

**EVALUATION OF THE MONTESSORI-BASED  
ACTIVITIES PROGRAM OF THE  
ALZHEIMER'S AWARENESS AND CARE  
PROGRAM**

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## Executive Summary

- An evaluation was conducted of the Montessori-Based Activities Program, an activities program based on Montessori principles for people with dementia (PWD) attending four adult day service (ADS) centers in the District of Columbia.
- MBAP programming was implemented two days per week over a six month period by a trained MBAP specialist. Each MBAP session lasted approximately one hour.
- MBAP principles and activities were shared with ADS staff. Staff was trained to implement programs, and support was provided to help the centers continue with programming efforts beyond the demonstration period.
- MBAP sessions were structured to provide maximum engagement of participants. Activity kits were prepared that contained all the materials necessary for the task. Most kits were designed as an individual activity, although many could also be used as a small group activity.
- The demonstration was carried out in two phases: Two ADS centers participated in the first phase, recruiting a total of 24 participants. The remaining two ADS centers participated in the second phase, recruiting a total number of 26 participants. Participants had to be attending ADS a minimum of three days per week, have memory or behavior problems consistent with a dementia diagnosis, and be able to attend MBAP sessions. Prior to the start of the demonstration, staff obtained written consent from the participants' primary caregiver and completed a client background and interest survey. The evaluation consultant then observed and recorded participants' behavior during a regular non-MBAP activity. This observation served as a baseline report of client behavior. Over the subsequent six month period, the MBAP specialist worked with clients and staff to implement the MBAP activities. At the mid and end-points of the demonstration (three months and six months), the evaluation consultant made a repeat observation of client behavior and engagement during the MBAP activity, as well as during a regular non-MBAP activity.
- In terms of engagement, longitudinal findings over the six month period included the following:
  - During non-MBAP activities, levels of *constructive engagement* decreased over time, while during MBAP activity, the level of constructive engagement remained stable.
  - Levels of *passive engagement* remained stable over time during both non-MBAP and MBAP activities.
  - Levels of *non-engagement* remained stable during non-MBAP activities, but during MBAP activities, levels went down significantly over the six month period.
  - Levels of *helping behavior* towards other participants remained stable during non-MBAP activities, but during MBAP activities, levels went up significantly from baseline to six months.
  - Level of *difficulty with the activity* went up during non-MBAP activities, while during MBAP activities, the level went down slightly, though this change did not reach statistical significance.
- Cross-sectional comparisons of MBAP and non-MBAP activities revealed significant differences at three and six months. MBAP activities were associated with higher levels of *helping behavior* at three months. At six months MBAP activities were associated with higher levels of *constructive engagement*, lower levels of *non-engagement*, increased *helping behavior*, and less *difficulty with the activity*.

- In terms of the behavior and mood of the participant with dementia, longitudinal findings included the following:
  - The amount of time that participants exhibited *positive behavior* (a.k.a. expressed pleasure) during the activity went down during non-MBAP activities, while during MBAP activities, the amount of positive behavior went up between three and six months.
  - The amount of time that participants *slept or expressed boredom* during the activity went down during MBAP activities.
  - Disruptive and restless were not reported during either the MBAP or non-MBAP time periods; thus, change in these behavior domains could not be assessed.
- Cross-sectional comparisons of MBAP and non-MBAP activities showed no significant differences in behavior and mood at three months between types of activity. At six months the amount of positive behavior was higher during MBAP activities, and the amount sleeping/boredom was lower during MBAP activities as compared to non-MBAP activities.
- In terms of staff satisfaction with the MBAP programming, the overwhelming majority was very satisfied, enjoyed the program, and commented that the activities successfully engaged the participants. They noted that the activities were fun and that other clients at their centers could benefit. A few difficulties were noted and included comments such as it was difficult to convince the participant to participate, that the activities were sometimes too juvenile for the participants, and that it was a hassle to get ready for MBAP. These difficulties were also noted as possible barriers to the continued implementation of MBAP beyond the demonstration period.
- Overall, MBAP presents a promising and useful tool among the many tools that adult day centers have to engage their participants and improve their mood. Careful planning of MBAP activities, training of staff to appropriately implement the program, and fostering an environment that is open to the change from traditional programs are key variables that can influence the success of MBAP.

## **I. Background and Introduction**

The Montessori-Based Activities Program (MBAP) was implemented as part of the Alzheimer's Awareness and Care Program (AACP) funded by the D.C. Office on Aging. The funds were made possible by the U.S. Administration on Aging's Alzheimer's Disease Demonstration to States program. The goals of AACP were to reach at-risk members of the African American community who were not previously linked to services and to provide an innovative program of MBAP within four adult day centers who receive funding from the D.C. Office on Aging.

One of the most promising ways of addressing care needs for people with dementia living in the community is through adult day service programs (ADS). These programs provide structured activities that utilize participants' remaining abilities, and give caregivers a break from the often continuous pressures to provide care and supervision. ADS programs are widely available in most states and communities and are continuing to gain in popularity (Cox, 2003). ADS is not as costly as alternatives such as having paid help come to the home, or placing the PWD in a long-term care institution, and their use has been linked to positive client outcomes (Femia, Zarit, Stephens, & Greene, in press; Orsulic-Jeras, et al., 2000; Woodhead, Zarit, Braungart, Rovine, and Femia, 2005; Zank and Schacke, 2002). Research by Woodhead and colleagues (2005) showed that over a three month period, participants with dementia experienced a decrease in depressive symptoms during the time they attended an ADS program. One notable finding is that the type of activity that the ADS client participated in influenced the gains that were experienced. Activities that were actively engaging (e.g., games, arts and crafts, singing, drama, discussion groups) were associated with greater improvements in mood and behavior than activities that were less engaging. These findings are encouraging, though unsurprising.

Activities that are less engaging can lead to boredom, which often causes problems such as aggression, agitation, and withdrawal. On the other hand, activities that are engaging can effectively stimulate a person with dementia, leading to the improvements thus mentioned.

### The Montessori Activities Method

Montessori activities, based on the principles developed by Maria Montessori, involve the teaching of cognitive, social, and functional skills to participants, breaking down tasks into steps that progress from simple to complex and from concrete to abstract (Bowlby, 1993; Dreher, 1997). Historically, these methods were applied in the context of early childhood education, but more recently, have found success within the older adult population, notably, for people with dementia (Camp, 1999). Montessori methods have been developed and implemented within the long-term care setting with success, and most recently, within the adult day care environment. The evolution of the Montessori method in the adult day care setting is an example of an appropriate fit between the person and his/her environment: Adult day programs emphasize daily routine through activities and socialization, and the Montessori methods emphasize the fit between the activity and the person's ability level.

Research on Montessori-based activities in the adult day care setting has shown Montessori activities to improve engagement, enhance mood, and reduce behavior disturbances of people with dementia (Judge, et al., 2002). Activities have also been shown to provide sensory and cognitive stimulation that allow the expression of existing social skills (Camp and Mattern, 1999). One unique aspect of the Montessori approach is the ability to modify the activity based on the participants' physical and cognitive ability *as well as* that person's cultural background and interest. In this way, Montessori-based activities have the potential of reaching a wide range of participants, which includes both the person with dementia and the helpers

guiding the activity itself.

### Goal of the Demonstration

Given these positive findings, the Alzheimer's Awareness and Care Program sought to implement Montessori-based Programming (MBAP) within four adult day centers affiliated with the D.C. Office on Aging. The concept of MBAP was new to each of the centers, and its success could potentially offer them a new activity method that could be integrated into their current program offering. The goal of the demonstration was to implement MBAP into the Centers, train staff in its usefulness and method, assess the impact of MBAP on the clients' engagement, mood and behavior, and support the center staff in taking over the program once the demonstration period ended.

## **II. Methods and Procedures**

### Description of Participating Adult Day Centers and Participants

Four adult day service (ADS) centers participated in the demonstration over a two year period: These were not-for-profit centers who receive funding from the D.C. Office on Aging, and included Center Care Day Treatment Program (CC), Isabella Breckinridge Center (IONA; Year One), Genevieve N. Johnson Senior Day Care Program (GJ), and Downtown Cluster's Geriatric Day Care Center (DC; Year Two). These programs served a primarily African American population living in the District of Columbia. Compared to other ADS participants in other regional areas, some of the participants in this demonstration had potential challenges including lower income levels, lower educational attainment, and limited life opportunities not uncommon in this generation of African American elders.

Participating centers referred clients to the demonstration program, assigned staff to be available during MBAP sessions, as well as made accommodations in their space for the MBAP

activities. This included moving non-participating clients to another room or space, or creating a new space for the MBAP participants to participate. At the end of the demonstration period, centers received a \$1,000 stipend for their participation as well as a collection of materials, a bookshelf storage area, activity kits, a research manual, training videos, and training by the MBAP specialist.

Prior to the start of the program, staff from each of the four centers received an orientation from the MBAP specialist. Staff included the center's director, activity assistants, and other relevant personnel who were invited by the director to attend. For the first two centers participating in Year 1 (CC and IONA), the orientation was fairly brief, involving higher level staff and focusing more on the logistics of the program. For the second two centers in Year 2 (GJ and DC), the orientation was expanded to include training on specific MBAP methods. The training lasted for three hours and included information on the principles of Montessori-based activities, a demonstration of sample activities and kits, and a description and timeline of the six month long program including the evaluation and observation components. Staff from the first two centers were included in this more intense training session to boost and solidify their MBAP skills.

### Design of the Evaluation

In total, the four centers had a combined total of 50 seniors with cognitive impairments who were eligible for the program. Participants had to be attending ADS a minimum of three days per week, have memory or behavior problems consistent with a dementia diagnosis (but not necessarily a definitive diagnosis), and be able to attend MBAP sessions. The program was explained to the participants' primary caregiver, who gave written consent for the participant to participate in the demonstration.

MBAP participants participated in MBAP sessions twice a week over a 24-week period (six months). Prior to the start of the MBAP activities, a baseline observation of the participants' engagement and behavior was made by the evaluator (the author) during a non-MBAP activity. Following the start of the program, follow-up observations were conducted mid-way (three months) and at the end of the program (six months). Two types of observations took place at these follow-up periods: an observation of behavior during the MBAP session and an observation of behavior during a non-MBAP activity.

In addition to these observations, data were collected by the center staff on the MBAP participants' history, interests, and capabilities. This data were used by the MBAP specialist to design activity kits that would match the interests and ability levels of the participants.

At each of the follow-up assessments, staff people at the centers were given written surveys to measure their satisfaction and evaluation of the program. This gave them the opportunity to explore potential barriers to successfully implementing the program and potential difficulties in continuing the program beyond the demonstration period.

#### Description of MBAP Sessions

MBAP sessions lasted approximately one hour during which participants were seated individually or in small groups to participate in an MBAP activity. Activities were packaged in "kits" that were developed and prepared for in advance, based on the information gathered about the clients' background and interest. These kits consisted of a shoe-box size, clear plastic container that held all of the materials necessary for that activity. These kits were stored and prominently displayed at each day care site on an open bookshelf that was purchased for the center. The open shelves provided visibility and accessibility by the participant and the center staff. A description of activities is provided in the Montessori-based Activities Manual

(Appendix A of this report).

During each MBAP session, the MBAP specialist arranged the participants in either small groups or at the participant's individual workspace for work on an individual activity. After introductions were made, she offered participants a choice of activities and with the help of center staff, oriented the participant to the activity. Participants were given an activity kit and encouraged to participate in the activity through modeling of the activity by the specialist or center staff or through spoken directions. Most of the time, however, the activities were self-directed and self-explanatory, meaning that the participant was able to engage in the activity with minimal direction from the specialist or center staff. Throughout the session, the MBAP specialist provided healthy encouragement and a pleasant environment, observing whether the activity was appropriate to the ability level of the participants, and whether it was engaging and stimulating to them. Depending on each, the specialist encouraged either greater or lesser challenge or offered a different activity when one was done.

#### Description of MBAP Activities

The Montessori-based activities included a variety of stimulating, visually-appealing materials taken from the everyday environment. This approach made it easy and appealing for staff to see how additional kits could be created from inexpensive, easily-replaceable materials (many purchased from the Dollar Store). Activity kits represented five domains of functioning: 1) Cognitive stimulation; 2) life skills; 3) motor movement and fitness; 4) sensory stimulation; and 5) socialization. Examples of cognitively stimulating activities included containers full of multi-colored poker chips, clothes pins, colorful straws, dominoes, number tiles, or matching cards. Participants could spread out the objects and sort them, physically move them, examine relationships between the objects, count them, or spell, arrange, or reminisce about the objects.

Activities utilizing life skill functions include kits containing baby clothes, napkins, towels, socks, yarn, etc. Participants exercised the skills of folding clothes, “cooking,” preparing foods, folding yarn, polishing shoes, etc. Examples of activities that utilize motor skills include cutting with scissors, working with tongs or tweezers, tearing paper, forming shapes with clay, squeezing clothes pins, sanding wood, and so on. To exercise gross motor skills, participants could roll dice, toss bean bags, sweep/vacuum, and stretch large bands. Examples of sensory activities include massaging hands with hand lotion, finding hidden items in cheerios, sand or corn kernels, “koosh” balls, slinkies, bubbles, bells, wind chimes, or arranging flowers. Finally, examples of socialization activities include “fill-in-the-blank” expressions, a discussion of favorite foods/holidays, or jokes and humor. These activities were done in small groups and were intended to maximize enjoyment and laughter.

### Measures

The evaluation instruments for this demonstration project were designed to assess the engagement, behavior, and mood of the MBAP participants. The data were collected by the evaluator through observing the participants during MBAP and non-MBAP activities on a selected day at three and six months. In addition, staff provided information about any changes in participants’ health and memory, as well level of engagement during the day, and during the MBAP activities. The presentation of results will first describe the evaluation instruments used and then present the results from the analyses conducted.

### Planned Analyses

The first step was to examine the background characteristics of participants, comparing these characteristics across the four centers to assess comparability. Any differences between participants were used as covariates in subsequent analyses. The second step was to look at the

changes in engagement and behavior over the six month period during both a non-MBAP activity and during the MBAP activity. This allowed us to examine the changes in participants' engagement and behavior over time. The next step was to look at each follow-up observation separately and compare the participants' engagement and behavior during the MBAP activity with their performance during the non-MBAP activity. This allowed us to directly compare the impact of the type of activity to the participants' engagement and behavior. The last step involved an assessment of the staff's evaluation and satisfaction with the program.

Repeated and one-way Analyses of Variance (ANOVA) were used to analyze the steps described above. Where the four centers were significantly different from one another, these variables were included in the analyses as control variables. It was expected that MBAP activities would provide considerable benefit to the participants in terms of their constructive engagement and mood both over time and compared to non-MBAP activities. Since each center provided high quality programming to their participants, and the prevalence of behavior disturbances was already low, it was not expected that there would be significant differences in problematic behavior between MBAP and non-MBAP activities. A significance level of .05 was used for all tests. However, because the sample size used for these analyses were relatively small, the results should be viewed with some caution, as a reduced level of power increases the likelihood of Type I error (rejection of the null hypothesis when it is in fact, true).

### **III. Evaluation Results**

#### Characteristics of the Participants

Table 1 shows the characteristics of the participants across the four adult day center sites. Taking the participants all together, the overwhelming majority were women (89.4%) of African American descent (82.0%), with a mean age of 89.4 years. Almost all were not married (83.3%).

In terms of their place of residence, most participants lived with their primary caregiver (69.4%) or with other family or friends (14.3%). A few lived in a facility setting such as a nursing home or assisted living (12.2%) and even fewer lived alone (4.1%). All participants had a primary caregiver, which was most often the adult child (66.0%), followed by another family member or friend (24.0%), and least common, a spouse (10.0%). Turning to the participants' impairment profile, almost all had a dementia diagnosis: 71.7% had an Alzheimer's diagnosis, and 19.6% had some other diagnosis, such as Vascular dementia. Only 6.7% had no diagnosis for their memory impairments but did have symptoms consistent with a diagnosis. MMSE scores were available for participants from two of the centers, where the mean score was 13.2 (range: 0-30), indicative of the middle stages of dementia. This score was consistent with the amount of ADL impairment within the group: A minority of participants (26.0%) had no impairments in any of the 3 domains of eating, hygiene (dressing and bathing), or toileting, while most required assistance with one or two ADLs (54.0%), and 20.0% required help with all three ADLs. Finally, in terms of enrollment at the day care centers, the mean number of days that the client attended per week was 4.5 days, and the mean number of hours attending per day was 5.7 hours.

Comparing participants across the four centers, we found that participants were roughly equivalent in terms of demographic characteristics, with one minor difference, client education. IONA participants had higher levels of education and lower weekly attendance than the other three centers. In addition to differences in education level, there were other background differences, namely, weekly enrollment, daily attendance, and ADL limitations. GJ participants attended the center fewer hours per day (explained by the fact that the center itself is only open five hours each day). DC participants were slightly more impaired in terms of ADL performance while IONA participants were the least impaired. It was hypothesized that differences in client

education, weekly enrollment, or attendance would not influence the evaluation results, so these differences were considered largely ignorable. However, it was considered possible that differences in ADL limitations could affect participants' level of engagement, behavior, and mood; consequently ADL impairment was used as a covariate to account for potential differences in the impact of MBAP on participants' outcomes.

#### Participants Interests and Activities

Prior to the start of the program, center staff members were asked to report on the history, background, and interest of MBAP participants. Participants were a dynamic group of individuals who came to Washington D.C. from sixteen different states in the U.S., and two countries (Jamaica and Trinidad). In fact, only five of the fifty participants (10%) were originally from the District. Almost all of them were previously employed in jobs ranging from university professor, government employees, and telephone operators. Many participants had physical challenges –needing glasses (62%), hearing aids (7%), communication difficulties (55%), or limiting medical condition (83%); however, none of these conditions prevented their ability to participate in the program. This is because rather than having the participant adjust themselves to the MBAP activity, it was the activity itself that was modified to suit the ability and limitations of the participants.

Table 1. Demographic and Background Characteristics of MBAP Participants

|                                   | ALL<br>(N=50) | CC<br>(n=14) | IONA<br>(n=10) | DC<br>(n=13)  | GJ<br>(n=13)  |
|-----------------------------------|---------------|--------------|----------------|---------------|---------------|
| Client gender                     |               |              |                |               |               |
| % Female                          | 89.0%         | 85.7%        | 100.0%         | 69.2%         | 70.0%         |
| Client age (Mean years)           | 89.4          | 83.5         | 83.8           | 84.1          | 83.5          |
| Client race                       |               |              |                |               |               |
| % African American                | 82.0%         | 100.0%       | 40.0%          | 100.0%        | 77.0%         |
| % White or other                  | 18.0%         | 0.0%         | 60.0%          | 0.0%          | 23.0%         |
| Client education*                 |               |              |                |               |               |
| % Less than HS                    | 23.3%         | 40.0%        | 25.0%          | 58.3%         | 30.8%         |
| % HS Graduate                     | 48.8%         | 50.0%        | 25.0%          | 25.0%         | 53.8%         |
| % Post-college                    | 28.0%         | 10.0%        | 50.0%          | 16.7%         | 15.4%         |
| Client marital status             |               |              |                |               |               |
| % Married                         | 16.7%         | 15.4%        | 20.0%          | 15.4%         | 16.7%         |
| % Not married                     | 83.3%         | 84.6%        | 80.0%          | 84.6%         | 83.3%         |
| Living Arrangement                |               |              |                |               |               |
| % With primary caregiver          | 69.4%         | 61.5%        | 70.0%          | 69.2%         | 83.4%         |
| % With other family/friends       | 14.3%         | 7.5%         | 10.0%          | 31.8%         | 8.3%          |
| % Assisted living or similar      | 12.2%         | 31.0%        | 10.0%          | 0.0%          | 0.0%          |
| % Lives alone                     | 4.1%          | 0.0%         | 10.0%          | 0.0%          | 8.3%          |
| Relation (client to caregiver)    |               |              |                |               |               |
| % Spouse                          | 10.0%         | 0.0%         | 10.0%          | 15.4%         | 15.4%         |
| % Parent                          | 66.0%         | 78.6%        | 80.0%          | 69.2%         | 38.5%         |
| % Other                           | 24.0%         | 21.4%        | 10.0%          | 15.4%         | 46.1%         |
| #days attending per week*         | 4.5           | 5.0          | 3.4            | 4.3           | 5.0           |
| #hours per day attending*         | 5.7           | 6.9          | 6.2            | 4.0           | 6.8           |
| Dementia diagnosis                |               |              |                |               |               |
| % Alzheimer's disease             | 71.7%         | 71.4%        | 75.0%          | 69.2%         | 72.7%         |
| % Other dementia                  | 19.6%         | 21.4%        | 25.0%          | 30.8%         | 27.3%         |
| % No diagnosis                    | 6.7%          | 7.1%         | 0.0%           | 0.0%          | 0.0%          |
| MMSE<br>(Mean (s.d.); range 0-30) | 13.2<br>(7.6) | n/a          | n/a            | 10.5<br>(6.6) | 16.3<br>(7.7) |
| ADL limitations (of 3)*           |               |              |                |               |               |
| % No impairment                   | 26.0%         | 28.6%        | 50.0%          | 0.0%          | 30.8%         |
| % 1-2 impairments                 | 54.0%         | 64.2%        | 50.0%          | 46.2%         | 53.9%         |
| % Impairment in all 3 areas       | 20.0%         | 7.1%         | 0.0%           | 53.8%         | 15.4%         |

NOTE: CC = Center Care; DC = Downtown Cluster; GJ = Genevieve Johnson

\* Indicates a significant difference across centers at  $p < .05$  level.

Staff indicated that participants enjoyed a variety of activities – cards, music, dancing, arts and crafts, etc. From this information, the MBAP specialist created a selection of activity kits that addressed a variety of purposes and needs of clients, including cognitively stimulating activities, activities that utilized life skills, activities that stress motor movement and fitness, sensory-stimulating activities, and socializing-type activities. These activities were described above and found also in the MBAP Manual (Appendix A). Initially, approximately ten different kits were assembled and give to the center. Throughout the program, based on staff and client feedback, new kits were added, or existing ones were modified.

#### Baseline Levels of Engagement and Mood

Measure Description. Participants' baseline level of engagement was observed by the evaluator prior to the start of the MBAP programming and during a regularly scheduled non-MBAP activity. During the observation period, three categories of engagement as well as helping behavior and difficulty with the activity were assessed. These categories were taken from the Engagement Measure developed by Judge and colleagues (2000). The categories of engagement included constructive engagement, passive engagement, and non-engagement.

*Constructive engagement* was defined as any physical, verbal, or emotional response directly related to the activity that the participant was participating in. For example, putting puzzle pieces together, stacking blocks, arranging flowers, making comments, discussing ideas, or contributing to the discussion were all considered forms of constructive engagement. *Passive engagement* was defined as listening, attending to, and/or looking at the activity. For example, listening to the discussion or speaker, watching others manipulate objects were all considered forms of passive engagement. *Non-engagement* was defined as attending to things other than the activity: staring into space, sleeping, or any physical or verbal action not related to the activity

that the participant was participating in. *Helping behavior* was defined as one participant helping another participant with the activity. Examples include pointing out answers, assisting another participant with the activity materials, giving clues to another participant, helping another participant read, and so on. Finally, *difficulty with the activity* was defined as a participant's attempt to engage, but could not because of difficulty concentrating, having difficulty coming up with responses, or generally finding the activity too challenging.

For each of the categories of engagement, the evaluator rated how engaged (constructively engaged, passively engaged, etc.) each client was on a five point scale, ranging from 1=not at all engaged to 5=extremely engaged. This coding scheme differed from the original Engagement Scale, which asked observers to measure the length of time each type of engagement was exhibited. At baseline, the evaluator and the MBAP specialist observed the participants' engagement and behavior at two of the four centers; inter-rater agreement (i.e., the level of agreement between the two raters) among the 24 participants observed was greater than 90% (i.e., ratings for participants were similar 90% of the time or higher) and deemed acceptable.

In addition to these measures, participants' mood and behavior were also assessed in five domains: Positive behavior, depressed mood or sadness, sleeping/boredom, disruptive behaviors, and restlessness/agitation. This measure was based on the Affect Measure used by Judge and colleagues (2000), and modified slightly to include five commonly-reported domains of behavior in dementia. Positive behavior was defined as any expression of pleasure, laughing, smiling, and overt enjoyment of the activity. Depressed mood or sadness was defined as tearfulness, crying, and any vocal expressions of sadness. Disruptive behaviors was defined as loud vocalizations, arguments, irritability, threats to hurt others, and general aggression.

Restlessness and agitation included hand wringing, rocking, anxiety, and other restless vocalizations. For each of these domains, the observer indicated the length of each behavior, ranging from 1=behavior did not occur, 2=up to ½ of the activity time; 3=more than ½ of the activity time; and 4=the entire period. Inter-rater agreement on this measure was also greater than 90% and deemed acceptable.

Evaluation Results. At baseline, before the Montessori-based activities were introduced, the participants at each of the four centers were observed during a regularly-scheduled activity. Activities at each center were different and included reminiscence/current events discussion (at two centers), bingo, and exercise. On average, activities lasted 40 minutes (range: 25 – 60 minutes), involving the selected MBAP participants and staff as well as other clients at the center. The average group size was eighteen participants and two staff members.

In terms of participation, 49 of the 50 MBAP participants participated in the non-MBAP activity. Two participants resisted the activity, and three tried to leave; however no one actually left the activity. Generally, the activities were effective in constructively engaging the participants: The mean level of constructive engagement was four out of a possible five points, which translated into roughly 75% of participants engaged either “very much” (value=4) or “extremely” (value=5). Consistent with this, the level of passive engagement was also high (M = 4.4), with 83% of participants oriented to and attending to the activity, even if not “actively” participating. The level of non-engagement was fairly low with a mean of 2.0. More than half (60%) of participants did not demonstrate non-engagement; however, this also meant that 40% did exhibit some form of non-engagement. In fact, 19% (10 participants) were either “very” or “extremely” non-engaged. In terms of difficulty, exactly half of the participants found the activity “not difficult at all” (value =1); however, that indicated that the other half had some

difficulty with the activity: Twenty-seven percent had a little difficulty; 14.5% had some difficulty; and the remaining 8.5% had “very much” to “extreme” difficulty with the activity. Finally, in terms of helping others with the activity, the mean level was low ( $M=1.3$ ); half of the participants did not exhibit this behavior at all, while 27% showed a little helping; 15% showed the behavior “somewhat”, and 8% showed it “very much” or “extremely.”

Turning to the behavior and mood of participants, only two of the five domains were exhibited by participants: positive behavior and sleep/boredom. Pleasure was observed by 87% of participants; 29% for the entire activity period; 29% for more than half the period; 29% for less than half the period, and 13% did not show positive behavior at all during the activity. For the sleep/boredom domain, the overwhelming majority (73%) did not exhibit the behavior at all during the activity; however, 21% exhibited it for less than half the period, and 6% for more than half the period. The other three behavior domains, depressed mood, disruptive behaviors, and agitation/restlessness were virtually not observed during the activity; only two participants showed these other behaviors and for less than half of the activity. Due to the lack of variability on these behavior measures, changes in these behaviors could not be assessed, and these variables were not included in subsequent analyses.

To account for these baseline findings, a series of one-way Analysis of Variance analyses were conducted using ADL impairment as a covariate to assess whether participants’ level of impairment could have affected their baseline levels of engagement or behavior. Results revealed one trend: Participants with fewer ADL impairments were more engaged than those with greater amounts of impairment, although this difference did not reach statistical significance. The one area where impairment had a marginally significant effect was in level of difficulty with the activity, where the most impaired participants (those with three of the three

ADL impairments) had greater difficulty with the activity ( $M = 2.7$ ;  $F = 2.65$ ;  $df = 3$ ;  $p = .06$ ) than those with no to fewer impairments ( $M = 1.43$ ).

Following this first set of analyses, a second set of one-way Analysis of Variance Models were constructed, using the adult day center variable as the covariate. The rationale here was that the particular activity done at each of the centers could have affected the participants' engagement and behavior. Results showed that the center did have a significant effect on two measures: level of passive engagement and positive behavior. The center that had exercise as an activity showed significantly higher levels of passive engagement ( $M=4.85$ ;  $F = 3.74$ ;  $df = 3$ ;  $p = .02$ ) and higher levels of positive behavior ( $M=3.23$ ;  $F = 5.22$ ;  $df = 3$ ;  $p = .00$ ). Conversely, the centers that had reminiscence/ discussion group activities showed slightly higher levels of non-engagement and fewer helping behaviors; however, these differences were only marginally significant.

#### Impact of MBAP on Participant Engagement, Behavior, and Mood Over Time

MBAP was hypothesized to positively affect participant engagement, behavior, and mood. Specifically, constructive engagement was expected to increase, and non-engagement was expected to decrease. Since Montessori activities are flexible and self-correcting in terms of "activity rules," we also expected level of difficulty to decrease. In terms of behavior, positive behavior was expected to increase while sleep/boredom was expected to decrease from baseline through the end of the demonstration period. It should be noted that the changes in engagement and behavior for the MBAP activity, is in fact, a comparison of a non-MBAP activity at baseline to MBAP activities at each of the follow-up observations. These changes were compared to changes in engagement and behavior during non-MBAP activities over the six month period.

Table 2

Changes in Engagement and Mood Over Time during MBAP and non-MBAP activities

| Variable                 | Non-MBAP Activity |                |                 | MBAP Activity  |                 |
|--------------------------|-------------------|----------------|-----------------|----------------|-----------------|
|                          | Baseline          | 3-Month        | 6-Month         | 3-Month        | 6-Month         |
| <b>ENGAGEMENT</b>        |                   |                |                 |                |                 |
| Constructive Engagement  | 4.25<br>(0.91)    | 4.25<br>(0.89) | 3.80*<br>(1.48) | 4.41<br>(1.10) | 4.64<br>(0.95)  |
| Passive Engagement       | 4.65<br>(0.67)    | 4.40<br>(0.82) | 4.10*<br>(1.25) | 4.55<br>(1.10) | 4.77<br>(0.61)  |
| Non-Engagement           | 1.90<br>(1.25)    | 1.75<br>(0.97) | 1.95<br>(1.23)  | 1.68<br>(1.13) | 1.36<br>(0.95)  |
| Helping Behavior         | 1.05<br>(0.22)    | 1.15<br>(0.67) | 1.25<br>(0.64)  | 2.00<br>(1.02) | 1.91*<br>(1.27) |
| Difficulty with Activity | 1.75<br>(0.91)    | 1.45<br>(0.76) | 2.01<br>(1.40)  | 1.41<br>(0.92) | 1.41*<br>(0.85) |
| <b>BEHAVIOR and MOOD</b> |                   |                |                 |                |                 |
| Positive (Pleasure)      | 2.65<br>(0.93)    | 2.90<br>(1.07) | 2.10*<br>(0.97) | 3.18<br>(1.00) | 3.14*<br>(0.89) |
| Sleep/Boredom            | 1.30<br>(0.57)    | 1.40<br>(0.68) | 1.60<br>(0.82)  | 1.18<br>(0.50) | 1.14<br>(0.47)  |

NOTE: Range of engagement scales is 1 = not at all engaged to 5 = extremely engaged; Range of behavior and mood scales is 1 = behavior did not occur; 2 = less than ½ activity; 3 = more than ½ activity; 4 = entire period.

\* Significant change of measure over time ( $p < .05$ ).

Evaluation Results. Follow-up observations were conducted mid-way (at three months) and at the end of the demonstration period (six months). As to be expected in this group of impaired elders, there was some attrition in the sample. At three months, two participants were discharged from the respective center (5%), thus reducing the sample to 48 participants. By six months, this number was reduced further, with four clients discharged from their center (8.3%), three clients who died (6.3%), and one client who moved into a nursing home (2.1%). The resulting end sample size was forty participants; however, not all of these individuals were

present during the observations due to a variety of reasons (e.g., vacations, sickness, etc.); hence, in some instances, the power to detect significant effects was potentially limited by the low sample size.

To assess changes over time, repeated measures Analysis of Variance Models were constructed using ADL impairment as a covariate. These models were analyzed for a significant time effect, which would indicate a change in mean levels over time. Additionally, the models could also show a significant interaction term—time by ADL impairment--which would indicate a differential change among those with higher or lower ADL impairment. For the sake of simplicity, the results of the ANOVA models are not presented; however Table 2 shows the means and standard deviations of engagement and behavior across time during both non-MBAP and MBAP activities.

Turning first to the engagement measures, results showed that levels of *constructive engagement* decreased over time during non-MBAP activities ( $F=5.64$ ;  $df = 2$ ;  $p = .02$ ) while during MBAP activities, the levels increased somewhat, though not significantly. During both types of activities, ADL impairment was not significant, indicating that level of impairment did not differentially affect constructive engagement. For *passive engagement* during non-MBAP activities, results showed a significant decrease in levels over the six month period ( $F = 6.08$ ;  $df = 2$ ;  $p = .01$ ) and that higher levels of ADL impairment was related to this decrease over time. In other words, participants with greater impairment had lower levels of passive engagement over time. During MBAP activities, passive engagement remained stable over six months, and ADL impairment did not significantly influence this change. That is, participants, regardless of how much impairment they had, showed stable levels of passive engagement over time during MBAP activities. For non-engagement, there were no significant changes over time during either the

non-MBAP or MBAP activities.

In terms of helping behavior, results showed no significant changes during the non-MBAP activity; however, during the MBAP activity, *helping behavior* significantly increased over the six month period ( $F = 8.72$ ;  $df = 2$ ;  $p = .00$ ). The biggest change was between the non-MBAP baseline observation and the three month MBAP observation, jumping from a mean value of 1.1 (indicating that the behavior mostly did not occur) to a value of 2.0 (indicating a small amount of helping between participants). Interestingly, ADL impairment was not a significant predictor, indicating that participants, regardless of impairment level, showed similar levels of helping behavior. Finally, in terms of *difficulty with the activity*, during the non-MBAP activity, difficulty tended to increase somewhat over time, although this increase did not reach statistical significance ( $F = 2.62$ ;  $df = 2$ ;  $p = .10$ ). In contrast, during MBAP activities, the *level of difficulty* showed a marginally significant decrease ( $F = 3.13$ ;  $df = 2$ ;  $p = .07$ ). Again, the biggest difference was between baseline and three months.

Next, a similar series of analyses were conducted for two of the five domains of behavior, positive behavior and sleep/boredom. Recall that the three other domains (depressed mood, disruptive behavior, and restlessness/agitation) could not be analyzed due to insufficient variability in the variable (i.e., participants did not exhibit the behavior). Results showed a marginally significant decrease in positive behavior over time during non-MBAP activities ( $F = 2.89$ ;  $df = 2$ ;  $p = .09$ ), but a marginally significant increase in *positive behavior* during MBAP activities ( $F = 3.17$ ;  $df = 2$ ;  $p = .07$ ). In the domain of sleep/boredom, there were no significant changes over time during either MBAP or non-MBAP activities.

#### Comparison of Activity Type on Engagement and Behavior at Each Time Point

Following the longitudinal analyses, a series of cross-sectional comparisons were made to

assess differences in engagement and behavior between non-MBAP and the MBAP activities. At each observation period, a paired-samples t-test was conducted, and the means of engagement and behavior were compared between the non-MBAP and MBAP activity. These analyses served to answer the question of which type of activity was associated with higher or lower levels of engagement and behavior at each time point. Because each center had a different type of non-MBAP activity, the analyses were also conducted using center as a covariate to account for possible differences in the type of non-MBAP activity on engagement and behavior.

Evaluation Results. Table 2 shows the mean levels of engagement and behavior at three and six months during both the non-MBAP and MBAP activities.

*Three and Six Month Engagement.* At three months, the mean differences in constructive engagement, passive engagement, and difficulty between non-MBAP and MBAP activities were not statistically significant. The levels of *constructive engagement* during both types of activities was relatively high, (M = 4.5 during non-MBAP and M = 4.4 during MBAP activities; range 1 - 5). Levels of *passive engagement* were similarly high during both non-MBAP (M= 4.4) and non-MBAP activities (M = 4.6) as were levels of difficulty (M = 1.4 for both non-MBAP and MBAP activities). Turning to levels of *non-engagement and helping behavior*, however, analyses revealed a significant difference between types of activities: In both instances, MBAP activities showed a greater benefit. The levels of *non-engagement* were significantly lower during MBAP activities (M = 1.6) as compared to non-MBAP activities (M = 1.9;  $F = 5.03$ ;  $df = 1$ ;  $p = .04$ ). Here, the adult day center variable was also significant, suggesting that the type of non-MBAP activity also influenced levels of non-engagement. At the center that conducted a reminiscence/ discussion activity, participants were more non-engaged than participants at centers that conducted other types of activities (bingo, singing, and exercise). For *helping*

*behavior*, analyses also revealed significant mean differences; namely, that during the MBAP activity, participants showed significantly higher levels of helping ( $M = 2.00$ ) compared to non-MBAP activities ( $M = 2.00$ ;  $F = 17.9$ ;  $df = 1$ ;  $p = .00$ ). The variable, center, was not significant, suggesting that the type of non-MBAP activity did not influence levels of helping behavior. On the other hand, MBAP activities were more likely to promote helping behavior between participants.

At six months, the mean differences between non-MBAP and MBAP activities were more distinct for all the measures of engagement. Table 2 above shows these results. For *constructive engagement*, the mean difference between MBAP and non-MBAP activities was about 0.7 points higher during the MBAP activity ( $M = 4.6$  vs.  $M = 3.9$ ;  $F = 17.7$ ;  $df = 1$ ;  $p = .00$ ). For *passive engagement*, this difference was marginally significant ( $M = 4.2$  during non-MBAP activity vs.  $M = 4.5$  during the MBAP activity;  $F = 3.5$ ;  $df = 1$ ;  $p = .08$ ), and for *non-engagement* and *helping behaviors*, the differences were significant and striking. The mean levels for non-engagement were 2.0 during non-MBAP activities and 1.4 during MBAP activities ( $F = 9.4$ ;  $df = 1$ ;  $p = .01$ ), and for helping behavior the means were 1.2 during non-MBAP activities and 1.7 during MBAP activities ( $F = 12.3$ ;  $df = 1$ ;  $p = .00$ ). In the case of helping behaviors, there was also a significant center effect whereby, one center that had successfully implemented MBAP programming into their regular activities had a much higher level of helping behavior during MBAP as compared to non-MBAP activities. Finally, for *difficulty with the activity*, the mean difference between non-MBAP and MBAP activities was also significant ( $M = 2.2$  vs.  $M = 1.4$ ;  $F = 7.6$ ;  $df = 1$ ;  $p = .01$ ), with participants having much less difficulty with the MBAP activity compared to the non-MBAP activities. These results suggest a greater match between the participant's ability level and the activity's demands during MBAP activities as

compared to non-MBAP activities.

*Three and Six Month Behavior.* In terms of behavior domains, mean differences in behavior between non-MBAP and MBAP activities were not significant at three months. The amount of positive behavior and sleep/boredom were not significantly different during non-MBAP activities compared to MBAP activities (see Table 2). However, at six months, significant mean differences emerged in both of these behavior domains. For positive behavior the duration of the behavior was almost a full point higher during MBAP activities as compared to non-MBAP activities. During the MBAP activity, positive behavior was observed on average, for almost the entire one hour activity period ( $M = 3.0$  during MBAP vs.  $M = 2.1$  during non-MBAP;  $F = 17.7$ ;  $df = 1$ ;  $p = .00$ ). For sleep/boredom, results showed similar findings, although the differential was not as great as for positive behavior ( $M = 1.5$  during non-MBAP activities, and  $M = 1.1$  during MBAP activities). This finding reflects the fact that sleep/boredom were rarely reported during MBAP activities, but was observed in several participants for up to  $\frac{1}{2}$  of the activity during non-MBAP activities. Again, this result is impressive considering that MBAP activities lasted one hour in length as compared to non-MBAP activities, which lasted on average, twenty minutes shorter.

#### Staff Report and Satisfaction

One of the primary goals of this demonstration was to introduce and educate staff on the MBAP methods and provide training, support, and initial funding so that centers could continue the program beyond the demonstration period. Throughout the program, activity staff attended the MBAP sessions, during which the MBAP specialist modeled the principles behind the MBAP method and provided guidance to staff on ways to interact with participants that would maximize their abilities and enjoyment. The staff at each center was given the additional

opportunity to evaluate the program and assess their readiness to take over the program at the end of the demonstration period.

### Measure

Staff members were given a written survey to complete at the three month and six month observation periods. First, they were asked to rate their overall satisfaction with the MBAP program on a scale of zero to four, with zero indicating “very dissatisfied” and four indicating “very satisfied.” In addition, they rated their level of satisfaction on seven different aspects of the program, including the room, the lighting, the supplies and materials, the amount of time, and so on. Subsequently, staff members were asked the extent to which they agreed or disagreed with a series of eight statements that dealt with participants’ enjoyment, participation, and difficulty with the MBAP activities. These were rated along a five point scale with a score of one indicating strong disagreement and five indicating strong agreement. Items included such things as MBAP participants enjoy participating in MBAP; it is a hassle to get participants ready for MBAP; MBAP is successful in engaging the participants, and MBAP activities are fun and interesting. Finally, staff were asked about the major benefits and drawbacks of MBAP, the top barriers for continuing the program, and their level of confidence and readiness to continue the program when the demonstration period ended. For the latter two items, staff rated their level of confidence and readiness on a scale of one to ten, with one indicating “not at all ready” and ten indicating “extremely ready.”

### Evaluation Results

The staff completing the written evaluation included the four center directors, one assistant director, two center social workers, four activity directors, and six recreation staff. A total of seventeen staff completed the survey at three months, and fourteen completed the survey

at six months. Table 3 shows the results for staff satisfaction on the program overall and on individual aspects of the program.

In terms of overall satisfaction, staff members were overwhelmingly very satisfied with the program, and as well, were satisfied with many of the logistical elements -- the room, lighting, materials used, and amount of time devoted to the program. In particular, they were very satisfied with the skill of the MBAP specialist, often suggesting that she was instrumental to the success of the program. Of the seven items assessed, staff suggested only two areas that could have used improvement: the room for the activities and the type and range of activities. In terms of the room, it was important that participants had sufficient table space and a place where there was not too much ambient noise or activity. At one center, the space devoted to MBAP activities was the dining room, which was difficult to set up and move around in. However, by six months, the space was moved, and the level of satisfaction on that item reflected the improvement. The other item that scored lower than the others was the type and range of MBAP activities. Here, some staff initially made comments that the activities appeared juvenile or inappropriate for their adult participants. However, as staff continued to learn about the MBAP method and principles, and as different types of activities were introduced into the center, there came to be greater acceptance of the activities. At six months, the satisfaction level with activities did improve.

Table 3. Staff Satisfaction with MBAP at Three and Six Months

|   | 3-Months<br>(n=17) |      | 6-Months<br>(n=14) |      |
|---|--------------------|------|--------------------|------|
|   | Mean               | S.D. | Mean               | S.D. |
| Overall satisfaction with MBAP (range: 0 – 4) | 3.54               | 0.97 | 3.86               | 0.36 |
| 1. Room used for activities (range: 1 – 5)    | 4.17               | 1.40 | 4.79               | 0.43 |
| 2. Lighting in room used for activities       | 4.70               | .48  | 5.00               | 0.00 |
| 3. Supplies and materials used for MBAP       | 4.46               | 0.97 | 4.64               | 0.63 |
| 4. Amount of time for MBAP sessions           | 4.58               | 0.67 | 4.79               | 0.58 |
| 5. Number of days per week MBAP offered       | 4.54               | 0.88 | 4.79               | 0.43 |
| 6. Skill of MBAP specialist                   | 4.75               | 0.62 | 4.86               | 0.54 |
| 7. Types and range of MBAP activities         | 4.38               | 1.12 | 4.64               | 0.63 |

Turning to the staff's evaluation of the impact of MBAP on participant's engagement and behavior, in general, staff believed that MBAP was having a positive impact on their clients with dementia. At both three and six months, staff strongly agreed that MBAP participants seemed to enjoy participating in the program and that the program was successful in engaging the participants. The mean levels of both these items went up slightly from three to six months although this increase was not statistically significant. In terms of behavior, staff reported relatively little difficulty with convincing the participants to participate in MBAP activities. The level of this variable went up slightly in a positive direction (from more difficulty to less) although this increase was also not statistically significant. In addition, at three months staff neither agreed nor disagreed with the statement that MBAP participants were easier to handle after participating in MBAP activities. By six months, however, staff reported a marginally significant increase, indicating a stronger level of agreement that the statement was true ( $F = 4.67$ ;  $df = 1$ ;  $p = .07$ ).

Turning to the staff's report of the more logistical aspects of the program, they rated the activities as fun and interesting and that other clients could benefit from MBAP activities. They

also “somewhat disagreed” with the statement that it was a hassle to get participants ready for MBAP, suggesting a good integration of MBAP in the center’s daily activities. Similarly, they reported increasing agreement with the statement that other staff was supportive of MBAP. Again, these positive findings provided evidence for a good foundation for the program to continue beyond the demonstration period. This finding was further supported by the other two quantitative measures: confidence and ability in continuing the program beyond the six month period. In terms of confidence, staff reported an average confidence of 8 out of 10 at three months, and 9 out of 10 at six months. This increase was marginally significant ( $F = 3.45$ ;  $df = 1$ ;  $p = .11$ ). In terms of ability, however, staff reported a three month level of seven out of ten, and at six months, a level of almost nine out of ten. This increase was statistically significant ( $F = 24.96$ ;  $df = 1$ ;  $p = .00$ ).

Table 4. Staff Evaluation of Impact of MBAP on Participants at Three and Six Months

| (Range: 1 – 5)  | 3-Months |      | 6-Months |      |
|---|----------|------|----------|------|
|   | Mean     | S.D. | Mean     | S.D. |
| 1. MBAP participants enjoy MBAP.  | 4.67     | 0.65 | 4.79     | 0.43 |
| 2. Difficult to convince participants to participate.                                       | 2.85     | 1.67 | 3.07     | 1.64 |
| 3. Hassle getting ready for MBAP.   | 4.00     | 1.47 | 4.14     | 1.46 |
| 4. Participants are easier to handle after MBAP.  | 3.15     | 1.28 | 4.00     | 0.46 |
| 5. MBAP is successful in engaging participants.   | 4.69     | 0.48 | 4.79     | 0.43 |
| 6. Other clients could benefit from MBAP.   | 4.42     | 1.24 | 4.71     | 0.83 |
| 7. MBAP activities are fun and interesting.   | 4.46     | 1.20 | 4.64     | 0.84 |
| 8. Other staff at center are supportive of MBAP.  | 4.00     | 1.41 | 4.36     | 0.75 |
| Confidence that center will continue MBAP<br>(range: 1 – 10)                                | 8.00     | 2.58 | 9.29     | 1.64 |
| Readiness of center to continue with program<br>beyond demonstration period (range: 1 – 10) | 6.92     | 2.43 | 8.64     | 2.02 |

## Qualitative Findings

The quantitative findings described above only paint some of the story in terms of the impact of MBAP programming on participants' engagement and mood. Qualitatively, additional benefits and challenges were noted over the six month demonstration period. Many of these findings took place one-on-one between particular clients and staff, who may have had initial challenges but who showed tremendous progress over the demonstration period.

One MBAP participant was observed as becoming easily agitated and upset at the beginning of the program, and who would only sit and watch the MBAP activity in a passive way. This participant would not allow the MBAP specialist to approach her. As a result the center staff person who had the strongest relationship with the participant began working with her one-on-one, and after several sessions the participant began to constructively engage in the activity. Over time, the participant could stay focused on the activity for short intervals without constant one-on-one support. In addition, she slowly gained the ability to self-engage into the activity after the staff person set the activity up for her.

Another participant initially was shy and quiet. As she was exposed to the MBA, she began blossoming and within three months became very conversational and would regale everyone with funny memories of growing up on a rural farm. Besides socially engaging with the group, she also became more confident of her ability to work with activity materials.

Two participants at another center with very low functional capability initially only sat passively watching others in the group or napping. Mid-way through the six month project, one of the activity aides began working one-on-one with each of them experimenting with different tactile objects to try and engage them. With this aide's patience, support and gentle cueing within several sessions both participants were engaging for 10 to 15 minutes with tactile

manipulatives. Their enjoyment and interest was evident by their focused determination and smiles visible on their faces.

One of the centers at the time of the project had no male participants with dementia so the MBA project included only women. After several months of exposure to the MBA, several of the women in the group began calling the MBA time “the ladies who laugh a lot” as the sessions were fun and evoked much laughter. It was especially noteworthy that the participants themselves ‘labeled’ their time engaging in the MBA this way since it expressed how they were experiencing the MBA sessions.

In addition to these breakthroughs with participants, there were also significant instances of breakthroughs with center staff. At one center, one of the staff people was initially suspicious of the program and kept a distance from the activities. However, within the first 3-months, that staff person began setting up and starting the program before the MBAP specialist arrived. The comment from this staff person was that he heard so much laughing that he wondered what was going on during MBAP sessions. This was especially encouraging because that center had a more strict hierarchical structure where this type of self-initiative and inventiveness was less typical.

Beside breakthrough experiences with participants and staff, a number of other significant qualitative outcomes were noted. One of the centers has a high number of staff and activity aides employed at the center (approximately 18). During the MBA project, all of the staff and aides rotated to have an opportunity to work with the MBA. The MBA specialist noted that a few of them lacked certain personality traits that would have enabled them to be more successful with the program. These traits included an over-emphasis on successful completion of a task (as opposed to a greater degree of flexibility) and an over-analytical approach to the

program steps that hindered their ability to master even the basic Montessori principles.

Unfortunately, in these cases, staff had a more difficult time engaging the participants, apparent through a qualitatively higher level of boredom and lower level of positive behavior by the participant.

On the other hand, several key staff members were able to successfully grasp the Montessori principles and not only succeeded in engaging participants, but also in creating new kits and committing themselves and the center to continuing the program after the program period. These staff were those that understood dementia and its impact on participants as well possessed a flexibility and openness that enabled them to adjust their expectations of success with an activity.

#### **IV. Conclusions**

Overall, MBAP presents a promising and useful tool among the many tools that adult day centers have to engage their participants and improve their behavior and mood. The findings of this evaluation found that MBAP participants were generally engaged in both non-MBAP and MBAP types of activities, and experienced few to no behavior problems during the day. In this regard, the adult day programs are successful in serving their clients. However, the addition of MBAP activities into the center's daily program can greatly enhance this success. This evaluation showed that during non-MBAP activities (e.g., bingo, exercise, reminiscence therapy, discussion groups) over time, levels of constructive engagement tended to go down while levels of difficulty with the activity tended to go up. One might expect this finding to be the result of the participants' increasing level of impairment. However, two findings discount this. First, the data suggest that impairment levels (out of a possible three ADLs) and the participant's cognitive abilities tended to remain stable over the 6-month period. Second and more compelling, results showed that during MBAP activities, levels of *constructive engagement* were higher than during non-MBAP activities and remained stable over the six month period. Similar results were found for *difficulty with the activity*, where levels during MBAP activities were lower than non-MBAP

activities and tended to decrease over time. *Passive engagement* and *non-engagement* remained stable during non-MBAP activities; however, during MBAP activities levels of non-engagement went down, indicating that participants were more actively engaged in the MBAP activity than during the non-MBAP activity. These findings suggest that MBAP activities has a positive impact on the participants' impairment despite levels of ADL or cognitive impairment.

The most notable finding in terms of engagement was in the level of *helping behavior*. These types of social interactions between participants were rarely found during non-MBAP activities; in fact, most of the time, the participants rarely talked with one another during the activities. More commonly, it was usually the staff who interacted with participants. However, during MBAP activities, the level of helping behavior increased significantly over the six month period. Participants began to interact with one another, reaching out to assist or comment on another participant's success.

In terms of behavior, the impact of MBAP programming was less on problematic behavior (disruptive, restless, etc.) since these behaviors were rarely reported. Rather, the impact was on the expression of positive behavior – expressions of pleasure, laughter, smiles – which went up during the six month period as compared to non-MBAP activities, where levels tended to go down over time. The impact of MBAP was also felt on participant's expressions of boredom (closing their eyes, sleeping, staring). During MBAP activities, most participants were focused on the activity in either a constructive or passive way and rarely expressed any level of boredom.

Limitations of the study include the single-group design and the limited number and time frame of observations. Since there was no comparison group, there was less control over carry-over effects between MBAP and non-MBAP activities, bias by staff members and the evaluator. To account for potential threats to validity, it would be necessary to replicate these findings with larger samples of participants and within a greater number of centers.

MBAP provide meaningful activities that can improve an adult day participant's engagement and mood, which arguably, can provide a greater sense of self-worth, purpose, and quality of life. The implementation of MBAP programming offers some challenges, but as the results of this evaluation

showed, staff were overwhelmingly supportive of the activities and reported only a few difficulties in its implementation. Selecting the right kind of activities, ones that present a good fit with the participants' abilities and interests is important. In addition, training staff on effective Montessori principles is crucial, as their interaction with participants can mean the difference between a participant's feeling of frustration or pride. Staff who tried to do too much (i.e., force the participant into following the "rules" of the activity; take over the activity from the participant; or not allow enough time for the participant to engage) were ultimately less successful in producing positive outcomes.

Although the results of this evaluation showed positive benefits of MBAP activities, ultimately, the key issue is whether the program can be integrated within the center and whether the center staff can conduct the activities in the face of scheduling and organizational constraints. In this regard, the most important factor determining the continuation of the program is the cultural environment of the center, that is, whether the center director and staff are open to the innovation that MBAP provides and supports staff at all levels to the continuation of the program. In other words, centers with inculcation of MBAP at all levels of staff have the best chance of successful implementation. Unfortunately, at one of the four centers, staff turnover (of the center director and assistant director) and a lack of commitment and training by remaining staff has contributed to difficulty in maintaining the program. At a second center, the center director believes in the program and is personally committed to it; however, staff resistance and space restrictions have limited its use to occasional at best. At the third and fourth centers, a more positive picture emerges. There, directors support the program's continuation; staff at multiple levels has been trained; the MBAP specialist has been consulted; and funds have been directed to purchase and maintain MBAP materials and supplies. At one of these two centers, the big test came when two key staff with the most MBAP experience resigned. Undoubtedly, the continuation of MBAP was in jeopardy; however, the center director consulted with the MBAP specialist, who provided training to the new staff, and happily, the program survived and continues. Participants at these two centers participate in MBAP activities on a daily basis, and staff continue to find ways to improve quality and implementation.

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## VII. Appendix