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Analyzing the Use of a Montessori-Based Activity & Its Effect on Engagement & Affect in
Persons with Dementia: A Replication Study

By

Emilee J. Andersen

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of

Master of Arts

In

Clinical Psychology

Minnesota State University, Mankato

Mankato, Minnesota

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Table of Contents

Introduction.....	1
Method.....	10
Results.....	16
Discussion.....	18
References.....	27
Tables	
Operational Definitions of Each Type of Prompt.....	34
Mean Percent of Occurrence for Active, Passive, and Non-Engaging Behaviors, and Positive Affect Across All Sessions.....	35
Aggregated Descriptive Statistics for Pre and Post QUALIDEM Subscale Scores.....	36
Figures	
% Occurrence of Active Engagement Behaviors Between Activities.....	37
% Occurrence of Passive Engagement Between Activities.....	38
% Occurrence of Non-engagement Between Activities.....	39
% Occurrence of Positive Affect Between Activities.....	40
Appendices	
A. Informed Consent for Participation in Research (Resident).....	41
B. Informed Consent for Participation in the Research Study (Staff).....	43
C. “Memory Bingo” Social Validity Questionnaire.....	45

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Abstract

Activities are an essential element in institutionalized settings for persons with dementia. Challenges are faced, however, when developing and implementing stimulating and meaningful activities for this population. Over the past two decades, Montessori-based activities (MBAs) have been investigated as a means for meeting the needs of persons with dementia residing in long-term care facilities. MBAs were developed to enhance the quality of life for individuals experiencing dementia through maximization of engaging and meaningful activities. The purpose of the current study was to expand on the empirical literature related to the use of MBAs for persons with dementia by replication of a previous study conducted by Hindt and colleagues (2018). The current study compared behavioral observations of engagement and affect of six participants during an MBA (Memory Bingo), and regularly offered activities within a long-term care facility. The MBA appeared to produce greater positive affect, active and passive engagement, as well as fewer indications of non-engagement than the regularly offered activities. This study provided a means for defining and identifying empirically supported activities for persons with dementia and infers that the MBA may serve as a promising alternative to other regularly offered activities that may not produce as many positive forms of behavior.

Analyzing the Use of a Montessori-Based Activity & Its Effect on Engagement & Affect in Persons with Dementia: A Replication Study

Alzheimer's disease (AD) is the most common form of dementia, it is currently the 6th leading cause of death in the United States, and it is projected that by 2050, the number of people age 65 and older with Alzheimer's dementia will reach 12.7 million. (Alzheimer's Association, 2021). AD is associated with progressive declines in cognitive abilities such as short-term memory, expressive language, problem-solving, and visuospatial skills (Alzheimer's Association, 2021). In addition, persons with AD often experience non-cognitive symptoms such as depressed mood, delusions, hallucinations, resistance to care, and activity disturbances (e.g., low physical engagement, isolation; Harwood et al., 1998). Currently there is no cure for AD and available interventions only slow the progression of the disease. Therefore, intervention strategies focus on minimizing sources of excess disability, maintaining functional abilities for as long as possible and enhancing quality of life.

The combination of cognitive and behavioral disturbances may contribute to a number of difficulties for both the afflicted individual and their caregivers. For example, language deficits associated with AD can disrupt communication between persons with AD and their caregivers. Memory problems can result in lost items, confusion, and conflict with caregivers. Individuals with AD may also have difficulties initiating and carrying out activities, which can lead to inactivity and can increase the likelihood of behavioral disturbances (Buettner & Fitzsimmons, 2003). For those who reside in institutionalized settings, persons with AD tend to be perceived as inactive, apathetic, irritable, disengaged, and have little positive affect (Judge, Camp, Orsulic-Jeras, 2000; Schreiner, Yamaoto, & Shiotani, 2005; Wood et al., 2005).

Importance of Activities

It is clear that for individuals living in an institutional setting, finding engaging, stimulating and meaningful activities is an important part of care plans. Challenges are faced, however, when developing activities for persons with dementia. These challenges are in part due to the decline in cognitive abilities (Orsulic-Jeras, Schneider, & Camp, 2000). Additionally, activities in institutionalized settings (e.g., nursing homes, memory care units, assisted living facilities), are mainly developed and conducted to serve a group of individuals throughout each day of the week in order to serve as many residents as possible. Facility staff members may prefer group-based activities in order to serve residents all at once, however, meeting the needs and interests of a diverse group of individuals in terms of interests, personal backgrounds, gender, and cognitive ability can be challenging (Hindt et al., 2018). Activities that can meet the needs of individuals who have differing levels of severity in dementia are, therefore, likely to be appealing to long-term care facility staff members (Hindt et al., 2018).

Examples of activities that are used within institutionalized settings involve bingo, sing-along, crafts, exercise, or trivia (Hindt et al., 2018; Jarrott, Gozali & Gigliotti, 2008; Orsulic-Jeras, Judge & Camp, 2000). Implementing activities in long-term care facilities is beneficial to residents in order to help provide structure and routine for each day, to help pass time, bring purpose to their lives, minimize behavioral challenges, decrease negative mood or depression, and to help reach therapeutic goals (Silknitter, 2018). Activities in long-term care settings are also, by law, required and implemented to help increase quality of life, to meet physical and mental needs of all residents, to reach therapeutic goals, and must be conducted by qualified individuals (Ice, 2000). Unfortunately, many long-term care facilities face difficulties in providing care to residents due to being understaffed (Shah, 2017; Cook, Fay, & Rockwood,

2012) and lacking education and training (Cook, Fay, & Rockwood, 2012). Activities in these settings also tend to lack individualization (e.g., focus on interests) and can lead to disruptive behaviors if residents become bored or are deficient of stimulation (Buettner & Fitzsimmons, 2003). These disruptive behaviors may function to evoke attention from caregivers, which usually concludes with a staff member removing the resident from the activity and placing them in an area that is more isolating and devoid of activity (Buettner & Fitzsimmons, 2003).

A small set of relevant empirical studies highlight the challenges of developing engaging and interesting activities for persons with dementia living in long-term care settings. For example, Tak and colleagues (2015) investigated nursing home residents' attitudes and perceptions towards regularly offered activities at their residing facilities. The study involved thirty-seven residents from various nursing homes, all diagnosed with dementia. Data were collected through semi-structured interviews, which focused on the residents' current activity engagement, involvement, and barriers and motivators to attending activities. Popular activities identified by participants included: bingo, card games, religious gatherings, live music, and sing-along. An important reason why some of these activities were preferred (specifically bingo) was because the residents could meet others and socialize. However, concerning results from this study indicate that many of the participants felt that there were too few activities to choose from and that there is a strong need for more relevant and meaningful activities. Not only was there a lack of interesting activities, but some residents also noted that activities involving exercise were much too physical for them. Similar comments were gathered from residents such as: "there is nothing to do", "there is no excitement", and "we just sit here and never say a word." The findings from this study suggest that there is a strong need for more meaningful and engaging activities, but also activities that can meet and enhance the functional competencies of residents.

Others have made similar conclusions (Ice, 2002; Kane, 2001; Bates-Jensen et al., 2004; Kolanowski, Buettner, Costa, & Litaker, 2001), calling for a need in individually focused and interesting activities. Overall, it appears as if there is a continuous need to empirically identify activities that provide more purpose, meaning, and stimulation for institutionalized residents living with dementia.

Montessori-Based Activities

Over the past two decades, Montessori-based activities (MBAs) have been investigated as a means for meeting the needs of persons with dementia residing in long-term care facilities. MBAs were developed to enhance sensory and cognitive stimulation (Orsulic-Jeras et al., 2000), combat therapeutic nihilism, provide opportunities to reminisce, and to enrich the lives of those affected by and experiencing dementia through maximization of interesting and meaningful activities (Malone & Camp, 2007). The structure and intent of MBAs differ from regularly offered activities at long-term care facilities in a multitude of ways. Montessori-based activities are designed on a number of principles such as building on the individuals' existing skill set, making tasks self-correcting, using prompts or cues to guide behavior, providing clear instructions for activities, adapting the environment into the activity, starting with materials or tasks at the simplest level and progressing to higher complexities, and ensuring that activities meet various levels of individual competencies by covering a range of multisensory modalities (Orsulic-Jeras et al., 2001; Rijn, Hoof, & Stappers, 2010). Additionally, an individual's personal interests, past hobbies and occupation are taken into strong consideration when formulating MBAs for older adults (Hindt et al., 2018). MBAs are also flexible in terms of who is facilitating the activity, whether it be volunteers, nursing aides, rehabilitation staff, activities personnel (Schneider & Camp, 2002), other residents with mild dementia, or intergenerationally;

schoolchildren engaging with residents through MBAs (Hitzig & Sheppard, 2017). While MBAs are designed to incorporate the principles mentioned above, it is anticipated that increased engagement, positive affect, reminiscence, and a general liking for these types of activities will occur as older individuals experience them. In fact, much of the literature on the use of MBAs for persons with dementia has indicated support for these activities when compared to typical activities or routines in long-term care settings, or centers such as adult day programs.

For example, some studies have investigated the effectiveness of MBA facilitation through intergenerational programming (Camp et al., 1997; Lee, Camp & Malone, 2007). Exploration of intergenerational programming with the use of MBAs has involved the pairing of preschool-age children and persons diagnosed with dementia. To aid in the pairing process, the competencies and skills of the children and the older adults are evaluated to ensure a good match. One study involved older participants with dementia from a nursing home and an adult day care center (Camp, 1997), and the other involved participants from a specialized memory care unit within a long-term care facility (Lee, Camp & Malone, 2007). A study conducted by Camp and colleagues (1997) encouraged the older adult to instruct, or teach, the child using an MBA. Another study conducted by Lee, Camp and Malone (2007), on the other hand, instructed the paired participants to work together and collaborate through an MBA as a team. Findings from both studies reveal positive results, suggesting that persons with dementia can take on a role of being an instructor (Lee, Camp & Malone, 2007), and that they can work together well with children through intergenerational programming utilizing MBAs (Camp et al., 1997; Lee, Camp & Malone, 2007). Camp and colleagues' (1997) results indicated that there were no observed instances of disengagement in persons with dementia when participating in the intergenerational MBAs and that the older adults and children both expressed interest,

enjoyment, and a positive experience through the programming. Lee, Camp and Malone (2007) found that through comparison of the intergenerational MBAs and regular unit activities, higher frequencies of constructive engagement and lower frequencies of active, passive, self-, and non-engagement were indicated during the intergenerational MBAs. Such results from intergenerational programming infer positive findings in behavioral engagement for older persons with dementia.

Another novel form of MBA facilitation is through a resident assisted approach (RAMP; Camp & Skrajner, 2004; Camp, Skrajner & Kelly, 2005; Skrajner & Camp, 2007). In this form of facilitation, usually an older adult with a mild level of dementia is trained to facilitate MBAs to a small group of persons experiencing advanced dementia. Montessori-based activities used in these studies included a reading activity, called Question Asking Reading (QAR; Camp, Skrajner & Kelly, 2005; Skrajner & Camp, 2007) and Memory Bingo (Camp & Skrajner, 2004). Activity leaders and activity participants involved in this form of activity have been recruited from long-term care facilities, assisted living facilities (Camp & Skrajner, 2004; Camp, Skrajner & Kelly, 2005; Skrajner & Camp, 2007), nursing home special care units, and adult day care centers (Skrajner & Camp, 2007). Similar goals are sought out to identify whether persons with mild dementia can lead an MBA and if activity participants with more advanced dementia are found to be engaged and interested in activities lead by another resident. Findings regarding the activity leaders suggest that they are able to partially adhere to activity protocols and that they expressed high satisfaction with the opportunity to lead activities (Camp & Skrajner, 2004; Camp, Skrajner & Kelly, 2005; Skrajner & Camp, 2007). As for activity participants, more frequent positive forms of engagement and affect were found when comparing observations of RAMP to regularly offered activities facilitated by staff members (Camp & Skrajner, 2004; Camp, Skrajner & Kelly,

2005; Skrajner & Camp, 2007). Also, in two of these studies, it was observed that participants in the activities began to form social groups and utilize prosocial behavior (e.g., helping others) after implementation of RAMP had taken place (Camp & Skrajner, 2004; Camp, Skrajner & Kelly, 2005).

Another novel approach to implementing MBAs is through facilitation by a family member (e.g., Schneider & Camp, 2002). In this study, information was gathered from the visitors regarding burden and life satisfaction in relation to visiting their relatives, and they were also trained in on how to implement MBAs. Once the visitors mastered their understanding and facilitation of MBAs, observed levels of engagement and perceived affect from the resident were recorded while the visitor would complete the MBA with their relative. Visitors were asked again at the end of the study about burden and life satisfaction, as well as their general opinions about the MBAs. Results from this study indicated that higher levels of active engagement, lower frequencies of passive engagement, and almost non-existent observations of non- and self-engaging behaviors were found when visitors implemented MBAs with their relatives when compared to observations conducted during regular visitations. There were no significant changes in the affect of residents between regular visits and MBA-driven visits. The visitors reported a reduction in self-reported burden and that they would recommend training other visitors in the use of MBAs. They also felt that they observed positive changes in their relatives when utilizing MBAs.

Although facilitation of MBAs through visitors, intergenerational approaches, and resident assisted methods have shown promising results as previously mentioned, a considerably more popular and routine approach of facilitation is through staff members in dementia care settings. Much of the previous methods of facilitation may be deemed helpful by freeing facility

staff members from administering or overseeing activities, however it is common practice in institutionalized settings for staff to engage residents in scheduled weekly activities. A number of studies have investigated the effect of MBAs on resident behaviors when directed by facility staff members in comparison to regularly offered activities (Hindt et al., 2018; Judge, Camp & Orsulic-Jeras, 2000; Jarrott, Gozali & Gigliotti, 2008; Orsulic-Jeras, Judge & Camp, 2000, Orsulic-Jeras, Schneider & Camp, 2000) and have found similar results as the previously mentioned research. Research conducted with staff-directed facilitation has been utilized in various dementia care settings including a specialized dementia unit (Orsulic-Jeras, Schneider & Camp, 2000), adult day care center (Judge, Camp & Orsulic-Jeras, 2000; Jarrott, Gozali & Gigliotti, 2008), senior living facility (Orsulic-Jeras, Judge & Camp, 2000) and a long-term memory care unit (Hindt et al., 2018). Results are similar regardless of the types of typically offered activities used as comparisons to MBAs across the board. Examples of regularly offered activities used as comparisons include musical programs/sing along, exercise, discussion groups (Judge, Camp & Orsulic-Jeras, 2000; Orsulic-Jeras, Judge & Camp, 2000; Hindt et al., 2018), art therapy, crafts (Judge, Camp & Orsulic-Jeras, 2000; Jarrott, Gozali & Gigliotti, 2008), trivia, and storytelling (Orsulic-Jeras, Judge & Camp, 2000).

When comparing observations of resident engagement and affect during typically offered activities in dementia care settings to that of MBAs, common themes arise. Participants are typically found to have increased constructive, or active, engagement (Hindt et al., 2018; Jarrott, Gozali & Gigliotti, 2008; Judge, Camp & Orsulic-Jeras, 2000; Orsulic-Jeras, Judge & Camp, 2000; Orsulic-Jeras, Schneider & Camp, 2000) and less passive engagement (Judge, Camp & Orsulic-Jeras, 2000; Orsulic-Jeras, Judge & Camp, 2000; Orsulic-Jeras, Schneider & Camp, 2000) during staff-directed MBAs when compared to regular unit activities. In one study, more

pleasure and less negative affect were observed during MBAs (Orsulic-Jeras, Schneider & Camp, 2000). In another study, higher indications of perceived pleasure and lower indications of perceived anxiety and fear were observed during MBAs when compared to regular unit activities (Orsulic-Jeras, Judge & Camp, 2000). Two studies report that observations of non-engagement and self-engaging behaviors were almost exclusively seen during regular unit activities rather than MBAs (Jarrott, Gozali & Gigliotti, 2008; Orsulic-Jeras, Judge & Camp, 2000). Lastly, two studies reported no change in perceived affect between regular unit activities and MBAs (Hindt et al., 2018; Jarrott, Gozali & Gigliotti, 2008), which may be because individuals with moderate to severe dementia tend to show fewer expressions of positive affect and may be apathetic (Hindt et al., 2018; Jarrott, Gozali & Gigliotti, 2008).

Purpose of the Study

The current literature investigating the benefits of MBAs for persons with dementia is small, but quite promising. Nevertheless, most of the studies reviewed included small samples and generalization may be difficult to determine, hence replication of such studies is necessary. Therefore, the purpose of the current study was to expand on the empirical literature on the use of Montessori-based activities for persons with dementia. The current study replicates procedures from a previous study led by Hindt and colleagues (2018), which found no changes in positive affect between the MBA and regular activities but did find increased active engagement during the MBA. The current study, however, measured a wider range of dependent variables such as quality of life and the number of prompts and assists staff provided during activities. In addition, rather than exclusively relying on visual inspection of data, the current study used a more stringent effect size statistic to determine the effect of the intervention on the primary dependent variables (i.e., engagement and affect). In the current study, it is hypothesized that participants

will show greater active engagement and positive affect during the MBA when compared to observations during regularly offered activities in the facility. It was also hypothesized that fewer prompts and assists would be necessary during the MBA compared to regularly offered activities.

Method

Participants

Data for this study was collected from two different participant populations: residents and facility staff members.

Residents

Seven individuals, two men and five women, met the following criteria for inclusion in this study: experiencing moderate to severe dementia or memory loss, participate regularly in unit activity programming, and have adequate sensory and physical abilities to participate in activities as judged by facility staff. The ages of the participants ranged from 76 to 93 years old ($M = 87.5$). All participants resided in a secured memory care unit of a long-term care facility located in the Midwestern United States. Participants were recruited by asking staff at the participating long-term care facility to identify residents that have a diagnosis of a condition that causes dementia (e.g., Alzheimer's disease) that was judged to be of at least moderate severity and that meet the inclusion criteria as stated above. The Brief Interview for Mental Illness (BIMS; Chodosh et al., 2008) was used to assess each participant's mental status. Guardians of the participants were asked to provide informed consent (see Appendix A) for the individual. During the study, one participant deceased, so the study continued with six individuals (two men, four women).

Facility staff

Two female staff members of the participating long-term care facility were recruited for the study, one of which was the Director of Activities (DA) and the other was an activities staff member. The DA was first contacted to recruit staff participation while also being given the opportunity to participate herself. Inclusion criteria for the staff members involved: regularly attending or facilitating activities and having an adequate amount of contact with residents in order to reliably report on their behavior.

Measures

Before implementation of the study, participants' mental status was assessed using the BIMS. The BIMS is both a reliable and valid assessment that has been found to perform in strong correlation with the Modified Mini Mental State (3MS) Test, which is considered a Gold-standard measure (Saliba & Buchanan, 2008). The BIMS is a short questionnaire that analyzes a participant's ability of repetition, orientation and recall. Scores on the BIMS range between 0 and 15. Scores between 13-15 indicate an intact cognition, scores between 8-12 indicate a moderate cognitive impairment, and scores between 0-7 indicate a severe cognitive impairment (Thomas et al., 2018). BIMS assessments were conducted in each of the participants' private rooms. The average BIMS score of all six participants was seven.

In order to determine whether the Montessori-based activity influenced how staff perceived each participant's quality of life, staff participants completed the QUALIDEM (QUALIDEM; Ettema et al., 2007). The QUALIDEM is an instrument that provides a measurement to assess care relationship, positive affect, negative affect, restless tense behavior, positive self-image, social relations, social isolation, feeling at home, and having something to

do. The QUALIDEM has been found to have strong internal consistency of most of its subscales supported by several studies (Ettema et al., 2007; Dichter et al., 2011; Graske et al., 2015; Bouman et al., 2011; Dichter et al., 2013, as cited in Dichter et al., 2016), as well as construct validity (Ettema et al., 2007).

Participant affect (positive or negative) and engagement in an activity (active, passive, or non-engagement) were measured through direct observation. Positive affect was defined as a participant showing overt signs of pleasure and/or interest (e.g., smiling, laughing). Negative affect was defined as a participant showing overt signs of anger, sadness, or anxiety (e.g., furrowing eyebrows, wrinkling forehead). Active engagement was operationally defined by any verbal or motor behavior exhibited in response to the activity that the participant is engaged in (e.g., talking in discussion, manipulating an object associated with the activity). Passive engagement was defined as listening or looking behavior exhibited in response to the activity (e.g., watching others participate, watching the facilitator). Non-engagement was defined as the eyes gazing away from the activity for 3 seconds or longer, sleeping, or purposeless movements (e.g., fidgeting with one's clothing, talking to oneself). The operational definitions for all five of these measured behaviors were based off previous studies (Hindt et al., 2018; Orsulic-Jeras, Judge & Camp, 2000).

Staff-resident interactions were also measured during an activity. Specific behaviors observed were assists and prompts. An assist was operationally defined as an act of a staff member physically giving a resident supplementary support or aid (e.g., a staff member assisting a resident re-adjust their seating during an activity). A prompt was operationally defined by four different situations: physical prompt, positional/visual prompt, verbal prompt, and gestural prompt. The operational definitions for these types of prompts were derived from those defined

and peer reviewed by the National Professional Development Center on Autism Spectrum Disorders (ASD toddler initiative, n.d.), since research on the use of behaviorally driven prompts for those with dementia is nearly non-existent. Research in the autism literature has demonstrated that prompting is an important skill for those with autism and the definitions used for observing prompts have aided in empirical research (ASD toddler initiative, n.d.). The current study adopted these definitions and slightly modified them in respect to persons with dementia. A prompt was generally defined as occurring if a participant's interest, involvement, or engagement has ventured away from the activity at hand and a staff member attempts to reinstate their interest, involvement, or engagement by involving a physical, gestural, positional/visual, or verbal prompt. See Table 1 for the specific operational definitions for each type of prompt.

Research Design and Experimental Conditions

An alternating treatments design (ATD) was implemented to compare two conditions in terms of their effects on engagement and affect. The first condition was regularly offered activities (ROAs) at the long-term care facility. The DA provided the researchers with a monthly schedule of the unit's activities and highlighted which activities each participant is most likely to attend based on her experience of attending and running activities. The ROAs were also chosen based on a study conducted by Tak et al. (2015), which found that the most popular activities in nursing homes were regular bingo and live music, or sing along. Based on these two sources, the ROAs observed for this study were stretches, crafts, music therapy, sing along, and regular bingo. Activities were facilitated by the DA, or an activities staff member, and at times, a volunteer.

The second condition is the Montessori-based activity called "Memory Bingo," an activity that has been investigated in previous studies (Hindt et al., 2018; Orsulic-Jeras, Judge &

Camp, 2000; Jarrot, Gozali & Gigliotti, 2008; Camp, 1999). Memory bingo is a simplified version of regular bingo and is designed to compensate for some of the cognitive deficits found in those with dementia (Hindt et al., 2018). Memory Bingo is played by giving each participant four cards which contain names or pictures of people, places or items (e.g., Elvis Presley, the Lone Ranger, poodle skirts, etc.) that were likely to be popular in the 1940s and '50s when the participants were teenagers and or young adults. The cards were designed to represent people, places and items from this time frame because remote, factual memory tends to remain better preserved into the moderate stages of dementia (Geldmacher, 2009). The facilitator has a corresponding stack of cards from which they randomly choose one card, and then show it to the participants. If the chosen card matches one of the cards that a participant has, the participant flips over their card. If a participant was having a difficult time manipulating a card to flip it over, or if they had motor deficits, assistance in card flipping was provided. Another aspect of Memory Bingo is that the facilitator is encouraged to ask questions (e.g., "What did you like about Elvis Presley's music?") about each card in order to promote discussion and reminiscence among the participants. The first participant to have all four of their cards flipped over wins the game.

The researchers trained the DA to facilitate Memory Bingo prior to the beginning of the study. The DA was also asked to complete a social validity questionnaire (see Appendix C) which was given at the end of the study to obtain feedback about Memory Bingo. This questionnaire asked questions regarding Memory Bingo's use in a memory care unit, participants' observed levels of engagement and affect, their perceived understanding of Memory Bingo, and whether it seemed beneficial to the participants in terms of behavior and enjoyment.

Data Collection

In both conditions, data were collected via direct observation using a 10-s partial-interval recording system. Once the activity began, a participant was chosen at random to begin observations. That participant was observed for 10 seconds, with the next 10 seconds devoted to recording the behaviors observed. Then, in clockwise fashion, the researchers rotated to the next participant who was observed for the next 10 seconds. This observation method continued until the activity was complete, or until at least 30 minutes passed. Therefore, each participant was observed multiple times throughout the activity. Prompts and assists were recorded for any participant during an interval. For example, if participant B was currently being observed, but participant D was observed being assisted or prompted, an assist or prompt was recorded for that interval. In addition, if an observer noticed prompting or assisting during an interval devoted to recording behaviors, the observer still recorded the prompt or assist.

Two to four observation sessions per week were conducted for each condition and data collection lasted four weeks. Eight activity sessions were observed for each of the two conditions. For each session, the percentage of intervals in which each type of affect and engagement occurred was calculated for the entire sample of participants rather than for each participant given that the purpose of the study was to determine the impact of the intervention on the entire group. A frequency count of the number of occurrences of prompt and assists were calculated for each activity.

Although there were six participants in this study, all six participants were not required to attend each activity (e.g., some were sleeping, had visitors). Instead, all six participants were asked if they wished to join an activity and if they refused, this decision was honored. In addition, other residents in the unit were allowed to join all activities because staff could not reasonably exclude those who wanted to participate in activities. Data was not collected on

residents who were not part of the study. If two or fewer study participants attended an activity, observations were not conducted and the session was cancelled and rescheduled. Approximately three sessions were rescheduled. On average, four study participants attended each activity session.

Inter-observer agreement (IOA) data was collected for affect, engagement, prompt and assist behaviors during 30% of all data collection sessions. Calculation of IOA involved totaling the number of intervals where observers agreed about the occurrence or nonoccurrence of a specific behavior. The number of agreements was divided by the sum of all agreements and disagreements and then multiplied by 100. The average IOA for affect (negative and positive) observations was 88.8%. For engagement (active, passive, and nonengagement), IOA was 86.2%. Lastly, for prompts IOA was calculated at 97% and for assists it was 98%.

Results

The four primary dependent variables measured in this study were active, passive, and non-engagement, and perceived affect (positive or negative). Data concerning negative affect are not reported because this behavior was observed very infrequently throughout the study. Secondary dependent variables included quality of life, social validity, as well as the use of prompts and assists.

Engagement and Affect

The mean percent of interval occurrence across all 16 sessions for all three types of engagement as well as positive affect are shown in Table 2. Visual inspection of the data suggests that active engagement, passive engagement, and positive affect across all participants were greater during MBA sessions when compared to ROA sessions (see Figures 1, 2 and 4).

The results also indicate there were fewer occurrences of non-engagement during MBA sessions than during the ROA sessions (see Figure 3).

Because definitive trends in the data were difficult to interpret through visual inspection alone, a non-overlap of all pairs (NAP) analysis was conducted to provide a statistical measure of effect size. NAP effect sizes below 50% indicate an ineffective or inconsistent intervention effect, results between 50% and 70% indicate an unclear effect, effects sizes between 70% and 90% indicate a fair or moderate effect, and results above a 90% are indicative of a strong effect (Pustejovsky, 2016). The NAP analysis indicates that the MBA had an unclear effect on active engagement (60%) and passive engagement (66%). Moderate effects were found for non-engagement (85%) as well as positive affect (75%), indicating that during the MBA sessions, there was less non-engagement and greater positive affect when compared to observations made during the ROA sessions.

Secondary Dependent Variables

Data was also collected concerning the number of prompts and assists observed during activities. Although both of these behaviors were observed infrequently throughout the study, results show that during the MBA sessions, there was a higher frequency of observed prompts ($M=2.75$) and assists ($M=1$) than during the ROAs (prompts; $M=1$, assists; $M=.125$).

The QUALIDEM was completed for each participant by two staff members who were familiar with the participants. This instrument was completed before the study began and when the study concluded to determine if any changes in perceived quality of life occurred.

Aggregated descriptive statistics of pre and post QUALIDEM subscale scores are presented in

Table 3. High subscale scores are indicative of someone doing ‘well’ in a particular domain (Dichter, et al., 2016). The results show few meaningful changes in perceived quality of life.

Qualitative data were collected in order to gather information regarding the social validity of the MBA. A social validity questionnaire was completed by the DA, who administered the MBA during all sessions and was present for all ROA sessions. Results obtained from this questionnaire indicate a positive perception of the MBA. The DA reported that the MBA was perceived as being beneficial to residents with a memory impairment, that the residents enjoyed the activity, and that the MBA produced more socialization. The DA also reported that facilitating this activity was enjoyable.

Discussion

Positive Affect

The hypothesis that greater indications of positive affect will be identified during the MBA when compared to the ROAs, was supported. The MBA appeared to increase positive affect in persons with dementia, which may indicate that participants experienced more pleasure and interest in the MBA versus the ROAs. Although this finding contradicts that of the study on which the current one was based (Hindt et al., 2018), other studies have found similar results (Orsulic-Jeras, Schneider & Camp, 2000; Orsulic-Jeras, Judge & Camp, 2000). Several possibilities emerge with regard to the increase in positive affect observed during the MBA. One reason may be that participants were able to relate, socialize and reminisce with one another with regard to popular items, people, or events from their youth; memories that tend to be accessible to persons with dementia (Malone & Camp, 2007). Participants may not get the chance to discuss and socialize upon memories from their earlier years during ROAs, as ROAs are likely to

be more narrowly focused on particular tasks or topics, and they may focus on present-day interests that may be unfamiliar to the residents. For example, with an ROA such as sing-along, participants spent the majority of this time singing and not necessarily socializing with one another. Other ROAs such as crafts, stretches, and regular bingo were not identified as producing any forms of reminiscence, however some socialization typically occurred during these activities between other residents and staff members.

Active Engagement

Although an NAP analysis indicated that the MBA had an unclear effect on active engagement, trends in the data suggest that more active engagement was observed during the MBA, a finding that is consistent across the literature (Hindt et al., 2018; Jarrott, Gozali & Gigliotti, 2008; Judge, Camp & Orsulic-Jeras, 2000; Orsulic-Jeras, Judge & Camp, 2000; Orsulic-Jeras, Schneider & Camp, 2000). Montessori-based activities are developed to compensate for cognitive deficits found in those with dementia (Hindt et al., 2018), which may explain why a higher degree of active engagement was observed during MBAs. Participants are also encouraged to socialize upon discussion cues when playing Memory Bingo, which would be considered a form of active engagement. Regular bingo is also deemed a popular activity among long-term care residents (Tak et al., 2015) and since Memory Bingo is similar, participants may show more positive forms of engagement during the MBA. One reason that Memory Bingo was found to have an unclear effect on active engagement when compared to ROAs may be because the current study chose to specifically observe ROAs that have been found to be popular in long-term care settings (Tak et al., 2015) and can potentially promote active engagement among residents. Had the MBA been compared to a random assortment of ROAs as has been done in

other studies (e.g., Hindt et al., 2018), more robust results may have been found. Popular ROAs were chosen, however, to provide a more stringent comparison group.

Passive Engagement

Contrary to typical findings, where passive engagement is observed at lower levels during MBAs (Judge, Camp & Orsulic-Jeras, 2000; Orsulic-Jeras, Judge & Camp, 2000; Orsulic-Jeras, Schneider & Camp, 2000), the current study indicated higher frequencies of observed passive engagement during the MBA when compared to the ROAs. It is difficult to determine why passive engagement was observed more frequently during the MBA, but one reason may be that when playing Memory Bingo, participants may express more looking or listening behavior when the facilitator is both showing and calling out cards, or when other participants are reminiscing on a particular topic.

Non-Engagement

Behaviors indicating non-engagement were found to be moderately lower during the MBA when compared to the ROAs, a result that has been supported elsewhere (Jarrott, Gozali & Gigliotti, 2008; Orsulic-Jeras, Judge & Camp, 2000). Overall, indications of non-engagement between the MBA and ROAs had the largest discrepancy between all dependent variables. This finding again may suggest that there is an increased amount of stimulation and interest occurring during the MBA than during the ROAs, which may account for the low frequency of indicators of non-engagement, such as sleeping, talking to oneself, or fidgeting with an un-related activity item.

Secondary Dependent Variables

The hypothesis that prompts and assists would be less frequent during the MBA than during ROAs was not supported. Results indicated that prompts and assists were actually observed more during the MBA. It was hoped that the need for staff directed prompts and assists would be minimized during the MBA to indicate a smooth process of activity implementation for both the staff and the participants, however the findings suggest otherwise. A few reasons come to light as to why prompts were observed more frequently during the MBA. One may be that participants had difficulties learning and remembering how to play the MBA, Memory Bingo, whereas with ROAs, the participants are likely to have experienced them many times before and they may be more embedded into their routines. Therefore, staff may have needed to prompt participants more frequently throughout the MBA to ensure that they were playing it properly. Another reason may be because part of the MBA required the facilitator to encourage, or prompt, discussions to take place regarding topic(s) on the current calling card.

It is uncertain as to why more frequent assists occurred during the MBA compared to the ROAs. One possible reason could be that because Memory Bingo was typically scheduled in the afternoon, participants were more restless (Koven, 2005; Little et al., 1995; e.g., being uncomfortable in their seat and needed to be re-adjusted) if their day consisted of little activity prior to Memory Bingo. Some instances were also noted in which participants may have had a hard time physically placing, manipulating, or seeing the playing cards, so the facilitator would then aid them in that situation.

Although there were very little differences in the perceived quality of life determined by pre- and post-study QUALIDEM scores, the results may be helpful in simply understanding how participants are generally perceived within the unit. The results indicated a relatively stable view of the participants quality of life across the extent of the study. It is possible, however, that the

measure used to determine aspects regarding quality of life may cover a fairly broad range when formulating a quality-of-life profile (Ettema et al., 2007). Therefore, it may limit the ability to detect any tangible changes in quality of life. It is also judged unreasonable to expect that the introduction of one activity would have a broad impact on the quality of life across participants from the perception of the staff members.

Strengths of the Study

The current study had some notable strengths that are worth mentioning. For example, the study incorporated an empirically derived approach to collecting observational data on behavior, rather than employing casual observation. Utilizing these methods to collect behavioral data can contribute to making stronger claims and inferences as to what activities are preferred and engaging to residents. Although more time and effort may be required to train observers to collect observational data, a set of empirically supported activities can be identified through this process, which could benefit residents (e.g., more interesting and stimulating activities) as well as activity staff (e.g., taking the guesswork out of identifying pleasurable group-based activities). Information as to which model of activity “works” can aid in the process of activity programming within long-term care settings.

Another strength is that the current study did not place any special constraints or include any extra demands on activity staff members. Doing this maximized external validity, increased the likelihood that the MBA would continue to be used after the study, and did not impede upon the typical routines of the participants or other residents. For example, there were no limitations on who could or could not attend activities being observed, participants were not forced to attend observed activities, there were no restraints on the scheduling of activities, and adjustments to the MBA were allowed if the facilitator felt it was necessary.

Lastly, the study provided a more stringent test on the benefits of the MBA by comparing it to ROAs that were considered popular among residents in long-term care facilities (Tak et al., 2015) and ones that residents in the facility were most likely to attend. Promising inferences can therefore be made as to the effects of the MBA on positive forms of behavior when compared to highly preferred ROAs.

Limitations and Recommendations for Future Research

There are several limitations of the current study that must be acknowledged. One limitation is that the sample of participants was small, and the sample was recruited from one long-term care facility located in the Midwest. Therefore, the findings from this study cannot be generalized to other care settings and the larger portion of the population affected by dementia. Studies that include larger and more diverse samples of the dementia population are needed to confirm the effects of MBAs.

There was also a limitation in available times to observe participants. The observers had limited availability to observe due to scheduling constraints that allowed them to be available only during certain times throughout the week. This reduced the ability to observe activities during various times throughout the day. For example, implementation of the MBA was almost always in the afternoon to best accommodate facility scheduling and observer availability. This limited flexibility in scheduling and observing activities may have influenced the validity of the data. For example, typical behaviors could be expressed during particular times of the day in persons with dementia, such as the development of increasing agitation or restlessness as the afternoon progresses (Koven, 2005; Little et al., 1995). Moreover, in the social validity questionnaire, the DA suggested that Memory Bingo may have been more effective on active engaging behaviors if it was implemented earlier in the day when residents may be more alert.

There were also limitations associated with the observation method used in this study. For example, because only one participant was observed during any given interval, the behavior of other residents was not observed. Therefore, it is possible that many instances of target behaviors were missed, leading to an under- or over-estimation of the effects of the MBA. Future studies should, therefore, implement methods of behavioral observation that can capture higher volumes of participant behaviors and enable flexibility in times of observation to obtain behaviors at various points throughout the day.

A couple of other future directions should also be mentioned here to encourage a deeper investigation into the effects that MBAs have on behavior and to identify to what degree they can accommodate for common deficits found in persons with dementia. One suggestion would be to develop a dependent variable that focuses more on the socialization aspect that tends to be promoted in MBAs (Malone & Camp, 2007). Since socialization in result of the activity at hand was considered a form of active engagement in the current study, it would be interesting to identify differences of social behavior between MBAs and ROAs to determine the frequency of social behavior, as well as its quality. It is assumed that activities staff members would value and encourage more socialization between the residents during activities to produce positive forms of behavior. It may also be assumed that with an increase in socialization, there may be a decrease in the need for staff-assisted prompting, as well as other negative forms of resident behavior including disruptive or non-engaging behavior during activities.

Another suggested form of investigation is to analyze the effect that MBAs have on disruptive behaviors that may be exhibited by persons with dementia in institutionalized settings. Since MBAs are developed to be interesting and meaningful to residents, as well as accommodate for cognitive deficits (Hindt et al., 2018), it would be assumed that disruptive

behavior (e.g., attention-seeking behavior) that is often found during regular activities (Buettner & Fitzsimmons, 2003), would subside. It would be recommended to identify residents that often produce disruptive forms of behavior during activities and collect baseline data on these individuals to then compare the effects of an MBA. It would then be presumed that disruptive behaviors during the MBA(s) would decrease, and then positive forms of behavior, such as positive affect and active engagement would increase. Investigating this type of research inquiry could therefore extend on the effect that MBAs have on disruptive behavior in particular, and if increasing positive forms of behavior would therefore replace or diminish disruptive behaviors to some degree.

Conclusion

Activities are an essential element in institutionalized settings for persons with dementia. The purpose of implementing activities is to add structure to one's day, help pass time, generate cognitive, physical and social stimulation among residents, and minimize the likelihood of behavioral disturbances. Nevertheless, there is a need to develop and implement activities that can better match an individual's, competencies, interests, and skills. Montessori-based activities have evolved for persons with dementia to meet such needs and promising results have emerged in the limited amount of research available. Because of this paucity of research, there is a need for replication of previous studies to validate findings. By expanding research in this area, it is hoped that MBAs can be further implemented into institutionalized settings to create environments that improve the quality of life for individuals living with dementia.

This study provided a means for defining and identifying empirically supported activities for persons with dementia within a specific facility. In this respect, activity staff can be provided with empirical data about what activities are found to "work," which has direct implications for

activity programming in dementia care settings. Comments from the DA collected from the social validity questionnaire also indicate a positive perception of the MBA, Memory Bingo, and further signify a need for such activities. Montessori-based activities can therefore serve as a promising alternative to other ROAs that may not produce as much socialization, engagement, interest, or enjoyment due to the possibility of lacking individualization and being unable to compensate for cognitive deficits found in those with dementia.

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Table 1*Operational Definitions of Each Type of Prompt*

Type of Prompt	Definition
Physical	A staff member physically guiding someone to complete an activity (e.g., physically covering up a bingo number with a token on the participant's card if they had not done so at the appropriate time)
Positional/Visual	A staff member placing materials in a manner to complete an activity (e.g., placing crafting materials in front of a participant to create a craft).
Verbal	A staff member telling the participant to respond and or giving a direction more than once.
Gestural	A staff member pointing or reaching to give information about a desired response for the activity (e.g., pointing to craft materials to get a participant to create a craft).

Note. Definitions derived from ASD Toddler Initiative (n.d.).

Table 2

Mean Percent of Occurrence for Active, Passive, and Non-Engaging Behaviors, and Positive Affect Across All Sessions

Observed Behavior	ROAs	MBA
	<i>M</i>	<i>M</i>
Active Engagement	49%	55%
Passive Engagement	36%	43%
Non-Engagement	23%	6%
Positive Affect	9%	21%

Note. ROAs = Regularly Offered Activities, MBA = Montessori-Based Activity

Table 3*Aggregated Descriptive Statistics for Pre and Post QUALIDEM Subscale Scores*

QUALIDEM Subscales	Highest Score Possible	QUALIDEM Subscale Scores				
		Pre	Post	Pre	Post	Difference
		<i>M</i>	Range	<i>M</i>	Range	<i>M</i>
Care Relationship	21	11.5	5.5-15	12.25	7.5-15.5	0
Positive Affect	18	12.75	11-14.5	13	10.5-15	+.08
Negative Affect	9	4	2.5-5.5	4	2-6	0
Restless Tense Behavior	9	4	1-6	4	1.5-6	+.25
Positive Self Image	9	4.75	3.5-6	4	3-5.5	-.83
Social Relations	18	12.5	10.5-15	11.5	8.5-13.5	-1
Social Isolation	9	6	4.5-7.5	5.5	4.5-7.5	-.67
Feeling at Home	12	5.5	2.5-10	5.25	2.5-8.5	+.5
Having Something to Do	6	3.5	2-5	3.5	2.5-5.5	+.167

Note. + indicates an increase in change, - indicates a decrease in change between before and after scores.

FIGURE 1

% OCCURRENCE ACTIVE ENGAGEMENT BEHAVIORS BETWEEN ACTIVITIES

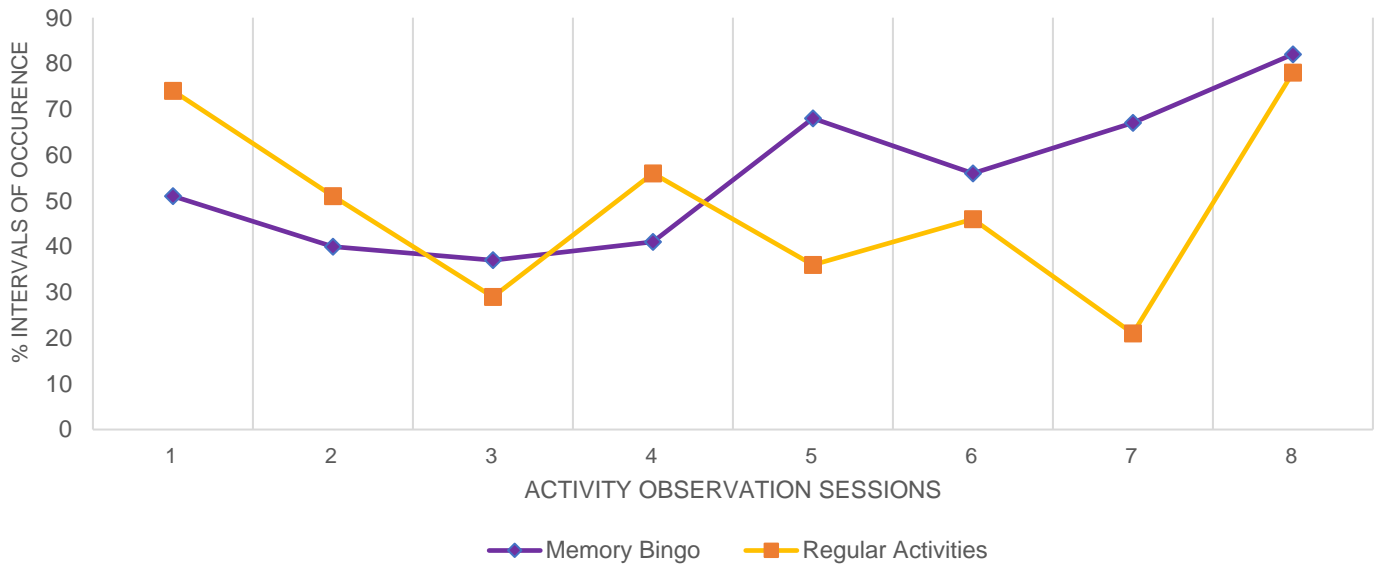


FIGURE 2

% OCCURRENCE OF PASSIVE ENGAGEMENT BETWEEN ACTIVITIES

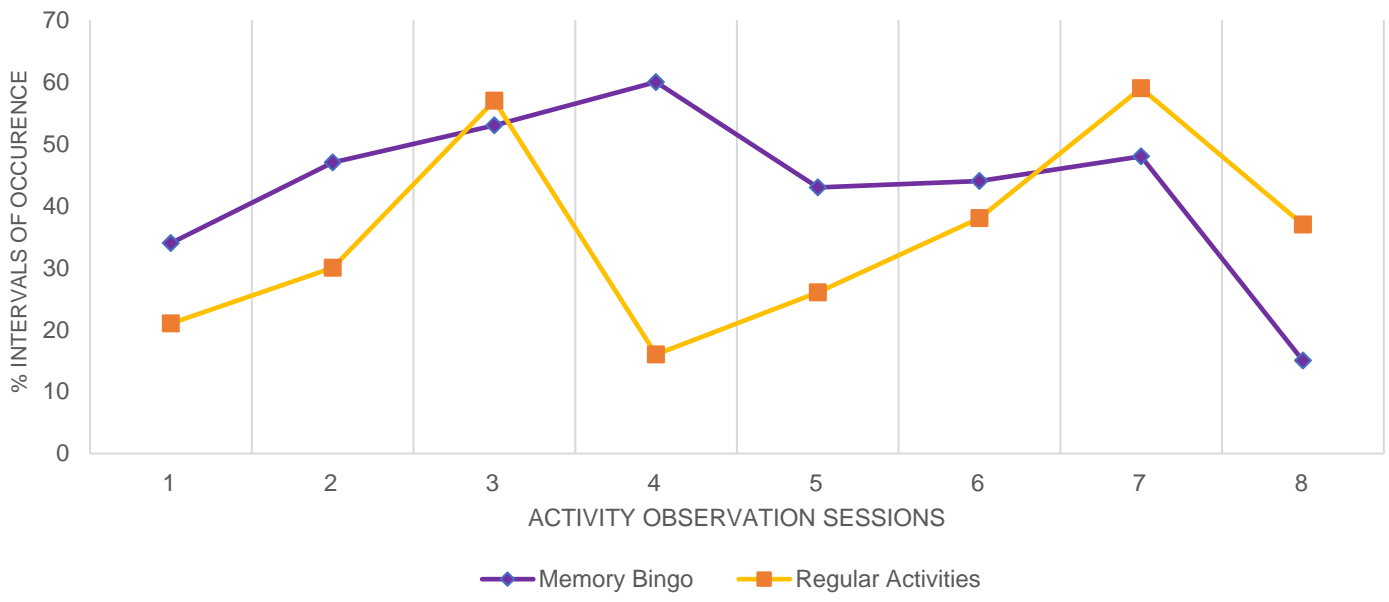


FIGURE 3

% OCCURRENCE OF NON-ENGAGEMENT BETWEEN ACTIVITIES

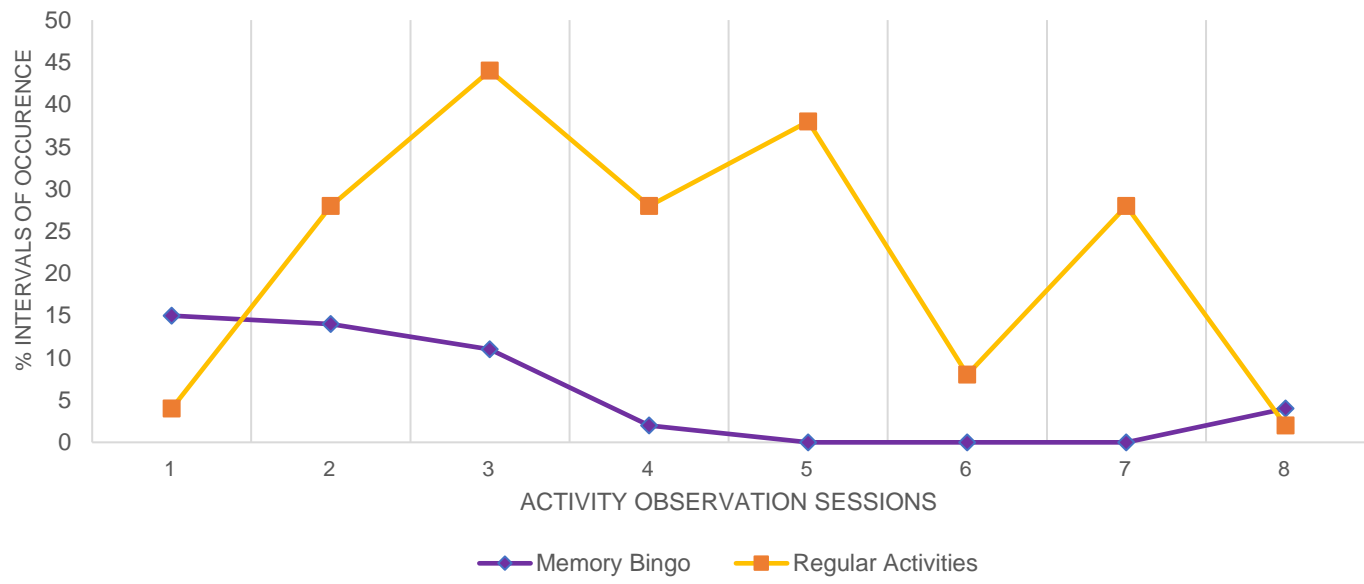
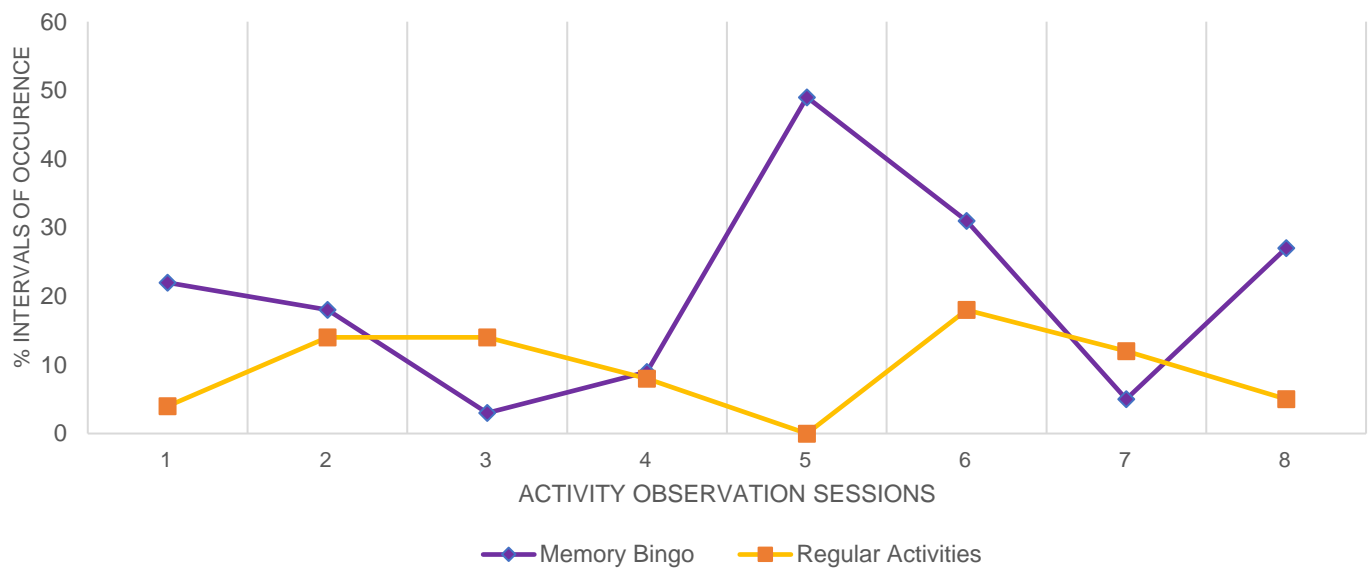


FIGURE 4*% OCCURRENCE OF POSITIVE AFFECT BETWEEN ACTIVITIES*

Appendix A

Informed Consent for Participation in Research (Resident)

Purpose

I understand that the purpose of this research is to see how well persons with memory impairment enjoy a group-based game called Memory Squared (the game was specifically designed for persons with memory impairment). Memory Squared is a simplified version of Bingo where the person receives 4 cards with words/phrases on them. A caller shows individuals a series of words/phrases and if the individual has that word/phrase on one of their cards, they are to turn the card over. The first person to have all 4 cards turned over wins the game.

Participants

I understand that the person for whom I am a guardian has been asked to participate because they have been diagnosed with a condition that causes memory impairment and regularly participates in activities offered in the facility in which they live.

Procedure

I understand the experimenter will ask the individual several questions to assess the individual's memory and language abilities. Also, I understand that the experimenter will observe the individual during activities regularly offered at the facility as well as during the Memory Squared game. Experimenters will observe the individual's expression of positive emotions (laughing, smiling), negative emotions (frustration, anxiety), as well as whether the individual appears engaged in the activity or not (are they playing the game, are they sleeping, etc...). Activities will be observed four times per week (two observation periods of regularly offered activities and two observation periods of the Memory Squared activity, per week) for about two months. Each activity session is expected to last between 20-30 minutes.

Risks

I understand that there are minimal risks associated with participation in this study. It is possible that an individual may become upset or fatigued during activities, including the Memory Squared game. Should this occur, the individual will be given the option of ending the activity and either going to their room or going to another quiet area in the facility.

Benefits

I understand that benefits from participating in this study include enjoyment of the Memory Squared activity (increases in positive emotions and being more engaged in activities). An additional benefit is that staff responsible for conducting activities may gain an additional activity program that residents with memory impairment enjoy.

Confidentiality

I understand that confidentiality will be protected in that no identifying information will be included on any records collected during this study. Should the findings of this study be presented or published in the future, no identifying information (such as their name, occupation, city of residence, or the name of the facility they live in) will be used, and instead only general

information will be shared (e.g., the individual's gender, age, diagnosis). All information will be kept in a locked cabinet and destroyed after three years.

Right to Refuse or Withdraw

I understand that I may refuse to allow my family member to participate or withdraw them from the study at any time without penalty. Furthermore, withdrawal from the study may occur if the participant frequently becomes agitated, upset, or fatigued during any part of the study. Choosing not to participate or withdrawing from the study will in no way affect your relationship with Oak Terrace or with Minnesota State University, Mankato.

Questions

I have been informed that if I have any questions, I am free to ask them. I understand that if I have any additional questions later, I may contact the office of the principal investigator, Jeffery Buchanan, PhD at (507) 389-5824. If you have any questions about your rights as a participant, please contact the Institutional Review Board Administrator, Dr. Barry Ries, at (507) 389-2321.

Closing Statement

My signature below indicates that I have decided to allow my family member to participate in a research study and that I have read this form, understand it, and have received a copy of this consent form.

Signature of Legally Responsible Person

Date

Signature of Investigator

Date

Name of individual for whom
you are providing consent

Appendix B

Informed Consent for Participation in the Research Study (Staff)

Purpose

I understand that the purpose of this research is to see how well persons with memory impairment enjoy a group-based game called Memory Squared (the game was specifically designed for persons with memory impairment). Memory Squared is a simplified version of Bingo where the person receives 4 cards with words/phrases on them. A caller shows individuals a series of words/phrases and if the individual has that word/phrase on one of their cards, they are to turn the card over. The first person to have all 4 cards turned over wins the game.

Participants

I understand that I am being asked to participate in this study because I am a professional who facilitates activities to individuals with memory impairment.

Procedure

I understand the experimenter will ask me to complete a questionnaire before and after the study regarding the quality of life of individuals (QUALIDEM) with memory impairment that are participating in the research study, as well as another questionnaire at the end of the study regarding my thoughts of the Memory Squared activity. These questionnaires will take approximately 10-15 minutes each to complete and I will be asked to complete these questionnaires on separate occasions; before the start of the study and after the study is complete.

I also understand that I will be asked to facilitate regularly offered activities (e.g., sing-alongs, group discussion, etc.), and possibly be trained to facilitate the Memory Squared activity, at times that agree with both my schedule and the observer's schedules. I understand that for the purpose of this study, observations of both the Memory Squared activity and the regularly offered activities are to occur twice a week for each activity (four observation periods per week total) for a time period of about two months. Each activity session is expected to last between 20-30 minutes.

Risks

I understand that there are minimal risks associated with participation in this study. I understand that a potential risk may include the addition of stress while learning a new activity to facilitate and/or collaborating observation scheduling with the research investigators.

Benefits

I understand that a potential benefit may include gaining an additional activity program that residents with memory impairment enjoy.

Confidentiality

I understand that the findings of this study will be completely confidential. Confidentiality will be protected in that no identifying information will be included on any records collected during this study. All information will be kept in a locked cabinet in University Square.

Right to Refuse or Withdraw

I understand that I may refuse to participate or withdraw from the study at any time without penalty. I understand that I will not be penalized or jeopardize my relationship with Minnesota State University as a result of withdrawal from the study.

Questions

I have been informed that if I have any questions, I am free to ask them. I understand that if I have any additional questions later, I may contact the office of the principal investigators Jeffrey Buchanan, Ph.D. at (507) 389-5824 or if you have questions or concerns about the treatment of human subjects, please contact the IRB Administrator and Associate Vice President of Research and Dean of Graduate Studies, Dr. Barry Ries at (507) 389-2321.

Closing Statement

My signature below indicates that I have decided to participate in a research study; that I have read this form; that understand it; that I have had all my questions answered; and that I have received a copy of this consent form.

Signature of Participant

Date

Signature of Investigator

Date

Appendix C

“Memory Squared” Feedback Questionnaire

Please complete this questionnaire regarding your thoughts of the “Memory Squared” activity that you have facilitated to a group of people with memory impairment (e.g., dementia).

The following questions include a mix of open-ended questions and questions that are to be answered by circling the most appropriate answer.

1. Do you think that the Memory Squared activity was beneficial to residents with memory impairment?

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

2. Can you please explain why you think the activity was or was not beneficial to the residents?

3. Do you think that the residents enjoyed this activity?

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

4. Do you think this activity was useful in increasing residents’ engagement levels?

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

5. Do you think this activity was useful in influencing residents’ positive affect (e.g., smiling)?

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

6. Do you think that resident behaviors (e.g., yelling, aggression, etc.), if any, were minimized during this activity?

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

7. Do you think this activity promoted socialization amongst the residents and/or the instructor (yourself)?

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

8. Do you plan to continue this activity in your facility?

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

9. Do you think that the residents were confused about how to play Memory Squared?

Strongly Disagree Disagree Neutral Agree Strongly Agree

10. Did the residents frequently display frustration during this activity?

Strongly Disagree Disagree Neutral Agree Strongly Agree

11. On the following scale, indicate how difficult it was to facilitate Memory Squared.

Very Difficult Somewhat Difficult Neutral Somewhat Easy Very Easy

12. Did you enjoy facilitating this activity? *Yes* *No*

13. Do you have any suggestions regarding the activity (e.g., what could have been done better, was there anything that you did not like)?
