Practice Concepts

Eleanor S. McConnell, RN, PhD, Editor

Sixteen residents in long-term care with advanced dementia (14 women; average age = 88) showed significantly more constructive engagement (defined as motor or verbal behaviors in response to an activity), less passive engagement (defined as passively observing an activity), and more pleasure while participating in Montessori-based programming than in regularly scheduled activities programming. Principles of Montessori-based programming, along with examples of such programming, are presented. Implications of the study and methods for expanding the use of Montessori-based dementia programming are discussed.
Key Words: Cognitive deficits, Rehabilitation, Objective observation

Montessori-Based Activities for Long-Term Care Residents With Advanced Dementia: Effects on Engagement and Affect

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Studies have shown that behavioral disturbances, such as apathy and agitation, are prominent in persons in the more advanced stages of Alzheimer's disease (AD; Cohen-Mansfield & Werner, 1995; Mega, Cummings, Fiorello, & Gornbein, 1996). Additionally, the paucity of activities programming designed specifically for persons in the later stages of AD and related disorders can lead to an increase in problematic behaviors and behavioral disturbances in a long-term care setting (Acello, 1997; Vance, Camp, Kabacoff, & Greenwalt, 1996). According to Acello (1997), residents who often exhibit problematic behaviors are usually responding to an unmet psychosocial need. Because activities staff in many long-term care settings tend to offer mainly large-group activities, such as discussion groups and current events programs, many residents with advanced dementia

are unable to participate fully and lack opportunities to use their remaining cognitive abilities. Lack of appropriate activities programming may, therefore, lead to behavioral disturbances in residents, whereas use of dementia-appropriate materials and activities can reduce agitation and other problem behaviors (Buettner, 1999).

Elsewhere (Camp, 1999a, 1999b; Camp et al., 1997; Camp, Koss, & Judge, 1999; Camp & Mattern, 1999; Dreher, 1997; Vance et al., 1996), we have described the development of a line of research in which activities for persons with dementia have been developed based on the Montessori method. This approach to education, developed by Maria Montessori, has been used to teach cognitive, social, and functional skills to children. Activities, or "lessons," are generally based on principles used in occupational therapy, for example, breaking down tasks into steps and programming activities to progress from simple to complex and from concrete to abstract (Bowlby, 1993; Dreher, 1997; Kaufmann, 1994; Pool, 1999). These materials also provide sensory and cognitive stimulation and allow persons with dementia to express their social skills (Camp & Mattern, 1999).

Judge, Camp, and Orsulic-Jeras (in press) found that adult day care clients participating in Montessori-based group programming showed significantly higher

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levels of constructive engagement (defined as motor or verbal behaviors in response to an activity) than control group clients (controls participated in regular day care programs only). Additionally, during the 9-month study, clients in Montessori-based activities exhibited less passive engagement (defined as passively observing an activity) than clients in regular activities programming.

In the current study we extended this research by examining the effects of Montessori-based activities programming on various forms of engagement exhibited by residents with advanced dementia in a long-term care facility. We hypothesized that long-term care residents would display higher levels of constructive engagement, lower levels of passive engagement, and more positive affect during Montessori programming than during regular activities programming.

Method

Sample Selection

The study was conducted at Menorah Park Center for Senior Living in Beachwood, OH, an Orthodox Jewish facility with more than 350 beds in long-term care. The sample comprised 16 residents (14 women) from a step-down advanced dementia unit, who provided complete data across the entire 9-month time frame of the study. Their Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) scores ranged from 0 to 19 ($M = 6.1$, $SD = 5.9$, median = 4). Age ranged from 79 to 94 years ($M = 88$, $SD = 4.3$, median = 88).

We used several measures to further describe the characteristics of the present sample. Standardized and validated measures of functional status (MOSES; Helms, Csapo, & Short, 1987), depression (CSD; Alexopoulos, Abrams, Young, & Shamoian, 1988), and agitation (CMAI; Cohen-Mansfield, Marx, & Rosenthal, 1989) taken at the beginning of the study indicated relatively low functional status (MOSES, $M = 100$), low levels of depression (CSD, $M = 5.9$), and little agitation (CMAI, $M = 24$) among these residents. These scores remained stable throughout the study.

Regular Unit Programming

Regular activities programming used as a control condition was varied. Large group activities ($n = 10$–20) on this particular long-term care unit included storytelling, trivia, exercise, current events, movies, discussion groups, and musical programs that allowed the residents to interact with small musical instruments. These activities were conducted by an activities therapist with one or more nursing assistants. Most small group activities ($n = 3$–10) tended to stress sensory stimulation, including hand massage, aroma therapy, and tai chi. Finally, activities staff and nursing staff also implemented different types of individualized activities. For example, during independent table activities, materials such as puzzles were

placed in front of each resident, and an activities therapist or nursing assistant rotated from person to person to provide assistance in completing the activity. Another type of individualized programming included therapeutic visits, in which the activities therapist spent time with a specific resident, engaging him or her in programming based on the interests of that particular individual.

Montessori-Based Programming

This programming occurred concurrently with the regularly scheduled unit programming. A within-subjects design was used, with all participants serving as their own controls. Two types of intervention programming were available to participants: (a) individual activities and (b) two small group activities—Memory Bingo and Group Sorting (e.g., Camp, 1999a, 1999b; Judge et al., in press; Schneider, Diggs, Orsulic, & Camp, 1999).

Individual Activities

In the individual Montessori-based activities, various aesthetically pleasing materials taken from the everyday environment were used. Because residents were familiar with the materials, they found the activities to be interesting and thus applied meaning to them.

Activities were presented in a defined order from simple to complex, thus allowing learning to progress in a sequence (Camp, 1999b). More important, materials were designed to facilitate upward or downward extension, in order to meet the skill level of each individual participant. For example, in the golf ball scoop activity, participants were presented with 12 golf balls (4 yellow, 4 white, and 4 orange), a muffin tin (with 4 yellow-colored wells, etc.), and an ice cream scoop. Residents were asked to name the colors of the balls and the color of the wells in the muffin tin and were then instructed to use the ice cream scoop to transfer balls from the basket to the corresponding colored wells in the muffin tin. (If manipulation of scoop was too difficult, residents used their hands.) After the balls were placed in the muffin tin, they were counted. Residents returned the balls to the basket using either the scoop or their hands. Another example of an individual Montessori-based activity used in the study was category sorting using pictures or words. For example, the living–not living sorting activity comprised pictures or words of things living or not living, such as a butterfly, a cow, a watch, or an ice cream cone. When shown a picture, residents were asked to name each picture and then categorize it as living or not living by placing the picture under its appropriate category label. The happy–not happy sorting activity followed the same procedures using photographs of persons whose facial expressions were either happy or not happy. (Research staff at the Myers Research Institute of the Menorah Park Center for Senior Living have developed more than 100 individual Montessori-

based activities for use with persons at various stages of dementia.)

Memory Bingo.—Memory Bingo was a small group activity (*n* = 3–7) designed for participants who were able to read one word at a time (Camp, 1999a, 1999b). Each participant received four playing cards with the printed answers to corresponding calling cards, which contained questions or phrases (e.g. "Fred Astaire and Ginger _____"). Participants took turns reading the questions or phrases on the calling cards and looked to see if they had the correct answer on one of their playing cards. If so, they turned that card over; once all four playing cards were turned over, the game was finished. An advantage of this activity was that the procedure remained the same every time the game was played, yet the content changed. More than 30 different versions of Memory Bingo have been developed, with games including Famous Couples, Song Lyrics, Proverbs, and Household Tasks.

Group Sorting.—Group Sorting was another small group activity (*n* = 3–5) that served as an extension of the individual Montessori-based picture sorting activity described previously, in that all individualized Montessori-based category sorts can be transformed into Group Sorts. A large board was placed in front of all the participants and each side of the board was labeled with one of two categories (e.g., Living or Not Living). Each participant was given a copy of the large picture the group leader was presenting. After each picture was shown and discussed, the group leader's large picture was placed on the board under the appropriate category.

Procedures

In addition to the MMSE, the Myers Menorah Park/ Montessori-Based Assessment System (MMP/MAS; Camp et al., 1999) was administered to all residents. Developed by research staff at Menorah Park Center for Senior Living for assessment of participants' preserved abilities, the MMP/MAS was used for placing persons with dementia into individual Montessori-based intervention programming and for selecting appropriate activities. The MMP/MAS was used to assess motor skills, sensory skills, cognitive skills, and social skills. Specifically, the MMP/MAS assessed fine and gross motor skills, tactile stimulation, vision, hearing, reading skills, abstract thinking, language skills, ability to follow one-step and multistep commands, object permanence, counting skills, and formal versus concrete operations (Camp et al., 1999).

Participants received intervention programming twice a week for approximately 15–30 min per session with either a research assistant or the activities therapist on the unit.

Training

Training sessions designed for research assistants and activities staff took place prior to the start of data collection. Topics presented included background on dementia, discussion of the Montessori method, presentation of Montessori-based activities, and use of the MMP/MAS as an assessment tool. Methods of training included videotape training, direct observation of programming, and role playing. After the training sessions concluded, both research and activities staff were given opportunities to conduct individual and group Montessori-based activities with clients from our facility's adult day care center, under the supervision of experienced research staff.

Measures

Engagement Measure.—To quantify the varying levels of engagement occurring in the regularly scheduled activities programming in comparison with engagement occurring in the Montessori-based intervention programming, we used an engagement scale, which was developed to assess levels of engagement in adult day care clients (Judge et al., in press). Although large-scale validity studies of this experimental measure have not yet been conducted, the categories of engagement measured by this scale were selected after extensive discussion with activities and nursing staff, followed by lengthy observations of long-term care residents. The scale has achieved interrater agreement levels of more than 95%. Four main categories of engagement were assessed: constructive engagement (CE), passive engagement (PE), nonengagement (NE), and self-engagement (SE).

CE was defined as any motor or verbal behavior exhibited in response to the activity the client was participating in. For example, talking in a discussion group, painting in a creative arts activity, and singing or dancing to music would all be coded as CE. PE was defined as listening and/or looking behavior exhibited in response to the activity in which the client was participating. For example, listening to a discussion or a speaker, watching others paint or color in an art therapy project, and listening to music would all be coded as PE. NE was defined as staring into space or another direction away from the activity for longer than 10 s or sleeping during an activity, which is comparable to disengagement and apathy. SE was defined as any purposeless behavior involving the resident's active engagement with him- or herself during an activity. Examples of SE include fidgeting with one's clothing, hair, or face, and talking to oneself. Observations took place in 10-min windows; observers used a stopwatch to measure the length of time each type of engagement was exhibited.

Affect Measure.—To measure the amount and type of affect displayed by residents participating in regular unit and Montessori-based programming, we used the Affect Rating Scale (Lawton, Van Haitsma, & Klapper, 1996), a standardized and validated instrument, and assessed instances of pleasure, anger, anxiety/ fear, and sadness.

Affect was observed during the same 10-min ob-

servation window as engagement and was recorded immediately afterward. Interrater agreement for this measure across 25 observations was once again more than 95%. Residents were observed at three different periods: initial baseline, Posttest 1 (approximately 3 months after baseline), and Posttest 2 (approximately 6 months after baseline). At baseline, residents were observed four times in the control situation during 10-min segments, twice in the morning and twice in the afternoon, in regularly scheduled activities offered on the unit. At both Posttest 1 and Posttest 2, residents were observed four times in the regularly scheduled activities as well as four times in Montessori-based programming, again during 10-min segments of observation.

Results

Engagement Measure

Four measures were associated with engagement: CE, PE, SE, and NE. In the control condition, that is, regular unit activities programming, we compared scores on these four measures across the three time periods (baseline, Posttest 1, and Posttest 2) of the study. No significant differences were found for any measure ($p > .05$). This indicates that behavior during regular programming remained stable across the course of the study.

We analyzed engagement measures using a 2 × 2 repeated measures analysis of variance (ANOVA) representing the within-subjects factors Treatment (Montessori-based programming vs. regular programming) and Time (Posttest 1 vs. Posttest 2). Means associated with each dependent variable for these factors are shown in Table 1.

CE.—For CE, we found a significant main effect for the Treatment factor, $F (1, 15) = 102$; $p < .001$. Substantially more CE was observed during Montessori-based programming than during regular program-

ming. In fact, CE was observed the majority of the time in which these residents took part in Montessori-based activities, whereas CE was a low-frequency event during regular activity programming.

PE.—For PE, we found a significant main effect was found for the Treatment factor, $F (1, 15) = 5.5$; $p < .03$. Residents showed less PE in Montessori-based programming than in regular programming.

NE and SE.—Instances of NE and SE were not often seen during the activity periods when observations were conducted. However, NE and SE, when they did occur, were almost exclusively seen during regular programming, not during Montessori programming.

Affect Measure

Similar to the engagement analyses, we analyzed affect measures using a 2 × 2 repeated measures ANOVA representing the within-subjects factors Treatment and Time. Affect means associated with these effects are shown in Table 2.

Pleasure.—With regard to pleasure, we found a significant main effect for Treatment, $F (1, 15) = 62.3$; $p < .001$, and for Time, $F (1, 15) = 6.7$; $p < .03$. Pleasure scores were significantly higher during Montessori programming than during regular unit activities. However, the levels of pleasure exhibited by participants in both the control and the treatment conditions appeared to decline from Posttest 1 to Posttest 2.

Anxiety/Fear.—Results for anxiety/fear showed significant main effects for both Treatment, $F (1, 15) = 12.1$; $p < .003$, and Time, $F (1, 15) = 12.6$; $p < .003$. As with pleasure, levels of anxiety dropped from Posttest 1 to Posttest 2. Anxiety was higher in regular programming.

Table 1. Means (and Standard Deviations) of Constructive Engagement (CE), Passive Engagement (PE), Nonengagement(NE), and Self-Engagement (SE) Measures for Different Activity Types by Time of Test

		Time of Test[a]		
Measure	Activity	Baseline	Posttest 1	Posttest 2
CE	Montessori	—	450 (132)	410 (140)
	Regular	79 (105)	72 (107)	74 (102)
PE	Montessori	—	144 (126)	168 (127)
	Regular	248 (183)	297 (179)	274 (175)
NE	Montessori	—	0 (0)	10 (26)
	Regular	159 (182)	134 (176)	143 (177)
SE	Montessori	—	0 (0)	0 (0)
	Regular	32 (1.4)	23 (69)	6 (13)

[a]600 total s were possible (10-min observations).

Table 2. Means (and Standard Deviations) of Pleasure, Anger, Anxiety/Fear, and Sadness for Different Activity Types by Time of Test.

		Time of Test		
Measure	Activity Type	Baseline	Posttest 1	Posttest 2
Pleasure	Montessori	—	2.9 (.7)	2.4 (.8)
	Regular	1.3 (.5)	1.4 (.6)	1.2 (.4)
Anger	Montessori	—	1.0 (0)	1.0 (0)
	Regular	1.1 (.4)	1.1 (.3)	1.1 (.4)
Anxiety/ fear	Montessori	—	1.6 (1.0)	1.3 (.6)
	Regular	1.9 (1.3)	2.4 (1.5)	1.8 (1.4)
Sadness	Montessori	—	1.1 (.3)	1.1 (.4)
	Regular	1.5 (.8)	1.8 (1.2)	1.3 (.8)

Note: The Affect Rating Scale was used, in which 1 = "never," 2 = "less than 16 s," 3 = "16–59s," 4 = "1–5 min," and 5 = "more than 5 min."

Anger and Sadness.—As was the case with NE and SE, anger and sadness were not observed in many of the participants, but when they did occur they were almost exclusively seen during regular programming, not during Montessori-based programming.

Discussion

We are not certain why reductions in both pleasure and anxiety/fear were found from Posttest 1 to Posttest 2. Staffing and other environmental variables remained relatively stable over this time frame. However, no significant interactions were seen with these measures, indicating that greater pleasure and lower anxiety/fear were seen in Montessori-based activities throughout the study. In addition, although these time effects were statistically significant, their overall size was relatively small.

Limitations of the study include the fact that it took place in a facility where administrative, nursing, and activities staff were open to innovation and where individualized and small group programming were valued. In settings where only large group activities are conducted, the effects of Montessori-based programming may be more limited, though still beneficial. Replicating these results with large sample sizes in different settings would add to the robustness of the present findings.

Although Montessori-based activities appear to elicit positive forms of engagement and affect in persons with dementia, a key issue is whether regular long-term care staff and volunteers can conduct Montessori-based activities within existing schedules and organizational structures and constraints. Preliminary results indicate that they can. For example, on the step-down dementia unit where these data were collected, nursing and activities staff have been trained by research staff to implement Montessori-based programming and are doing so within existing activities scheduling (Schneider et al., 1999). Volunteers have also been trained to implement Montessori-based activities for persons with dementia in adult day care settings (Judge et al., in press). In addition, family members are currently being trained to implement Montessori-based activities with their family member during visits. A training manual (which may be obtained from Dr. Camp) has been developed to help recreational therapists, nursing staff, volunteers, and family members create and implement such activities in long-term care and other settings (Camp, 1999b). It is our hope that the positive effects seen with Montessori-based programming will be success-

fully and widely implemented across a variety of settings serving persons with dementia.

References

Acello, B. (1997, March). Managing difficult behavior. *Journal of Nursing Assistants,* 24–26.

Alexopoulos, G. S., Abrams, R. C., Young, R. C., & Shamoian, C. A. (1988). Cornell scale for depression in dementia. *Biological Psychiatry, 23,* 271–284.

Bowlby, C. (1993). *Therapeutic activities with persons disabled by Alzheimer's disease and related disorders.* Gaithersburg, MD: Aspen.

Buettner, L. L. (1999, January/February). Simple pleasures: A multilevel sensorimotor intervention for nursing home residents with dementia. *American Journal of Alzheimer's Disease, 14*(1), 41–52.

Camp, C. J. (1999a). Memory interventions for normal and pathological older adults. In R. Schulz, G. Maddox, & M. P. Lawton (Eds.), *Annual review of gerontology and geriatrics* (Vol. 18, pp. 155–189). New York: Springer.

Camp, C. J. (Ed.) (1999b). *Montessori-based activities for persons with dementia: Volume 1.* Beachwood, OH: Menorah Park Press.

Camp, C. J., Judge, K. S., Bye, C. A., Fox, K. M., Bowden, J., Bell, M., Valencic, K., & Mattern, J. M. (1997). An intergenerational program for persons with dementia using Montessori methods. *The Gerontologist, 37,* 688–692.

Camp, C. J., Koss, E., & Judge, K. S. (1999). Cognitive assessment in late stage dementia. In P. A. Lichtenberg (Ed.), *Handbook of assessment in clinical gerontology* (pp. 442–467). New York: Wiley.

Camp, C. J., & Mattern, J. M. (1999). Innovations in managing Alzheimer's Disease. In D. E. Biegel & A. Blum (Eds.), *Innovations in practice and service delivery across the lifespan* (pp. 276–294). New York: Oxford University Press.

Cohen-Mansfield, J., Marx, M. S., & Rosenthal, A. S. (1989). A description of agitation in a nursing home. *Journal of Gerontology: Medical Sciences, 44,* M77–M84.

Cohen-Mansfield, J., & Warner, P. (1995, January/February). Environmental influences on agitation: An integrative summary of an observational study. *American Journal of Alzheimer's Care and Related Disorders and Research, 10*(1), 32–39.

Dreher, B. B. (1997, May/June). Montessori and Alzheimer's: A partnership that works. *American Journal of Alzheimer's Disease, 12*(3), 138–140.

Folstein M. F., Folstein, S. E., & McHugh, P. R. (1975). Mini-mental state: A practical method of grading the cognitive state of patients for the clinician. *Journal of Psychiatry Research, 12,* 189–198.

Helms, E., Csapo, K. G., & Short, J. (1987). Standardization and validation of the multidimensional observations scale for elderly subjects (MOSES). *Journal of Gerontology, 47,* 395–405.

Judge, K. S., Camp, C. J., & Orsulic-Jeras, S. (in press). Use of Montessori-based activities for clients with dementia in adult day care: Effects on engagement. *American Journal of Alzheimer's Disease.*

Kaufmann, M. M. (1994). Activity-based intervention in nursing home settings. In B. R. Bonder & M. B. Wagner (Eds.), *Functional performance in older adults* (pp. 306–321). Philadelphia: F. A. Davis.

Lawton, M. P., Van Haitsma, K., & Klapper, J. (1996). Observed affect in nursing home residents with Alzheimer's disease. *Journal of Gerontology: Psychological Sciences, 51B,* P3–P14.

Mega, M. S., Cummings, J. L., Fiorello, T., & Gornbein, J. (1996). The spectrum of behavioral changes in Alzheimer's disease. *Neurology, 46,* 130–135.

Pool, J. (1999). *The Pool activity level (PAL) instrument: A practical resource for carers of people with dementia.* London: Jessica Kingsley.

Schneider, N. M., Diggs, S., Orsulic, S., & Camp, C. J. (1999, March). Nursing assistants teaching Montessori activities. *Journal of Nurse Assistants,* 13–15.

Vance, D., Camp, C. J., Kabacoff, M., & Greenwalt, L. (1996). Montessori methods: Innovative interventions for adults with Alzheimer's disease. *Montessori Life, 8,* 10–12.