tr>
<td>% time exhibited OE “&gt;1/2 of the observation”</td>
<td>0.64</td>
<td>0.752</td>
<td>0.038</td>
</tr>
<tr>
<td>Average number of behavior problems exhibited during the observation period</td>
<td>0.31</td>
<td>0.998</td>
<td>0.143</td>
</tr>
<tr>
<td>Average amount of time exhibiting behavior problems during the observation period</td>
<td>-0.28</td>
<td>0.913</td>
<td>0.127</td>
</tr>
</tbody>
</table>

*Multiple Correspondence Analysis.* Multiple correspondence analysis (MCA) is a multivariate method for analyzing categorical and nominal data. It is a method of factoring categorical variables and displaying them in a property space that maps their association in two or more dimensions. It is a special case of canonical correlation, where one set of entities (categories rather than variables as in conventional canonical correlation) is related to another set (Clausen, 1998; Greenacre, 1984; Greenacre, 1993). The analysis defines a measure of distance between any two points, where points are the values (categories) of the discrete
variables. The approach is similar conceptually to conventional factor analysis; however, conventional factor analysis determines which variables cluster together, and correspondence analysis determines which category values are in close proximity to one another. The data are then represented pictorially on a correspondence map, which plots points (categories) along the factor axes.

MCA can be used with a wide variety of data, including that which has a non-normal distribution (Greenacre, 1993). In this study, dichotomous values were utilized rather than several values for each variable to reduce the chance of empty cells in the correspondence table and to minimize the points on the pictorial representation in order to facilitate a more coherent interpretation of the plots. The MCA was conducted to explore and describe the relationships between the three affective states and the five engagement categories exhibited by program participants during the observed activity programming. Because MCA requires the variables to be categorical or nominal in nature, the raw data were utilized to calculate an average score between 0 and 2 for each of the eight affective and behavioral states. These average scores were then recoded into categorical variables with dichotomous values (high or low levels of each behavioral or affective state) based on the continuous distribution (0-2). There was an equal distribution of all states except anxiety. Table 7 displays a variety of descriptive statistics illustrating the frequency of individuals and percentage they represented for each of the two coding categories.

The use of MCA allows the researcher to visually examine the interrelationships between the three affective states (pleasure, anxiety/sadness, and interest) and the five engagement behaviors coded (active-engagement, passive-engagement, self-engagement, non-engagement, and other-engagement). Upon viewing the MCA plots, subsequent chi-square analyses were conducted when inclusion of a point was questionable to determine whether significant differences existed between the debatable points. It was necessary to keep these subsequent chi-square analyses to a minimum in order to preserve degrees of freedom and
preclude the need to perform Bonferroni corrections. Therefore, only those points that could not be conclusively deciphered from the visual plot were subject to these post-hoc, Chi-square analyses.

Qualitative Analysis

To gain a greater understanding of the process and context variables that influenced the outcomes observed in the study participants, multiple informants were tapped through a variety of methods, including brief structured interviews with support staff, semi-structured interviews with traditional and HT activity facilitators, and focus groups with the observational research team. The facilitator journals were not analyzed in the current study because the data was not provided on a consistent basis and there is an abundance of missing information from this source. The analyses presented in the current investigation discuss the systematic analysis of the five interviews conducted with the HT and comparison site activity facilitators.

The interviews were transcribed verbatim and verified by checking the transcripts against the tapes to ensure accuracy. During this process, the PC noted salient responses and began to look for patterns of congruence and contention in the respondents’ answers. In addition, responses given by the facilitators that deviated from those provided during the focus group session were noted. Once the initial list of constructs was generated, they were grouped into preliminary categories of themes and subthemes based on Lawton and Nahemow’s Theory of Environmental Press (1973). Several additional categorical themes emerged after rereading the transcripts several times.

Both the PM and the PI read and reread the same transcripts while coding passages in the margins. These open-coding procedures were performed independently and then discussed at weekly meetings to identify commonalities and areas of dissention. Once saturation was reached via open-coding procedures, a coding scheme was developed. The coding scheme was refined and verified three times as it was applied to the transcripts. While many of the codes remained constant, they were reorganized and reassembled to reflect the
final version of the coding scheme (see Appendix N). ATLAS TI was used to organize the data and facilitate the analysis process. This qualitative analysis program enabled us to remove codes that were superfluous and further refine the coding scheme (Thomas, 2004). The original coding scheme was comprised of 34 codes that were organized into five coding categories. After reviewing the coding output, that provided information about the total number of times that each code was used, revisions were made to the coding scheme and the final coding scheme was comprised of 29 codes, representing six major coding categories, each with a range of two to 15 codes per category. Each transcript was then coded with the final coding scheme by the PM and then reviewed and recoded by the PI. Weekly meetings and discussions enabled the PM and the PI to achieve 100% coding agreement. These coding and re-coding strategies were employed to enhance the rigor of the study by bolstering the dependability of the analysis procedures (Anfara, Brown, & Mangione, 2002).

In an effort to systematically organize the data and facilitate comparisons among the various sites, tables (see Appendix O) were created using the coding categories and sites as axis headers. Relevant data and quotes from the transcripts were inserted into these tables so direct comparisons could be made between each of the programs and facilitators on each of the coding categories. Each of the transcripts was transferred from Microsoft Word into ATLAS TI. Using ATLAS.TI, quotes that corresponded to each of the coding categories were systematically identified, so transparency in the data could be revealed to further support the findings (Thomas, 2004). Two of the six coding categories that relate to the environmental press model were used in the analysis for this paper: (a) features of the physical environment that influenced press level and (b) aspects of the social environment that influenced press level. The other four coding categories pertained to the competencies and outcomes of the participants with dementia, properties of the activities, and measurement-related issues. The theory of environmental press provided a conceptual framework for linking the facilitators’ insights and experiences to the research literature. In addition, the use of this theory supported the selection
of these coding categories, while minimizing the attention given to the other themes that were generated from analysis of the interviews.

Qualitative research rigor and quality. A variety of strategies were used to enhance the rigor of the qualitative analyses conducted and the findings generated from them. Highlighting the techniques and procedures utilized can greatly enhance the study’s trustworthiness. The trustworthiness of a qualitative investigation can be addressed through a variety of procedures that speak to the credibility, transferability, dependability, and conformability of the research process. The credibility of a qualitative study parallels internal validity in a quantitative investigation. In the current study, credibility was attained investigator triangulation; this process involved regular feedback from and discussions with the PI about the coding scheme and procedures.

Transferability in a qualitative investigation parallels external validity in a quantitative study. In this investigation, transferability was addressed through purposive sampling, meaning that the research participants were chosen for the qualitative interviews based on their role as facilitators during the observed activities. In addition, thick description was achieved through the creation of tables that simultaneously consolidated the data and provided information about each of the facilitators and the sites in which they worked. In addition, using the direct quotes of the interviewees enables the reader to see the data and come to their conclusions about whether the participants’ statements do in fact support the findings purported by the investigators.

The dependability, or reliability, of the study was enhanced through the code-recode strategy, which entailed open coding procedures, followed by systematic coding procedures using the coding scheme. Additionally, the PC and PI coded the data to ensure inter-rater agreement in terms of coding the transcripts. The use of both quantitative and qualitative data and the use of both focus group data and interview data also increased the dependability of the study.
Confirmability, or the objectivity of the analyses, is demonstrated through the triangulation of the data with the previous literature. Thorough literature reviews in the realm of dementia-care intervention research, horticulture therapy, factors in the contextual environment that impact study outcomes, and the relationship of the facilitator or nurse’s behaviors in relation to the person with dementia’s behavior and quality of life were conducted, synthesized, and considered in concordance with the data analysis procedures. Finally, during the research process, it was extremely important that my biases were recognized and considered. Because I have an extensive background as a program facilitator implementing both HT and traditional activities for persons with dementia in a variety of facilities, it was critical that my prior experiences did not cloud my judgment and override the systematic processes described to reach my conclusions. Regularly assessing these preconceptions and discussing them with the PI enabled me to both recognize that they existed while minimizing the impact that they had on the findings generated and conclusions reached.

The utilization of these procedures and the transparency of the data as demonstrated by all speak the rigor employed in the current study. The audit trail comprised of the coding scheme, the tables that provide data on each of the interviewees and sites, as well as the analysis tables that demonstrate the organization of the raw data into coding categories enable the readers to make their own conclusions and assessment of the presented findings. This audit trail in combination with attention to the credibility; transferability, dependability, and confirmability speak to the rigor and quality of the procedures employed in this investigation.
CHAPTER IV

Results

The following three interrelated, yet distinctly unique, manuscripts were developed out of my dissertation research and were written with the final goal of publication in clear sight. Each of the papers is informed by the others; however, the driving research questions and methodological and analytical strategies employed differs from one paper to the next. Although mixed methods were utilized to capture a more holistic picture of the observed outcomes and the procedural and contextual factors that contributed to them, the underlying intent of each paper was to explore a distinct phenomenon within the context of the larger project.

The first paper was the impetus for the project and sought to build on previous Horticulture Therapy (HT) for persons with dementia research by quantitatively comparing a treatment group receiving six weeks of HT programming to a comparison group receiving TA programming using observational assessments. This study paralleled previous HT projects in that the outcome variables of interest included engagement and affect, which are both indicators of a person-environment fit and contributing factors to well-being in persons with dementia. Findings revealed that although HT facilitated higher levels of active, passive, and other engagement, affect non-engagement and affect did not differ between the groups. The current investigation expanded on my previous work and other HT studies in the realm of dementia-care by expanding the sample size significantly, including participants from both ADS programs and nursing home sites, and utilizing measures that had demonstrated good to excellent psychometric properties in previous work.

At the culmination of the observational evaluation, research team members participated in a focus group to discuss their experiences working on the project. Findings revealed that a variety of contextual and procedural factors, including the facilitators, appeared to impact the engagement and affect levels of the participants during the programming sessions. The observers expressed their frustration with the inability to systematically capture this information.
using the observational measures designed to assess engagement, affect, and behavior problems. This information coupled with results that only partially supported the findings of our previous work, prompted the facilitation of qualitative interviews with the HT and comparison site facilitators in an attempt to further explore those factors.

Therefore, the second paper presented the qualitative investigation of contextual and procedural factors that impacted the outcomes observed by the research team. Semi-structured interviews were conducted with the five facilitators to explore their background and experience, the physical and social environments that characterized their distinctive programs, and the procedures and strategies that they utilized to interact with and engage groups of elders with varying manifestations of dementia.

Findings informed theoretical, methodological, and practical domains and demonstrated that the person-environment fit model could and should be applied beyond the person with dementia to also include the facilitator. In fact, through the acquisition of information that demonstrated that a number of unique challenges faced the HT facilitators as a result of their temporary status at each facility, the conclusion was made that the fit of the program participants is dependent on the fit of their facilitator. This hierarchical person-environment fit model further highlights the importance of attending to and assessing both the individual competencies and environmental contexts of both the facilitators and the program participants when conducting intervention research in natural settings.

The third manuscript presented in the series explored the interrelationships between the five engagement and three affect outcome variables. This investigation utilizes multiple correspondence analysis (MCA) to systematically and graphically assess the degree (high or low) of each affective state and engagement category displayed by the program participants from both groups collectively over the course of the observational assessment. Although research demonstrates that engagement in meaningful activities has positive outcomes for persons with dementia, the systematic exploration between the various engagement categories
of the Menorah Park Engagement Scale (MPES) and the affective states of the Apparent Affect Rating Scale (AARS) have not been previously analyzed in this manner.

The MCA analyses supported the Environmental Press Model in that they demonstrated the interrelationship between adaptive behavior with high levels of positive affect and non-adaptive behavior with low levels of positive affect. These findings further supported the need to identify activities that can be adapted and facilitated to support a person-environment fit. In addition, these results highlight the importance of nurturing social and physical environments that supports programming that can optimize outcomes for persons with dementia.

Therefore, each of these manuscripts highlights findings that address several unique yet interrelated hypotheses that collectively contribute to a greater understanding of the processes and outcomes observed during a HT intervention study for persons with dementia. Each manuscript describes various aspects of one mixed-method investigation that explores theoretical, methodological, and practical issues associated with dementia-care intervention research in the applied setting.
Manuscript A

Running Head: EVALUATING THE EFFECTS OF HORTICULTURE THERAPY

Comparing Horticulture Therapy to Traditional Activities in Dementia Care Programs:
Assessing Differences in Engagement and Affect
Acknowledgements

The authors would like to thank Drs. Karen A. Roberto, P. Diane Relf, Michelle L. Stevenson, and Jay A. Mancini for their oversight and valuable insights on this paper as well as Dr. Katherine Hertlein for her statistical consultation and review. I would also like to thank each of the eight dementia-care programs that agreed to participate in the study as well as the team of research assistants that collected and processed the data. This research was only possible in its current form thanks to the ARDRAF research grant funded by the Virginia Center on Aging (VCOA), Fund # 04-3. Finally, I would like to thank Dr. Jay Mancini for his support donation of the V. R. Mancini and J. A. Mancini Research Prize, through the Center for Gerontology at Virginia Tech, which was awarded to the first author and provided additional monetary support for the completion of this manuscript.
Comparing Horticulture Therapy to Traditional Activities in Dementia Care Programs:
Assessing Differences in Engagement and Affect

Abstract

Purpose of the study: Engaging persons with dementia in meaningful activities supports well-being; however care staff are challenged to identify activities that are developmentally (ability) and generationally (age) appropriate in a group setting. Design and Methods: In this study, I compared a randomly assigned treatment group, who received Horticulture Therapy (HT) to a comparison group, who engaged in traditional activities (TA) programming, on outcome variables, including engagement, affect, and problem behaviors. HT programming was implemented twice weekly at four treatment sites for six weeks, while TA were also observed during that time period. Results: Results revealed no statistical differences between the treatment and comparison groups on the three affective domains; however, levels of adaptive behavior did differ between the two groups, with the treatment group demonstrating significantly higher levels of active, passive, and other engagement, and the comparison group demonstrating significantly higher levels of self-engagement. Implications: These results highlight the value of HT and the importance of simultaneously capturing the participants’ affective and behavioral responses. Theoretical and practical considerations about the facilitation of and context in which the programming occurs are discussed.

Key Words: Alzheimer’s Disease, Dementia, Environmental Press, Holistic approaches, Horticulture Therapy, Therapeutic Activities
Comparing Horticulture Therapy to Traditional Activities in Dementia Care Programs:

Assessing Differences in Engagement and Affect

Introduction

Alzheimer’s disease and related dementias (ADRD) currently affects 4 million Americans and this number will continue to grow along with the number of older adults in the United States (Alzheimer’s Association, 2004). Persons with dementia progressively lose cognitive and functional capacities that require them to receive assistance and oversight. Familial caregivers often fill this role; however, as caregiving demands increase, respite options such as adult day service (ADS) programs and nursing homes are available.

Cognitive disorders, such as ADRD, have been consistently ranked as one of the top two conditions present in older adults at the time of nursing home admission over the last 20 years; in fact, half of all nursing home residents have ADRD (Alzheimer’s Association, 2004; CDC, 2001). Research suggests that elderly patients in long-term care are totally inactive and isolated from human contact for most of their time and that a virtual lack of planned activity for patients is the norm (Nolan, Grant, & Nolan, 1995). This is particularly problematic for persons with ADRD because of deficits inherent in the disease process, including a lack of organizational ability, a lack of initiation, and a decreased attention span make it difficult for persons with dementia to engage in meaningful activity without staff support or environmental prompting (Nolan et. al, 1995).

The increasing prevalence of ADRD coupled with the knowledge that many dementia care programs are viewed as undesirable options for persons with dementia, demonstrates support for person-centered care. Proponents of the person-centered care paradigm emphasize the importance of supporting dignity and well-being of persons with
dementia through supportive social interactions and successful engagement in meaningful activities (Kitwood & Bredin, 1992). This person-centered approach requires caregivers to adopt a strengths perspective that highlights competencies and minimizes deficits through an in-depth understanding of each unique person’s abilities, interests, and social histories. This approach contrasts the previously dominant medical model, which focuses on the disease rather than the person and adopts a deficit approach concerned with physical and cognitive outcomes. Increasingly the person-centered approach is guiding the development, implementation, and evaluation of innovative interventions designed to promote well-being in persons with dementia. The purpose of this paper is to examine one such intervention, horticulture therapy (HT) on the behaviors and affect of persons with dementia. In the current study the aim was to compare the outcomes of a treatment group receiving a six-week dementia-specific horticulture therapy (HT) program with those of a comparison group receiving traditional activities (TA) at eight dementia-care programs.

**Theory of Environmental Press.** The theory of environmental press points to the behavioral and affectual indicators exhibited by persons who achieve an optimal person-environment fit, which is characterized by a balance between the individual’s competence level and the level of demand in his or her environment (Lawton & Nahemow, 1973). According to Lawton and Nahemow (1973), the result of achieving a balance between competence and environmental press is the exhibition of adaptive behavior and positive affect, which is termed the individual’s adaptation level (AL) (See Lawton & Lahemow, 1973, p.661 for an illustration of the environmental press model). Conversely, persons who are unable to achieve this congruence display maladaptive behavior and negative affect characterized by self-stimulating behaviors (or need-driven behaviors such as wandering and repetitive questioning and movements), non-engagement, and emotions such as anger, anxiety, and depression. In the therapeutic
context, a skillful facilitator capable of modifying appropriate tasks and the environment can help individuals with limited competencies to achieve a person-environment fit and hence elicit desired behavioral and affectual outcomes.

Additionally, Lawton and Nahemow specifically addressed the heightened vulnerability of less competent individuals to their environment; they termed this phenomenon *environmental docility*. Because persons with ADRD have a limited ability to independently reduce environmental press through exertion of individual competencies, a person-centered approach mandates that others, primarily their caregivers, help them achieve a desirable person-environment fit. Caregivers can adapt the physical and social environment to better suit the person’s competence level or help them to increase their competency through the continued use of intact skills and abilities.

*Enhancing competence to reduce press.* Utilization of a strengths perspective has increasingly informed researchers and practitioners focused on the creation and implementation of dementia-care program activities (Bowlby Sifton, 2000; Buettner, 2001). A strengths perspective encourages caregivers to support persons with dementia to continue to engage in activities that enable them to exercise intact abilities (Bowlby Sifton, 2000). Tasks that tap into emotional memory, procedural memory, sensorimotor function, and social skills enable persons with ADRD to engage in overlearned behaviors, which can slow decline and maximize functional competence, hence reducing environmental press.

*Modifying activities.* Other researchers have also emphasized the value of fostering meaningful engagement to facilitate appropriate behavior and positive affect (Camp, 1999; Orsulic-Jeras, Judge, & Camp, 2000; Chung, 2004; Wood, Harris, Snider, & Patchel, 2005). Camp and colleagues applied the *Montessori Method* to working with older adults with dementia. This approach entails the recognition of both the physical environment and competence level because pre-planned modifications, termed
extensions, are created for each presented activity. Extensions are utilized to enable all interested persons to participate, to sustain their interest in the activities, and to enhance their competence level by tailoring the tasks to best suit their existing abilities. The use of extensions can result in modifications to the activities that simplify, add complexity to, or subtly change the materials or processes involved to sustain engagement and facilitate success (Camp, 1999). Research comparing the Montessori-method to TA approaches has revealed that persons with dementia exhibited more constructive engagement, less passive engagement, and more pleasure while participating in the Montessori-based programming than in the regularly scheduled activities programming (Orsulic-Jeras, Judge, & Camp, 2000).

Modifying the environment. A variety of dementia-care researchers have noted the importance of the social and physical environments on the behavior and affect of persons with AD (Cohen Mansfield & Werner, 1998; Morgan & Stewart, 1997; Sloan, Mitchell, Preisser, Phillips, Commander, & Burker, 1998). Techniques encompassed in the Montessori approach, such as arranging objects from simple to complex and reducing unnecessary stimulation, minimize the external press that is placed on individuals with compromised abilities and subsequently enhances competence to foster increased levels of well-being (Camp, 1999). In addition, researchers have demonstrated that the freedom to go outdoors or to have access to extra physical space results in decreased verbal and physical aggression as well as medication use (McMill, & Hinton, 2000). Others have emphasized the value of sensory stimulation and the presence of elements encompassed by the natural environment, including bird songs and plants to reduce agitation and aggression (Whall, Black, Yankous, Kupferschmid, Foster, & Little, 1997). Therefore, a wide variety of studies have demonstrated empirical support for the importance of the physical environment on the behavior and well-being of persons with dementia.
A number of researchers and theorists have also emphasized the importance of the social environment. A person-centered perspective that mandates the preservation of the identity, dignity, and autonomy of persons with AD to support personhood is increasingly integrated into the approach adopted by scholars and professionals in the dementia field (Bowlby Sifton, 2000; Kitwood & Bredin, 1992; Morgan & Stewart, 1997). Social environments that support personhood are those that require staff persons to learn about the unique social and personal histories of their participants to foster well-being. Activity professionals who fail to utilize this approach and continue to offer activities that are childlike and developmentally insulting result in maladaptive behaviors and decreased socialization (Bowlby Sifton, 2000; Salari & Rich, 2000; Teri & Logsdon, 1991). The recognition of the importance of the social environment has also informed research that demonstrated the relationship between staff interactions and persons’ with dementia behavior, motivation, and levels of learned helplessness (Baltes & Reisenzein, 1986; Burgio, et al., 2000).

Horticulture Therapy. Horticulture Therapy (HT) is one therapeutic alternative that considers both the environment and the individual’s competence level to facilitate an optimal person-environment fit (American Horticulture Therapy Association, 2004). Trained HT professionals enhance individuals’ competence levels by systematically matching their unique abilities to the presented activity sequence to reduce levels of environmental press. Activity modification often involve the process of task analysis, which requires the therapist to break down the activity procedures into smaller components that can be successfully achieved by persons with compromised abilities (Allen, 1982; Ebel, 1991). In addition, Horticulture therapists use their knowledge of their clients and incorporate the use of extensions into their programming to sustain levels of engagement and facilitate success.
Horticulture Therapists also attend to the physical and social environment when working with clients to achieve an optimal fit. The use of adaptive equipment, raised beds and container gardening, as well as attention to the weather, sun intensity, and paving all increase the capacity for persons with compromised abilities to successfully engage in the activities. In addition, HT professionals attend to the social environment by incorporating reminiscence and sensory stimulation into the programming to highlight the unique meaning that the activities may hold for each program participant.

A strengths perspective that focuses on the remaining abilities of the participants informs the practice of HT, and participants are encouraged to work as independently as possible through the modifications made by the therapist. For example a Horticulture therapist may present plant propagation through stem cuttings to a group of clients with dementia. Those individuals who are more cognitively intact may engage in the entire sequence of steps involved in the process or specifically be appointed to the most difficult step of the process, such as taking the cutting and removing the bottom leaves, while those individuals with greatest limitations may simply fill the pots with soil repetitively or stick the cutting into the filled pots. In addition, they may use specialized tools with elongated handles and enhanced safety features to compensate for limited range of motion and difficulties with discrimination. A horizontal extension to extend engagement in the activity could involve taking cuttings from a wide variety of species and planting them in different sized pots.

Although these techniques can be used with a variety of interventions, the use of live plant materials is hypothesized to generate additional benefits that traditional activities may not. Plants are an age-appropriate medium that is enjoyed throughout the life course by many people in a variety of contexts. They provide individuals with an activity that is familiar and often stimulates reminiscence of agrarian pasts in this population of elders. In addition, they provide tactile, olfactory, and optical stimulation,
which is beneficial to persons with dementia. Cultivating live plant materials provides individuals with limited roles the opportunity to care for another living entity and instills the role of caregiver in a person who has likely become a care-recipient.

Investigations of HT have demonstrated that a wide range of elderly populations have achieved benefits in social, psychological, physical, and cognitive domains of functioning (Kim, Cho, Han, & Kim, 2002, Midden & Barnicle, 2000; Mooney & Milstein, 1994; Powell, Felce, Jenkins, & Lunt, 1979). Specific psychosocial outcomes observed included increased socialization and reminiscence as well as self-esteem and life satisfaction. Other outcomes attributed to participation in HT programs for various groups of older adults included increased motivation, initiation, and physical functioning, resulting in greater levels of independence and autonomy (Burgess, 1990; Mooney & Milstein, 1994).

Although a wide range of populations have benefited from HT, the current repertoire of empirical articles documenting the benefits of HT to persons with dementia are insufficient. Three pilot investigations of HT for adults with dementia precede this investigation and yielded encouraging results (Gigliotti & Jarrott, in press); Gigliotti, Jarrott & Yorgeson, 2004; Jarrott, Kwack, & Relf, 2002). In the first study, results indicated that the percentage of time that the participants were non-engaged was lower and the percentage of time productively engaged was higher during the HT activities compared to the TA, while affect did not significantly differ between the activities. In the second investigation, results similarly indicated that the percentage of time non-engaged was higher during TA; however, unlike the previous study, the percentage of time that participants were actively engaged did not significantly differ between the two types of activities. In these studies, TA included a range of options, including crafts, coloring, cooking, games, and music that employ a variety of facilitation techniques. Oftentimes however, these types of activities are less amenable to the use of extensions and are
therefore less likely to engage a group of persons with dementia representing variable rates of disease progression.

Findings also demonstrated that participants exhibited higher levels of positive affect during HT activities than during the TA, which differed from the first study. Similar to the second investigation, results of the third investigation revealed that levels of productive behavior were significantly higher and levels of non-engagement were significantly lower during the HT activities compared to the traditional activities. Result also supported the finding from the second study that found significant differences in the levels of positive affect exhibited between the two types of activities. A variety of factors may have impacted variability of findings across the studies, including variability in the magnitude of the intervention, differences in the facilitators leading the traditional activities, and small sample size. Despite the reported differences in outcomes, the overall results overwhelmingly indicated that HT activities are a useful approach to facilitate the selection and modification of tasks that can meet the individualized needs of persons with compromised competencies (Bowlby Sifton, 2000; Ebel, 1991). Providing activities in a group context that can be modified results in persons spending greater proportions of their time engaged in purposeful activity and less time engaged in self-stimulating and sedentary behaviors.

In the current study, I applied Lawton and Nahemow’s model of environmental press (1973) to the practice of HT with persons with dementia. I was also able to address some of the limitations inherent in previous HT and dementia-care work and enhance internal validity by increasing and diversifying the sample to include participants from eight facilities, comprised of ADS programs and nursing homes settings. I also included a comparison group, so inter-individual comparisons could be made between the treatment group receiving HT and a comparison group receiving traditional activity programming, rather than examining only intra-individual differences. Alternative
measures demonstrating good psychometric properties were also incorporated into the
current investigation as were multiple assessment methods, in order to more holistically
capture both the outcomes elicited by the various activities and the procedural and
contextual factors that simultaneously influenced the observed outcomes.

Study Hypotheses

I tested three primary hypotheses concerning the type and level of engagement and affect during HT activities compared to the traditional activity programming.

1. Participants in HT will exhibit higher levels of adaptive behavior (a greater percentage of time exhibiting high levels of active engagement and a lesser percentage of time exhibiting passive engagement) than participants in TA during the presented activities.

2. Participants in HT activities will spend a smaller percentage of time exhibiting behavior problems than participants in TA during the presented activities.

3. Participants in HT activities will experience more positive affect (a greater percentage of time exhibiting higher levels of pleasure and interest and a lesser percentage of time exhibiting higher levels of anxiety/sadness) than participants in the TA during the presented activities.

Design and Methods

Participants

The sample contains 129 persons with a diagnosis of dementia from eight dementia care programs in rural southwest Virginia. Five nursing homes and three ADS programs served as host sites for data collection. Four of the programs were randomly assigned to the treatment condition, which involved six weeks of twice weekly HT programming, while the other four programs served as comparison sites and provided traditional activity programming. The programs ranged in size from small ADS programs...
serving between 10 to 12 clients daily to large nursing homes licensed to house up to 226 residents (See Table 1A).

Inclusion criteria for individual participants included a documented diagnosis of dementia, the ability to leave the private bedroom to attend activities in the common area at long-term care facilities, verbal assent from the participants and a signed consent form signed by the legal guardian or familial caregiver. Participants must have attended at least half (15 minutes of the possible half hour) of one observed HT or traditional activity session to be included in the analyses. The mean number of total time frames observed was 9.9 ($SD = 2.9$). The decision to include participants who only had three timeframes of data was made to increase the sample size to enhance statistical power.

**Background Characteristics.** A total of 129 cases were included in the analyses; a breakdown of the number of participants from each of the eight sites is presented in table 1A. There were 75 participants in the treatment group, and 54 participants in the comparison group; demographic data and background characteristics are presented in Table 3A. Of all the individuals invited to participate in the study from each of the eight sites, a total of 22 caregivers did not return the consent forms or indicated that they did not want their family member to participate in the study. Results of the independent sample *t*-tests and *Chi-square* analyses indicated that the treatment and comparison groups were not statistically different on any of the demographic or background characteristics (see Table 3A) except age, revealing that the treatment group was significantly older than the comparison group ($t(96.53) = -2.01, p = 0.05$). This may be because the HT group was comprised of three NH and one ADS program, while the comparison group was comprised of two NH and two ADS programs. Correlations were conducted between age and the ten outcome variables. Interest was the only statistically significant relationship, indicating an inverse relationship with older participants expressing less interest ($r = -0.19; p = 0.034$).
Procedures

Following IRB approval, eight dementia-care programs (5 nursing homes and 3 adult day care programs) made a commitment to host the observational research team during traditional activities, provide demographic data on the participants, and aid in the distribution and collection of informed consent forms. The treatment sites agreed to supply an area where the HT activities could be facilitated and provide staff that could support the participants’ physical care needs and transport them to and from the activities. Each facility received a cash donation and a manual of HT activities developed by the Primary Investigator (PI; second author) and site Project Coordinator (PC; first author).

Two HT facilitators worked as a team and developed and facilitated a schedule of activities that they facilitated at the four treatment sites. All of the HT activities were selected for anticipated therapeutic benefits within social, physical, psychological, and cognitive domains. These activities were selected from a variety of sources, including a HT manual developed specifically for use with persons with dementia (Gigliotti et al., 2004). In addition, chosen activities included those that were simple, cost-effective, and versatile enough for modification in order to be inclusive of individuals representing a wide range of ability and interest levels. All of the plant materials were researched to ensure safety and to avoid toxic or poisonous species, due to the tendency of many individuals with dementia to place objects in their mouths indiscriminately.

The group sizes ranged from 4-20 participants on any given day; however, the average number of participants at any given session varied at each site. When the group size exceeded eight participants, the two HT facilitators divided the participants into smaller subgroups. This enabled each leader to work more intimately with a smaller group of individuals, so step-by-step instructions, physical and verbal assistance, and a steady supply of materials could all be provided to each participant in need.
The HT activities represented a range of opportunities from sowing seeds and training topiaries to craft activities that incorporated horticulture materials or themes. While some of the activities were designed to facilitate teamwork or cooperative group activity, others were designed to engage the participants individually in the same activity as one another, or in different steps of one collective task. During the activities, the HT facilitators engaged the participants in social interaction and reminiscence by asking questions about their social histories and past involvement with gardening, farming, cooking, and other related topics. This emphasis embraced the person-centered philosophy and enhanced the social environment by stimulating social interaction and highlighting the meaning associated with engaging in the Horticulture activities.

Program staff were asked to join the sessions each week, to provide assistance getting participants out to the activity area, and to attend to ADL needs of the participants during the HT sessions; this request was only honored at two of the four treatment sites. The environment for the sessions varied per facility although each group participated in an area designated by program staff, and several of the sites had outdoor patio areas that were accessible when the weather conditions were amenable.

Data Collection. Two observational research teams (treatment group team and comparison group team) of research assistants (RAs) collected data over a period of six weeks at two data points; observations took place twice a week during weeks one and two and again twice weekly during weeks five and six. This observation schedule enabled the researchers to capture data at multiple observation points to maximize the sample size as well as the opportunity to collect information on participants over the course of the study intervention. In a previous HT study conducted by the second author, findings comparing data over time revealed that participants did not immediately realize positive effects because they were not previously familiar with the HT activities and it took time for them to become comfortable engaging with new materials and
facilitators (Jarrott et al., 2002). The observations recorded for each participant during the first two weeks and last two weeks of the six-week period were averaged together to account for the differences in the participants’ responses that may have occurred over time. A total of three RAs collected data at any given site on any given day. Each of the three RAs was responsible for a different scale; however they all worked together to conduct the MMSE assessments and collect the Barthel index scores. Each RA could observe up to six participants at once, and they all observed the same six participants during the 30-minute observation periods, enabling each team to collect data on a maximum number of 24 participants at each site during each two-week observation period. RAs positioned themselves to have a full view of the residents’ faces and body language, while attempting to remain as unobtrusive as possible. This observation schedule enabled the researchers to observe each person twice over the study period.

The RAs utilizing the AARS and MPES scales coded the occurrence of the different categories of affect and engagement at five-minute intervals over a 30-minute time frame, while the behavior and memory problems were recorded continuously for the same participants by the third observer. Observers used digital timers with a second counter to accurately determine the level of engagement and affect for each time frame. In instances where participants engaged in conversation with the RAs, procedures dictated that the time frames impacted by that conversation be excluded from analyses.

At each of the participating sites, observers collected data for approximately thirty minutes in the morning. At the treatment sites, the RAs observed the HT activities, while at the comparison sites, traditional activities were observed. Within groups of participants, HT activities were administered during the same time and day each week; however between groups there were slight differences in the days and times that HT activities took place even though they were all morning activities.

*Instrumentation*
Information was gathered on each of the study participants, including demographic information and cognitive and functional status. Assessments utilized to address the study hypotheses were collected through observational data that focused on the occurrence and duration of engagement, affect, and behavior problems exhibited by persons with ADRD during HT and traditional activities.

**Participant Characteristics**

*Demographics.* Demographic information of participants was obtained from facility staff using the participants’ files to gather data regarding gender, age/birth date, race, and diagnosis. A survey inquiring about each treatment participant’s gardening social history was distributed with the informed consent forms; however, the low return rate precluded our ability to utilize this information in the analyses.

*Mini Mental Status Exam (MMSE).* Level of cognitive impairment was assessed using the MMSE, which was administered during the six weeks of data collection at that site, in order to assess whether participants were operating at mild (>21), moderate (10-20), or severe levels of impairment (<9) (Folstein, Folstein, & McHugh, 1975).

*Barthel Index.* The Barthel Index is one of the most widely used scales to assess functional levels of self-care and mobility (Mahoney & Barthel, 1965; Wade & Collin, 1988). During the six-week observational period, research team members received assistance from designated program staff who had access to the participants’ charts, so scores could be assigned using clinical notes. Research team members worked with nursing staff, who had an in-depth understanding of each participant’s functional status to obtain scores for each of the participants on the Barthel Index.

*Measure of affect.* In the current investigation, affect was assessed using a modified version of the Apparent Affect Rating Scale (AARS) (Lawton, Van Haitsma, & Klapper, 1996). The AARS is an observational tool designed to assess affect in persons with moderate to severe dementia, because these individuals are often unable to self-
report on their own affective status. In the current study a streamlined version of the scale was utilized to assess three affective domains: pleasure, anxiety/sadness, and interest. This decision was justified by previous research, which demonstrated that anger was rarely observed, and that inter-rater reliability could be enhanced if anxiety and sadness were collapsed into one code (Gozali, 2002; Judge, Camp, & Orsulic-Jeras, 2000). Conceptually, anxiety and sadness represent types of negative affect, pleasure represents positive affect, and interest represents neutral affect.

Each affective state was coded using a set of guidelines that included examples of facial and vocal expressions as well as hand and eye movements that indicated the emotions exhibited by each participant. Each observer rated the length of time (0 = not at all, 1 = up to ½ of the observation, 2 = More than ½ of the observation, and 9 = sleeping or cannot tell and was considered missing data during analysis procedures) that the emotion was exhibited by each participant at the culmination of five-minute increments over a total time frame of 30 minutes. Following extensive training and practice, each observer reached 95% coding agreement.

Measure of engagement. The Menorah Park Engagement Scale (MPES) (Judge, et al., 2000) was utilized to capture five types of engagement (see Table 2A) commonly displayed by persons with dementia when they are presented with activities. The categories reflect the level and type of involvement with the activity, and the codes reflect the amount of time spent in a certain category of engagement (0 = not at all, 1 = up to ½ of the observation, 2 = more than ½ of the observation). The observer recorded the duration of time each participant spent in each type of engagement at the culmination of five-minute time frames over a total period of 30 minutes. If two or more of the behaviors took place at the same time, the observers were trained to make coding decisions based on a hierarchical ladder of the behaviors (see figure 1A). This scale has not yet been assessed for validity in large-scale studies; however, the scale
developers report a 95% inter-rater agreement and high content validity (Orsulic-Jeras, et al., 2000). Prior to observations, inter-rater reliability of 95% was achieved between the observers.

**Measure of Behavior Problems.** The Revised Memory and Behavior Problem Checklist (RMBPC) (Teri, Traux, Logsdon, Uomoto, Zarit, & Vitaliano, 1992) reflects characteristics of dementia strongly associated with caregiver stress and well being. These characteristics may also be indicative of the well-being of the person with dementia, as they are often interpreted as need-driven behaviors (Algase, et al., 1996). The scale has demonstrated good to excellent reliability and validity and is recommended for use in both clinical and empirical assessments of behavior problems in persons with dementia (Teri et al., 1992).

Although the original version of the instrument is administered in an interview format, in which caregivers are asked to retrospectively report on the person with dementia’s behavior, in the current investigation a trained observer coded the participants’ behaviors over the course of the 30-minute activity to indicate whether the behavior was displayed as well as the number of times and duration that each instance of the behavior lasted. This information enabled the researchers to determine the total amount of time that each problem behavior occurred over the course of each activity for each observed individual. This indicated the degree to which the participants were exhibiting need-driven and disruptive behaviors during the two types of programming. The observers achieved 95% coding agreement prior to data collection in order to enhance inter-rater reliability by coding 5 of the same participants simultaneously and calculating the percentage of agreement across the 30 frames of data.

**Analysis**

Preliminary analyses, including descriptive statistics and frequencies, were run on each of the demographic characteristic variables (see Table 3A). Subsequently, the
HT and comparison groups were assessed for significant pre-existing differences on these variables using independent sample $t$-tests for the continuous variables (MMSE, Barthel index, age) and Chi-square analyses for the categorical variables (gender, race).

**Coding Procedures.** The measures provided categorical information about the actual amount of time that the participants displayed any given affective and behavioral state. With eight possible behavioral and affective states (passive, active, self, none-other, pleasure, anxiety, and interest) and three possible values representing the amount of time that each participant was observed exhibiting each state ($0 = \text{not at all}, 1 = \text{up to } \frac{1}{2}, 2 = \text{more than } \frac{1}{2}$), a total of 24 coding categories were generated. In order to convert the categorical data into continuous scores for analysis, the percentage of time that each participant spent exhibiting each value ($0 = \text{not at all}, 1 = \text{up to } \frac{1}{2}, 2 = \text{more than } \frac{1}{2}$) in each state (passive, active, self, none-other, pleasure, anxiety, and interest) over the course of the observed frames was calculated.

This method of converting the categorical data into continuous values was selected over the alternative of averaging the data across the time frames (up to 12) because an average of a categorical value decreases measurement specificity (an average of 1.5 interest does not have an interpretation based on the scoring conventions of the scale). On the other hand, presenting the percentage of time that the participants spent exhibiting each value retains the original intent of the scale, which links percentage of time with a descriptive value. The calculation of the percentage of time that the participants were observed in each of the 24 possible engagement and affect coding categories was undertaken during a series of steps that involved recoding data and computing new total scores and ultimately percentage scores. For example, a participant who was observed exhibiting pleasure up to half of the observation (score of 1) for eight of the 12 observed frames generated a percentage score of 67%, which is
interpreted to mean that the participant exhibited pleasure up to half of the observation 67% of the time.

Analysis of the behavior problem data did involve the calculation of averages because these scores were continuous in their original form. Average scores were calculated for both the number of behavior problems exhibited during the observation period and the amount of time that the participants were observed exhibiting these maladaptive behaviors. For example, a participant that exhibited 5 behavior problems during the first observation period and 7 behavior problems during the second observation period received an average score of 6 behavior problems.

Each of the calculated percentages and averages for the engagement, affect, and behavior problem data exhibited a non-normal distribution, characterized by positive skewness and kurtosis. Because neither logarithmic nor square root transformations corrected the distribution of these continuous variables, a non-parametric test, the Wilcoxon-Mann-Whitney-U test was used to test the study hypotheses. In this study, the hypotheses were tested using a total of ten variables, including the eight coding categories that represented the greatest percentage of time (2 = more than ½ of the observation) spent exhibiting each of the affective and behavioral states and the two average scores that were calculated to capture both the number of behavior problems exhibited as well as the amount of time that the participants exhibited problematic behaviors for the observational period.

The decision to only use the eight percentages calculated for the value representing more than half of the observation period (score of 2) enabled the researchers to understand how the participants were spending the majority of their time during the observational period while simultaneously minimizing the number of variables utilized in the analysis in order to avoid compromising statistical power. This decision limited the ability of the researchers to make comparisons about behaviors and emotions
that were expressed on a limited basis. This may have resulted in losing meaningful information such as brief expressions of pleasure or anxiety/sadness. Even if these affective states were only briefly observed, they may have provided useful information for understanding engagement behaviors. Retrospective power analyses and effect sizes were conducted for all ten outcome variables. Because power calculations with nonparametric statistics cannot be calculated without specialized software packages, statisticians have suggested using power calculations using the corresponding independent samples t-test (Singer, Lovie, & Lovie, 1986). The majority of power levels were acceptable, ranging from 0.53 to 1.0. The exception was the percentage of time exhibiting pleasure more than half of the observation, which had a low power of 0.175, indicating the increased likelihood of committing a type II error, or failing to detect a significant result when it may have existed.

Results

\textit{Wilcoxon-Mann-Whitney-U results.} The results of the Mann-Whitney test are presented in Table 4A. Significant differences between the treatment and comparison groups were found in four of the five engagement categories. Analyses partially supported the first hypothesis. The HT group spent a significantly greater percentage of time exhibiting high levels of active engagement (AE) more than half of the observation than did the comparison group during the presented activities ($z = -2.90, p = 0.00$), indicating that the horticulture activities were better able to solicit high levels of participation than were the TA. However, while findings indicated that the comparison group was significantly more likely to be self engaged (SE) for the greatest percentage of the observational period ($z = -4.60, p = 0.00$). The HT group was significantly more likely to be passively engaged (PE) ($z = -2.72, p = 0.01$) and also more likely to be engaged in an activity other than the HT activity being presented to the group (OE) ($z = 3.47, p = 0.00$). No significant differences were found between the HT and comparison
groups on the percentage of time non-engaged (NE) for more than half of the observation \( (z = -1.45, p = 0.15) \).

Hypothesis two, which purported that the HT group would spend a lesser percentage of time exhibiting behavior problems, was not supported by the findings, and furthermore, there were no significant differences between the two groups on the average number of behavior problems \( (z = -0.225, p = 0.822) \) or the average time spent engaging in problem behaviors during the observation period \( (z = 0-.904, p = 0.366) \).

The results of the Mann-Whitney test also did not support the third hypothesis. There were no significant differences between the treatment and comparison groups on the three affective coding categories, including pleasure \( (z = -1.544, p = 0.123) \), anxiety \( (z = -0.086, p = 0.932) \), and interest \( (z = -1.26, p = 0.208) \).

**Discussion**

The current study was part of a larger mixed-method investigation concerned with the effects of HT programming on persons with dementia in institutional care programs. I applied Lawton and Nahemow’s Theory of Environmental Press to determine whether HT programming supported the achievement of a good person-environment fit, as evidenced by adaptive behavior and positive affect. The findings, interpreted through the theory’s lens, suggest that neither the HT or TA programming supported the participants’ attainment of the AL, which is characterized by an optimal person-environment fit.

In the current study, the HT group demonstrated higher levels of certain adaptive behaviors such as active engagement and lower levels of maladaptive behaviors such as self-engagement than did the TA. However, despite these behavioral differences, they did not differ in terms of non-engagement levels, behavior problems, or the affective states they exhibited during the observed programming. This may suggest that the HT group attained the zone of maximum performance potential, depicted just to the right of
the AL, where press slightly outweighs personal competence. The fact that the HT programming was new to the participants and was introduced for a relatively short period of time may explain why the HT group appeared to fit in this zone of the model, which induces adaptive behavior. Future research should examine the programming over time to determine if the behaviors change over time, suggesting that press is weakening though practice and the development of associated procedural memory.

Conversely, the TA group appears to be situated just to the left of the zone of maximum comfort, which lies to the left of the AL. These activities and facilitators were more familiar to the participants and therefore press from the activity context has been weakened over time with routine. This group exhibited higher levels of self-engagement and lower levels of active engagement, even though their affect did not significantly differ from the HT group. These behaviors suggest that the participants may have been slightly under challenged. If this imbalance between press and competence level was sustained for a lengthy period of time it would eventually become boring and participants would eventually exhibit maladaptive behavior and negative affect.

**Adaptive behavior.** Our first hypothesis, that participants in HT would exhibit higher levels of adaptive behavior (a greater percentage of time exhibiting high levels of active engagement and a lesser percentage of time exhibiting passive engagement) than participants in traditional ADS activities was partially supported. The HT group was significantly more actively engaged for the greatest percentage of the observation period than was the traditional activity group. This finding suggests that the HT activities were appealing to the participants and that they sustained their attention over the course of the activity sessions, even in the group context. Persons with dementia, representing a wide range of cognitive and skill levels, were able to actively participate in the HT activities, which enabled them to exercise intact abilities and subsequently reap the long-term biopsychosocial benefits that can be achieved through maintenance of those skills.
Our hypothesis that the HT group would spend a lesser percentage of their time exhibiting self-engagement than the traditional group was also supported. Findings demonstrated that the traditional activity group spent a significantly greater percentage of their time self-engaged during the observed activity programming. Self-engagement includes repetitive and self-stimulating behaviors such as wandering or repetitively asking to go home, and it is often interpreted as the expression of an unmet need (Algase, et. al., 1996). These maladaptive behaviors were more pervasive during the traditional activity programming, which indicates that the participants were unable or unwilling to engage during the traditional programming. According to the theory of environmental press, high levels of self-engagement are indicative of a poor person-environment fit and may reflect a lack of person-centered programming and environmental modifications (Lawton & Nahemow, 1973; Lawton, 1982). In addition to the fact that self-engaging behaviors do not result in higher-order benefits, they are often viewed as problematic by caregivers because they can be disruptive in a group setting and require disproportionate levels of attention by limited staff persons.

Unexpectedly, I found that the HT group spent a significantly greater percentage of their time exhibiting passive engagement and engagement in other activities during the observed programming than the comparison group. Although active engagement is the most likely behavioral category to elicit higher-order benefits, passive engagement and engagement in other activities during the HT programming demonstrates that, at the very least, the participants were alert and attentive to tasks, individuals, and environmental stimuli outside of themselves, which can be viewed as adaptive behavior for persons with dementia who are apt to spend great proportions of their time exhibiting self-engaging behaviors and non-engagement (Ice, 2002; Nolan, et al., 1995). In addition, the creation of a physical and social environment that affords the participants
the choice to be engaged on a variety of levels speaks to the person-centered nature of HT programming guided by the theory of environmental press framework.

In contrast to our previous studies, (Gigliotti & Jarrott, 2004; Jarrott et al., 2002) non-engagement was the only behavioral category that did not differ significantly between the HT and traditional groups. The percentage of time spent in which non-engagement accounted for more than half of the observation, was low for both the HT (13.7%) and traditional groups (9.5%). This finding is encouraging considering the previous research that demonstrates high levels of inactivity and non-engagement among persons with dementia in institutional care programs (Buettner & Fitzsimmons, 2003; Ice, 2002; Nolan et al., 1995). Because observations were only captured during scheduled activity programming, rather than over the course of the day, and on persons that agreed to join the activity session, rather than the entire sample of clients with dementia, these findings indicate that when individuals voluntarily agree to participate in planned activity programming, incidences of non-engagement can be minimized. In addition, other factors may have affected levels of non-engagement, including the facilitators’ characteristics and skill facilitating activities with this population of elders.

Contrary to the second hypothesis, the HT and the traditional programming groups did not differ significantly on the number of behavior problems exhibited or amount of time spent exhibiting behavior problems during the activity sessions; however, this does not account for floor effects. Overall, both the total number of behavior problems and the amount of time exhibiting behavior problems was low for both the HT (1.17; 02:03) and the traditional (.85; 03:56) groups during the observation period. This finding is curious considering the significant differences found in self-engagement levels between the groups; however, some behaviors coded as self-engagement, such as fidgeting with a thread on one’s sweater do not qualify as “problem behaviors” in accordance with the scale protocol (Teri, 1992). Although these types of behaviors may
not have been considered problematic by staff persons or disruptive to the group, they may have been subtle indicators of discomfort or the need for attention and stimulation among the participants. Because TAs are commonly criticized for being generationally and developmentally inappropriate and for also lacking the flexibility to include a wide range of participants, it was expected that they would induce higher levels of problem behaviors. This expectation fits with the assumptions of the environmental press model, which highlights the maladaptive behavior of participants as a result of them experiencing a mismatch between their competence level and activity context.

Affective states. The third hypothesis that stated that the HT activities would elicit higher levels of pleasure and lower levels of anxiety, was not supported. No significant differences between the HT and the traditional groups were observed on any of the three affective states. Interest was the most commonly observed affective state, accounting for greater than half of the observation for both groups. Pleasure was less commonly observed in both groups; this may be due to the flattening of affect that occurs in persons with dementia in combination with the strict coding conventions that mandate specific emotional expressions and behaviors to receive a score for pleasure. Anxiety was the least commonly exhibited affective state in both groups; in fact, anxiety was only observed more than half of the observation period 1.2% of the observation period in the HT group and only 0.9% of the observation period in the comparison group. This finding may speak to the importance of activities programming regardless of the content.

Although it was not supported in this investigation, our pilot research revealed that HT activities elicited more positive affect than the traditional activities (Gigliotti & Jarrott, in press; Gigliotti, et al., 2004); however, because the observational measure differed in the current study, as did the study design, it is impossible to speculate whether this discrepancy was a function of the measure or the programming. The theory of environmental press recognizes that a person-environment fit between the
environment and competency level of each individual results in positive affect due to a sense of mastery and esteem that results from adaptive behavior. Because levels of positive affect were not higher during the HT programming, it cannot be inferred that within the environmental press model the HT group reached the desired AL, despite the fact that their behaviors were adaptive in nature. In fact, the model does depict intermediary zones that lie between the AL and the zone characterized by a poor person-environment fit that are characterized by tolerable affect and marginally adaptive behavior. This zone of the model appears to best capture the participants’ status.

**Limitations**

The current study represents an advancement of HT and dementia care research; however, limitations of the investigation need to be considered. Although the sample size was significantly larger than that which was utilized in previous HT studies with persons with dementia, it was comprised of a racially and ethnically homogenous group of older adults living in rural southwest Virginia. Therefore, external validity and the generalizability of these findings are limited.

The naturalistic study design, which resulted in data collection at eight different functional dementia-care programs, made it impossible to control environmental factors and other confounding variables that may have influenced the observed outcomes. Because our measures focused on the participants as sources of information, I did not assess environmental characteristics that may have affected the participants’ experiences, such as features of the physical and social environment, including the facilitators that supported or detracted from fit. Although environmental characteristics are commonly agreed to impact the well-being of persons with dementia, systematic assessment scales that are designed for use in combination with activity interventions are currently not available. Many environmental measures are more general and do not
assess fluid characteristics of the environment, which would be more useful in observational studies that are focused on a small portion of the participants’ days.

The facilitators differed at each of the traditional sites and from the HT facilitators at the treatment sites. Differences in these individuals’ personalities, interpersonal communication skills, and programmatic approach became increasingly evident and may have influenced the participants’ outcomes as well. Another staffing difference between the programs was that the traditional activity facilitators were the regular full-time facility staff and the HT facilitators were placed at each site solely for the purposes of the six-week intervention. Therefore, HT facilitators reported that their lack of insider knowledge and abbreviated tenure at each site impacted their ability to most effectively and holistically implement a person-centered approach. While the traditional facilitators were more likely to have experience working with their group of participants over time, the HT facilitators may have had a more difficult experience trying to elicit positive reminiscence by tapping into the participants’ unique social histories.

Despite its limitations, the current study contributes valuable information to the fields of HT and dementia care programming. It helps to fill a gap in the HT research concerning persons with dementia. Although the prevalence of this disease process is expanding, very little research has been conducted on HT for persons with dementia and viable alternatives for achieving benefits while supporting personhood.

*Future Research*

The design and methods utilized in the current investigation represent an improvement in this domain of research; however, further changes to the design and methods utilized could further enhance the magnitude and utility of the findings. Subsequent studies must examine innovative therapeutic practices with more attention to the contextual factors impacting the participants’ outcomes, especially given the naturalistic setting inherent in the data collection sites. When aspects of the physical
and social environment cannot be controlled, they must be measured and statistically accounted for in order to ensure an accurate interpretation of the findings. Because the environment greatly impacts the behavior of persons with dementia, it should be systematically evaluated in any intervention study conducted at multiple sites.

Similarly, measures that assess the facilitator should be included in future research in this domain. Because the implementation of a person-centered approach is essential to the success of any intervention with this population of individuals, an analysis of the facilitators’ personality, interaction style, knowledge of dementia-care practices, and techniques and strategies employed during the programming would greatly inform the findings and further ascertain which variables were most directly influential in fostering the observed outcomes. Attention to the procedures and processes employed by the facilitators would also increase the ability of others to replicate the approach that is associated with the documented benefits.

The development of measures that can accurately assess the participants’ behaviors and associated emotions, interactions, and overall well-being is essential to improving the utility of the findings in the realm of dementia care. Because persons with dementia may have difficulty expressing themselves verbally during interviews, researchers are in great need of observational measures that accurately and reliably capture this data. As the emphasis shifts from a medical model focused on treatment to a more holistic model that equalizes psychosocial well-being with physical health, the importance of measures that can accurately assess these psychosocial constructs will be demonstrated. Although modifying and combining exhausting scales is demonstrates promise and is therefore recommended, the RMBPCL may be most useful in its original form. Its utility as a systematic, timed, observational assessment, rather than a retrospective summative assessment, was limited.
Future research in this area should also seek to understand the dosage of the intervention that is necessary to induce the desired outcomes. Thus far, resources and collaborative agreements between the researchers and the administrators at each of the facilities have determined the intervention dosage. Gaining a systematic understanding of desired number of days per week and the length of time appropriated to the sessions will also help program planners develop the processes and procedures that must be adopted to facilitate the maximum benefits possible.

Continued utilization and refinement of theory is also essential for improving future research in this realm. Although the theory of environmental press provides a useful framework for understanding what conditions must be present to produce certain behavioral and affective outcomes, it does not indicate how facilitators can alter the environment or enhance competencies to achieve a good fit for participants. In addition, the theory of environmental press does not explain why differences between two approaches using similar techniques in terms of balancing the environment and competence levels of participants may be expected. Synthesizing the theory of environmental press with theories that speak to the unique properties inherent in HT, may further explain observed differences when both activities use similar strategies. Theories that address human-nature interactions and the value of caring for and nurturing living plants have been put forth in the literature, but these theories have not been specifically applied to persons with dementia in institutional care programs (Relf & Lohr, 2003).

Conclusions

The current study demonstrates that HT activities are a viable and desirable choice for dementia-care programs because they successfully engage groups of participants in an activity that elicits high levels of adaptive behavior characterized by alertness and attention to individuals and events outside of themselves. HT
programming also facilitates lower levels of self-engaging behaviors that may be indicative of distress and are even viewed as problematic by caregivers. These findings can inform practitioners and program administrators in their quest to identify programming that can successfully engage groups of individuals with dementia who represent a wide variety of cognitive and functional abilities.

HT activity facilitators are trained to embrace the environmental press model by adapting the environment and the activities in a systematic and ongoing manner to facilitate a balance between the environmental demands and the competence levels of the targeted population. Attainment of a good fit between the participants’ competencies and the environment is hypothesized to elicit appropriate behavior and positive affect; however, in the current investigation, the totality of proposed outcomes were not realized. Although adaptive behavior was an observed outcome of the HT programming, levels of positive and negative affect did not significantly differ between the groups.

Partial attainment of the criteria that are indicative of a person-environment fit led the investigators to further explore those procedural and contextual factors that may have influenced the observed outcome variables. Results of this investigation (see Gigliotti & Jarrott, 2006) identified factors in the physical and social environment, including the powerful influence of the facilitator that impacted the implementation of the intervention and subsequently the participants’ behavior and affect. Practitioners must acknowledge these contextual factors and consider their influence as they plan for the facilitation of activities programming, including HT, for persons with dementia.

Practitioners should be encouraged by the findings of this study in combination with the knowledge that HT activities represent a generationally and developmentally appropriate outlet for older adults with dementia. In addition, HT programming that is well facilitated supports the dignity and social history of elders with dementia, which supports their personhood and contributes to their quality of life. HT activities should be
incorporated into the therapeutic programming schedule of persons with dementia to diversify the programming options available in formal care settings. HT offers dementia-care programmers an activity alternative that can target holistic outcomes in a group context. Continued exploration of this topic will greatly inform facilitators and contribute to best practices in dementia-care programming in order to most effectively support personhood and enhance quality of life through facilitating a good person-environment fit.
References


<table>
<thead>
<tr>
<th>Did/Commented On Target Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listened/Watched Target Activity</td>
</tr>
<tr>
<td>Did Something “Productive” Other Than the Activity</td>
</tr>
<tr>
<td>Repetitive Behavior</td>
</tr>
<tr>
<td>Slept/Kept Eyes Closed/Stared Into Space</td>
</tr>
</tbody>
</table>

*Figure 1A.* Menorah Park Engagement Scale (MPES) Hierarchy Ladder. Coding directions indicated that if two or more of the following behaviors are taking place at the same time, code the behavior that is higher on the “ladder.”
### Participating Sites’ Descriptive Characteristics

<table>
<thead>
<tr>
<th>Site and Condition</th>
<th>Type of Program</th>
<th>Number of participants served by the facility</th>
<th>Number of participants included in the sample</th>
<th>For Profit/Not for Profit</th>
<th>Mixed Unit or SCU</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>ADS</td>
<td>8-12 daily</td>
<td>7 participants</td>
<td>Not for profit</td>
<td>Mixed group</td>
</tr>
<tr>
<td>T2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Nursing home</td>
<td>90 bed facility</td>
<td>23 participants</td>
<td>For profit</td>
<td>Mixed unit</td>
</tr>
<tr>
<td>T3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Nursing home</td>
<td>60 bed facility</td>
<td>25 participants</td>
<td>For profit</td>
<td>SCU&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>T4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Nursing home</td>
<td>100 bed facility</td>
<td>20 participants</td>
<td>State veterans care facility</td>
<td>Mixed unit</td>
</tr>
<tr>
<td>C1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Nursing home</td>
<td>30 bed facility</td>
<td>13 participants</td>
<td>Federal veterans care facility</td>
<td>SCU&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>C2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>ADS</td>
<td>30 participants daily</td>
<td>13 participants</td>
<td>Not for profit</td>
<td>Mixed group</td>
</tr>
<tr>
<td>C3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>ADS</td>
<td>10-16 daily</td>
<td>11 participants</td>
<td>Not for profit</td>
<td>Mixed group</td>
</tr>
<tr>
<td>C4&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Nursing home</td>
<td>226 bed facility</td>
<td>17 participants</td>
<td>Not for profit</td>
<td>Mixed unit</td>
</tr>
</tbody>
</table>

*Note.* Several abbreviations were used in this table as indicated below.

<sup>a</sup>T1-T4 = Treatment Groups 1-4. <sup>b</sup>C1-C4 = Comparison Groups 1-4. <sup>c</sup>SCU = Special Care Unit to describe units that specifically cater to persons with dementia.
<table>
<thead>
<tr>
<th>Category</th>
<th>Description of Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active (AE)</td>
<td>Active Engagement in presented activity: motor or verbal response to the activity</td>
</tr>
<tr>
<td>Passive (PE)</td>
<td>Passive engagement in presented activity: listening to or observing the activity</td>
</tr>
<tr>
<td>Self (SE)</td>
<td>Repetitive or self-stimulating behaviors: excessive rubbing, wringing hands, wandering</td>
</tr>
<tr>
<td>Non (NE)</td>
<td>Asleep or disengaged from an activity: “zoned out” or blank stare</td>
</tr>
<tr>
<td>Other (OE)</td>
<td>Doing or attending to an activity other than the target activity presented</td>
</tr>
</tbody>
</table>

Note. Each of the categories was coded as 0 = not at all, 1 = up to ½ of the 5-minutes observation, 2 = > ½ of the 5-minute observation
Table 3A

Participants’ Demographic and Background Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Entire Group</th>
<th>Treatment Group</th>
<th>Comparison Group</th>
<th>df</th>
<th>T-Statistic,</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Female</td>
<td>53.1%</td>
<td>56.8%</td>
<td>49.1%</td>
<td>1</td>
<td>-</td>
<td>.736</td>
</tr>
<tr>
<td>Percent Caucasian</td>
<td>93.0%</td>
<td>94.6%</td>
<td>90.6%</td>
<td>1</td>
<td>-</td>
<td>.761</td>
</tr>
<tr>
<td>Mean Age in years (S.D.)</td>
<td>80.09 (8.05)</td>
<td>81.34 (7.17)</td>
<td>78.36 (8.92)</td>
<td>96.53</td>
<td>-2.01*</td>
<td>-</td>
</tr>
<tr>
<td>Mean MMSE score (S.D.)</td>
<td>9.62 (7.76)</td>
<td>10.77 (7.08)</td>
<td>8.12 (8.41)</td>
<td>81.63</td>
<td>-1.66</td>
<td>-</td>
</tr>
<tr>
<td>Mean Barthel index score (S.D.)</td>
<td>62.41 (20.51)</td>
<td>63.50 (19.26)</td>
<td>61.06 (22.08)</td>
<td>103.94</td>
<td>-.635</td>
<td>-</td>
</tr>
</tbody>
</table>

*indicates significance at the <.05 level
<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>HT Group N=75</th>
<th>Comparison Group N=54</th>
<th>Mann-Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of time exhibited pleasure “&gt;1/2 of the observation”</td>
<td>8.6</td>
<td>9.4</td>
<td>-1.544</td>
</tr>
<tr>
<td>% of time exhibited anxiety/sadness “&gt; 1/2of the observation”</td>
<td>1.2</td>
<td>0.9</td>
<td>-0.086</td>
</tr>
<tr>
<td>% of time exhibited interest “&gt;1/2 of the observation”</td>
<td>58.0</td>
<td>65.1</td>
<td>-1.26</td>
</tr>
<tr>
<td>% of time exhibited AE “&gt;1/2 of the observation”</td>
<td>35.6</td>
<td>20.7</td>
<td>-2.897</td>
</tr>
<tr>
<td>% of time exhibited SE “&gt;1/2 of the observation”</td>
<td>2.5</td>
<td>11.7</td>
<td>-4.597</td>
</tr>
<tr>
<td>% of time exhibited NE “&gt;1/2 the observation”</td>
<td>13.7</td>
<td>9.5</td>
<td>-1.451</td>
</tr>
<tr>
<td>% of time exhibited PE “&gt;1/2 of the observation”</td>
<td>41.5</td>
<td>28.8</td>
<td>-2.718</td>
</tr>
<tr>
<td>% of time exhibited OE “&gt;1/2 of the observation”</td>
<td>24.8</td>
<td>11.1</td>
<td>-3.470</td>
</tr>
<tr>
<td>Average number of behavior problems exhibited during the observation period</td>
<td>1.169</td>
<td>0.851</td>
<td>-0.225</td>
</tr>
<tr>
<td>Average amount of time exhibiting behavior problems during the observation period (minutes: seconds)</td>
<td>02:03</td>
<td>03:56</td>
<td>-0.904</td>
</tr>
</tbody>
</table>
Running Head: CONTEXTUAL FACTORS IMPACTING PERSONS WITH DEMENTIA

Contextual Factors Impacting Persons with Dementia in an Intervention
Study of Activity Programming
Acknowledgements

The authors would like to thank Drs. Karen A. Roberto, P. Diane Relf, Michelle L. Stevenson, and Jay A. Mancini for their oversight and valuable insights on this paper. I would also like to thank each of the eight dementia-care programs that agreed to participate in the study as well as the team of research assistants that collected and processed the data. This research was only possible in its current form thanks to the ARDRAF research grant, fund # 04-3, funded by the Virginia Center on Aging (VCOA). Finally, I would like to thank Dr. Jay Mancini for his support donation of the *V. R. and J. A. Mancini Research Prize*, through the Center for Gerontology at Virginia Tech, which was awarded to the first author and provided additional monetary support for the completion of this manuscript.
Abstract

Researchers have documented the powerful influence of the physical and social environment on persons with dementia; however, most intervention studies have failed to include contextual assessments in their exploration of outcomes. As part of a larger study assessing a Horticulture therapy (HT) intervention, I explored the contextual and procedural factors that impacted outcomes. Guided by the theory of environmental press, interviews were conducted with five of the study’s activity facilitators who worked in eight different adult day service and nursing homes characterized by social and physical environments that varied in terms of size, availability of resources and conductivity to a wide range of programming, as well as the values upheld and philosophies adopted.

Findings indicated that the theory of environmental press should be expanded beyond the person with dementia and applied to program facilitators. A hierarchical relationship became evident; in order for program participants to achieve congruence between their competence and their environment, the facilitator must first achieve such a fit. Findings also indicated that facilitators with fewer competencies were more vulnerable to the shortcomings of their environments and that supportive environments could minimize deficits in competence.

Key Words: Horticulture therapy, environmental press, activity facilitators, engagement, affect, dementia, well-being
Contextual Factors Impacting Persons with Dementia in an Intervention Study of Activity Programming

Introduction and Review of the Literature

Varying models and research endeavors highlight the importance of attending to the physical and social environment in order to support the functional capabilities and psychosocial well-being of persons with Alzheimer’s disease and related dementias (ADRD) (Lawton, 1994; Lawton, 2001; Morgan & Stewart, 1997; Morgan & Stewart, 2002; Salari & Rich, 2001). Specific elements in the environment that affect behaviors and affectual responses of persons with dementia, ranging from design features such as the impact of color, lighting, and way finding cues to the types and levels of stimulation provided (Day, Carreon, Stump, 2000; Zeisel, Silverstein, Hyde, Levkoff, Lawton, & Holmes, 2003). Such studies provide insights about key environmental qualities that must be modified to provide a match between the compromised competencies of persons with dementia and their surrounding environments (Lawton, 2001).

Other dementia-care scholars have highlighted the critical role of the social environment, which consists of institutional and cultural forces as well as social relationships in an individual’s life. Formal and informal caregivers are important aspects of the social environment; their role provides them with the potential to support or diminish the “personhood” of individuals with dementia (Kitwood & Bredin, 1992). Researchers have examined a variety of social environmental factors ranging from the developmental and generational appropriateness of interventions to the interaction patterns observed between care staff and persons with dementia (Allen-Burge, Burgio, Bourgeois, Sims, & Nunnikhoven, 2001; Salari & Rich, 2001). Results demonstrated that engagement in social activity is extremely important to eliciting positive outcomes in persons with dementia, including increased communication, positive affect, and higher levels of well-being (Allen-Burge et al., 2001; Beck, et al., 2002; McKee, Houston, & Barnes, 2002).
Because persons with dementia have sensory and cognitive impairments that diminish their ability to initiate activity engagement, caregivers must engender meaningful opportunities for these individuals to exercise intact abilities and experience positive outcomes. Tasks that tap emotional memory, procedural memory, sensorimotor function, and social skills enable persons with ADRD to engage in overlearned behaviors, which can slow decline and maximize functional competence, thus enabling them to achieve a more desirable fit with their environmental context (Bowlby Sifton, 2001).

Despite the accrual of research documenting benefits of innovative interventions and political mandates such as the Omnibus Reconciliation Act of 1987 (OBRA) that require ongoing activities that meet individualized needs, dementia-care staff remain challenged, whether by care load or lack of experience, to facilitate group activities for persons with ADRD. Several dementia-care researchers have addressed this challenge by developing approaches that foster meaningful engagement to facilitate appropriate behavior and positive affect (e.g., Orsulic-Jeras, Judge, & Camp, 2000). For example, Camp and colleagues effectively adapted the Montessori Method for older adults with dementia. Their approach utilizes pre-planned modifications, termed extensions that match environmental characteristics and the individuals’ competence level. Extensions enable facilitators to tailor activities to best meet participants’ abilities. The use of extensions can result in modifications to the activities that simplify, add complexity to, or subtly change the materials or processes involved to sustain engagement and facilitate success (Camp, 1999).

One activity intervention that incorporates the use of extensions and has demonstrated its utility as an inclusive programming option for a wide range of cognitive and skill levels is Horticulture Therapy (HT) (Gigliotti & Jarrott, in press; Gigliotti, Jarrott, & Yorgason, 2004; Jarrott, Kwack, & Relf, 2002; Midden & Barnicle, 2000; Mooney & Milstein, 1994). HT is the use of plant materials and gardening activities that have been adapted to meet individualized needs and reach targeted treatment goals (AHTA, 2003). Horticulture therapists can either
modify the environment or the activity in order to enhance the person’s competence level and
assist them in achieving a person-environment fit that results in adaptive behavior as well as
positive affect. Research documenting the effects of HT on adults with dementia indicated that
persons with dementia are able to successfully engage in HT programming and that they
display higher levels of engagement and positive affect than during traditional activity
programming. In their theory of environmental press, Lawton and Nahemow (1973) discussed
positive affect and adaptive behavior as observable indicators of well-being that result when
congruence between the individuals’ competence level and their environment is achieved.

Theory of Environmental Press

The theory of environmental press enables researchers to embrace a contextual
approach to investigating the behavior and affect of persons with dementia. According to
Lawton and Nahemow (1973), such outcomes are significant indicators of congruence between
individual competence and environment. A good person-environment fit is characterized by a
balance between the individual’s competence level and the level of demand (i.e., press) in their
multidimensional environment (See Lawton & Nahemow, 1973, p.661 for an illustration of the
environmental press model). In contrast, persons who are unable to achieve this congruence
will display maladaptive behavior and negative affect characterized by self-stimulating
behaviors, non-engagement, and emotions such as anger, frustration, and depression. In the
therapeutic context, a skillful facilitator capable of identifying and modifying appropriate tasks as
well as the environment can help individuals lacking functional competencies to achieve a
person-environment fit that elicits positive behavioral and affectual outcomes.

Additionally, Lawton and Nahemow (1973) specifically addressed the heightened
vulnerability of less competent individuals, a phenomenon known as environmental docility.
Because persons with ADRD have limited ability to independently reduce environmental press,
a person-centered approach would mandate that social relationships in the person’s life,
primarily caregivers, either adapt the environment or help the individual with ADRD to increase their competencies through continued use of skills and abilities.

*Theory of Personhood in Dementia*

The theory of personhood in dementia has guided many dementia-care studies and provides a framework for examining the importance of the social environment for persons with dementia (Brooker, 2004; Brooker & Duce, 2000; Innes & Surr, 2001; Kitwood, 1995). The theory of personhood shifted the focus in dementia care from the disorder to the person, thus challenging caregivers to look for strengths in the person with ADRD and highlighting the importance of treating the individuals as human beings deserving respect and autonomy (Kitwood & Bredin, 1997). According to Kitwood’s theory, personhood is not a matter of abilities and capacities; rather, it is created or diminished in the social relationships around the person with dementia (Kitwood, 1992). This theoretical approach supports the well-being of persons with dementia and highlights the need to value persons with dementia, treat them as individuals, understand their perspective, and provide a positive social environment (Brooker, 2004). Kitwood’s theory of personhood elaborated on the manner in which social environments could be enhanced by emphasizing the need to value the person with dementia and those individuals who care for them.

*Purpose of the Current Investigation*

Dementia-care researchers who focus on psychosocial interventions often target similar outcomes, including behavior, affect, and states of well and ill-being (Cohen-Mansfield & Werner, 1995; Day, et al., 2000; Woods, 1999). Many of these interventions attempt to support personhood and foster a person-environment fit for participants; however, the tools and approaches adopted by facilitators to achieve this balance are poorly understood. Although such interventions have demonstrated promising results, inconsistencies in the findings and methodological limitations restrict their generalizability (Sloane, Lindeman, Phillips, Moritz & Koch, 1995; Snyder, et al., 2001). For example, collecting data at multiple sites presents a wide
variety of counterfactual circumstances that often confound observed outcomes. Failure to account for physical and social environmental factors, including individual competencies and facilitators’ approaches to programming, raise questions about the generalizability of specific therapeutic approaches.

The current qualitative investigation was guided by the Theory of Environmental Press and the Theory of Personhood in Dementia. I investigated those contextual and procedural factors that influenced the implementation of HT and traditional activities programming in eight dementia-care programs as well as the outcome that they had on the program participants. This investigation was conducted to achieve a greater understanding of the nature of the interventions and the implementation by the facilitators as well as the unique facets of the multiple environments in which they occurred. The current paper focuses on qualitative interviews conducted with the two HT facilitators and three of the traditional activity facilitators who provided the programming examined during the observational data collection portion of this study.

Methods

The data for this study were from a larger combined method investigation of behavioral and affectual responses to differential activity interventions, including HT. The larger study involved observational data collected at eight dementia-care programs in southwest Virginia. Four of the eight programs were randomly selected to receive the treatment (HT), which was facilitated by two trained facilitators from Virginia Tech, while the other four programs were observed during traditional activity programming led by the facilities’ regular staff persons. Each of these sites varied in type (e.g. nursing home or ADS), size, type of funding, and clients served (dementia only vs. mixed unit) (see Table 1B). The observation period spanned a six-week time frame, with observations collected during weeks one, two, five, and six at each site.

Observations were collected on 129 participants’ types and levels of engagement, affect, and behavior problems for the statistical analyses (see Gigliotti & Jarrott, 2006 for a complete
description of the study). Anecdotal reports from observers indicated that social and physical environmental factors at the sites were contributing to observed outcomes, indicating a need to capture information about the activity facilitator. In response to this concern and to learn more about the processes by which each facilitator approached program implementation for groups of individuals with dementia, I conducted individual qualitative interviews with each facilitator.

Participants

Five individuals were interviewed using a semi-structured interview guide (see Appendix 1B). All five were female and Caucasian. The two HT facilitators were students at Virginia Tech majoring in Horticulture or Human Development; the other three facilitators represented a diverse array of training and field experiences at a range of sites (see Table 2B). The two HT facilitators worked together at all four treatment sites, and each of the three facilitators of traditional programming worked full-time at one of the three comparison sites. While the comparison site facilitators may have led the activities alone at times, they were often accompanied by nursing assistants, interns, and other facility staff during activities programming. Pseudonyms are used throughout this article to protect the identity of the study participants. Amy and Betty are the HT facilitators, who implemented programming in one adult day service (ADS) program and three nursing homes (NH); Cara, and Emma worked in a NH and Dana worked in an ADS program facilitating the comparison groups.

Procedures

The Virginia Tech Protection of Human Subjects Committee approved this study. At the culmination of the observational data collection period, a focus group was conducted with the observational research team to give them a voice in the research process and to gain a qualitative assessment of their experiences observing at each of the sites and using the observational measures. Results from the focus group indicated that practices and characteristics of the facilitators leading the activities at each site greatly influenced participant outcomes in the presented activities. Because the facilitators varied from site to site, the project
manager (PM; first author) invited both the HT facilitators and comparison site facilitators to participate in a 1-hour face-to-face interview in a private location of their choice. Because observed activities at one site were infrequently attended by the activity director and were rather facilitated by a variety of staff and volunteers, that program’s activity director was not contacted for an interview. All five individuals contacted for an interview accepted the invitation and agreed to be recorded on tape.

After reviewing the informed consent form, the tape-recorded interview took approximately one hour to complete. Following the interviews, the PM recorded field notes on each interview regarding contextual information about the interview process and any insights that would further inform the analysis process. The PM and the primary investigator (PI; second author) utilized weekly meetings to discuss the interview data and the similarities and differences between it and the focus group data.

*Interview Questions*

The construction of the interview guide was informed by several sources, including the focus group data, the Theory of Environmental Press, and the research literature documenting procedural and contextual factors that influence behavioral outcomes in persons with dementia. Eleven open-ended questions were used to elicit thoughtful, uninhibited answers from the respondents. Questions covered a range of topics, including information about the facilitators’ backgrounds, training, and experiences, philosophical approaches to working with persons with dementia, materials and approaches utilized when working with this population, and insights about their physical and social environments. Respondents were given the freedom to provide additional information not addressed in the interview protocol, and the interviewer used prompts and subsequent questions to probe respondents to elaborate on their comments.

*Analysis*

The interviews were transcribed verbatim and verified by checking the transcripts against the tapes to ensure accuracy. During this process, the PM noted salient responses and
began to look for patterns of congruence and contention in the respondents’ answers. In addition, responses given by the facilitators that deviated from those provided during the focus group session were noted. Once the initial list of constructs was generated, they were grouped into preliminary categories of themes and subthemes based on Lawton and Nahemow’s Theory of Environmental Press (1973). Several additional categorical themes emerged after rereading the transcripts several times.

Both the PM and the PI read and reread the same transcripts while coding passages in the margins. These coding procedures were performed independently and then discussed at weekly meetings to identify commonalities and areas of dissention. Once saturation was reached via open-coding procedures, a coding scheme was developed. The coding scheme was refined and verified three times as it was applied to the transcripts. While many of the codes remained constant, they were reorganized and reassembled to reflect the final version of the coding scheme. ATLAS TI was used to organize the data and facilitate the analysis process (Thomas, 2004). This qualitative analysis program enabled us to remove codes that were superfluous and further refine the coding scheme. The final coding scheme was comprised of six major coding categories with a range of two to 15 codes per category. Each transcript was then coded with the final coding scheme by the PM and then reviewed and recoded by the PI. Weekly meetings and discussions enabled the PM and the PI to achieve 100% coding agreement. These coding and re-coding strategies were employed to enhance the rigor of the study by bolstering the dependability of the analysis procedures (Anfara, Brown, & Mangione, 2002).

In an effort to systematically organize the data and facilitate comparisons among the various sites, tables were created using the coding categories and sites as axis headers. Relevant data and quotes from the transcripts were inserted into these tables so direct comparisons could be made between each of the programs and facilitators on each of the coding categories. Using ATLAS.TI, I was able to systematically identify quotes that
corresponded to each of the coding categories, so transparency in the data could be revealed to further support the findings (Thomas, 2004). Two of the six coding categories that relate to the environmental press model were used in the analysis for this paper: (a) features of the physical environment that influenced press level and (b) aspects of the social environment that influenced press level. The other four coding categories pertained to the competencies and outcomes of the participants with dementia, properties of the activities, and measurement-related issues; these categories provided little additional insight about the environmental and procedural factors that impacted the implementation of the observed programming.

Findings and Discussion

Including the perspectives of the activity facilitators illustrated the importance of examining the person-environment fit beyond the individual level of application and analysis. The data revealed that the person-environment fit also affected the functions and processes of the facilitators. These individuals are an integral component of the participants’ social environments and their role in shaping and continually influencing the activity context should be systematically explored.

Because persons with dementia are subject to environmental docility as a result of their cognitive impairment, they are often dependent on the activity facilitator to achieve a balanced person-environment fit. However, the fact that persons with dementia depend on the facilitator to achieve a person-environment fit results in a hierarchical. Findings reveal that the facilitator must achieve a person-environment fit before this outcome can be realized for participants. In this sense, the facilitator’s person-environment fit is reflected in the person-environment fit of the program participants. Our interviews with facilitators reflect this trickle down effect on the behavioral and affective outcomes of persons with dementia. These findings are represented pictorially in figures 1B and 2B.

Features of the Physical Environment
Each facilitator discussed specific aspects of the physical environment that either contributed to or detracted from their ability to support the program participants’ achievement of an optimal fit. Because each of the facilities differed in terms of the physical layout of the space, the level of stimulation, the size of the group in relation to the physical space, and the proximity to desirable materials and support staff, the activity facilitators reported diverse experiences regarding their ability to successfully implement the planned activities and facilitate the desired outcomes for the program participants.

**Level of stimulation.** One feature of the physical environment that was discussed by all five facilitators was the importance of implementing activities in an environment with optimal levels of stimulation. Identifying quiet spaces that minimize distractions and eliminate unnecessary stimuli is extremely important for persons with dementia because they have difficulty concentrating and may become easily confused and disoriented. Low levels of unnecessary external stimulation enables the participants to focus on the materials and activities presented to them and therefore reduce the level of press in their physical environment. Achieving the correct balance of stimulation with support is important in both the recreational activity context and during more routine aspects of daily life such as activities of daily living. Cara highlighted the value of a reduced stimulation environment that characterized the long-term care facility in which she worked. She alluded to the need to balance competence levels and environmental stimuli:

I see what you are calling *institutional* as being a benefit for these patients because it’s less, there is more structure and there is less required of them; therefore, they are less stressed and more able to engage in more equal activities.

Controlling the level of stimulation was often difficult at several sites where there was only one activity space and multiple people and activities were occurring simultaneously. Amy, one of the HT facilitators described the difficulty of sustaining the participants’ attention in an overstimulating physical environment that was beyond her control:
In one of the units, we were in the middle of the unit... just a table in the middle of the unit. Folks were walking in, walking out, getting distracted by the TV that was in the room. Just constantly, it was really hard to focus people and keep them unified on what we were doing.

Emma also supported this claim:

I can’t overstimulate, you know with Alzheimer’s and dementia residents too much stimulation could be aggravating and then they get agitated and want to get out, so, no, you can’t have two or three things going on at one time; it is just one central thing. Her tenure at the program and her ability to establish connections with staff and administrators enabled Emma to have more control over these stimuli than the HT facilitators who were temporary guests at each intervention site. The HT facilitators were disadvantaged in that they did not have an ongoing rapport with program staff, who had the power to control distracting stimuli in the environment. This disadvantaged position affected their competency level in terms of their ability to modify the physical environment to best accommodate the participants’ needs.

_Proximity to supplies and staff_. Another aspect of the physical space that was discussed by facilitators was proximity to activity supplies and care staff. The ability to access materials and staff support quickly minimized the likelihood that participants would become distracted and disassociated from the activity when additional support was needed. The comparison-site facilitators mentioned the value of having activity supplies handy and staff nearby, and these factors influenced their decisions of where to present programming. Cara, one of the comparison site facilitators discussed her decision to facilitate programming in one activity area that was not optimal in terms of space but was in close proximity to the nurses’ station:

Yes, I do it right down there in the blue room, that’s where everybody seems to go. If I do it in the other end of the dining room, it’s too far away from the nursing staff and if there is a situation and I need help, I would have to run down the hall and leave the group and it wouldn’t be conducive to what I’m doing.
Emma focused more on proximity to the materials she utilized in her programming. She discussed the benefits of spaces designed to consolidate activity materials. Emma expanded on this point when she commented:

Just being able to have a room that is equipped with everything that you need in one place that was the big thing; that I have an activity room that had all the supplies in the little kitchen and everything all right there so, that you didn’t have to move very far and you had them all in a group.

Because the HT facilitators were not as familiar with the layout of the physical environment and had fewer options when choosing spaces favorable to activity programming, they described greater instances of the physical environment serving as a barrier to achieving optimal outcomes. The high level of press in their physical environment was not a good match for their limited knowledge of the facility’s layout and subsequently, the degree to which the environment could best support the participants’ successes.

Appropriateness of the physical space. Additionally, each site varied in terms of the activity spaces available, and several had environments that were more conducive to a wide array of activities. Access to the outdoors and adaptive equipment, such as raised beds, was available at five of the eight treatment and comparison sites; however, the cold weather often served as a barrier to their use. This limited the options available to the HT facilitators, especially since many of the sites were unsupportive of live plant material and dirt inside the facility; this caveat forced the facilitators to stretch the definition of HT and incorporate more horticulture craft activities into the curriculum rather than focusing on propagating, cultivating, and harvesting live plant materials. Although this demonstrated flexibility and creativity of the HT facilitators, it also showcased the degree to which impediments in the environment can impact the facilitation of the intended intervention. Amy highlighted this situation when she commented, “It was winter, I didn’t have a garden space where I could start seeds, cultivate in the garden, harvest the vegetables. I had to shift more to what I could do.”
Emma, one of the comparison site facilitators, described the wealth of opportunities at her disposal because her facility had been designed specifically for persons with dementia. She pointed out several ideal features:

[Participants] can go right out off the little activity room and go right out in the courtyard. I would have picnics and things, and they keep that door open on a regular basis so they could let [participants] go out and it’s enclosed and they can’t get out [of the NH area] and can’t get hurt.

Having access to an environment that was accommodating to a wide range of programming provided Emma with greater flexibility to implement a range of activities that met the unique interests and individual needs of her various program participants. In contrast, the HT facilitators’ ability to modify programming and diversify activities to best meet the unique needs of the program participants was stifled by the limited nature of the surrounding physical environment in several facilities.

Aspects of the Social Environment

Although the physical environment greatly influenced the facilitators’ ability to implement programming that targeted behavioral and affective outcomes, the social environment affected the achievement of a good person-environment fit for both the participants and the facilitators. This coding category was the largest generated from the data and reflected behaviors, beliefs, and professional and personal qualities of the facilitators that supported or detracted from a desirable person-environment fit for the program participants. In addition, the larger ecological context of the facility, including factors such as social interactions between participants and the overarching institutional culture, had an enormous influence on facilitators’ ability to implement programming that optimized fit and hence, elicited positive participant outcomes.

Facilitators’ characteristics. The facilitators’ characteristics embodied a number of items deemed important for the achievement of participant outcomes. Their varying beliefs, backgrounds, and behaviors altered the course of the activity sessions irrespective of the
medium utilized during the programming. Facilitators discussed the manner in which they interacted with participants, which was often guided by personal beliefs as well as official regulations. Each facilitator’s unique personality and level of training also informed these behaviors during interactions with program participants.

Two comparison site facilitators discussed the importance of the communication strategies they used when facilitating activities. Each of these facilitators highlighted the importance of making eye contact and one-to-one contact. Cara explained:

When you are presenting in front of a patient you have to get up where they can visually see you and where they can see your lips move; it is so important and having that one-to-one direct eye contact; you cannot minimize the importance of the eye contact, the facial gestures, and the body language.

Emma corroborated this claim by stating, “With Alzheimer’s and dementia you … never [come from] behind them … you have to look at them at their level”.

Efforts to use effective communication techniques are not always successful, as noted by one of the HT facilitators. Betty described one such experience, “you want to kneel and get in their face. Sometimes I’d be speaking really loud and they’d say ‘you know, I can hear fine, why are you yelling at me!’” Having a working knowledge of each program participant’s abilities and weaknesses would have minimized situations like this. The HT facilitators’ limited knowledge of each participant hampered their ability to optimize interactions and levels of engagement and positive affect.

Personal characteristics of the facilitators, coupled with their professional training, were also critical aspects of the activity context. Facilitators commented on the qualities necessary to be a good facilitator with this population of older adults. They described the need for flexibility, creativity, empathy, excellent observation skills, and an upbeat personality. Dana described the need to stay energetic and enthusiastic about her work:
The greatest challenge … you know, … you can become boring and get in a rut if you allowed yourself, I mean, this isn’t just a job. This is a challenge to stimulate minds to, stimulate people to do things, and it takes a lot of energy.

Personal characteristics such as extraversion and excitability influenced the degree to which facilitators formed a relationship with the participants and motivate them to get involved. Each of these personal characteristics can be enhanced through increased comfort, confidence, and experience, which were limited for the HT facilitators. Therefore, because the HT facilitators were new to the various treatment sites and relatively inexperienced with the population, their poise in the activity context and ability to generate excitement may have been compromised.

All of the comparison site facilitators talked about the importance of training and knowledge of dementia-specific programming and strategies. Although the majority of comparison-site facilitators had been in the field of dementia-care programming for an extensive period of time, Emma had no experience with this population when she began her position. She described the wealth of knowledge she gained during the continuing education classes that facility administrators required her to attend. Emma commented on her experiences, “They [educators] teach you skills on how to work with Alzheimer’s and dementia residents, things that help them when they are aggravated and agitated, things like that. They give you all kinds of little tips that are extremely helpful.”

The emphasis on training and the acquisition of specific skills and experience acquired while working with an ADRD population underscores the importance of the facilitators’ personal competencies. The facilitator’s competence must be adaptable to the level of environmental press in order to optimize the intervention and participant outcomes. Facilitators with limited experience, knowledge, comfort, and participant knowledge may be even more dependent on the physical and social environment to support an optimal fit. The environmental docility hypothesis states that persons who have compromised competencies are more vulnerable to environments that are lacking adequate supports than are persons that can compensate for
environmental limitations as a result of their inherent abilities (Lawton & Nahemow, 1973). Thus, just as persons with dementia are more vulnerable to environmental press imbalances as a result of their limited cognitive resources, facilitators with limited resources in several domains are at an increased risk for incongruence between their competence level and their environment. Important stakeholders in the social environment such as administrators, care-staff, and family members have the power to enhance the social environment and support facilitators by transmitting social history knowledge, fostering a team-approach in the workplace, allocating adequate resources, and rewarding committed staff members.

Administrators have the power and resources to support facilitators by providing dementia-specific training and education sessions to enhance their competencies. In addition, administrators can reorganize the hierarchical approach to management by empowering staff through the redistribution of power, employing self-managed work-teams for staff, and developing incentive programs to motivate individuals to work together (Sheridan, White, & Fairchild, 1992; Yeatts & Seward, 2000). Care staff can enhance the social environment of the facilitators and the participants by providing support throughout the day, including activity sessions, and working with facilitators to optimize benefits for the participants rather than solely focusing on activities of daily living (ADLs) and medical care. Involved and supportive family members can also enhance the social environment of the facilitators and their loved ones by providing detailed and accurate social history information that can be utilized during programming to optimize benefits and elicit reminiscence.

While the majority of facilitators employed a variety of techniques to support fit, several facilitator behaviors detracted from fit and may have diminished the personhood of the participants. The HT facilitators' challenge of providing person-centered programming was exacerbated by their limited understanding of the desired outcomes that should be targeted in a group setting for persons with dementia. Despite her education and experience facilitating HT with a variety of special-needs populations, Amy lacked the comfort and experience necessary
to achieve optimal outcomes specific to participants with dementia. She described her feelings at the onset of the project, “this was a whole new client group for me; I was really apprehensive going into it.”

Further comments revealed her misinterpretation of the desired outcomes when she stated, “We were having to focus more on social quality of life kinds of things, wellness types of things, rather than [being] treatment oriented.” This comment reflects a restricted knowledge of this population and a focus on outcomes rather than process. In contrast, Cara described the outcomes that she targeted in her programming:

Well, partially what I’m looking for may not be a big change. I’m looking for, it might be a smile, it might be some eye contact, it might be a word or two and then the moments are brief and they are not long term and that’s just the nature of [working with persons with ADRD]. It’s going to be that way.

Cara’s training and experience enabled her to have realistic expectations and define appropriate goals for activity programming sessions.

Amy’s limited experience with an ADRD population was also reflected in her overemphasis on independence, which appeared to impede the participants’ engagement. She provided an illustration of her tough-love strategy, which was intended to facilitate initiative and independent action among participants:

If something would fall on the floor and [the participant said, “Well, I can’t get that], then I guess we weren’t very indulgent. I mean, I didn’t encourage that [learned helplessness behavior], it was like well, “I bet you can pick that up, and if you’re not gonna do it then it’s gonna stay on the floor.”

Other facilitators described their awareness of the participants’ varying abilities from person to person and day-to-day. Dana, one of the comparison-site facilitators, adopted an opposite perspective from Amy. She empathized with the participants and interpreted their behaviors in accordance with her perspective, which may have reflected greater sensitivity to
the participants’ moment-to-moment needs. She commented on how she interpreted such behavior, “I have a wonderful reader that comes in and maybe after a couple of short stories some folks nod off, and that’s okay if they want to nod off. That’s okay because it’s comfortable to them.” Dana’s value for the participants’ moment-to-moment enjoyment overrode her desire to optimize the participants’ engagement, initiation, or self-reliance. The theory of personhood highlights the value of supporting well-being in the moment since participants’ abilities to remember the past or foresee the future is often diminished. The facilitator’s ability to look at the world from the participants’ perspectives enabled her to provide a social environment in which participants could experience relative well-being (Brooker, 2004; Kitwood & Bredin, 1992).

Presence and availability of support-staff. Several features of the program support staff influenced the degree to which a person-environment fit could be supported for the program participants. Facilitators who have the support of other key members of the social environment will experience lower press on their competence level and will be better equipped to optimize programming for the participants. Having a limited rapport with other care staff members can be detrimental, and researchers have cited this as a threat to intervention programming in naturalistic observations (Sloane, et al., 1995; Snyder, et al., 2001).

The presence or absence of support-staff during the activity programming was discussed by each of the facilitators as a critical factor related to the achievement of a person-environment fit for the participants. The HT facilitators, who worked at four different sites, described the differences that they experienced from one facility to the next. Betty elaborated on her observations:

At one of the sites, they got us materials and checked up constantly to see what I needed, if the participants had personal care issues, they took care of that. While at another site, I had a harder time. If there was a personal care issue, it was impossible to
get help, so I would bring the participant in need to the toilet and the other facilitator was left with a million people.

In addition to the problems encountered when participants had care needs, the absence of facility staff also affected the facilitators’ competence levels. The HT facilitators were not privy to some of the detailed social history and functional and sensory capacity information that the care-staff had committed to memory. Their inability to acquire that personalized information from these more informed and experienced individuals during the sessions reduced their ability to facilitate person-centered programming and resulted in a less than optimally supportive social environment during the activity sessions for both the facilitators and the program participants.

In other instances, the presence of care staff had a negative effect on the activity session. Occasionally, care staff, who did not understand person-centered care principles were present during the HT programming. As Amy described, their comments often diminished the participants’ personhood.

She [care staff] would talk to us [other facilitators in the room] about the participants and say things about them that were discouraging or condescending, saying things like… “poor Mr. Smith, he doesn’t have a clue where he is or what he is doing; I can’t believe that he is even sitting here. Normally he can’t do anything at all. He just sits there all day”…It was horrible, she said the most horrible things about the participants while they were there.

These types of derogatory comments may significantly reduce the overall well-being of the participants. Specific to the intervention, they may have decreased the participants’ motivation to remain engaged in the activity and significantly affected behavioral and affectual responses during the HT sessions. The HT facilitators were not in a position to reprimand this staff person or stop the inappropriate comments that detracted from the participants’ personhood.

Other program staff would not allow the HT facilitators to send potted plants home with the participants because they appeared more concerned about the plant’s welfare than the
potential benefits the participants could obtain from keeping their plants. Betty commented on this situation, “Most of the CNAs would say ‘Oh don’t put that in their rooms. It’ll [plant] die, they [participants] won’t water it.’” Because the HT facilitators were not full-time staff and other staff members were not willing to help the participants tend to the plants, the participants were not given this additional opportunity to nurture a living plant. These instances of staff interactions that served as personal detractors for the participants were embedded in the larger ecological context of the institutional culture in which they worked. The lack of staff support and interest in optimizing participant outcomes limited the extent to which the HT facilitators could maximize outcomes for the participants and directly affected the overtone of the HT context.

*Features of the larger social ecological context.* Several features of the social environment extended beyond the activity facilitator and support staff during the activity programming sessions. These characteristics of the larger ecological context included the institutional culture unique to each facility, as well as the residents’ interaction patterns at each site. The more distal levels of the social environment affected both facilitators’ and participants’ person-environment fit. Institutional culture at each facility varied widely from site to site. Several aspects appeared to support fit, including a team approach among staff, an openness and willingness to try new things, and high levels of administrative support. Conversely, several sites were understaffed and lacked adequate resources to optimize person-environment fit for facilitators or participants. The lack of support for staff resulted in a fragmented approach to care and an environment that deterred support among staff, which trickled down to the participants. The HT facilitators highlighted the variability in staff receptivity at the HT sites. Amy made an explicit comparison between treatment sites when she stated:

> At two of the sites the staff were awesome; they were so supportive and they really recognized that this [HT] was a group that had goals and that I were there for a reason. At one of the sites I really struggled. The facility support was not there and although the activity director was nice, she wasn’t getting the support she needed from the
administration. The nursing staff would not help us get people to and from their rooms and if there was a personal care issue, it was impossible to get help.

Each of the comparison site facilitators discussed the nature of the social environment in terms of the relationship between care-staff and activities professionals. All three of these professionals spoke positively about their situations but acknowledged that other sites were not as cohesive. Feeling supported by their co-workers and administrators was one highly salient aspect of the institutional culture influencing their work. Dana sang the praises of her co-workers and administrator and emphasized the importance of their support and value for activities. She highlighted their facility’s care philosophy by stating, “When I have an activity, the whole staff helps. I help everybody with everything; we all work together beautifully and it works so much better if you work together as a team and we do that here.”

Emma, echoed this sentiment:

The only way that a good program would work [is] if you have the team effort, and … I’ve seen a lot of places that just don’t have staff support, and it is really difficult on the activity person having to round everybody up and do the activity.

Those facilitators who felt that they were an integral part of a team and who had appropriate support of other key players in the social environment were best able to implement the desired programming. Participants were therefore best supported when facilitators and staff persons worked together to balance their competence levels and environments through person-centered programming that provided the appropriate level of challenge and elicited positive outcomes.

In addition to the staff support and interactions, the HT facilitators discussed the differing philosophies implicitly embraced by each site’s staff and administration. They addressed how their outsider status limited their understanding of how various situations would be viewed and subsequently handled at each of the sites. For example, HT facilitators soon learned that different sites reacted to the participants’ problematic behaviors differently. Betty illustrated this point with the following example:
At one site, they [staff] flipped out when people ate paint. I mean, naturally you don’t want people eating paint, but it was non-toxic paint. I didn’t know that when I went into that facility that they were going to be so worried about things like that; whereas, at a different site, one of the participants ate some soil during the session and again it was nontoxic, it was just dirt, and they [staff] were really relaxed about it; they were like, ‘Yeah, they do things like that. It’s just dirt, don’t worry about it too much. We’d rather them eat some dirt than undergo some social shaming or something like that’… it was good to know.

Several of the comparison site facilitators touched on the support, or lack thereof, from their facility’s administration. Betty mentioned that when she was hired for the position, her superiors expressed their views about the capabilities of the persons with dementia. She explained, “when I was hired, they had told me what Alzheimer’s [patients] wouldn’t be able to do.” The administrators at her facility adopted a deficit-model perspective and minimized the capabilities the participants retained. This perspective sent a message about the nature of the activities she should employ and the degree to which they would be supported by the administration. Dana described an alternate experience as she highlighted the support that she received from her administrator, “She is so supportive; she will go right with us and help… she has been in this business a long time.” Betty discussed the institutional climate at one of the sites and how it affected the manner in which staff interfaced with participants.

It appeared that the staff at one site weren’t treated very well and they didn’t seem happy with their jobs… so they didn’t want to be there so of course they’re not going to be the best to the residents.

Another observation of the HT facilitators concerning the social environment was the variance in the participants’ culture. Levels of learned helplessness appeared more pervasive at some facilities, thereby reducing participants’ willingness to join activities that demanded active participation. Both HT facilitators shared this observation:
At two of the sites, there was a lot more of the learned helplessness that I observed. We’d say, “Let’s pot up this plant,” and they’d say, “Well, I just can’t do it. I just can’t do that…I’m gonna mess it up anyway, so you just do it for me.” But at the other two sites, they were much more willing to try new things; they were interested in new tasks.

This unwillingness to try new things and the adoption of a dependency on others to perform tasks that they could perform themselves made it difficult for HT facilitators to motivate the participants to get engaged in the activities. Their efforts during the short time at the site could not overcome socially ingrained beliefs and behaviors that were ultimately rewarded by care staff at that site. The implicit positive reinforcement of learned helplessness by staff members has been documented in the research literature, and its effects can be reversed if the reinforcement behavior is discontinued (Baltes & Reisenzein, 1986).

The social environment also consisted of the interactions observed between the participants at the various sites, and these interactions also affected the implementation of the activities and the outcomes observed. Amy discussed her experience trying to pair up residents of varying ability levels:

One of the things they recommend in HT is to team a high functioning person with a lower functioning individual, and that did not work for us at all because people would get irritated with one another, they’d get frustrated and the higher functioning person would say, “you’re messing it up,” and it was horrible.

Dana had a very different experience with the participants in her program where she observed participants’ courtesy for one another, “I love it because they compliment one another. That’s what I really love is here nobody really makes fun of anybody and I laugh together, it’s together.” Documenting the interactions that transpire between participants could be a valuable addition to standard data collection practices. While the activity professionals may be working to facilitate a fit between the participants’ competence levels and their environments, social interactions during the activity may affect the degree to which fit can be achieved. Because the social
environment influences participants and facilitators both directly and indirectly, researchers must be attuned to the inherently dynamic social context when studying participant outcomes.

The size of the groups also affected the facilitators’ ability to elicit desirable outcomes. All of the facilitators agreed that small groups were necessary to facilitate targeted outcomes and work with participants to optimize person-environment fit. However, group size was overwhelmingly large at many of the sites and precluded the ability to maximize person-centered practices and desired outcomes. Dana, one of the comparison site facilitators alluded to the increased potential of a smaller group size when she stated, “It would be good if I could do smaller groups because there is so much I could do. The only difficulty I have is working with that bigger group in that small space.” She also indicated that the participants’ wheelchairs and Geri-chairs “are kind of in the way, so I have to work around it.” Cara explained, “You can’t do group activities with 20 people [with Alzheimer's] … like you would in assisted living.” While the facilitators’ control over the group size varied at the comparison sites, the HT facilitators experienced difficulty regulating and monitoring the number of participants who joined the group. Amy, one of the HT facilitators, commented on her frustration with this situation, “With HT, it should be more tailored to the individual and with groups of 20-25 people there was no way to know whether the different individuals were enjoying the activity, not enjoying, getting benefits from it or not.”

Facilitators who had adequate support in their social environments were better able to provide person-centered programming that achieves anticipated outcomes. Despite the type of programming implemented, facilitators who did not have an optimal staff to client ratio were not able to support the unique needs of the participants and actively modify the programming to best support their competencies. Supportive administrators acknowledged the need to adequately staff all activities during the day and delegate responsibilities accordingly. Supportive staff members appeared to adopt a team approach and support participants throughout the day despite the focus of the task at hand. Facilitators who had this level of
support from those key individuals in the social environment were much more likely to achieve a person-environment fit and hence support that outcome for the program participants. Conversely when facilitators did not have adequate support in the social environment, they were unable to provide the highest level of person-centered programming that is theorized to result in an optimal congruence between competence and press for persons with dementia in the activity context.

Limitations of the research

Because the current study uses self-report interview data gathered from facilitator interviews and was not systematically triangulated with the data gathered during participant observations, the reliability of this information should be considered. The interviewees may have provided some responses that reflected their desire for social desirability. It may have been the case that their behaviors during the facilitation of the activities did not necessarily correspond to the philosophies that they espoused during the interview process. For example, at the culmination of one interview, a facilitator who purported person-centered philosophies discussed program participants in a negative and uncensored manner during a conversation with a fellow staff person while conducting a tour with interviewer.

Conclusion

Our findings reveal the value of exploring the contextual factors and programmatic processes that impact participants’ receptivity to varied activity interventions. Analyses yielded theoretical, methodological, and practical insights that should be applied to future dementia-care research and intervention efforts. The findings are graphically represented in Figures 1B, 2B, and 3B, which highlight the multitude of factors that influence the implementation of activity interventions in dementia-care programs as well as the relationships between those factors and the attainment of the desired outcomes for the program participants. The hierarchical relationship between the facilitator’s fit and the participants’ fit is also depicted in these illustrations. In Figure 1B this hierarchical relationship is represented through the nested nature
of the participant’s fit within the facilitator’s. In figure 1B this relationship is represented through
the hierarchical pyramid that illustrates the facilitator’s fit as the basis for the attainment of fit for
the participant. In Figure 1C, the fit of the participant with dementia falls within the facilitator’s fit
subsection of the venn diagram. Although program facilitators are conceptualized as part of the
social environment, their contribution to the activity context is unique and also subject to the
environmental characteristics outside of themselves that impacts the program participant.
Therefore, the facilitator is represented independently of the social environment in the figures to
highlight this distinction.

Findings reveal that the unique role that the facilitator plays in the implementation of
therapeutic interventions is paramount to the outcomes experienced by the participants and
should be operationalized and measured systemically in order to best understand outcomes
observed in participants’ behaviors and affective states. Although the facilitator is considered
one aspect of the social environment, their role is so critical in terms of the implementation of
the programming and outcomes generated by it that they must be independently acknowledged
and assessed. Results indicate that facilitators’ competencies directly affect their ability to
employ strategies that support activity engagement for participants with dementia.

The facilitators’ knowledge of participants’ abilities, interests, and goals plays a critical
role in shaping their interaction with the program participants during programming. Quality
person-centered programming requires facilitator knowledge of and rapport with clients prior to
facilitating group interventions. While it is desirable to hire program staff who are energetic and
outgoing and who possess high levels of dementia-specific training and education, such
candidates are often difficult to find in a field with excessive turnover and low levels of pay.
Administrators can cultivate facilitators’ competencies through support of on-site training,
continuing education classes, and by providing an environment that provides a good balance
with their competence level.
Although facilitators’ competencies were critical factors to achieving optimal fit for participants, the impact of the environment was equally salient. Even the most competent facilitators with high levels of training and education can fail to elicit desired outcomes for program participants when the level of press in their environment exceeds their capacity to perform most effectively. While it is difficult to identify programming that is generationally and developmentally appropriate and that can be adapted for a wide range of ability levels, impediments originating in the environment exacerbate this challenge.

Factors beyond the facilitators’ control such as unsupportive care staff, resource limitations, and less-than-ideal activity areas can be addressed by administrators who recognize the importance of creating a supportive environment for both their staff and their participants. The theory of personhood in dementia highlights the importance of valuing persons with dementia as well as those who care for them (Brooker, 2004). Administrators at dementia-care programs must be prepared to create a supportive and nurturing environment that can optimize the competencies of both their program facilitators and their program participants (Jarrott, Gigliotti, & Smock, in press).

The expanded application of the person-environment fit model in the current study broadens the level of analysis to include multiple perspectives, which enhances our understanding of intervention programming. Additionally, the emergent findings reinforce the importance of systematically assessing physical and social environmental factors. Because the observational data were collected at multiple sites with varying facilitators, attention to contextual factors is especially critical. Operationalization of physical and social features is currently under investigation by numerous researchers; however, environmental features essential to an optimal person-environment fit have not been clearly delineated in the literature, nor have features that impact the performance level of activity staff.

In light of our findings, I recommend that specific aspects of facilitators’ techniques be captured. Communication patterns, materials chosen, and the manner of implementation
should be operationalized and systematically assessed in order to understand how the facilitation of the activities affects participant outcomes. Such data could help intervention researchers distinguish the effects of programming content from facilitator qualities and behaviors. Future research should explore the interface between facilitators’ competence levels and their environments in order to support a positive person-environment fit for both the facilitators and participants.

Because persons with dementia are vulnerable to environmental docility as a result of their cognitive impairment, the importance of care staff and activity facilitators in their social environments is paramount. Facilitators responsible for optimizing a balance between the environment and competence levels of person with dementia must also achieve a good fit with their environment. Once facilitators are able to achieve a person-environment fit, they are better equipped to optimize outcomes for program participants.


Snyder, M., Tseng, Y., Brandt, C., Croghan, C., Hanson, S., Constantine, R., & Kirby, L. (2001). Challenges of implementing intervention research in person with


### Table 1B

**Site Descriptions**

<table>
<thead>
<tr>
<th>Site</th>
<th>Type of Program</th>
<th># Participants served by the facility</th>
<th># Participants in the activity</th>
<th>For Profit/Not for Profit</th>
<th>Mixed Unit or SCU</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>ADS</td>
<td>8-12 daily</td>
<td>7</td>
<td>Not for profit</td>
<td>Mixed group</td>
</tr>
<tr>
<td>T2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Nursing home</td>
<td>90 bed facility</td>
<td>23</td>
<td>For profit</td>
<td>Mixed unit</td>
</tr>
<tr>
<td>T3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Nursing home</td>
<td>60 bed facility</td>
<td>25</td>
<td>For profit</td>
<td>SCU&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>T4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Nursing home</td>
<td>100 bed facility</td>
<td>20</td>
<td>State veterans care facility</td>
<td>Mixed unit</td>
</tr>
<tr>
<td>C1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Nursing home</td>
<td>30 bed facility</td>
<td>13</td>
<td>Federal veterans care facility</td>
<td>SCU&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>C2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>ADS</td>
<td>10-16 daily</td>
<td>11</td>
<td>Not for profit</td>
<td>Mixed group</td>
</tr>
<tr>
<td>C3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Nursing home</td>
<td>226 bed facility</td>
<td>17</td>
<td>Not for profit</td>
<td>Mixed unit</td>
</tr>
</tbody>
</table>

*Note.*  
<sup>a</sup>T1-T4 = treatment sites 1-4,  
<sup>b</sup>C1-C4 = comparison sites 1-4,  
<sup>c</sup>SCU = special care unit (specifically for persons with dementia)
## Table 2B

### Participant Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>HT facilitator 1</th>
<th>HT facilitator 2</th>
<th>Traditional Facilitator</th>
<th>Traditional Facilitator</th>
<th>Traditional Facilitator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>Sites: T1-T4</td>
<td>Betty</td>
<td>Cara</td>
<td>Dana</td>
<td>Emma</td>
</tr>
<tr>
<td>Betty</td>
<td>Sites: T1-T4</td>
<td>Site: C1</td>
<td>Site: C2</td>
<td>Site: C3</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>23</td>
<td>22</td>
<td>43</td>
<td>57</td>
<td>48</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
</tr>
<tr>
<td>Race</td>
<td>Caucasian</td>
<td>Caucasian</td>
<td>Caucasian</td>
<td>Caucasian</td>
<td>Caucasian</td>
</tr>
<tr>
<td>Education/</td>
<td>B.S. in HT,</td>
<td>B.S. in HD</td>
<td>M.S. in progress,</td>
<td>B.A. certified in</td>
<td>4 years experience</td>
</tr>
<tr>
<td>Training</td>
<td>experience in</td>
<td>training and</td>
<td>board certified in</td>
<td>activities for 15 years,</td>
<td>with activities, 3 yrs</td>
</tr>
<tr>
<td></td>
<td>psychiatric</td>
<td>experience with</td>
<td>music therapy,</td>
<td>24 years in healthcare,</td>
<td>with persons with</td>
</tr>
<tr>
<td></td>
<td>hospital; limited</td>
<td>persons with</td>
<td>experience with all</td>
<td>working with persons</td>
<td>dementia; no formal</td>
</tr>
<tr>
<td></td>
<td>experience</td>
<td>dementia; limited</td>
<td>populations, many</td>
<td>with dementia, 500 hrs</td>
<td>education; on the job</td>
</tr>
<tr>
<td></td>
<td>working with</td>
<td>Horticulture</td>
<td>CEUs</td>
<td>in CEUs</td>
<td>training and CEUs</td>
</tr>
<tr>
<td></td>
<td>persons with</td>
<td>training</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>dementia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* CEUs is an abbreviation for continuing education units.
Appendix 1B. Interview Guide for the Activity Facilitator Interviews

1. What is your educational background and training related to dementia-care programming?

2. What is your philosophy of facilitating therapeutic activities for older adults with dementia?
   a. What outcomes/benefits are you seeking?
   b. How do you determine what these outcomes should be?

3. What theory or philosophy guides your approach to facilitating activities for this population?

4. What materials seem to work best when working with this population of older adults? Why do you think this is? Is there ever a tension between what is best for the participants and resources? If so, what are those tensions and how do you reconcile those differences?

5. What are the biggest challenges to facilitating activities with this group of elders? How do you overcome/address those through your practice?

6. How do you feel about the physical environment of this facility? Is it conducive to what you try to achieve through activity programming...why or why not?

7. How do you feel about the social environment here in this facility? Do you feel part of a connected team? Do you receive help and support from other staff members?

8. What is family involvement like at this facility? How does that impact activity programming?

9. How did you feel about the observers’ presence? Did you feel like it affected the participants' behaviors during the sessions?

10. What other contextual factors seem to affect the activities besides the activities themselves?

11. What feedback do you receive from the participants and/or staff and family members?
Figure 1B. Nested Hierarchical Environmental Press Model. Hierarchical achievement of a person-environment fit for program participants and those conditions that must be present to support well-being by achieving an optimal person-environment fit for persons with dementia in the therapeutic activity context.
Figure 2B. Pyramidal Hierarchical Environmental Press Model. Hierarchical achievement of a person-environment fit for program participants and those conditions that must be present to support well-being by achieving an optimal person-environment fit for persons with dementia in the therapeutic activity context.
Figure 3B. Venn Diagram Hierarchical Environmental Press Model. Hierarchical achievement of a person-environment fit for program participants and those conditions that must be present to support well-being by achieving an optimal person-environment fit for persons with dementia in the therapeutic activity context.
Utilization of Multiple Correspondence Analyses to Examine the Relationships Between
Against and Affect in a
Study of Activity Interventions for Persons with Dementia
Acknowledgements

The authors would like to thank Drs. Karen A. Roberto, Diane Relf, Michelle Stevenson, and Jay Mancini for their oversight and valuable insights on this paper as well as Dr. Katherine Hertlein for her statistical consultation and review. I would also like to thank each of the eight dementia-care programs that agreed to participate in the study as well as the team of research assistants that collected and processed the data. This research was only possible in its current form thanks to the ARDRAF research grant funded by the Virginia Center on Aging (VCOA). Finally, I would like to thank Dr. Jay Mancini for his support of the V. R. and J. A. Mancini Research Prize, which was awarded to the first author and provided additional monetary support for the completion of this manuscript.
Abstract

Adaptive behavior and positive affect are hypothesized to be indicators of a good person-environment fit as well as integral components of well-being for persons with dementia. The purpose of this study was to explore the relationships between the type and frequency of eight engagement activities and three affective states of persons with dementia over a six-week period. Descriptive analyses revealed that interest, active engagement, and passive engagement were the most commonly observed behavioral and affective categories.

Multiple Correspondence Analysis was used to explore the interrelationships between the classification (high/low) of the engagement and affective states. Individuals who exhibited high levels of active engagement were also likely to display high levels of pleasure and low levels of non-engagement. Individuals who exhibited low levels of passive engagement also tended to experience low levels of anxiety and low levels of self-engagement. Findings support the value of active engagement in activities to optimize well-being of persons with dementia and suggest the need for researchers to use a combination of measures to obtain a more holistic assessment of the quality of life.

Key Words: Horticulture therapy, dementia, activities programming, MCA, engagement, affect, quality of life
An Examination of the Interrelationships between Engagement and Affect in a Study of Activity Interventions for Persons with Dementia

Introduction and Literature Review

The estimated projections for the prevalence of Alzheimer’s disease (AD) demand increasing attention from practitioners, policy makers, and researchers. Estimates reveal that the progressive disease will affect 16 million persons by the year 2050 if the current rate of progression continues and those already affected continue to live longer lives (Alzheimer’s Disease and Related Disorders Association, 2004). Because AD can persist for up to 20 years and results in functional and cognitive losses, persons with dementia must increasingly rely on others to manage and provide their care. As behavioral alterations and functional impairments become more pronounced, familial caregivers often turn to formal service providers such as adult day programs and nursing homes to provide care for their loved ones. These programs receive criticism for limited levels of stimulating programming and minimal opportunities for meaningful interaction. Evidence-based interventions and care quality enhancements are greatly needed considering the increasing prevalence of the disease, the level of dependence it fosters, and the limited resources currently available.

Formal care providers have begun to shift their focus from the disease to the person with the disease and are subsequently interested in supporting the psychosocial well-being and quality of life (QOL) of persons with dementia, rather than solely attending to their physical care needs. This paradigm shift has occurred as a result of legislation such as the Omnibus Reconciliation Act (1987) as well as theoretical and empirical advances in the field highlighting the importance of providing quality care that enhances QOL (Kitwood & Bredin, 1993; Kane, 2001; Lawton, 1994; Ready & Ott, 2003). Although QOL for persons with dementia has become a major focus of research and practice over the past decade, defining and assessing this construct, as well as
identifying those factors that contribute to it, continues to be a challenge (Lawton, 1997; Ready & Ott, 2003; Selai & Trimble, 1999). To illustrate this challenge, Ready and Ott (2003) compared, and critiqued nine different QOL measures for persons with dementia that differed in conceptualization and measurement of the construct. They concluded that QOL assessment has improved in recent years given numerous efforts to operationalize and measure the construct. However, given the critical importance of QOL, future research should focus on assessing QOL scales for their sensitivity to capturing change over time, identifying the factors that affect QOL reports, determining how perceived QOL affects decisions regarding the care of persons with dementia, and evaluating interventions that increase QOL.

Theory of Environmental Press

Lawton and Nahemow (1973) emphasized the importance of the environment and the person’s competence levels as important determinants of QOL. The interface between these elements results in behavioral and affective outcomes for the individual. When people’s competence levels and environments are congruent, they are hypothesized to display adaptive behavior and positive affect, characterized as achievement of the individual’s adaptation level (AL) (See Lawton & Lahemow, 1973, p.661 for an illustration of the environmental press model). Conversely, persons who are unable to achieve this congruence will display maladaptive behavior and negative affect characterized by non-engagement and self-stimulating behaviors (including wandering, asking repetitive questions, or repetitively picking or rubbing oneself), as well as emotions such as anger, anxiety, and depression. In the therapeutic context, a skillful activity facilitator capable of modifying tasks and the environment can help individuals with limited competencies achieve a person-environment fit and hence elicit desired behavioral and affectual outcomes. To assess the effects of interventions that are designed to foster a person-environment fit for persons with dementia, it is necessary to
operationalize and measure of those behavioral and affective states exhibited by participants in response. Several measures have been increasingly used in the dementia-care literature to assess these constructs.

*Examination of Well-being in Dementia-Care Research*

Consistent with indicators of fit and well-being emphasized by the environmental press model, several dementia-care researchers have examined behavior and affect as indicators of well-being. A considerable amount of the intervention research in the field of dementia-care has focused on disruptive and aggressive behaviors, which are hypothesized to occur when the environmental demands are not well matched to the individual's competence (Cohen-Mansfield, Marx, & Rosenthal, 1990; Cohen-Mansfield, Werner, & Marx, 1994). These behaviors threaten both the well-being of the individual exhibiting them as well as other individuals in the social environment, including program staff and other program participants. Such behaviors are theorized to result from a poor person-environment fit characterized by the individuals' attempts to communicate unmet needs (Algase, et al., 1996; Camp, Cohen-Mansfield, & Capezuti, 2002). The most common of these needs are for social and physical stimulation, which can be addressed through activity programming. However, these need-driven behaviors are also the most common impetus for removing persons from activity sessions, hence exacerbating the lack of an appropriate person-environment fit (Beck, et al., 2002; Buettner, Lundegren, Lago, Farrell, & Smith, 1996). The Bradford Dementia Group scholars have highlighted the disproportionate focus on negative “problem” behaviors and the limited attention given to positive behaviors exhibited by persons with dementia (Bradford Dementia Group, 1997; Brooker, 2004; Kitwood & Bredin, 1992;)

In an attempt to address this criticism and focus on a more holistic picture of the activity and affect patterns of persons with dementia, Dementia Care Mapping (DCM) was developed by the Bradford Dementia Group (Bradford Dementia Group, 1997).
Dementia Care Mapping enables researchers to capture both behavior and affect through observation. The method applies to various situations that occur throughout the day and is designed to simultaneously capture a wide range of behaviors and assign an affective rating as well. Combined, these scores enable the mappers to understand the connections between various behaviors and affective states, so inferences can be made about the activities and interactions that result in well- or ill-being (WIB score).

Researchers at Menorah Park also developed a scale designed to capture a range of behaviors; however, the Menorah Park Engagement Scale (MPES) was designed specifically for use in the activity context (Judge, Camp, & Orsulic-Jeras, 2000). Although these researchers did measure affect in conjunction with engagement behaviors, they did not specifically assess the interrelationships between those variables. Brooker (1999) asserts that there is a correlation between WIB scores as measured by DCM and the level of engagement observed; however, she cautions that the very small sample size in her study is one of several methodological issues that limits the ability to make conclusions about these relationships. Despite these limitations, she concluded that combining the methodologies of DCM and engagement could provide a reliable indicator of care quality and subsequent QOL for persons with dementia, which provides great insight into well-being. Practitioners that adopt a person-centered care philosophy recognize that supporting psychosocial well-being is as important to care quality as attending to physical well-being.

Affect has been explored less often than behavior in the dementia-care literature. However, as theory is increasingly used to guide research in this realm, affect is increasingly examined as an outcome measure during psychosocial interventions. Affect is comprised of a correlated set of responses involving the facial muscles, the respiratory system, skeleton, autonomic blood flow, and vocalizations. In adults, affect plays an important role in determining the relationship between one’s body and
environment. Lawton utilized the term affect to describe the display of emotions such as anger, anxiety, fear, pleasure, interest, and sadness and viewed the construct as a means in which to learn more about the preferences of persons with dementia (Lawton, Van Haitsma & Perkinson, 2000). The challenges of reliably capturing affectual information on persons with dementia have been acknowledged in the literature (Feinberg & Whitlatch, 2001; Lawton, et al., 2000). Because of the inherent threats to reliability that result from interviewing individuals with cognitive impairments with communication deficits, observed affect has been accepted as one reasonable indicator of subjective well-being for this population.

Engagement and Well-Being

In addition to the research on environmental factors that impact well-being, researchers have demonstrated support for the important role that activities play in the well-being of persons with dementia. Appropriate activities designed to support the participants’ meaningful engagement and personhood can result in benefits for persons with dementia (Judge, Camp, & Orsulic-Jeras, 2000; Schreiner, Yamamoto, & Shiotani, 2005; McKee, Houston, & Barnes, 2002). Despite practical and methodological challenges ranging from implementation inconsistencies to small sample sizes and confounding effects, researchers have demonstrated positive outcomes, including behavior problems and levels of engagement, grip strength, and affect (Beck, et al., 2002; Buettner, Lundegren, Lago, Farrell, & Smith, 1996; Wood, Harris, Snider, & Patchel, 2005).

Despite these findings, recently published studies have revealed that many persons with dementia in formal care programs such as nursing homes continue to spend a great deal of their time unoccupied and alone (Armstrong-Esther, Browne, & McAfee, 1994; Buettner & Fitzsimmons, 2003; Ice, 2002; Nolan, Grant, & Nolan, 1995). In other cases, inappropriate programming that is generationally or developmentally
mismatched to the individualized needs of the participants is the norm (Salari & Rich, 2001). These findings highlight the degree to which care-staff are challenged by the task of providing meaningful activities to groups of individuals with dementia, who represent a wide range of cognitive and functional abilities. In addition, researchers have demonstrated that environmental features and activity situations are not enough to optimize engagement and positive outcomes for persons with dementia. Findings indicate that the role that staff persons play in facilitating engagement with objects and other individuals in the environment, irrespective of the potential opportunities available, is paramount to achieving these outcomes (Wood, Harris, Snider, & Patchel, 2005).

The dementia-care literature has often associated quality of life and well-being with meaningful engagement (Bowlby Sifton, 2000; Brooker, 2004; Camp, 1999; Cohen-Mansfield, 2001; Buettner, 2001). Environments that support meaningful time use by persons with dementia include those that sustain and enhance their functional capacities, provide them with a sense of continuity, introduce opportunities to enjoy positive interactions with others, and support their sense of success, belonging, and personhood. Observations of behavior and affect throughout the day have been recorded in various dementia-care studies and comparisons have been examined across activity situations (i.e meal time compared to structured activity time) (Brooker & Duce, 2000; Nolan, Grant, & Nolan, 1995; Wood, Harris, Snider, & Patchel, 2005). However, the relationships between various engagement categories and affective states have not been systematically explored.

In most studies, engagement and affect have been independently explored as outcomes of various interventions. For example, in a Montessori-based programming study that examined engagement and affect among persons with dementia during traditional and modified Montessori activities, the Montessori-based activities were more likely to promote higher levels of active engagement and higher levels of pleasure than
traditional activities; however, the relationship between active engagement and pleasure was not assessed (Judge, Camp, & Orsulic-Jeras, 2000).

Although researchers have demonstrated that programming designed to promote social engagement and the utilization of intact abilities can promote positive well-being, the direct relationship between types of engagement and positive affect has not been addressed. The literature also suggests that non-engagement and self-engagement are indicative of boredom and anxiety; however, the systematic analysis of these engagement states with anxiety has not been published in the dementia-care literature (Algase et al, 1996; Cohen-Mansfield, 2001). Because the majority of investigations of engagement and affect have focused on an intervention, they have primarily compared engagement in one context to another and affect in one context to another, yet they have failed to examine the relationships between these two constructs with one another.

The interrelationships between various engagement categories and affective states not have received systematic attention in the research literature. While inferences can be made from intervention studies about the relationship between active engagement and positive affect and non-engagement and negative affect, other engagement categories such as passive and other engagement are less clear-cut regarding their relationship to an affective state. While active engagement is associated with higher order benefits, passive engagement in activity programming also can prove to be very enjoyable for older adults with dementia (Jarrott & Bruno, 2003). Systematic assessments of affective states observed during various engagement categories is needed to clarify these relationships and provide additional insights about the role that passive engagement plays in the emotions of persons with dementia. In the current investigation, I explored the interrelationships between the five engagement categories from the MPES and the three affective states from the Apparent Affect Rating Scale (AARS). Understanding the emotional states that accompany each of the various
engagement categories will further inform care professionals as they design and facilitate programming intended to enhance well-being and optimize outcomes for participants.

Based on the environmental press model coupled with the empirical literature in the realm of dementia-care, several relationships are expected between the engagement and affect categories. It is expected that high levels of active engagement will be related to high levels of pleasure and low levels of non-engagement. It is also expected that low levels of interest will be associated with high levels of non-engagement and high levels of other engagement. Finally, the relationship between high levels of anxiety and high levels of self-engagement is also expected.

Methods

Participants

The sample was comprised of 129 persons with a diagnosis of dementia from eight dementia care programs in rural southwest Virginia. As part of a larger study comparing the responses of an intervention group receiving Horticulture therapy (HT) with a comparison group receiving traditional activity (TA) programming, all eight programs were randomly assigned to each of the two conditions (four in the HT group and four in the traditional group). The programs ranged in size from small ADS programs serving between 10 to 12 clients daily to large nursing homes licensed to house up to 226 residents (See Table 1C).

Inclusion criteria for individual participants included a documented diagnosis of dementia, the ability to leave the private bedroom to attend activities in the common area at long-term care facilities, a signed consent form from the legal guardian or familial caregiver, indicating that they approved of the elder’s participation in the project, and verbal assent from the participants. To retain the largest number of individuals in the
sample to enhance statistical power, participants must have attended at least half (15 of
the possible 30 minutes) of one of 12 possible HT or TA session.

Procedures

Following IRB approval, eight dementia-care programs (5 nursing homes and 3
adult day care programs) were invited to participate in the study based on their
geographic proximity to the University. Each site agreed to host the observational
research team during traditional activities, provide demographic data on the participants,
and aid in the distribution and collection of informed consent forms. The project
coordinator (PC) and primary investigator (PI) randomly assigned sites to treatment and
comparison group conditions. The treatment sites received HT programming for six
weeks, and the comparison sites agreed to provide TA programming for observational
data collection over a six-week period. Each facility received a cash donation and a
manual of HT activities developed by the authors.

Trained HT facilitators developed a schedule of activities for the four treatment
sites, while the comparison site facilitators provided TA programming during the
observation periods. HT programming was offered at each of the four treatment facilities
twice weekly for six weeks, for approximately 30 minutes in a group setting. Traditional
programming was observed at the comparison facilities on the same schedule for a
comparable amount of time. The group size in both traditional and HT activities ranged
from 4-20 participants on any given day, but the average number of participants per
session was eight.

The observed activities represented a range of opportunities. The HT activities
included potting and cultivating live plants, training topiaries, and arranging flowers,
while the TA included crafts, active and trivia games, as well as music. Some of the
activities were designed to facilitate teamwork or cooperative group activity, and others
were designed to engage the participants individually in parallel activity, or different
steps that contribute to one collective task. The degree to which facilitators used techniques that enhanced competencies and supported social engagement and reminiscence varied per site, but this data was not systematically assessed and accounted for in the analyses. The number of program staff who provided assistance getting participants out to the activity area and attended to ADL needs of the participants during the HT sessions was mixed. The environment for the sessions also represented diverse situations at each of the facilities; however, program administrators worked with staff persons to designate a specific area for the programming.

**Instrumentation**

Assessments used in the current investigation included (a) demographic information, (b) cognitive and functional status, and (c) observational data that focused on the occurrence and duration of engagement and affect exhibited by persons with ADRD during HT and traditional activities.

**Participant Characteristics**

*Demographics.* Demographic information was obtained from facility staff, including gender, age/birth date, race, and diagnosis. A survey inquiring about each treatment participant's gardening social history was distributed with the informed consent forms; however, the low return rate precluded our ability to use this information in the analyses.

*MMSE.* Level of cognitive impairment was assessed using the MMSE, a widely used valid, reliable, and sensitive assessment of cognitive functioning (Folstein, Folstein & McHugh, 1975; Pangman, Sloan, Guse, 2000). Members of the observational research team administered this 30-point instrument, over the course of the six weeks that the study was conducted at that site, in order to assess whether participants were operating at mild (>21), moderate (10-20), or severe levels of impairment (<9).
Barthel Index. The Barthel index was used to assess functional levels of self-care and mobility (Mahoney & Barthel, 1965). Ten activities of daily living (ADLs) are scored according to whether the person can perform the task independently or not. A total score of 100 indicates independence in all ADLs. The Barthel Index has demonstrated adequate observer and test-retest reliability, validity, and sensitivity (Wade & Collin, 1988). During the six-week observational period, research team members received assistance from designated program staff persons who had access to the participants’ charts, so scores could be assigned to each participant using clinical notes.

Measure of affect. Affect was assessed using a modified version of the Apparent Affect Rating Scale (AARS) (Lawton, et al., 1996). The AARS is an observational tool designed to assess affect in persons with moderate to severe dementia. In the current study a streamlined version of the scale was used to assess three affective domains: pleasure, anxiety/sadness, and interest. The decision to combine anxiety and sadness was based on previous research that demonstrated that anger was rarely observed, and that inter-rater reliability could be enhanced if anxiety and sadness were collapsed into one code (Gozali, 2002; Judge, Camp, & Orsulic-Jeras, 2000). Conceptually, the modified scale was designed to assess positive (pleasure), neutral (interest), and negative (anxiety/sadness) affect.

Each affective state was coded using a set of guidelines that included examples of facial and vocal expressions as well as hand and eye movements that indicated the emotions exhibited in each state. Each observer rated the length of time (0 = not at all, 1 = up to ½ of the observation, 2 = More than ½ of the observation and 9 = sleeping or can’t tell) that the emotion was exhibited by each participant at the culmination of five-minute time frames during 30-minute activity sessions. Following extensive training and practice, each observer reached 95% coding agreement with the PC, who developed the
training materials and coding conventions and facilitated training efforts with the RAs on
site with the population of interest.

Measure of engagement. The Menorah Park Engagement Scale (MPES) was
used to capture five types of engagement (see Table 2C) commonly displayed by
persons with dementia when they are presented with activities. The categories reflect
the level and type of involvement with the activity, and the codes reflect the amount of
time spent in a specific category of engagement (0 = not at all, 1 = up to ½ of the
observation, 2 = more than ½ of the observation). The observer recorded the duration
of time each participant spent in each type of engagement at the culmination of five-
minute time frames over a 30 minute activity session. If two or more behaviors took
place at the same time, the observers were trained to make coding decisions based on a
hierarchical ladder of the behaviors (see figure 1C). This scale has not yet been
assessed for validity in large-scale studies; however, the scale developers report a 95%
inter-rater agreement and high content validity (Orsulic-Jeras, Judge & Camp, 2000).
Prior to observations, inter-rater reliability of 95% was achieved between the observers
and the PC.

Data collection. Two observational research teams (treatment group team and
comparison group team) of research assistants (RAs) collected data over a period of six
weeks at two data points; observations took place twice a week during weeks one and
two and again twice weekly during weeks five and six. A total of three RAs collected
data at any given site on any given day. Each of the three RAs was responsible for a
different scale; however, they all worked together to conduct the MMSE assessments
and collect the Barthel index scores. Each RA could observe up to six participants at
once, and they all observed the same six participants during the 30-minute observation
periods, enabling each team to collect data on a maximum number of 24 participants at
each site during each two-week observation period. RAs positioned themselves to have
a full view of the residents' faces and body language, while attempting to remain as unobtrusive as possible.

The RAs utilizing the AARS and MPES scales coded the occurrence of the different categories of affect and engagement at five-minute intervals over a 30-minute time frame, while the behavior and memory problems were recorded continuously for the same participants by the third observer. Observers used digital timers with a second counter to accurately determine the level of engagement and affect for each time frame. In instances where participants engaged in conversation with the RAs, procedures dictated that the associated time frames impacted by that conversation be excluded from analyses.

At each of the participating sites, observers collected data for approximately 30-minutes in the morning. At the treatment sites, the RAs observed the HT activities, while at the comparison sites, TA were observed. Within groups of participants, observed activities were administered during the same time and day each week; however between groups there were slight differences in the days of the week and times that the activities took place, though they were all morning activities.

**Analysis**

Multiple correspondence analysis (MCA) is a multivariate method for analyzing categorical and nominal data. It is a special case of canonical correlation, where one set of entities (categories rather than variables as in conventional canonical correlation) is related to another set (Clausen, 1998; Greenacre, 1984; Greenacre, 1993). The analysis defines a measure of distance between any two points, where points are the values (categories) of the discrete variables. The approach is similar conceptually to conventional factor analysis; however, conventional factor analysis determines which variables cluster together, and correspondence analysis determines which category
values are in close proximity to one another. The data are then represented pictorially on a correspondence map, which plots points (categories) along the factor axes.

MCA can be used with a wide variety of data, including that which has a non-normal distribution (Greenacre, 1993). In this study, dichotomous values were utilized rather than several values for each variable to reduce the chance of empty cells in the correspondence table and to minimize the points on the pictorial representation in order to facilitate a more coherent interpretation of the plots. The MCA was conducted to explore and describe the relationships between the three affective states and the five engagement categories exhibited by program participants during the observed activity programming. Because MCA requires the variables to be categorical or nominal in nature, the raw data were utilized to calculate an average score between 0 and 2 for each of the eight affective and behavioral states. These average scores were then recoded into categorical variables with dichotomous values (high or low levels of each behavioral or affective state) based on the continuous distribution (0-2). There was an equal distribution of all states except anxiety. Table 1C displays a variety of descriptive statistics illustrating the frequency of individuals and percentage they represented for each of the two coding categories.

The use of MCA enabled us to visually examine the interrelationships between the three affective states (pleasure, anxiety/sadness, and interest) and the five engagement behaviors coded (active-engagement, passive-engagement, self-engagement, non-engagement, and other-engagement). Upon viewing the MCA plots, subsequent chi-square analyses were conducted when inclusion of a point was questionable to determine whether significant differences existed between the questionable relationships between points. It was necessary to keep these subsequent chi-square analyses to a minimum in order to preserve degrees of freedom and preclude
the need to perform Bonferroni corrections. Therefore, only those points that could not
be conclusively deciphered from the visual plot were subject to these pos-hoc analyses.

Results

Results are comprised of descriptive analyses, MCA output, and several Chi-
Square analyses. Descriptive statistics present the frequency and percentage of
individuals who exhibited each of the categorical values. MCA results present the inertia
(variance) contributed by each categorical value and Chi square analyses clarify the
manner in which MCA plots are interpreted.

Descriptive Analyses

Observed affect. As shown in table 1C, very few participants (10.1%) displayed
anxiety/sadness during the observed programming. Of the 10.1% of individuals, who did
exhibit this negative affect category, nobody averaged anxiety/sadness levels that
occurred for more than half of the observation period (score of 2 on the AARS). Average
pleasure scores were also quite low overall. Nearly 90% of the participants displayed
pleasure less than half of the observed activity programming session, and only one
participant averaged pleasure more than half of the observed activities. Interest was the
most highly displayed outcome measure during the observed programming; 23.6% of
the participants averaged interest for more than half of the observation period and only
3.9% of the participants averaged interest “not at all.”

Observed engagement. Self-engagement was infrequently observed during the
activity sessions. A minority (31.8%) of the participants displayed this behavior during
the observed periods and nobody averaged self-engagement behaviors more than half
of the time observed during the activity programming. Other-engagement and non-
engagement were also observed fairly infrequently in relation to the total time period the
participants were observed. Ninety percent of the participants averaged less than “up to
half” of the observed period in activities other than those presented by the facilitators,
and 34.1% of participants did not engage in other activities during the scheduled programming. Forty three percent of the participants were not observed displaying non-engagement during the activity programming and only 3.1% of the participants averaged non-engagement scores that lasted more than half of the observation period.

Levels of active engagement and passive engagement were the most commonly observed behavioral categories. Average active engagement scores were the second most commonly observed behaviors; 61.3% of the participants averaged active engagement up to half of the observation period or more and of those individuals, 10.1% of the participants averaged active engagement for more than half of the observation period. Participants also averaged relatively high passive engagement scores. Only 2.3% of the participants averaged passive engagement “not at all” and 4.7% averaged passive engagement more than half of the observation period. The scores for passive engagement were distributed more evenly, with 41.1% of the participants averaging scores less than “up to half” of the observation period.

**Interrelationships between Engagement and Affect Categories**

Figure two 2C presents the joint plot of category points for the eight engagement and three affect domains. The figure illustrates the relationships between the level (high, low) of each engagement category and the level (high, low) of each affective state observed during the activity programming. The proportion of total inertia (i.e., variance) explained by the two factors was 43%. Dimension one (horizontal axis) represents the engagement categories and accounted for 27.2% of the total inertia. Dimension two (vertical axis) represents the affective states and accounted for 15.8% of the total inertia.

Quadrant I of Figure 2C shows that individuals who were high on self-engagement also tended to be high on other-engagement. While individuals who were high on passive engagement fell in this quadrant the visual proximity was questionable. Chi-square analyses demonstrated that passive engagement was significantly different
than other-engagement at the $X^2 (1, N = 129) = 7.41, p \leq .01$] indicating that these variables do not have a statistical relationship strong enough to warrant a grouping.

High levels of anxiety and interest were not associated with any of the other engagement categories or affective states. As illustrated in quadrant II, participants who were high on pleasure were also likely to be high on active-engagement and low on non-engagement. Quadrant III shows that individuals who were low on passive engagement were also low on self-engagement and low on anxiety. Individuals who were low on other-engagement did not fall into this categorization because chi-square analysis indicated a significant relationship between passive engagement and other engagement $[X^2 (1, N = 129) = 7.41, p \leq .01] (X^2 = 7.409, 1df)$, thus indicating that these variables did not characterize like cases. The fourth quadrant depicts the inverse relationship found in the second quadrant, demonstrating that individuals who were low on pleasure also tended to be high on non-engagement and low on active engagement. Low levels of interest were not associated with any of the other observed engagement and affective domains.

Discussion

This exploratory investigation utilizes an innovative statistical approach to examine the categorical relationships between five engagement and three affective domains. Findings provide further support for the value of actively engaging persons with dementia in organized social interventions designed to support personhood and enhance well-being. Participants exhibited relatively high levels of interest, active engagement, and passive engagement, while levels of anxiety, self-engagement, and engagement in other activities remained relatively low. Participants’ average time exhibiting pleasure and non-engagement were marginal in comparison. This suggests that when participants are provided with recreational activities, two “need-driven” states (self-engagement and anxiety) that result from an imbalance between competence and environment are less pervasive. These need-driven states have been reported in
conjunction with high levels of non-engagement by a variety of researchers who have observed persons with dementia throughout the day (Buettner & Fitzsimmons, 2002; Harper-Ice, 2001). Therefore, to minimize the degree to which persons with dementia are disproportionately disengaged, self-engaged, and anxious, dementia-care programs must provide an on-going program of activities.

The MCA analysis reveal that when persons with dementia exhibit high levels of active engagement and low levels of non-engagement, they are highly likely to exhibit high levels of pleasure. Conversely, low levels of active engagement and high levels of non-engagement are associated with low levels of pleasure. This finding is consistent with the therapeutic recreation literature, which advocates providing persons with dementia with meaningful opportunities for occupation in order to foster competence and well-being (Bowlby Sifton, 2000; Buettner, 2001).

While high levels of anxiety were not associated with any of the other affective and behavioral domains, low levels of anxiety were associated with low levels of self-engagement and passive-engagement. This discrepancy may be due to the fact that very few participants in the current investigation exhibited high levels of anxiety, so these outliers’ outcomes did not correspond with the other observed characteristics. Individuals who exhibited low anxiety were also likely to exhibit low levels of passive engagement. While the inverse relationship was not demonstrated, this finding provides insight about the fact that passive engagement should be minimized to enhance affective outcomes in persons with dementia. Our findings support the need-driven behavior model, indicating that when persons feel anxious and are unable to communicate their needs, they may engage in self-stimulating and repetitive behaviors to comfort themselves and convey their emotions through intact means (Algase et al., 1996)

While some of the aforementioned relationships were supported by theoretical and empirical findings, the association between high levels self-engagement and high
levels of other engagement has not been previously demonstrated in the literature. The commonality between these two behavioral domains is the fact that they both involve engagement in activities that deviate from those introduced by the program facilitator. Also curious is the finding that low other engagement is not associated with low self-engagement or any other behavioral or affective outcome. Other engagement is a unique category because it captures productive behavior that unrelated to the presented activity.

Interest was not associated with any behavioral or affective categories. This may be due to the fact that it was omnipresent and thus covered a range of behaviors and activities. Because affect is often flat in persons with dementia, strict adherence to the instrument protocol, which does not allow for coding variations personalized to each unique individual, may not account for individuals who might be experiencing pleasure while exhibiting behavior indicative of interest. Interest was the most commonly observed outcome and therefore cannot be separated from the other observed domains. In fact, this affective state plotted along the central axis evenly between all the other observed domains. This phenomenon may also be due to the fact that interest is the only neutral coding category for affect; while pleasure represents positive affect, anxiety/sadness represents negative affect and interest can be both.

Limitations

Several limitations inherent in the study design and procedures must be acknowledged. Despite the increase in sample size from previous intervention-based activity studies, the sample was relatively homogenous with regard to race. Even though the sample was comprised of participants from eight different dementia-care programs, all of the programs are located in rural southwest Virginia. Although the eight programs were randomly assigned to treatment or comparison group conditions,
participants were not randomly selected nor were the facilities that they attended; thus, generalizability of the findings is limited.

In order to capture a larger number of participants, the total time that each individual was observed was limited to a maximum of one hour during the course of a highly structured activity context. The results generated from the current exploration indicate that the activity context, comprised of participants in HT and TA were likely to be engaged and interested. This finding contrasts the outcomes observed in studies that have spanned the day, which indicate that participants are overwhelming non-engaged, self-engaged, and exhibiting problematic behaviors and negative affect (Buettner & Fitzsimmons, 2002; Wood, Harris, snider, & Patchel, 2005). Therefore, obtaining data that spanned a variety of contexts may have enabled the researchers to make comparisons between various activity contexts to further tease out the interrelationships between engagement and affect under a variety of circumstances.

Although the MPES and AARS have both been utilized in a variety of studies and have indicated acceptable psychometric properties, the sensitivity of these measures to capture the nuances of various behavioral and affective states may still be limited. For example, the coding conventions for the MPES dictate that whether a behavior is observed two seconds or two minutes in a 5-minute observational time frame, it is coded as “1 = up to half of the observation period”. This window does however increase the likelihood of achieving inter-rater reliability, especially given the number of individuals who are being observed by the same researcher.

Additionally, variations in the presented activities may alter the manner in which the same behavior is coded. For example, active engagement is coded when the participant is doing or commenting on the presented activity; however, while some activities require high levels of involvement from the participants to achieve this score (i.e. making a craft or potting a plant), other activities only require participants to observe
a performance or respond occasionally, as in a word game. Clearly the activity context and content alters the manner in which the observed behaviors will be coded utilizing these engagement categories. Despite the challenges experienced using each of these scales, they are among the most commonly used scales in observational research studies of persons with dementia. These limitations were weighed against the fact that these scales are among very few measures that are accepted in the realm of dementia-care research as reliable and valid.

**Future Research**

This study utilizes an innovative statistical approach to explore the interrelationships between various outcome variables to substantiate theoretical and practical predictions. Because MCA is a descriptive and exploratory technique, it cannot be used to predict relationships or infer causality. Rather, it serves as a building block in the dementia-care literature by describing the interrelationships among categories of variables, so these relationships can be further explored in future analyses.

Future research should further investigate the interrelationships between various types of engagement and affective states across multiple activity contexts to determine whether differences exist in the associations observed. Researchers who collect data during a variety of activities, including meals, activities of daily living, and family visits may better capture the range of emotions displayed by persons with dementia. The limited variability in observed affect may primarily be due to the nature of the context in which these outcomes were recorded.

In addition, a variety of other factors need to be included in the analysis to determine which factors are associated with the various behavioral and affective domains. Including variables that categorize characteristics of the physical and social environment may provide further information about the contexts that are associated with various observed outcomes (this data is presented in the second manuscript). The
utilization of systematic measurement to collect this data would greatly inform practitioners and researchers in the field who are interested in optimizing well-being for persons with dementia.

Conclusion

In conclusion, the current investigation enabled the researchers to expand on previous research in the field of dementia-care by systematically exploring the interrelationships between the two outcomes that are hypothesized to indicate the achievement of a person-environment fit, behavior and affect. Because the MPES has only been utilized in a limited number of studies and the AARS is a more commonly used instrument, the interrelationships between the observed outcomes on each scale is of interest to researchers whose goal is to capture the well-being of persons with dementia. Therefore, utilizing these scales in combination can enable researchers to obtain a more holistic picture of the participants’ experiences during a variety of activities in a number of contexts. Similar suggestions have been made by dementia care researchers such as Brooker (2004), who advocated for the use of DCM with engagement methods to capture a more holistic picture of the participants’ experiences.

These findings indicate that the activity context tends to elicit more positive behavioral and affective outcomes than the larger institutional context more typically observed by researchers in this realm. In addition, these findings further support research that has demonstrated support for the association between active engagement and non-engagement with high levels of pleasure. Because the goal of person-centered care is to foster well-being for persons with dementia, determining which types of engagement are most likely to be associated with pleasure is of primary interest. Moreover, because anxiety should be minimized in a person-centered environment, identifying those behaviors that are associated with it may provide practitioners with a systematic target behavior. Minimizing levels of self-engagement and passive
engagement may also minimize levels of anxiety. Each of these categorical associations highlights the value of activities that can successfully engage persons with dementia in an active capacity to enhance well-being.
References


### Table 1C

**Descriptive Statistics for Engagement and Affect Variables**

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
<th>Variance</th>
<th>Categories</th>
<th>Frequency</th>
<th>%</th>
<th>Continuous Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Anxiety</td>
<td>1.10</td>
<td>1.0</td>
<td>0.304</td>
<td>0.093</td>
<td>High</td>
<td>13</td>
<td>10.1</td>
<td>.08-1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>114</td>
<td>88.4</td>
<td>.00-.07</td>
</tr>
<tr>
<td>Average Pleasure</td>
<td>1.50</td>
<td>2.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>64</td>
<td>49.6</td>
<td>.22-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>63</td>
<td>48.8</td>
<td>.00-.20</td>
</tr>
<tr>
<td>Average Interest</td>
<td>1.51</td>
<td>2.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>65</td>
<td>51.2</td>
<td>1.67-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>62</td>
<td>48.8</td>
<td>.00-1.58</td>
</tr>
<tr>
<td>Average Non-Engagement</td>
<td>1.50</td>
<td>2.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>65</td>
<td>50.4</td>
<td>.11-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>62</td>
<td>49.6</td>
<td>.00-.10</td>
</tr>
<tr>
<td>Average Self-engagement</td>
<td>1.32</td>
<td>1.0</td>
<td>0.467</td>
<td>0.219</td>
<td>High</td>
<td>41</td>
<td>31.8</td>
<td>.08-1.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>88</td>
<td>68.2</td>
<td>.00</td>
</tr>
<tr>
<td>Average Other-engagement</td>
<td>1.48</td>
<td>1.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>62</td>
<td>48.1</td>
<td>.18-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>67</td>
<td>51.9</td>
<td>.00-.17</td>
</tr>
<tr>
<td>Average Passive-engagement</td>
<td>1.49</td>
<td>1.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>63</td>
<td>48.8</td>
<td>1.08-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>66</td>
<td>51.2</td>
<td>.00-1.0</td>
</tr>
<tr>
<td>Average Active-engagement</td>
<td>1.50</td>
<td>2.0</td>
<td>0.502</td>
<td>0.252</td>
<td>High</td>
<td>65</td>
<td>50.4</td>
<td>1.22-2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>64</td>
<td>49.6</td>
<td>.00-1.20</td>
</tr>
</tbody>
</table>
**Figure 1C.** Menorah Park Engagement Scale (MPES) Hierarchy Ladder. Coding directions indicated that if two or more of the following behaviors are taking place at the same time, code the behavior that is higher on the “ladder.” You can only count the time towards your score on 1 behavior; that which is higher on the ladder. Examples: singing with group and fidgeting in purse for 3 out of 5 minutes…code singing as (2) because higher on ladder, or if sleeping for 3 minutes and then they wake up and sing and fidget in purse for 2 minutes simultaneously …code as sleeping (2) and singing (1) because singing is higher on the ladder than fidgeting (other productive).

<table>
<thead>
<tr>
<th>Did/Commented On Target Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Listened/Watched Target Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did Something “Productive” Other Than the Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Repetitive Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Slept/Kept Eyes Closed/Stared Into Space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
Figure 2C. MCA Joint Plot of Engagement and Affect Points
CHAPTER V

Conclusions

The findings generated in this mixed method investigation collectively inform theoretical, methodological, and practical aspects of dementia-care programming and intervention research. The original purpose of the study sought to build on previous dementia-specific HT research and quantitatively compare a treatment group receiving HT programming with a comparison group receiving traditional activity programming. The final project, however, blossomed into an inductive, mixed-method assessment, comprised of observational data collection, a focus group session, and a series of qualitative interviews. These varied methods captured the perspectives of multiple informants, ranging from persons with dementia to observational research team members and activity program facilitators.

Theoretical Contributions

The theory of environmental press informed this investigation and the series of research questions that were examined in each of the three manuscripts. This model demonstrates the importance of achieving a balance between individuals’ competencies and their environments to facilitate adaptive engagement and positive affect. These outcomes have been identified by many dementia-care researchers as important determinants of well-being in persons with dementia. Because persons with dementia have limited competencies resulting from the disease progression, they are more vulnerable to the influence of their surrounding environment and must therefore rely heavily on caregivers to help them achieve an optimal person-environment fit. The Theory of Personhood in Dementia highlights this responsibility of caregivers and emphasizes the importance of supporting well-being and life quality for this vulnerable population of older adults.

Analysis of the interview transcripts presented in the second manuscript revealed that factors from the physical and social environment, including the program facilitators, greatly impacted the participants’ attainment of direct and indirect benefits. Indirect effects of
environmental influences were transmitted through the activity facilitators, who were also subject to the shared physical and social environment systems. Analyses resulted in the expanded application of the Environmental Press model to the program facilitators. Because these individuals are responsible for supporting the participants' well-being, a hierarchical connection between their person-environment fit and that of the participants became increasingly evident. Facilitators who achieved a good person-environment fit within the physical environment and sociocultural dynamics of their facility were better able to implement effective intervention programming and elicit benefits from the program participants.

These findings further support the application of the Environmental Press model to the field of dementia care programming by highlighting its relevance on multiple levels of analysis. The expansion of this model to multiple individuals whose outcomes are interrelated should inform researchers about the need to systematically assess factors indicative of person-environment fit in relation to both facilitators and participants. In addition, the interrelationships between facilitator characteristics and methods with participants' behavior, affect, and other outcomes should be systematically investigated.

The third manuscript provided further support for the environmental press model by systematically characterizing the interrelationships between the various engagement categories and affective states utilized in the analysis of the participants. According to the Environmental Press model, these outcome variables are indicative of the nature of the relationship between an individual and his/her environment. Typologies generated by MCA demonstrated that individuals who experienced adaptive behavior, such as high levels of active engagement and low levels of non-engagement were associated with high levels of pleasure. These adaptive behaviors and positive affect are associated with an optimal person-environment fit and attainment of the Adaptation Level from the Environmental Press Model. These hypothesized relationships were observed in the data.

*Methodological Contributions*
These theoretical insights have implications for methodological advances that can be employed to enhance future investigations. Findings from this study have highlighted the value of utilizing mixed methods and a range of analysis procedures as well as incorporating the perspectives of multiple informants to gain a more complete understanding of both the nature of the intervention and its outcomes. Because researchers conducting observational studies must often collect data at multiple sites with varying facilitators to increase sample size and subsequent power, attention to contextual factors is especially critical.

Operationalization of those physical and social features of the institutional care environment that impact participant well-being is currently under investigation by numerous researchers; however, environmental features essential to an optimal person-environment fit have not been clearly delineated in the literature, nor have features that impact the performance level of activity staff. Several factors specific to the facilitators were identified in the second manuscript, including their knowledge of the treatment population, their unique implementation approach, encompassed by the techniques and materials utilized, and the communication patterns they employed. Systematic assessment of these factors in addition to other more commonly described physical and social features of the environment can help intervention researchers distinguish between the effects of the programming content from the facilitator qualities and behaviors.

Observational measures that are capable of capturing a range of meaningful behaviors, emotions, and other outcomes in persons with dementia are still needed. Scales that are more holistic and attempt to capture the multifaceted components that comprise well-being and quality of life for persons with dementia should continue to remain a high priority in the realm of dementia-care research. Many of the scales in the domain have demonstrated marginal psychometric properties and are descriptive in nature. Oftentimes these scales are comprised of several independent outcomes rather than a summary score, which can limit the analytic procedures appropriate for the data. For example, rather than generating a total engagement
score, which could be utilized in a range of analysis procedures with a range of sample sizes, five engagement categories are computed using the MPES requiring separate analyses and a compromise in the degrees of freedom.

In addition, the challenges that face researchers who conduct intervention studies in naturalistic settings should continue to be discussed and addressed, so future researchers can work with administrators and facilitators to minimize implementation failure and deviations from the study protocol. Achieving staff cooperation, accessing necessary and desirable materials and resources, and truly creating an environment in which the program can flourish should be a primary concern of researchers interested in capturing accurate data. Hawthorne effects inherent in any observational research study must be acknowledged and alternatives should be increasingly considered, especially in an era of technological advances.

Practical Contributions.

Practitioners and administrators can benefit from results generated by the current study. My investigation provides empirical evidence that HT is a viable and desirable programming option for persons with dementia. The activities are generationally and developmentally appropriate and can provide participants with meaningful occupation and the indirect benefits that can be realized from the roles that occupation creates and the opportunity to maintain skills that preserve increased autonomy. HT programming further supports personhood by providing facilitators with a venue for generating supportive social interactions.

The first manuscript demonstrated the value of HT programming for persons with dementia in the institutional care environment. The finding that the HT facilitates higher levels of active engagement and lower levels of self-engagement demonstrates the capacity of HT programming to elicit adaptive behavior. These outcomes demonstrated that the participants were alert and engaged with materials and individuals outside of themselves. This benefit addresses the concerns that are consistently described in the dementia-care literature that
highlight the overwhelming amount of time that participants are understimulated and lacking interaction with others.

However, despite the adaptive behavior elicited by the HT programming, levels of positive affect were not different between the two groups. This finding contrasts with observed outcomes presented in our previous HT studies that demonstrated HT programming to elicit higher levels of positive affect than traditional activities. These findings, coupled with the information garnered from a focus group session with the observational research team members, prompted the researchers to further investigate those factors that may have influenced these outcomes. Qualitative interviews with the program facilitators, presented in the second manuscript, enabled the researchers to uncover numerous factors that impacted facilitation of the programming and hence participant outcomes. These factors should be addressed by facilitators to optimize programming efforts and the benefits that can subsequently be obtained by the program participants.

Findings also suggest the need for HT professionals to standardize training efforts and internship requirements so therapists can learn to implement population-specific adaptation approaches. Data captured during qualitative interviews demonstrated the importance of dementia-specific training that encompasses person-centered approaches for all professionals working with this population of elders. The lack of required licensure for both HT practitioners and activity professionals working in dementia-care facilities leads to inconsistencies in program development, implementation, adaptation, and overall quality and effectiveness.

Additionally, administrators interested in enhancing the quality of programming for their participants must provide a supportive physical and social environment to optimize the efforts of their facilitators. Appropriating adequate space, staff support, training opportunities, and other resources to activities facilitators and enabling them to achieve an optimal person-environment fit will trickle down to the program participants and enhance their well-being. In addition, acknowledging the competencies of each unique facilitator in relation to their unique
environmental context will more effectively support an optimal fit for facilitators and the participants they serve.

The continued empirical support for the value of HT programming in dementia-care facilities suggests that this approach should be more commonly utilized to support well-being. The empirical support for the interrelationships between adaptive behavior and positive affect should also highlight the need to identify more approaches that are capable of eliciting these outcomes in a group setting for this population of older adults. The overwhelming importance of the physical and social environments to the successful implementation of specialized programming further highlights the need to identify, operationalize, and assess these factors systematically and generate empirical support for the relationships between these variables and the desired outcomes.
References:  Synthesized List


Jarrott, S. E., & Gigliotti, C. M. (2002, August). *From the garden to the table: Evaluation*
of a dementia-specific HT program. Poster presented at the international Horticulture Congress, Toronto.


U.S. Department of Health and Human Services, Heath Care Financing Administration.


### Appendix A. Facility Characteristics

<table>
<thead>
<tr>
<th>Site</th>
<th>Type of Program</th>
<th># Participants served by the facility</th>
<th># Participants in the activity</th>
<th>For Profit/Not for Profit</th>
<th>Mixed Unit or SCU</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1(^a)</td>
<td>ADS</td>
<td>8-12 daily</td>
<td>7</td>
<td>Not for profit</td>
<td>Mixed group</td>
</tr>
<tr>
<td>T2(^a)</td>
<td>Nursing home</td>
<td>90 bed facility</td>
<td>23</td>
<td>For profit</td>
<td>Mixed unit</td>
</tr>
<tr>
<td>T3(^a)</td>
<td>Nursing home</td>
<td>60 bed facility</td>
<td>25</td>
<td>For profit</td>
<td>SCU(^c)</td>
</tr>
<tr>
<td>T4(^a)</td>
<td>Nursing home</td>
<td>100 bed facility</td>
<td>20</td>
<td>State veterans care facility</td>
<td>Mixed unit</td>
</tr>
<tr>
<td>C1(^b)</td>
<td>Nursing home</td>
<td>30 bed facility</td>
<td>13</td>
<td>Federal veterans care facility</td>
<td>SCU(^c)</td>
</tr>
<tr>
<td>C2(^b)</td>
<td>ADS</td>
<td>10-16 daily</td>
<td>11</td>
<td>Not for profit</td>
<td>Mixed group</td>
</tr>
<tr>
<td>C3(^b)</td>
<td>Nursing home</td>
<td>226 bed facility</td>
<td>17</td>
<td>Not for profit</td>
<td>Mixed unit</td>
</tr>
</tbody>
</table>

*Note.* \(^a\) T1-T4 = treatment sites 1-4, \(^b\) C1-C4 = comparison sites 1-4, \(^c\) SCU = special care unit (specifically for persons with dementia)
Appendix B. Interview Guide for the HT Activity Facilitator Interviews

1. Overall, what was your experience facilitating at these facilities like?
   a. Were you surprised by anything that you experienced?

2. What was the biggest challenge to facilitating at the various sites?

3. How did you feel about the way that staff from each site interacted with you? What was staff involvement at each site like? How did it differ from site to site?

4. Which activities seemed to work the best and elicit the most positive responses? How did you include a wide range of ability levels at the sessions?

5. What differences, if any, did you notice between the ADS and NH program participants?

6. What factors seemed to affect the activities besides the activities themselves?

7. How did you feel about the observers’ presence? Did you feel like it affected the participants’ behaviors during the sessions?

8. What suggestions would you make to improve the quality of the Horticulture programming based on your experiences?

9. How did your practices deviate from HT as you understand it? How could you overcome this?

10. What feedback did you receive from the participants and/or staff and family members?

11. What was the most rewarding aspect of this experience for you?
Appendix C. Interview Guide for the Traditional Activity Facilitator Interviews

1. What is your educational background and training related to dementia-care programming?

2. What is your philosophy of facilitating therapeutic activities for older adults with dementia?
   a. What outcomes/benefits are you seeking?
   b. How do you determine what these outcomes should be?

3. What theory or philosophy guides your approach to facilitating activities for this population?

4. What materials seem to work best when working with this population of older adults? Why do you think this is? Is there ever a tension b/w what is best for the participants and resources? If so, what are those tensions and how do you reconcile those differences?

5. What are the biggest challenges to facilitating activities with this group of elders? How do you overcome/address those through your practice?

6. How do you feel about the physical environment of this facility? Is it conducive to what you try to achieve through activity programming…why or why not?

7. How do you feel about the social environment here in this facility? Do you feel part of a connected team? Do you receive help and support from other staff members?

8. What is family involvement like at this facility? How does that impact activity programming?

9. How did you feel about the observers’ presence? Did you feel like it affected the participants’ behaviors during the sessions?

10. What other contextual factors seem to affect the activities besides the activities themselves?

11. What feedback do you receive from the participants and/or staff and family members?
Appendix D. Focus Group Interview

1. Please tell me about your experiences observing at these sites.
   a. Were you surprised about anything that you saw/didn’t see?
   b. What did you think of the facilities and facility staff? How well did they support the personhood of the residents/participants?

2. How did the staff interact with you and the HT facilitators? What was your impression of the HT activities?

3. Were you surprised at the activities you saw? Why?

4. How do you think that the adults responded overall (qualitatively, how do you feel about HT programming with this population?) what led you to this feeling?

5. What benefits do you think that the adults experienced as a result of participation in the activities? (reminiscence, physical benefits, social benefits, nurturance, self-esteem)

6. What drawbacks did you see? – these could be related to activities, efforts to involve participants etc.

7. How did the program staff react to the HT programming?

8. How did family members/caregivers respond? Did you get any feedback about their reactions?

9. Would you recommend that this type of programming be incorporated into more programs? Why/why not

10. What factors affected the adults’ experiences during the activities?

11. What activities seemed to engage the adults most completely?

12. What about the facilitator…
   a. What techniques seemed to engage the adults more holistically?
   b. What about the personality style of the facilitator?
   c. What about the ways the facilitator interacted with the adults?

12. How involved were the facility staff persons? Was this consistent from the HT to the other activities?

13. What about the environment?
   a. What about the group size?…how did that seem to impact the sessions?
   b. What about the location? (indoors/outdoors)

14. Using your scale and knowing about the scales that the other group members were using, what do you think you missed? Was there any important information that was not captured by the quantitative scales or interviews?

15. Would you recommend any other method of collecting data to capture more information?
Appendix E. Mini-Mental State Exam

Mini-Mental State Examination (MMSE)\(^1,2\)*

Make the patient comfortable and establish rapport. Ask questions in the order listed. Total possible score is 30.

### Maximum Score

- **ORIENTATION**
  - 5 ( ) What is the (year) (season) (date) (day) (month)?
  - 5 ( ) Where are we (state) (country) (town or city) (hospital) (floor)?

- **REGISTRATION**
  - 3 ( ) Name 3 common objects (eg, “apple,” “table,” “penny”).
  - Take 1 second to say each. Then ask the patient to repeat all 3.
  - Give 1 point for each correct answer. Then repeat them until he/she learns all 3.
  - Count trials and record. Trials: ______

- **ATTENTION AND CALCULATION**
  - 5 ( ) Serial 7s backwards. Stop after 3 answers.
  - Alternatively, spell “WORLD” backwards. The score is the number of letters in correct order (D____L_____R____O____W____).

- **RECALL**
  - 3 ( ) Ask for the 3 common objects named during registration above.
  - Give 1 point for each correct answer. [Note: recall cannot be tested if all 3 objects were not remembered during registration.]

- **LANGUAGE**
  - 2 ( ) Name a “pencil” and a “watch.”
  - 1 ( ) Repeat the following: “No ifs, ands, or buts.” (2 points)
  - 3 ( ) Follow a 3-stage command:
    - “Take a paper in your right hand, fold it in half, and put it on the floor.” (1 point)
  - 1 ( ) Read and obey the following: CLOSE YOUR EYES. (3 points)
  - 1 ( ) Write a sentence. (1 point)
  - 1 ( ) Copy the following design: (1 point)

### Maximum Score

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Score</th>
<th>Suggested guidelines for determining the severity of cognitive impairment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild: MMSE ≥21</td>
<td>Moderate: MMSE 10-20</td>
<td>Severe: MMSE ≤9</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>Expected decline in MMSE scores in mild and mild to moderate Alzheimer’s patient is 2 to 4 points per year.*</td>
</tr>
</tbody>
</table>

*Adapted from Folstein et al.\(^1\) and Cockrell and Folstein.\(^2\) © 1975, 1998 Mini-Mental LLC. Used with permission.

References:
## Appendix F. Barthel Index

<table>
<thead>
<tr>
<th>Ability</th>
<th>With help</th>
<th>Independent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feeding (if food needs to be cut up = help)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2. Moving from wheelchair to bed and return (includes sitting up in bed)</td>
<td>5-10</td>
<td>15</td>
</tr>
<tr>
<td>3. Personal toilet (wash face, comb hair, shave, clean teeth)</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>4. Getting on and off toilet (handling clothes, wipe, flush)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>5. Bathing self</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>6. Walking on level surface</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>(if unable to walk, propel wheelchair)</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>7. Ascend and descend stairs</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>8. Dressing (includes tying shoes, fastening fasteners)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>9. Controlling bowels</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>9. Controlling bladder</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

A score of 100 indicates independence in activities of daily living.

Mahoney FI, Barthel DW. Functional Evaluation: The BARTHEL index. Maryland State Medical Journal 1965; 14 (2): 61-5. Used with permission
## Appendix G. Apparent Affect Rating Scale (AARS)

Facility: ____________ Date:______________ Start time:_________ End time: ________ Observer:_______ Facilitator:_________ Activity observed:________

Affect Scores: 0= Not at all, 1= Up to 1/2 of the observation, 2= More than 1/2 of the observation, 9= Sleeping/Can’t tell

<table>
<thead>
<tr>
<th>Participants’ Names →</th>
<th>Participant Score</th>
<th>Participant Score</th>
<th>Participant Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Record score for each participant at the end of every five minutes.</strong></td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td><strong>Pleasure</strong>: laughing, singing, smiling, kissing, stroking or gently touching other, reaching out warmly to other, responding to music (only counts as pleasure if in combination with another sign, statements of pleasure. Also includes other physical signs including clapping, and a sparkle of the eyes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Record score for each participant at the end of every five minutes.</strong></td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td><strong>Anxiety/Sadness</strong>: repetitive calling out, restlessness, repeated or agitated movement, lines across forehead, hand wringing, rapid breathing, tight facial muscles, crying, moaning, sighing, head in hand. Statements of anxiety or sadness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Record score for each participant at the end of every five minutes.</strong></td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td><strong>Interest</strong>: participating in a task; maintaining eye contact, eyes following object or person, looking around room, responding by moving or saying something, turning body or moving toward person or object</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Protocol for Using the ARDRAF Affect Scale

- Fill in the blanks at the top of the form.
- Observations should begin when the activity begins; observations should end when the activity ends; record both of these times on your evaluation sheet. They should match the start and end time of your team members.
  - During the sessions, observe 6 participants for 30 minutes, giving each person a score every five minutes. Participants who were observed in previous observations and attend programming regularly have priority for being observed and should be observed before participants who attend fewer days each week. Observe participants simultaneously and code the predominant behavior for each five-minute period. Each 5-minute period = 1 cycle. After each 5-minute period, you should have one code for each emotion.

- Tips on how to document the amount of time a behavior takes place:
  - **Not at all** The emotion was not exhibited at all during the 5-minute observation. It may be that no emotion at all occurs over 5 minutes, in which case all are marked “not at all.”
  - **Up to 1/2 of the observation** The emotion occurred at least once or for up to 2 minutes and 30 seconds (i.e., half of five minutes or less). Some emotions may be visible for a split-second, while others may go on longer.
    - More than half of the observation = the emotion occurred for more than 2 minutes and 30 seconds (i.e., more than half of five minutes).
    - Use “9: can’t tell” only when (1) some emotion may have occurred but you are not sure (includes sleeping).
    - Do not double code simultaneously occurring affect episodes. If a participant demonstrates both pleasure and interest simultaneously, then code pleasure for that frame.

**Pleasure**
Signs: laughing, singing, smiling, kissing, stroking or gently touching other, reaching out warmly to other, responding to music (only counts as pleasure if in combination with another sign, statements of pleasure.

**Anxiety/Sadness**
Signs: repetitive calling out, restlessness, repeated or agitated movement, lines across forehead, hand wringing, rapid breathing, tight facial muscles, crying, moaning, sighing, head in hand. Statements of anxiety or sadness

**Interest**
Signs: participating in a task; maintaining eye contact, eyes following object or person, looking around room, responding by moving or saying something, turning body or moving toward person or object without obvious signs of pleasure or anxiety/sadness
## Appendix H. Menorah Park Engagement Scale

Facility: __________________  Date: ____________  Observer: _______________  Facilitator: _______________  Activity observed: ____________

Start Time: ____________  End Time: ____________  Affect Scores: 0  Not at all  1. Up to 1/2 of the observation  2. More than 1/2 of the observation

<table>
<thead>
<tr>
<th>Participants' Names →</th>
<th>Participant Score</th>
<th>Participant Score</th>
<th>Participant Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record score for each participant at the end of every five minutes.</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Active engagement in presented activity (doing or commenting on the presented activity)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passive engagement in presented activity (listening to or watching the presented activity)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engagement in another activity (doing or attending to an activity other than the target activity being presented – includes passively)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-engagement (repetitive or self-stimulating behaviors)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-engagement (asleep or disengaged from any activity: “zoned out”)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participants' Names →</th>
<th>Participant Score</th>
<th>Participant Score</th>
<th>Participant Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record score for each participant at the end of every five minutes.</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Active engagement in presented activity (doing or commenting on the presented activity)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passive engagement in presented activity (listening to or watching the presented activity)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engagement in another activity (doing or attending to an activity other than the target activity being presented – includes passively)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-engagement (repetitive or self-stimulating behaviors)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-engagement (asleep or disengaged from any activity: “zoned out”)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes on environment, significant events, and important contextual factors.
Directions for Completing the Engagement Scale Form

- Fill in the blanks at the top of the form.
- Observations should begin when the activity begins; observations should end when the activity ends; record both of these times on your evaluation sheet. They should match the start and end time of your team members.
- During the sessions, observe 6 participants for 30 minutes, giving each person a score every five minutes. Observe participants simultaneously and code the predominant behavior for each five-minute period. Each 5-minute period = 1 cycle
- Tips on how to document the amount of time a behavior takes place:
  - Not at all: The behavior did not take place at all during the 5-minute observation.
  - Up to 1/2 of the observation: The relevant behavior occurred at least once or for up to 2 minutes and 30 seconds (i.e., half of five minutes or less). If a participant engages briefly in the targeted activity 5 times, and each engagement lasts 5 seconds, the behavior took place for 25 seconds. You would code “Less than half of the observation” for “active engagement.” Please note that any behavior must be exhibited for a minimum of two seconds before it is coded at all. So, if a participant is observed touching his/her hair for only a fraction of a second, the observer should not count this towards “DID SOMETHING OTHER THAN THE ACTIVITY.”
  - More than half of the observation: The relevant behavior occurred for more than 2 minutes and 30 seconds (i.e., more than half of five minutes). For example, if a person colors a picture for three full minutes, you would code “More than half of the observation” for “DID/COMMENTED ON TARGET ACTIVITY.”

There is a hierarchy in coding engagement behaviors if two or more behaviors occur simultaneously in a given time frame. The figure on the following page should help to illustrate this “decision ladder.” Do not double code for simultaneously occurring behaviors.

- Constructive engagement (doing or commenting upon an activity) takes precedence over (a) passive engagement in the presented “target” activity, (b) doing something other than the activity, and (c) non-engagement. If a person is doing an activity (e.g., singing a song) but also watching the activity coordinator, you should code “DID/COMMENTED ON TARGET ACTIVITY” as the relevant behavior. Also, if a resident is looking through her purse while singing a song, you should code “DID/COMMENTED ON TARGET ACTIVITY” as the relevant behavior. Finally, if a resident has his/her eyes closed, and is at the same time playing a piano during a music therapy session, you should code “DID/COMMENTED ON TARGET ACTIVITY” as the relevant behavior.

- Passive engagement in the target activity takes precedence over doing something other than the activity. So, if a resident is watching other residents tango but is also playing with the buttons on his/her sweater, you should code “LISTENED/WATCHED TARGET ACTIVITY” as the relevant behavior.

- Finally, doing something other than the activity takes precedence over non-engagement (sleeping/closing eyes/staring into space). So, if a resident is fixing his/her hair and the resident’s eyes are closed, “DID OR ATTENDED TO THINGS OTHER THAN THE TARGET ACTIVITY” should be coded as the relevant behavior.

- Repetitive & self-stimulating behavior should be coded as such; they don’t count as “DID OR ATTENDED TO THINGS OTHER THAN THE TARGET ACTIVITY”

- For the different engagement codes, you can only code up to one “2” (More than half of the activity) on a given observation. This is because more than one “2” (More than half of the activity) would total more than five minutes.

- If you are observing a participant and they are removed from the group to do an alternate activity, continue to code the participant as if the alternate activity is the presented activity. Please indicate what the alternate activity was and what the staff to client ratio was.

- If no activity is going on, then observe anyway and there is no presented activity, so no one can receive a score for engagement in presented activity.
The Engagement Scale Hierarchy

If two or more of the following behaviors are **taking place at the same time**, code the behavior that is higher on the “ladder.” You can only count the time towards your score on 1 behavior; that which is higher on the ladder. Examples: singing with group and fidgeting in purse for 3 out of 5 minutes…code singing as (2) because higher on ladder, or if sleeping for 3 minutes and then they wake up and sing and fidget in purse for 2 minutes simultaneously …code as sleeping (2) and singing (1) because singing is higher on the ladder than fidgeting (other productive).

<table>
<thead>
<tr>
<th>Did/Commented On Target Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Listened/Watched Target Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did Something “Productive” Other Than the Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Repetitive Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Slept/Kept Eyes Closed/Stared Into Space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
Appendix I. Revised Memory Behavior Problems Checklist (RMBPC)

Observer’s Name: __________ Facility __________ Activity observed __________ Date __________ Location where activity took place __________

Total number of participants at the observed activity session __________ Total number of participants who refused to join __________

Total number of staff involved in: Activity set up __________ Activity implementation __________ Activity cleanup __________

1. Check if the activity occurred.
2. Indicate number of times behavior occurred.
3. Indicate average duration of behavior occurrence: Indicate Unit of Time (How long, on average, did each occurrence of the behavior last?)

| Participants’ Names → | 1 | 2 | 3 | T | 1 | 2 | 3 | T | 1 | 2 | 3 | T | 1 | 2 | 3 | T | 1 | 2 | 3 | T |
|-----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Asking the same question over and over again | | | | | | | | | | | | | | | | | | | | |
| 2. Trouble remembering recent events (e.g. something someone just told him) | | | | | | | | | | | | | | | | | | | | |
| 3. Forgetting significant past events (e.g., that a parent is deceased; or wanting to go to a past residence) | | | | | | | | | | | | | | | | | | | | |
| 4. Forgetting what day it is | | | | | | | | | | | | | | | | | | | | |
| 5. Difficulty concentrating on a task | | | | | | | | | | | | | | | | | | | | |
| 6. Losing, misplacing, hiding things | | | | | | | | | | | | | | | | | | | | |
| 7. Trying to wander away from facility or designated areas | | | | | | | | | | | | | | | | | | | | |
| 8. Not recognizing people he knows | | | | | | | | | | | | | | | | | | | | |
| 9. Being unable to keep occupied or busy by (him/her) self | | | | | | | | | | | | | | | | | | | | |
| 10. Following staff around or clinging to staff | | | | | | | | | | | | | | | | | | | | |
| 11. Being constantly restless/agitated | | | | | | | | | | | | | | | | | | | | |
| 12. Yelling or swearing | | | | | | | | | | | | | | | | | | | | |
| 13. Being suspicious or making accusations | | | | | | | | | | | | | | | | | | | | |
| 14. Appearing sad, tearful, or crying | | | | | | | | | | | | | | | | | | | | |
| 15. Becoming angry or aggressive | | | | | | | | | | | | | | | | | | | | |
| 16. Seeing or hearing things that are not there (hallucinations or illusions) | | | | | | | | | | | | | | | | | | | | |
| 17. Being incontinent (bowel, bladder) | | | | | | | | | | | | | | | | | | | | |
| 18. Showing inappropriate sexual behavior or interests at the wrong time or place | | | | | | | | | | | | | | | | | | | | |
| 19. Getting into an emergency situation that staff could not handle | | | | | | | | | | | | | | | | | | | | |
| 20. Was there any other problem? (SPECIFY) | | | | | | | | | | | | | | | | | | | | |

Please Make Qualitative Notes Here: (sleeping/why left room/additional observations/ significant events and contextual factors):
# Appendix J. Operationalization of the RMBPC

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Asking the same question over and over again</td>
<td>The participant may ask to go home repetitively or ask who will pick them up and when. Oftentimes this same question is asked an exhausting number of times even after multiple attempts to give adequate answers by staff persons.</td>
</tr>
<tr>
<td>2. Trouble remembering recent events (e.g. something someone just told him)</td>
<td>The participant may not remember that they just engaged in the activity or created the end-product sitting in front of them. They may have trouble remembering the steps involved in completing the task.</td>
</tr>
<tr>
<td>3. Forgetting significant past events (e.g., that a parent is deceased; or wanting to go to a past residence)</td>
<td>The participant may say that they need to get home for supper or their mother will be mad, or they may think that they are still living in Texas despite the fact that they have been in VA for many years.</td>
</tr>
<tr>
<td>4. Forgetting what day it is.</td>
<td>The participant may ask what day it is or provide some clue that they are confused about the day.</td>
</tr>
<tr>
<td>5. Difficulty concentrating on a task.</td>
<td>The person will not be able to complete the activity, and possibly steps within the activity, without becoming distracted.</td>
</tr>
<tr>
<td>6. Losing, misplacing, hiding things.</td>
<td>The person may be searching for an object/belongings (purse, keys, etc.) or they may take materials from the space and put them in a hidden place away from others.</td>
</tr>
<tr>
<td>7. Trying to wander away.</td>
<td>Walking in a non-purposeful way. Oftentimes this will mean from one end of the hallway/room to the other, only stopping when encountering locked doors. Wandering only counts as one behavior occurrence unless the person is redirected and then wanders again following intervention.</td>
</tr>
<tr>
<td>8. Not recognizing people he knows.</td>
<td>This may be difficult to determine, but if it is obvious that two people know each other (2 participants, or the participants and a staff person) and one person reintroduce him/herself or asks who the other person is.</td>
</tr>
<tr>
<td>9. Being unable to keep occupied or busy by (him/her) self</td>
<td>The person may sit passively engaged or engage in self-stimulating behaviors rather than engage in activities without the guidance and one on one attention of the facilitator.</td>
</tr>
<tr>
<td>10. Following staff around or clinging to staff.</td>
<td>Participant may stay close to staff persons at all times, not allowing them out of his/her sight for fear that they will be left alone. The person may grab the staff person and ask to go home.</td>
</tr>
<tr>
<td>11. Being constantly restless /agitated.</td>
<td>Often this will be manifested by persons who wander, engage in self-stimulating behaviors, ask repetitive questions, and act out towards others (yell, physical aggression) May try to grab or cling to a staff passing by or stopping to offer</td>
</tr>
<tr>
<td>12. Yelling or swearing</td>
<td>Verbalizations aloud either to oneself, another participant, a staff person, or the group.</td>
</tr>
<tr>
<td>13. Being suspicious or making accusations.</td>
<td>Person may blame staff or a peer for stealing their purse or taking their things.</td>
</tr>
<tr>
<td>15. Becoming angry or aggressive.</td>
<td>The individual becomes verbally or physically combative towards others or displays anger by talking aloud to oneself, slamming objects, etc.</td>
</tr>
<tr>
<td>16. Seeing or hearing things that are not there (hallucinations or illusions)</td>
<td>Participant verbalizes to another individual that something has occurred that clearly has not or becomes upset by the fact that something has occurred that isn't real. This also include not recognizing oneself in a photo or mirror.</td>
</tr>
<tr>
<td>17. Being incontinent (bowel, bladder)</td>
<td>Having an accident and relieving oneself somewhere other than the restroom.</td>
</tr>
<tr>
<td>18. Showing inappropriate sexual behavior or interests at the wrong time or place</td>
<td>This may include unzipping pants publicly or flashing other participants in the program. It could also include two married participants engaging in sexual conduct with someone other than their partner.</td>
</tr>
<tr>
<td>19. Getting into an emergency situation that staff could not handle.</td>
<td>This could include a physical fight with another participant, or wandering out of the facility (elopement).</td>
</tr>
<tr>
<td>20. Was there any other problem?(SPECIFY)</td>
<td>____</td>
</tr>
</tbody>
</table>
Appendix K. Revised Quality of Life-AD

Participant Name/ID #:____________ Interviewer Name/ID:____________ Date:____
Activity Observed:____________ Facility:____________

Good afternoon, Mr./Mrs. ___________, my name is ___________. I would like to ask you a few questions about your feelings and what you did today at the center. Do you have a moment to talk with me about your day here at [name program]? If you do not feel like answering my questions you do not have to. I am going to ask you some questions about your quality of life. I would like for you to rate these areas using one of four words: poor, fair, good, or excellent. Because I'll talk to several people, I need to ask you the questions the same way each time. Also, I want to make sure that you don't mind if I record your responses so that I can capture all of your answers without having to write so quickly. [Interviewer: Be sure to get one answer of poor, fair, good, or excellent for each item. Use the face prompt if the participant cannot answer the question with your verbal prompts]

Poor=1   Fair=2   Good=3   Excellent=4

1. Which word best describes your mood today during [name activity]? (Prompt: Have you been in good spirits today or have you felt down?) Circle:

   Excellent, Good, Fair, Poor

2. How would you describe your energy level during [name activity]? (Have you felt upbeat today or have you been feeling tired?) Poor, Fair, Good, Excellent

3. How would you describe the time you spent [name activity observed]? (Did you enjoy the activity or would you prefer to do another activity instead?) Excellent, Good, Fair, Poor

4. How would you describe your ability to do [name activity observed]? (Have you been able to join in any activities that you liked here at the center or do you dislike the types of activities that they do here?) Poor, Fair, Good, Excellent

5. How would you describe your ability to help out or feel useful during [name of activity]? (Were you able to help with any of the tasks related to the activity?). Excellent, Good, Fair, Poor

6. How would you describe your life as a whole? When you think of everything together how do you feel about your life today? (e.g., your opinion of your life satisfaction, well-being) (Would you say that you are pleased with your life overall or are you feeling disappointed about life). Poor, Fair, Good, Excellent

7. Of all of these activities [show pictures of various activities] which do enjoy the most?

+
Working with Plants

Arts and Crafts

Playing Games

Cooking and Baking
Face prompts for QOL-AD

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>POOR</td>
<td>FAIR</td>
<td>GOOD</td>
<td>EXCELLENT</td>
</tr>
</tbody>
</table>
Directions for conducting the QOL-AD

- Participation in the interview is voluntary; if the target participant does not wish to be interviewed, write an explanation of the situation on the blank interview sheet and file it with the completed interview forms.
- When conducting the interview, always speak in a clear and audible voice.
- Be sure to allow the older adult ample time to process the question and think of a response.
- After asking the question, allow the older adult to provide an original response before utilizing the prompts.
- If he/she is unable to provide a response, then provide the participant with the prompts (face chart) on the interview sheet.
- Make notes to describe cues and information that will not be captured on the face (e.g. facial expressions or a participant’s apparent confusion in answering a question).
- If the participant is unable to provide an answer to the question once the prompts and “faces chart” have been utilized, draw a slash mark through the corresponding answer space.
- At the conclusion of the interview, thank the participant for his/her time.
- The observer should review the completed interview sheet for accuracy and clarity before submitting it for data processing.
Appendix L. IRB Synopsis, Informed Consent Forms, and IRB Approval Letters

Study Protocol

Justification of Project

The proposed study involves an evaluation of horticulture therapy (HT) activities conducted at four adult day service (ADS) programs in the New River Valley. The evaluation will be a valuable tool in assessing the effectiveness of horticulture therapy for seniors with dementia in an ADS setting.

Horticulture therapy (HT) has been used in different settings with individuals with compromised abilities. It has been used primarily in institutional settings serving older adults, such as nursing homes and ADS programs. Although these programs have been well received by participants and staff at the programs, little gerontological research has been done to assess the effects of HT on seniors with memory problems. Such an evaluation would be of great use to horticulture therapists and other institutional care programs striving to provide therapeutic activities for their clients with dementia. The goals of HT range from increased social participation to greater range of motion.

It is expected that the proposed HT activities and evaluation will result in at least two professional presentations, one Master’s thesis, and scholarly publications. The program will also provide an opportunity for inter-departmental collaboration between the departments of Horticulture and Human Development.

Procedures

The principle investigator will work with two horticulture therapy students and two graduate research assistants (RAs) to develop, implement, and evaluate the HT activities conducted with the ADS participants over a ten-week period. The proposed project involves three different components.

First, the investigators will advise the students on development of activities appropriate for the participants in the ADS programs. The HT students will develop appropriate goals for each HT activity, lists of needed materials, and steps to set up and conduct each activity. For each type of plant and plant material to be used in the HT activities, students will verify during activity development that none are toxic or poisonous to humans.

Next, the students will have an orientation period at the ADS programs, during which time they will observe the participants in regular ADS activities. The orientation is necessary so that the students become familiar with the individual ADS participants, their abilities, and limitations. Following the orientation, the HT students will present weekly HT activities lasting 30-45 minutes each. Other horticulture activities will be limited during the program.

The HT activities and evaluation comprise the third step in the project. Observations will begin during regular ADS activities 30-minutes prior to when the HT activity begins and will continue through the HT activity. The RAs will observe the participants, recording two codes every five minutes, the predominant behavior and affect expressed by each participant. After each HT activity, the HT students will complete a group evaluation that describes factors that may contribute to the effectiveness of the
activity, for example, involvement of staff in the activity and the organization of the activity. HT students will also complete individual evaluation forms on the participants' involvement in each activity. The evaluation will describe the skill each participant exhibited in completing the presented HT activity, whether any modifications were utilized to keep the participant interested and to facilitate success, and what benefits the participant experienced in the activity. Finally, the RAs will conduct two interviews with each participant, one in the first three weeks of the project, and one in the last three weeks of the project, to obtain participant feedback about the activities, what was beneficial, what was disliked, and whether the participants found the activity to be meaningful.

Risks and Benefits

The risks involved in the proposed study are no greater than might be expected in any natural observation in an adult day service setting. Horticulture activities are common at most adult day programs. The HT student who will be leading the activities in the proposed study will verify that none of the plants or plant materials to be used are poisonous or toxic to humans. Additionally, participation in the HT activities is completely voluntary as none of the older adults are required to engage in any activities conducted at the adult day service program. No promise or guarantee of benefits will be made to encourage subjects to participate. No compensation will be give to those who choose to partake in the activities.

Confidentiality

Confidentiality of senior participants will be protected in the proposed project. Although participants' names will be used to aid in recording observations and assessments, the RAs and HT students will erase individual names and assign an ID number to distinguish participants following the assessment. Each participant will have his or her own ID number throughout the course of the evaluation. Participants' names will not be presented in publications or presentations.

Informed Consent

Family caregivers of the adult day service participants will receive a letter describing the proposed project and plans to observe their relative in HT activities. They will be asked to complete a consent form indicating whether or not their relative may be observed during the activities.
Title:
THE EFFECTS OF HORTICULTURE THERAPY ACTIVITIES ON DEMENTIA CARE PARTICIPANTS

Investigators:
Shannon E. Jarrott, Ph.D., Assistant Professor of Human Development
P. Diane Relf, Ph.D., Professor of Horticulture

Purpose:
The main objective of this proposed research project is to study the effects of horticulture activities on older adults with dementia. This will be determined by observing the level of activity and interactions among adult participants during horticulture activities over a 6-week period.

Procedures:
This program will involve 10-15 participants at the [name of the program]. Participants will have the freedom to choose whether or not to participate in any of the horticulture activities. All activities will take place at [name of the program].

The participants will engage in simple horticulture activities led by [facilitator’s name], a student of horticulture therapy. The activities will include planting and maintaining live plants, cooking, and creating crafts with horticulture materials. The activities will be designed to meet the abilities and interests of the adults participating in the study.

There will be two horticulture activities each week. Each activity will last approximately thirty minutes. The horticulture activities will occur indoors during cold or wet weather and outdoors whenever possible.

Information from each session will be collected using observations and interviews. Trained assistants will be observe the adults' involvement in the activities as well as their mood during the activities. Additionally, individual interviews will be conducted periodically with the participants so they may provide their assessment of the activities. The observations and interviews will help determine the effects of horticulture activities on the participants.

Risks and Benefits:
The horticulture activities have only minimal risk to the participants; similar to other activities offered at the program. The benefits include physical, intellectual, sensory, and social stimulation, and creative expression. No promise or guarantee of benefits will be made to encourage subjects to participate. No compensation will be given to those who choose to partake in the activities.

Confidentiality:
The data collected during this study will not be released at any time to anyone other than the individuals working on the project without the written consent of the participants or their guardians.

**Freedom to Withdraw:**

Participants may withdraw from the study at any time without penalty. The investigator may exclude a participant whose behavior is detrimental to the program and/or distracting to other participants.

**Approval of Research:**

This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University.

**Participant’s Responsibilities:**

I voluntarily agree to allow my relative to participate in this study. My relative does not have any responsibility or obligation if he/she chooses not to participate at any time during the study.

**Caregiver's Permission:**

I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for my relative to participate in this project. If my relative participates, he/she may withdraw at any time without penalty.

_________________________  ____________  _____________________________
Signature          Date   Family Member’s Name

Should I have any questions about this research or its conduct, I may contact:

Shannon Jarrott, Ph.D.  (540) 231-5434 / sjarrott@vt.edu
Investigator
Telephone / e-mail

Karen A. Roberto, Ph.D.  (540) 231-7657 / kroberto@vt.edu
Departmental Reviewer
Telephone / e-mail

David Moore, Ph.D.  (540) 231-4991 / moored@vt.edu
Chair, IRB
Telephone / e-mail

Office of Research Compliance
Research & Graduate Studies  (540)
Title:
THE EFFECTS OF HORTICULTURE THERAPY ACTIVITIES ON DEMENTIA CARE PARTICIPANTS

Investigators:
Shannon E. Jarrott, Ph.D., Assistant Professor of Human Development
P. Diane Relf, Ph.D., Professor of Horticulture

Purpose:
The main objective of this proposed research project is to examine the underlying processes, philosophies, and contextual influences that influence the facilitation of activities for persons with dementia in order to understand the processes that impact outcomes. This will be determined by interviewing activity facilitators and horticulture therapists about the philosophies that inform their approach and the mechanisms by which they work towards achieving beneficial outcomes for the older adults. The observational research team will also be interviewed to better understand the contextual information impacting outcomes in the participants that could not be captured by the observation scales.

Procedures:
These interviews will involve activity facilitators from eight dementia care programs in the NRV as well as two horticulture therapists facilitating HT in 4 of these facilities. These interviews will be conducted in a private location of the respondents’ choice and tape-recorded. In addition six observational research team members will be asked to participate in a focus group session in a private conference room on the Va. Tech campus. All respondents will be assigned a pseudonym to protect confidentiality and a name/pseudonym file will be stored in the PI’s office in a locked file cabinet.

The interviews and focus groups will help determine the philosophies and procedures that guide the activity facilitation at various sites. In addition, the observational research team will be asked to describe the contextual factors, including the facilitator’s style and demeanor in terms of the impact that it had the activity outcomes.

Risks and Benefits:
The interviews with the facilitators do not present any known risks to the participants. No compensation will be given to those who choose to partake in the activities.

Confidentiality:
The data collected during this study will not be released at any time to anyone other than the individuals working on the project without the written consent of the participants or their guardians.

Freedom to Withdraw:
Participants may withdraw from the study at any time without penalty.
Approval of Research:
This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University.

Participant's Responsibilities:
I voluntarily agree to participate in this study. I understand that I do not have any responsibility or obligation if I choose not to participate at any time during the study.

Permission:
I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for my participation in this project. If I participate, I may withdraw at any time without penalty.

______________________________________________________________
Signature Date Family member's Name

Should I have any questions about this research or its conduct, I may contact:

Shannon Jarrott, Ph.D. (540) 231-5434 / sjarrott@vt.edu
Investigator

Karen A. Roberto, Ph.D. (540) 231-7657 / kroberto@vt.edu
Departmental Reviewer

David Moore, Ph.D. (540) 231-4991 / moored@vt.edu
Chair, IRB Office of Research Compliance
Research & Graduate Studies (540)
May 8, 2003

MEMORANDUM

TO:    Shannon Jarrott  Human Development  416
       Paula Diane Relf  Horticulture  0527

FROM:  David M. Moore

SUBJECT: Expedited Approval – “The Effects of Horticultural Therapy Activities on Adult Day Services Participants” – IRB # 03-264ref 02-253

This memo is regarding the above-mentioned protocol. The proposed research is eligible for expedited review according to the specifications authorized by 45 CFR 46.110 and 21 CFR 56.110. As Chair of the Virginia Tech Institutional Review Board, I have granted approval to the study for a period of 12 months, effective May 8, 2003.

Approval of your research by the IRB provides the appropriate review as required by federal and state laws regarding human subject research. It is your responsibility to report to the IRB any adverse reactions that can be attributed to this study.

To continue the project past the 12 month approval period, a continuing review application must be submitted (30) days prior to the anniversary of the original approval date and a summary of the project to date must be provided. My office will send you a reminder of this (60) days prior to the anniversary date.

Cc: File
OSP 0170
DATE: January 25, 2005

MEMORANDUM

TO: Shannon E. Jarrott Human Development 0416
    Paula Diane Relf Horticulture 0327
    Kye Kim VA Medical Center’s Psychiatry Services cc

FROM: David Moore

SUBJECT: IRB Amendment Approval: “The Effects of Horticultural Therapy Activities on Adult Day Services Participants” IRB # 04-254 ref 03-264

This memo is regarding the above referenced protocol which was previously granted approval by the IRB on May 8, 2004. You subsequently requested permission to amend your approved protocol to include the addition of the listed changes. Since the requested amendment is nonsubstantive in nature, I, as Chair of the Virginia Tech Institutional Review Board, have granted approval for requested protocol amendment, effective as of January 25, 2005. The anniversary date will remain the same as the original approval date.

Virginia Tech has an approved Federal Wide Assurance (FWA00000572, exp. 7/20/07) on file with OHRP, and its IRB Registration Number is IRB00000667.

cc: File
Appendix M. HT and Traditional Activities Observation Schedule

<table>
<thead>
<tr>
<th>Site</th>
<th>Time 1 Observations</th>
<th>Time 2 Observations</th>
<th>HT</th>
<th>Traditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>1T*</td>
<td>9/8, 9/10</td>
<td>10/1, 10/6</td>
<td>10:30-11:30</td>
<td>9:30-10:00</td>
</tr>
<tr>
<td>2T</td>
<td>10/13, 10/15, 10/20, 10/22</td>
<td>11/10, 11/12, 11/17, 11/19, 11/22</td>
<td>9:30-10:00</td>
<td>10:30-11:00</td>
</tr>
<tr>
<td>3T</td>
<td>3/15, 3/17, 3/22, 3/24</td>
<td>4/12, 4/14, 4/19, 4/21</td>
<td>10:30-11:00</td>
<td>9:30-10:00</td>
</tr>
<tr>
<td>4T</td>
<td>4/26, 4/28, 5/3, 5/5</td>
<td>5/24, 5/26, 5/31, 6/2</td>
<td>10:30-11:00</td>
<td>9:30-10:00</td>
</tr>
<tr>
<td>1C*</td>
<td>10/14, 10/16</td>
<td>11/11, 11/13</td>
<td>X</td>
<td>9:30-10:00</td>
</tr>
<tr>
<td>2C</td>
<td>10/16, 10/23, 10/21, 11/6</td>
<td>11/11, 11/13, 11/18, 11/20</td>
<td>X</td>
<td>9:30-10:00</td>
</tr>
<tr>
<td>3C</td>
<td>2/17, 2/19, 2/24, 2/26</td>
<td>3/16, 3/18, 3/23, 3/25</td>
<td>X</td>
<td>9:30-10:00</td>
</tr>
<tr>
<td>4C</td>
<td>4/1, 4/3, 4/6, 4/8</td>
<td>4/27, 4/29, 5/4, 5/6</td>
<td>X</td>
<td>9:30-10:00</td>
</tr>
</tbody>
</table>

*Both of these sites had such small programs that all of the eligible participants were observed during the first week of observations at each time.*
Appendix N. Qualitative Coding Scheme

FACTORS THAT INFLUENCE THE LEVEL OF PRESS

ENVIRONMENT (Physical and Social)

Physical Environment (Inside the facility, outside the facility)
  • 101 Aspects of the physical environment that contributed to fit
    o Homelike
    o Sound system
    o Low level of stimulation
  • 102 Aspects of the physical environment that detracted from fit
    o Size of the space
    o Size of the group
    o Noisy/busy atmosphere
    o Bad/cold weather

Social Environment: (Staff/facilitators, Family, Institutional/Facility Culture, Client/Resident Culture, Larger Community/Appalachian Culture)
  • 201 Staff/Facilitators Behaviors that supported fit
    o Ability to stimulate participants and retain their attention through use of a variety of techniques (reminiscence)
    o Physical touch (hand over hand to stimulate procedural memory)
  • 202 Staff/Facilitators Behaviors that detracted from fit
    o Talked about residents in condescending ways in front of them
    o Directed activities at staff/volunteers
  • 203 Staff/Facilitators Beliefs that supported fit
    o Treat them with respect and dignity (not childlike)
    o View that participants are capable (focus on assets)
  • 204 Staff/Facilitators Beliefs that detracted from fit
    o The well being of the plant is more important than that of the person
    o They are like children in that they need rest
    o Make them do it attitude (to an extreme)
  • 205 Staff/Facilitators Professional qualities that supported fit
    o High levels of training interacting with and developing programming for this population
    o Holistic approach to programming; focus on the process
  • 206 Staff/Facilitators Professional qualities that detracted from fit
    o Lack of experience with this population
    o Training/education limited, so limited understanding of appropriate treatment goals
  • 207 Staff/Facilitators Personal qualities that supported fit
    o Level of energy and enthusiasm
    o Warmth exhibited towards the older adults
  • 208 Staff/Facilitators Personal qualities that detracted from fit
    o Inability to cope quickly/easily when unexpected events occurred
    o Lack of comfort with this group of older adults
  • 209 Family factors that supported fit
    o High levels of involvement and interest
  • 210 Family factors that detracted from fit
• Low levels of involvement and interest

• 211 Aspects of the institutional culture that supported fit
  o Team approach among staff and collective responsibility for client well-being
  o Openness and willingness to try new things
  o High levels of administrative support

• 212 Aspects of the institutional culture that detracted from fit
  o Poorly run facility lacking adequate resources and staffing
  o Treat care staff poorly, who in turn treat residents poorly

• 213 Aspects of the client/resident culture that supported fit
  o Higher functioning participants supportive of lower functioning participants
  o Participants gang up together and mock activity director when feeling infantilized

• 214 Aspects of the client/resident culture that detracted from fit
  o Learned helplessness/high levels of apathy

• 215 Aspects of Rural culture/larger community that supported fit
  o Generous supportive community

PROPERTIES OF THE PROGRAMMING (Properties of the Activities and Manner in which facilitated)

• 301 Properties of the activities that supported fit
  o Low level of complexity
  o Tapped into remaining abilities and interests
  o Opportunity for continuity

• 302 Properties of the activities that detracted from fit
  o Limited variety
  o Inadequate level of stimulation (too high or too low)

• 303 Manner in which the activities were facilitated that supported fit
  o Routine/structure provided
  o Individualized tasks delegated that all related to the same activity

• 304 Manner in which the activities were facilitated that detracted from fit
  o Whirlwind/too fast and too much
  o Activity completion emphasized

COMPETENCE LEVEL

• 401 Strengths/assets of persons with dementia
  o Procedural memory
  o Ability to remember and reminisce about familiar activities and tasks
  o Gross motor abilities

• 402 Challenges/limitations of persons with dementia
  o Limited ability to follow directions, complete series of steps
  o Sensory deficits
  o Attention span limited
OUTCOMES OF PERSON/ENVIRONMENT FIT OR LACK THEREOF

• 501 Benefits to participants
  o Physical
  o Social
  o Psychological
  o Physiological
  o Cognitive

• 502 Benefits to staff/facility
  o Gained new knowledge
  o Beautification of grounds/facility

• 503 Negative outcomes exhibited/experienced by participants
  o Aggression
  o Learned helplessness
  o Rebellion towards facilitator

• 504 Negative outcomes experienced by staff/facility

MEASUREMENT

• 601 Observers Presence
  o Level of involvement
  o Hawthorne effect
  o Differences by site/facilitator in how they were perceived and treated

• 602 Sentiments about the scales and the methods
  o QOL too structured and difficult for participants to understand
  o Pleasure difficult to recognize and rules of scale don’t necessarily capture
    the nuances of individual differences from one setting to another
  o No ability to capture effect of facilitator
## Appendix O. Qualitative Data Comparison Charts

<table>
<thead>
<tr>
<th>Site</th>
<th>Physical Environment</th>
<th>Social Environment</th>
<th>Properties of the programming</th>
<th>Competence level</th>
<th>Outcomes of person-environment fit or lack thereof</th>
<th>Measurement</th>
</tr>
</thead>
</table>
| T1   | -Outdoor space available  
-Good season=good weather; this group went outside for HT on several occasions  
-Accessibly activity room and supplies for HT facilitator | -Staff supportive of facilitators  
-Staff available to attend to the needs of the participants during the sessions  
-Organized, cohesive, more staff and other resources  
-HT facilitator DID feel supported | -programming was considered good by observers and facilitators | -Gardening was more familiar at this site and less resistance to the idea | | |
| T2   | -HT and traditional activities in same space  
-TV room also same as activity room  
-Outdoor space was available but residents complained about weather conditions | -Staff wheel them in or out (people stuck)  
-Got very upset when someone ate paint  
-Staff talked about residents in front of them  
-Staff surprised at accomplishments of people and would make a big deal when did things  
-1 activity person for the whole 300+ bed facility and no help from staff  
-Lack of administrator support, involved, and informed  
-staff not treated well so didn’t treat residents well  
-More concern about what looked good; didn’t practice what preached  
-Survival of fittest perspective  
-Mondays zoo b/c no activity planning on weekends  
-Radford activity director talked about participants in discouraging or conceding about participants in front of them; said horrible things about participants while they were there  
-Family members trained not to get involved  
-HT facilitator did NOT feel supported | -Bad activities (inappropriate generationally)  
-Residents commented that it was like kindergarten  
-Marty’s activities didn’t require work stations and her activities were set up so that people could come in and out and it didn’t make a difference | -Basic needs not met (people hungry, thirsty, need to go to bathroom)...facilitators put in bad position | -maladaptive behaviors | -Observed treatment activity before control activity |
<p>| T3 | --Small amount of space -Selective closed off room vs. open room for wanderers with distractions (TV) -Traditional activities took place in a different space -Outdoor space was available but weather did not permit -Difference in the size at the Arbor and the Cove location on arbor side...it was a huge, huge room. The place where they did the horticulture activity was adjacent to that room; it was open and flowed through so people were just wandering through. did activities in different places | -Sluggish environment (learned helplessness pervasive) -Low staff involvement probably just the lack of staff was a big thing b/c I mean, they had 1 person run around getting everybody and nobody was there to help encourage people -No help with watering or checking on plants -Burdened by plants and disliked mess -2 different comparison group facilitators. One more skillful than the other -Conflict with beauty shop at the time -1 HT facilitator able to go &quot;there&quot; with the participants...lady who did books and able to engage in conversation WH not set up to get dirty; big issue with making messes; they told them I don't like dirt, I don't like messes, I don't like gardening HT facilitator did NOT feel supported | -At the cove. Boring activities that didn't address remaining abilities -At the arbor side they sing and everybody was doing that, even people that during other activities weren't aware enough to be able to participate -couldn't grasp that you pick it up and dump dirt into the thing, but they could sing, so that was a big difference activities on the arbor side more familiar...it was obvious that they had been doing them a long time; where as the horticulture was new 1 HT facilitator wouldn't take the time to encourage them to keep going...well why don't you do this or why don't you do that. She just left them alone She wouldn't encourage them as much, wouldn't get on their level and help them and show them. She'd just give up and go to somebody else. she seems to be uncomfortable...she is very task oriented rather than going with just whatever they are going with it isn't even that she is inexperienced, just a different interaction style (HT facilitator) | -Residents very resistant to trying new things: seemed to have less background -More women than men and seemed “privileged” -Even though they were lower function on the on the arbor side, the activities were much more stimulating -it became a lot more than just horticulture more of a craft than plant material, and I think that those one with the dried flowers, cut out of magazines, and I think that they real thing definitely went over much better | -Control outcomes: bored, sleeping, apathy -Treatment outcomes: open body language, discussion about social history HT-. One day at VVCC, one guy would hold the trays, and another one would pour it in, and they would pack it in together and they were working together potted plant, and happened to be gentleman's anniversary, so he took that and gave it to his wife wife husband at WH, he would tell her what a wonderful gardener she used to be | At arbor People got involved and active and were happy and stuff. There were people singing along that had never spoken. I never heard them speak before, they were singing along and knew all the words and stuff. |</p>
<table>
<thead>
<tr>
<th>T4</th>
<th>-Wander Garden on site -Last site=warmest weather did activities in different places -Higher staff: client than WH -Staff more direct/told them to do/go -Staff who did talk about the residents in from them -Did not want residents to take plants to their rooms -laid back about residents eating dirt (preferred them eat dirt than endure social shaming) -Friendly inclusive environment -More abrupt interactions with participants -Inappropriate comments about participants -Very supportive and involved administrator -State funded (seemed different than WH in this way) -Conflict with preacher at that time -one HT facilitator let them sleep -And there was another gentleman who ate some dirt and it freaked her out -HT facilitator DID feel supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>-site specifically developed for low stimulation low demanding environment for residents with cognitive impairment -no outside access -Institutional environment Smaller groups ideal but resource limitations Need to structure the group to accommodate poor staff to client ratios No other distractions...TV is OUT! Door open so people can wander in and out Designed to mediate the level of stimulation...simplified yet visually pleasing as possible (murals that can’t be destroyed) Size of the room...not too big but too small gets cramped with wheelchairs and gerichairs -Music therapists excellent with residents; trained facilitators and staff to client ratios better: There were two music therapists very engaging, trained qualified staff Learning about the individuals’ social histories valued Team approach and staff cooperation Only MT for entire hospital...Nursing staff difficulty viewing her as professional who can aid daily activities (shower) CNAs well-trained and good at helping to get residents to sessions Some CNAs also stay for sessions and also benefit from that time with the residents...good time for them to bond b/c resident happier and excelling at something Not an institutional feel b/c variety of interventions and staff backgrounds...turn all interaction into opportunities to socialize day/activities are highly structured Importance of eye-contact, getting on their level, the relationship...can’t minimize importance of facilitator’s body language and facial gestures Eclectic philosophy...behavioralism and medical model</td>
</tr>
</tbody>
</table>
Importance of eye-contact, getting on their level, the relationship...can’t minimize importance of facilitator’s body language and facial gestures
Impressed/amazed; they learn about their own relative b/c therapist able to elicit things from their past before they knew the person sometimes
Also benefit from seeing loved one excel and succeed
Able to share new experiences and have good times together (dancing again)
Some families want confidentiality, so family members can’t join regular sessions
Appreciative

Changes in EEG responses
Decreasing stress hormones
Stimulus
Constructive activity
Decrease medications and hence reduce fall risk
Parties with music; benefits on multiple levels (residents, families, also outpatients that play music for the events...meaningful role)

C2
-large unorganized space with TV in the room and a great deal of people and volunteers
-Activities not geared to participants; instead geared towards volunteer staff
-One day chemical interaction sent observers home
-Observers sent to the back of the room one day by administrator

C3
-the room was big she has a sound system Homelike
-Windows big to see people moving outside
-All participants included even if didn’t get involved
-3 activity helpers to lead activities at times
-Enthusiastic facilitator
-Appalachian Culture (what activities they like, how they like to be addressed)
-Neve treat them like children
-Opportunity to interact with kids b/c IG facility
-Nobody makes fun of anybody...

Changes in EEG responses
Decreasing stress hormones
Stimulus
Constructive activity
Decrease medications and hence reduce fall risk
Parties with music; benefits on multiple levels (residents, families, also outpatients that play music for the events...meaningful role)

-One day chemical interaction sent observers home
-Observers sent to the back of the room one day by administrator

Help one another
Growing through interaction
Memory still they haven’t learned, like in reminiscence
Tap into strengths from previous life endeavors
Enhance self-esteem and worth
Enjoyment, fun, excitement, even through passive engagement
Relaxation, comfort
Sensory stimulation (hear sizzle, smell)
Compliment one another
Making choices (choosing colors)
Creating a product they can share with children or staff/give to others
Feeling needed and that they have a purpose
Exercise
Hand-eye coordination
Outings stimulation and interaction and excitement
IG: sense of touch, knowing they care about one another, feeling little
<table>
<thead>
<tr>
<th>C4</th>
<th>Safe environment/secure (elopement)</th>
<th>Limited stimulation</th>
<th>Can be scary and dangerous to this group</th>
<th>Need opportunities to wander and walk</th>
<th>Activity space developed so that all the equipment and resources are all in one place (organized and accessible)</th>
<th>Can't/don't overstimulate...always 1 activity centered around one theme</th>
<th>Facility; well designed; built with this population in mind (signage, no mirrors, colors used, homelike, simple, safety)</th>
<th>Closed patio that can be monitored by staff at all times; freedom to go outside</th>
<th>Full moon's impact on mood</th>
<th>Fire drills weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Activity director enthusiastic</td>
<td>-Mockery of impaired residents and staff encouraged this</td>
<td>-Forced participation We’ve actually seen people that look like they are in pain, but she still makes them participate...move your arm...move your leg too. When she was hired she was told that those with AD wouldn’t be able to do it Smaller groups b/c agreed that you can’t do group activities with 20 in this setting</td>
<td>Aids and staff help with lower functioning persons during activities Only way to have a good program is team effort and support; different from other sites</td>
<td>Staff well trained (cross trained) and required to obtain training and it is provide by the facility Must not demean persons or infantilized them One person’s agitation and expression of that, can impact others in the group (disruption) Get on their level to get eye contact and greet people to draw them in and build rapport</td>
<td>People’s feelings validated...ankle bracelet “normalized” she wore one too, decorating them Staff know the residents they will work with and are highly involved, invested, and valued...or they leave Activities valued at this site; sense of job security Employees valued and rewarded externally...all team members viewed as equally important b/c team effort Recognition program for staff to encourage/motivate staff Taught to bring back memories to them and focus on what they do remember can remember and not on negative side of dementia Alzheimer’s based care program that talks about all staff working together and nursing to engage in teamwork to develop a suitable AD program Importance of safety</td>
<td>They need a program that is centered on total care for the memory impaired (includes all members of treatment)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Rushed through activities: facilitator -prescribed to routine but very fast paced</td>
<td>-series of activities in short amount of time</td>
<td>Give different people different tasks that all contribute to a collective process</td>
<td>Outcome differ for varied individuals within the group Often groups separated by functional level and activities matched to the group ability</td>
<td>-Higher levels of dementia Don’t need a lot of things/decorating etc. Easily overstimulated/scared Hallucinate in many stages These folks are still very much full of life; just comes out differently than it used to Tap into overlearned/exising abilities Have to go to the bathroom often Many can’t walk and need help getting to activity area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Defiant residents Smiles Memory stimulation (autobiographical and task related) Accomplishment Display of excitement Meaningful engagement Gives them something that will motivate them Sensory stimulation Movement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friendly to observers</td>
<td>Felt that the implementation of the QOL-AD was actually an intervention of sorts b/c the adults received individual attention and had the opportunity to discuss their social history among other things</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
team and everything is done and incorporated into the activity program)
You know what they can do based on level and stage of AD
Want to give choice to support dignity
Need to have QOL for their final years
Came into the position 5 years ago knowing nothing...absolutely nothing
Facility sent her to classes to continue her education from Carillon and VT
Learned tips on managing challenging behaviors (gum)
Does music "therapy" too
Richfield’s has a therapy program on the premises
Students from several universities come and get involved
Families get involved/share appreciative
Families supportive and appreciative (good rapport)
Families also benefit from knowing/seeing their relative benefiting from the activity participation (helps them to know they did the right thing)...eases their burden

| HT 1 | No space that seemed desirable appropriate: WH table in middle of unit/ people easily distracted by TV and openness of the room: hard to focus people and keep them unified on what I was doing
Marty faced same challenge in physical space (used same room) |
| HT 2 | Higher functioning did independent work; set them up with plenty of supplies
Many participants able to work on their own if supplies available
She didn't want to hover b/c wanted to support independence
Teaming higher functioning with lower one did not work at all b/c people got irritated with one another and higher functioning person would get mad and say they messed it up
Assembly lines; different tasks suited to different individuals' needs and abilities |
| HD | First semester 
observer unobtrusive Second semester were not flies on wall; another set of facilitators; jumping in during activities, talking to the participants
Observers were constant distraction (whisper) and it affected the participants
Intervened when people ate dirt; they flipped out (contradictory to what observers said) |
| HT | Raised beds VVCC or ADS (stand or chair) Sensory stimulation
Used to easy things that were comfortable and having others do for them, so may have adjustment |
| HD | People challenged b/c new to them and more appropriate to their skill level or a bit above |
| HD | Measurement
Observer involvement QOL-AD too structured not appropriately handled always making people say right word
Hawthorne effect (Marty trying to look good for observers) |
responses represented in the data...doesn't mean that it wasn't good in long run

same at WH...often it would just be 2 people (the favorites) at word search activity
Social interaction
Completion of activity
Independently starting it (initiation)
Anxiety may be misrepresented: new activity; just b/c apprehensive and need help doesn't mean anxiety to extent of panic attack; how do I operationalize these codes and what about severity
### Facilitator comparisons by site

#### Site/Facilitator Beliefs that supported fit
- **HT facilitator 1**
  - HT Too much learned helplessness in NH…must encourage people to do things for themselves, important to support independence and not hover, set up assembly lines to match individuals to suitable tasks, don't believe in telling residents they are right / wrong
  - Belief that focusing on QOL and wellness types of things rather than treatment oriented was frustrating, if it resulted in finished product they like it more, teaming participants was a bad idea and resulted in conflict, no treatment goal that was measurable=problem and incongruence with HT

- **HT facilitator 2**
  - HD Don't believe in telling residents they are right / wrong, important for them to independently start the activity,

- **Facilitator C1**
  - Eclectic philosophy informed by diverse background and wide group of populations worked with, physical environment must be simple for these individuals so they can succeed and achieve more optimal outcomes, most important to have their attention and interest, valuable for CNAs to join MT so they can achieve a certain bond with patients in different environment, discussed

- **Facilitator C4**
  - Important to give people a reason to live…something to motivate them, need a safe environment that is not too stimulating or decorative, activities important to health and training staff very important, working with nursing so important…team approach, residents still very full of life, but it just isn't expressed as it used to be, training of staff very important to create educated teamwork, involving different group of people each day and same

#### Site/Facilitator Behaviors that supported fit
- **HT facilitator 1**
  - Gave good choices.
  - Let people sleep, gave up on people when they did not want to actively participate rather than engaging them on some other level, did not make conversation of choices available, did not take the time to encourage people on their level and showed them

- **HT facilitator 2**
  - Came back to sleeping people to engage them, got on their level and looked them in the eye, made choices into opportunities for interaction and reminiscence, good at engaging people on some level or another (able to tap into current place) tasks to meet group variation, did in-depth assessment of the participants (on-going) adapted to group's goals to wide range of abilities, gives individual attention which the group appreciates, got on their level and looked them in the eye, made choices into opportunities for interaction and reminiscence, good at engaging people by getting on their level and addressing them by name, try to support dignity (ankle braces to decorate and she wears to normalize it)

- **Facilitator C1**
  - Got on their level and looked them in the eye, hand over hand (physical touch), adapted tasks to meet group variation, did in-depth assessment of the participants (on-going) to learn about interests, abilities, backgrounds, social histories, do a variety of things within the group to appeal to wide range of abilities, gives individual attention which the group appreciates, got on their level and looked them in the eye, made choices into opportunities for interaction and reminiscence, good at engaging people by getting on their level and addressing them by name, try to support dignity (ankle braces to decorate and she wears to normalize it)

- **Facilitator C4**
  - Followed a routine, included people in various stages of an activity, engaged them in the activity, engaged people by getting on their level and addressing them by name, try to support dignity (ankle braces to decorate and she wears to normalize it)

- **Facilitator T4**
  - Very direct, gave clear instructions/demands, didn't indulge learned helplessness, had expectations of the clients to be involved, facilitator.

- **Facilitator T3**
  - On one wing Chose activities that were active and easy for many to participate in

- **Facilitator C3**
  - Had higher and lower functioning participants work together to support one another, able to get some things done, hand over hand (physical touch), adapted tasks to meet group variation, did in-depth assessment of the participants (on-going) to learn about interests, abilities, backgrounds, social histories, do a variety of things within the group to appeal to wide range of abilities, gives individual attention which the group appreciates

- **Facilitator T2**
  - Talked about participants in condescending manner in front of them, didn't give them much choice in joining activities, facilitated boring/child-like activities.
people look very different from day to day...need to be flexible and adapt programming according to interest/mood/etc of the group, important for residents to go outside (have safe access)

| Facilitator C3 | Important to respect and treat them like everyone else; not to single them out or treat them childlike, important to exercise in-tact abilities, important to challenge people, important to stay fresh and alive and keep yourself fit and active so you can be good at your job, activities important to health and training staff very important | They need a lot of sleep like children, |
| Facilitator T4 | Understood value and purpose of HT | Rather person eat dirt than undergo social shaming |
| Facilitator T3 | X | Saw HT as a time to take a break and get their own work done |
| Facilitator T1 | Understood value and purpose of HT, Strengths perspective | X |
| Facilitator C2 | X |
| Facilitator T2 | X | Deficit model |

<table>
<thead>
<tr>
<th>Site/Facilitator</th>
<th>Professional qualities that supported fit</th>
<th>Professional qualities that detracted from fit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HT facilitator 1 HT</td>
<td>Training in HT, experience working at Catawba with clients</td>
<td>Inexperienced, freaked out when man ate dirt, didn’t know background information (even names of participants at many sites), didn’t know site philosophies, medical background and concern about germs etc., no experience with persons with dementia/very apprehensive</td>
</tr>
<tr>
<td>HT facilitator 2 HD</td>
<td>Experience at ADS, background in HD and aging/dementia, experience with research</td>
<td>Didn’t know background information (even names of participants at many sites), didn’t know site philosophies, more person-centered approach social aspects emphasized rather than medical, first time out in the field</td>
</tr>
<tr>
<td>Facilitator C1</td>
<td>Knew and used their names, High level of professional education and training, extensive background in the field and working with a wide range of populations, board certified, working on masters degree, lots of continuing education</td>
<td>X</td>
</tr>
<tr>
<td>Facilitator C4</td>
<td>Knew and used their names, lots of continuing education training and learning on the job, musical background, CPR training, learned about the stages and appropriate expectations of various persons</td>
<td>Came into the position knowing nothing and had no experience, calls music...music therapy even though she was not trained in it/certified etc.</td>
</tr>
<tr>
<td>Facilitator C3</td>
<td>Knew and used their names, 15 years of experience doing activities and working with person with dementia, and 20+years in healthcare, trained to do meds and all aspects of ADL care</td>
<td>X</td>
</tr>
<tr>
<td>Facilitator T4</td>
<td>Knew and used their names,</td>
<td>X</td>
</tr>
<tr>
<td>Facilitator T3</td>
<td>Knew and used their names,</td>
<td>X</td>
</tr>
<tr>
<td>Facilitator T1</td>
<td>High level of training and education, person-centered philosophy</td>
<td></td>
</tr>
<tr>
<td>Facilitator C2</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Facilitator T2</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site/Facilitator</th>
<th>Personal qualities that supported fit</th>
<th>Personal qualities that detracted from fit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HT facilitator 1 HT</td>
<td>None</td>
<td>Different interaction style, emotionally distant, nervous and uneasy, disliked observers</td>
</tr>
<tr>
<td>HT facilitator 2 HD</td>
<td>More conversational, more friendly,</td>
<td>Lack of sensor on mouth</td>
</tr>
<tr>
<td>Facilitator C1</td>
<td>Creative, interested in making a difference and sharing her talents</td>
<td>None</td>
</tr>
<tr>
<td>Facilitator C4</td>
<td>Enthusiastic, had a routine, cared about residents and their families, able to work with other staff, flexible</td>
<td>2-faced (said one thing, did another)</td>
</tr>
<tr>
<td>Facilitator C3</td>
<td>Lots of energy and enthusiasm</td>
<td>None</td>
</tr>
<tr>
<td>Facilitator T4</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Facilitator T3</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Facilitator T1</td>
<td>Genuinely cared for residents and knew them in individualized manner</td>
<td>X</td>
</tr>
<tr>
<td>Facilitator C2</td>
<td>None</td>
<td>Bad attitude, blatant disregard for well-being/best interests of participants</td>
</tr>
<tr>
<td>Facilitator T2</td>
<td>None</td>
<td>Didn’t have any attachment to the participants</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Properties of the activities that supported fit</th>
<th>Properties of the activities that detracted from fit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horticulture</td>
<td>Flowering plants beautiful, familiar to many with rural background, good for eliciting memories to provoke reminiscence, good for sensory stimulation, good to have end</td>
</tr>
<tr>
<td>Product</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>Music</td>
<td>Appeals to wide range, many different types...something for everybody, no need to follow directions to engage, can bypass circuits and pathways and elicit functional behavior on more automatic level, improves mood, doesn't require a lot of clean up/set up, rejuvenating neuropathways, it's non-threatening</td>
</tr>
<tr>
<td>Cooking</td>
<td>Sensory stimulation, continuity with past activities, teamwork emphasized, many steps that can be shared by participants,</td>
</tr>
<tr>
<td>Coloring</td>
<td>Sensory stimulation, choice in colors used, repetitive motion soothing</td>
</tr>
<tr>
<td>Physical activity</td>
<td>Important to exercise intact abilities (flexibility, strength, balance), able to give directions by relating it to everyday tasks (rowing the boat), can be adapted to meet wide range of ability levels</td>
</tr>
</tbody>
</table>
EDUCATION

2006  Ph.D. Human Development, Adult Development & Aging, GPA: 3.7/4.0 Virginia Polytechnic Institute & State University, Blacksburg, VA
Dissertation: “Understanding the impact of horticulture therapy (HT) on persons with dementia in community based and institutional care programs: A mixed method assessment of processes and outcomes.”

2004  Intergenerational (IG) Specialist Certificate
Generations Together at the University of Pittsburgh

2003  M.S. Human Development, Adult Development & Aging, GPA: 3.9/4.0
Virginia Polytechnic Institute & State University, Blacksburg, VA

2003  Graduate Certificate in Gerontology, Center for Gerontology
Virginia Polytechnic Institute & State University, Blacksburg, VA

2001  B. S. Horticulture, Horticulture Therapy Option, GPA: 3.6/4.0
Virginia Polytechnic Institute & State University, Blacksburg, VA

2000  B. S. Human Development, Human Services Option, GPA: 3.7/4.0
Virginia Polytechnic Institute & State University, Blacksburg, VA

CLINICAL & RESEARCH EXPERIENCE

August 2005- Present  Psychometrician/Clinical Research Coordinator, Clinical Research Trials
Pacific Research Network, San Diego, CA

- Conduct memory assessments with older adults
- Assess each individual’s medical and social history, memory assessment scores, and current list of medications in relation to various study protocols’ inclusion and exclusion criteria.
- Rate older adults using the Clinical Dementia Rating Scale (CDR), the Clinician’s Impression of Change (CGIC/CIBIC), the Alzheimer’s Disease Assessment Scale (ADAS), Mini Mental State Exam (MMSE), Quality of Life-AD (QOL-AD)
- Interview caregivers of research participants using the CDR, CIBIC, NPI
- Phone screen participants with anxiety, depression, insomnia, and Restless Leg Syndrome (RLS) for eligibility in current enrolling trials and provide a summary of the appropriate trials to prospective participants
- Collect physiological data for clinical trials data, including blood pressure, respiration rate, heart rate, and ECG readings
- Attend investigator meetings to learn more in-depth information about upcoming trials, investigational therapies, and study procedures including enrollment efforts.
Intern with Dr. Kye Kim: Memory Disorders Clinic & Dementia Unit

Fall 2004
Veterans Affairs Medical Center, Salem Virginia

- Attended outpatient memory disorders clinic with multidisciplinary team
- Reviewed research literature on biopsychosocial aspects of dementia, informal caregiving for persons with dementia, caregiver grief, grief interventions, and life review
- Interviewed informal caregivers to gain an understanding of experiences with and reconciliation of grief in order to develop effective interventions.
- Developed a dataset for patient data to be used for research purposes.
- Reviewed patient records, multidisciplinary team notes, and assessment data to understand patient functioning
- Gained an understanding of the common diagnostic tools and drug therapies utilized in the case of memory disorders
- Assessed older adults with memory problems using the MMSE, Geriatric Depression Scale, and Clock Drawing Test

2003-2005
Research Assistant with Dr. Karen A. Roberto
Virginia Polytechnic Institute & State University, Center for Gerontology

Research project I: Chronic illness in rural older women with multiple health conditions
- Developed qualitative interview protocols in the area of chronic health conditions, including Diabetes, Heart Disease, and Osteoporosis
- Conducted literature searches concerning the psychosocial aspects of living with Diabetes in later life
- Conducted in-depth, open-ended, face-to-face guided interviews
- Administered standardized depression, stress, ADL, and social provision scales in an interview format
- Assessed elders’ upper and lower body strength using the timed-up-and-go measure and a grip dynamometer.
- Collaborated to develop a qualitative coding scheme for data analysis
- Transcribed interviews, coded transcripts, and analyzed data
- Developed corresponding SPSS dataset codebook
- Co-authored presentations and manuscripts based on the research findings
- Utilized ATLAS TI to code and analyze qualitative data

Research Project II: Service use of rural elders
- Cleaned, entered, and checked data in SPSS and Excel
- Analyzed quantitative data in SPSS
- Entered qualitative data into NUD*IST

Other Assignments:
- Searched funding opportunities weekly for Requests For Proposals (RFPs) relevant to Center affiliates’ research interests in aging
- Created and formatted the Center’s Newsletter using Adobe PageMaker
- Developed and delivered community presentations.
- Photographed guest speakers and special events for the Center’s Newsletter.
2001-2005  Research Assistant with Dr. Shannon E. Jarrott and Dr. Alison Galway
Virginia Polytechnic Institute & State University, Department of Human Development & Adult Day Services Program

Research Project I:  Intergenerational Community Building
- Developed, implemented, and documented therapeutic and intergenerational activities with planned modifications for persons with dementia (and children for the intergenerational program).
- Created a manual of intergenerational activities with scripts and specific instructions for replication.
- Evaluated activities using a variety of assessment techniques, including observational measures, self-report assessment forms, focus groups, functional assessments, and qualitative interviews.
- Developed interview protocols and surveys to assess community members' experiences in the IG program.
- Cleaned, entered, checked data in SPSS and created datasets.
- Trained undergraduate students in data collection and processing.
- Worked directly with ADS participants and the neighboring pre-school children and their teachers and parents both independently and during IG programming.
- Coordinated and facilitated service fraternity (Alpha Phi Omega) to install an IG garden.
- Collaborated with Child Development Lab (CDL) faculty, staff, and students in an intergenerational study group.
- Mentored incoming graduate and undergraduate students in research and facilitating IG opportunities.
- Developed and prepared IG cross-training materials for incoming students and staff.
- Created and documented research procedures.
- Recorded weekly observations and field notes during naturalistic observations of the IG literature project.
- Developed IRB materials.
- Interviewed caregivers for an IG promotional video.

Research Project II: Montessori activities for persons with dementia
- Created a manual of intergenerational and modified Montessori activities with scripts and specific instructions for replication.
- Developed and facilitated therapeutic activities guided by the Montessori method for persons with dementia twice weekly.
- Evaluated each participant's ability to engage in the activities at the culmination of each session.
- Processed the data using SPSS.

Research Project III: Active Together: Physical activity program for persons with dementia
- Collected observational data
- Analyzed quantitative data in SPSS and qualitative data using analytic induction and constant comparison.
- Catalogued research library of references using End*Note software program.
- Collaborated with graduate students from the Slips and Falls lab in the engineering department to coordinate site visits for ADS participants and their
caregivers.

- Accompanied ADS participants and their caregivers to the Slips & Falls lab.

Administrative Tasks:

- Prepared and collected fiscal materials for the ADS.
- Contributed to a social history file containing background information on each of the ADS participants.

2003-2004

*Project Coordinator with Dr. Shannon Jarrott*

*Virginia Polytechnic Institute & State University, ARDRAF Research Grant*

Horticulture therapy for persons with dementia

- Trained undergraduate and graduate students on observational data collection, MMSE administration, and data processing procedures.
- Developed educational and training materials for research team, HT facilitators, and participating administrators and activity programmers at participating research sites.
- Coordinated data collection and activity facilitation with site administrators.
- Prepared informed consent documents and identified appropriate measures.
- Created the datasets and codebooks for the project.
- Moderated a focus group sessions and individuals interviews with the research and facilitation team, developed the protocol, transcribed and analyzed the data.
- Contributed to the preparation and submission of the ARDRAF grant materials.

2000-2002

*Horticulture Therapist, Adult Day Services*

*Virginia Polytechnic Institute & State University*

- Developed and implemented a calendar of therapeutic activities with pre-planned modifications at four ADS facilities.
- Gathered materials and budgeted expenses for the project.
- Solicited donations from local businesses and university departments and clubs.
- Evaluated HT activities and participants through observation and face-to-face interviews with the older adults and their caregivers.
- Created codebook and datasets.
- Processed and analyzed data in SPSS.
- Contributed to conference presentations and peer-review publications.
- Organized and disseminated the activity plans and procedures into an educational manual for program staff.

2000

*Intern with Shelly Barham: Horticulture Therapist*

*Catawba Mental Health Hospital*

- Attended treatment teams bi-weekly with multidisciplinary staff to assess patient progress.
- Worked alongside Horticulture Therapist to facilitate HT activities with patients representing a wide range of ages and diagnoses.
- Assisted in researching suitable plant material and design for a sensory garden for patients with Dementia.
- Co-facilitated installation of a sensory garden with and for the patients.
1997-1998  Undergraduate Research Assistant with Dr. Diane Relf and Catherine McGuinne

Dissertation Research at the Wilson Avenue Alternative School
- Worked directly with youth at risk to facilitate horticulture programming.
- Journaled daily to describe the students’ progress and behaviors during horticulture sessions.
- Contributed to the development of a horticulture curriculum to teach students.
- Accompanied the group to various learning sites in the community.
- Administered attitudinal and behavioral scales.

RESEARCH INTERESTS

- Program evaluation and theory development
- Quality of care and quality of life for persons with dementia
- Therapeutic interventions for persons with dementia in community based and institutional care programs
- Non-familial intergenerational relationships
- The physical and social environments in dementia-care programs
- The experiences of caregivers of persons with dementia and the effects of empowerment and training on retention of care staff in formal settings
- Developing measures to assess outcomes in persons with moderate to severe dementia
- The experience of living with chronic conditions in later life

TEACHING EXPERIENCE

2004  Instructor (overall rating: 4.0/4.0)
Virginia Polytechnic Institute & State University, Department of Human Development HD 4114, Community-Based Services for Older Adults (six students)
- Developed syllabus.
- Chose textbook.
- Invited guest speakers.
- Facilitated learning through a variety of teaching methods ranging from PowerPoint presentations, to class activities and discussion, active learning assignments and journaling, research participation.
- Created class activities and projects.
- Graded student journals, presentations, and projects.
- Worked to develop meaningful active learning assignments and community connections for students’ active-learning projects.
2004  **Co-Instructor with Dr. Shannon Jarrott** (overall rating 3.8/4.0)  Virginia Polytechnic Institute & State University, Department of Human Development
HD 3114, Issues in Aging (52 students)
- Developed and presented lectures and activities to facilitate class discussion and active learning
- Assigned and graded class projects, papers, projects, and exams.
- Created multiple choice and essay questions for class exams.
- Worked with students during office hours to provide additional assistance
- Utilized electronic “Blackboard” to post class materials and grades and communicate with students via the web.
- Participated in the Service-Learning program by building service experiences into the class curriculum.

2003  **Teaching Assistant with Dr. Shannon Jarrott**  Virginia Polytechnic Institute and State University, Department of Human Development
HD 4114, Community-Based Services for Older Adults (46 students)
- Graded papers and projects.
- Developed multiple-choice questions, grading rubrics, and project descriptions.
- Posted materials to Blackboard.
- Presented class lectures.

**TEACHING INTERESTS**

- Adulthood & Aging
- Research Methods in Human Development
- Community Based Services for Older Adults
- Social Aspects of Aging
- Issues in Aging
- Implications of a Dementing Illness
- Aging & Health
- Intergenerational Programs

**PEER REVIEWED PUBLICATIONS**


**PUBLICATIONS IN PREPARATION**


Gigliotti, C. M., & Jarrott, S. E. (Manuscript in preparation). Utilization of Multiple Correspondence Analyses to Examine the Relationships Between Outcome Variables and Contextual Factors in a Study of Activity Interventions for Persons with Dementia.

Gigliotti, C. M., Jarrott, S. E., & Norris, D. J. (Manuscript in preparation). Therapeutic alternatives for persons with dementia; A comparison of music therapy and horticulture therapy in dementia care programs.


Roberto, K. A., Husser, E., Gigliotti, C. M. (Manuscript in preparation). I don’t do things like I used to! Examination of adaptation in rural elders living with multiple chronic conditions.
COMMUNITY TRAINING & EDUCATIONAL MATERIALS


PROFESSIONAL PRESENTATIONS


Roberto, K. A., Husser, E., & Gigliotti, C. M. (2005, November). *‘I don’t do things like I used to’: Multiple ways in which older women reconcile daily life with chronic health conditions.* Paper presented at the meetings of the Gerontological Society of America, Orlando, FL.


Rogers, S., Gigliotti, C. M., Jarrott, S. E., & Weaver, B. (2004, April). *A progressive physical activity program for persons with dementia.* Workshop presented at the meetings of the Southern Gerontological Society, Atlanta, GA.


Gigliotti, C. M. (2002, May). *Utilization of an ecological perspective to establish the practice of horticulture therapy in special care units.* Poster presented at the meetings of Quint State, Blacksburg, VA.


INVITED PRESENTATIONS


**AWARDS & HONORS**

- **2005**
  - Vetra R. & Jay A. Mancini Research Prize, Awarded by the Center for Gerontology, Virginia Polytechnic Institute & State University

- **2004**
  - S.J Ritchey Scholarship, Awarded by the Center for Gerontology, Virginia Polytechnic Institute & State University
  - Ora Goodwin Roop Scholarship, Awarded by the College of Liberal Arts & Human Sciences, Virginia Polytechnic Institute & State University
  - Harold A. Schlenker Scholarship, Awarded by the Virginia Tech Adult Day Service Program, Virginia Polytechnic Institute & State University

- **2003**
  - Intergenerational Specialists Certificate Scholarship, University of Pittsburgh

- **2002**
  - Ann Lane Mavromatis Scholarship from the American Horticulture Therapy Association
  - Outstanding Gerontology Student Award from the Virginia Association on Aging

- **1998-1999**
  - Studied at Oregon State University in Corvallis, Oregon as a National Student Exchange Program Representative of Virginia Polytechnic Institute & State University.

- **1996-2001**
  - Deans List, Outstanding Academic Achievement

**GRANTS**

- **2002**
  - Paolucci Research Grant from Kappa Omicron Nu Leadership Academy
  - Amount: $1,500
PROFESSIONAL & HONOR SOCIETY MEMBERSHIPS

2002-Present  Sigma Phi Omega
2001-Present  Golden Key Honor Society
              Gerontological Society of America (GSA)
              Southern Gerontological Society (SGS)
2000-Present  American Horticulture Therapy Association (AHTA)
2000-2003    Mid-Atlantic Chapter, AHTA

PEER REVIEWER

2006  -American Journal of Alzheimer’s Disease and Related Dementias
2004  -Dementia
       -Family Relations Student Reviewer
2003  -Southern Gerontological Society Conference Abstracts for the 2004
       Annual Meetings
2001-
2002  -Acta Horticulturae (XXX): Expanding Roles for Horticulture in Improving
       Human Well-Being and Life Quality

SERVICE

2002-
2005  Sigma Phi Omega:
       • Co-president, 2003-2004
       • Treasurer, 2002-2003

Contributions to the IG community through:
• Documentation of Intergenerational activities for a gallery display to raise
  visibility and advocate for the program.
• Participation in a CEUT study group committed to developing a collaborative
  mission statement.
• Coordinating and overseeing the installment of an IG garden space

1998-
2002  Horticulture Therapy facilitator with a variety of populations, including:
       • Youth at risk: Wilson Avenue Alternative School
       • Older Adults with Dementia, Parkinson’s, and a variety of physical and cognitive
         limitations: Adult Day Services at Virginia Tech, Warm Hearth Village Nursing
         Home in Blacksburg, VA, Heritage Hall Nursing Home in Christiansburg, VA; and
         Grace Center in Corvallis, Oregon
       • Adults with developmental disabilities: Salem Baptist Children’s Home
       • elementary school students: Price’s Fork Elementary