

# Effects of intergenerational Montessori-based activities programming on engagement of nursing home residents with dementia

Michelle M Lee<sup>1</sup>  
Cameron J Camp<sup>2</sup>  
Megan L Malone<sup>2</sup>

<sup>1</sup>Midwestern University, Department of Behavioral Medicine, Downers Grove, IL, USA; <sup>2</sup>Myers Research Institute of Menorah Park Center for Senior Living, Beachwood, OH, USA

**Abstract:** Fourteen nursing home residents on a dementia special care unit at a skilled nursing facility took part in one-to-one intergenerational programming (IGP) with 15 preschool children from the facility's on-site child care center. Montessori-based activities served as the interface for interactions between dyads. The amount of time residents demonstrated positive and negative forms of engagement during IGP and standard activities programming was assessed through direct observation using a tool developed for this purpose – the Myers Research Institute Engagement Scale (MRI-ES). These residents with dementia displayed the ability to successfully take part in IGP. Most successfully presented “lessons” to the children in their dyads, similar to the way that Montessori teachers present lessons to children, while persons with more severe cognitive impairment took part in IGP through other methods such as parallel play. Taking part in IGP was consistently related with higher levels of positive engagement and lower levels of negative forms of engagement in these residents with dementia than levels seen in standard activities programming on the unit. Implications of using this form of IGP, and directions for future research, are discussed.

**Keywords:** Montessori-based activities, intergenerational programming, engagement, dementia

Caregivers often have expressed anxiety regarding provision of intergenerational activities to persons with dementia, especially those activities involving young children. Concerns have involved agitation, frustration, or aggressiveness potentially being demonstrated by older adults in these contexts, while children have been expected to show confusion or apprehension when interacting with persons with dementia (eg, Seefeldt 1987). Salari (2002) found that when clients in adult day centers and children were treated as status equals during intergenerational programs (IGPs), and the activities and environments were only child oriented, infantilization of adult clients often occurred. Older adults needed an “escape option” when contact with children was either age inappropriate or overstimulating.

Middlecamp and Gross (2002), comparing children 3–5 years of age enrolled in daycare programs with or without IGP involving older adults, found that both groups rated older adults less positively than younger adults, and believed that older adults could participate in fewer activities than children could. Regarding children in IGP, caregivers have been challenged to provide environments which were stimulating yet safe, especially when older adults did not want to discipline or be overstimulated by children (Berk 2003; Santrock 2004). As a result, many IGPs have been designed to involve passive participation by persons with dementia, such as having older adults observe a group of children sing or perform, without one-on-one interaction between members of different generations.

Correspondence: Cameron J Camp  
Myers Research Institute, 27100 Cedar  
Road, Beachwood, OH 44122, USA  
Tel + 1 216 839 6632  
Fax + 1 216 595 7331  
Email ccamp@myersri.com

However, there are potential benefits to be achieved from more interactive IGP between children and adults with dementia. For example, intergenerational activities increased social responses in persons with dementia (Newman and Ward 1993; Short-DeGraff and Diamond 1996; Ward et al 1996). Jarrott and Bruno (2003) examined effects of a program at a co-located site which provided care during the day for preschool children and adults with dementia, in which IGP was a daily occurrence five days per week. They found that IGP was associated with significantly higher levels of positive affect in older adults with dementia compared to non-IGP activities. Gigliotti et al (2005) created a similar summer intergenerational program for persons with dementia and preschool children that was viewed as very beneficial to all parties.

A key issue in determining how to develop successful IGP for older adults with dementia and younger children is to determine how to structure interactions to provide positive results. Discussing general adult day center populations, Salari (2002) noted that positive IGP experiences involved providing a mentoring role for older adults, voluntary participation, and client-initiated contact with children. Applying these principles, Camp et al (1997) conducted an intergenerational program for nine residents on a special care dementia unit of a skilled nursing facility, three adult day center clients with dementia, and fourteen preschool children using Montessori-based activities. Such activities were structured to match the physical and cognitive capabilities of both the older adults and the children. For example, residents taught children how to perform activities of daily living and self-care (eg, folding clothes and/or hanging them up, cleaning a mirror or glasses, how to blow your nose using a tissue), motor skills (eg, using tools such as wrenches, screwdrivers, locks and keys, etc.; transferring objects using chopsticks), cognitive exercises (eg, sorting items into categories – summer or winter, happy or not happy, living or not living), sensory experiences (eg, practicing scent identification, sound identification, distinguishing rough from smooth), language and math skills (eg, learning phonics or one-to-one number and object correspondence), etc. Residents displayed no instances of aggression, confusion, or anxiety while working with these children. Apathy, as operationalized by a measure of disengagement (sleeping or staring into space for more than 10 s), was frequently observed in residents outside of IGP, but never was seen during IGP.

Montessori-based activities for persons with dementia have been described in detail (Camp 1999, 2006; Camp et al 1999, 2006; Plautz and Camp, in press). In essence, the

application of the Montessori method of educating children (developed by Maria Montessori) to the design of activities for persons with dementia involves principles of rehabilitation. Montessori-based activities involve task breakdown, provision of materials to manipulate, use of external cuing, and matching tasks to the capabilities of the individual to help decrease either boredom or frustration, which are root causes of problematic behaviors in persons with dementia. When combined with interacting with young children, the structure provided by this programming works to increase engagement in these older adults with dementia compared with other forms of programming (eg, Camp et al 1997, 2004).

Camp et al (2004) further examined the effects of Montessori-based activities used in IGP between fifteen persons with dementia in an adult day center and thirteen preschool children. In that study, persons with dementia showed more positive forms of engagement and affect, and less disengagement, than in standard day center programming. The current study represents an extension of that research to examine effects produced by this form of IGP for residents of a special care dementia unit within a skilled nursing facility. In addition, this study represents an extension of the Camp et al (1997) research. In their original study, only disengagement was assessed. In the current study, a variety of different forms of engagement were assessed in addition to disengagement. Thus, we wanted to determine if the findings of Camp et al (1997) could be replicated and extended into the domain of positive forms of engagement.

## Method

### Participants

Older adult participants were 14 nursing home residents on a dementia special care unit at a skilled nursing facility. All older adult participants had a diagnosis of dementia, were medically stable to participate in unit activities, and had family members who provided consent for study participation. Older adults provided assent for each IGP session. Older participants were all Caucasian, predominantly female (93%), and ranged in age from 85 to 94 years ( $M = 90.29$ ,  $SD = 2.89$ ). Most of these participants had at least a high school degree (57%), though 43% did not complete high school. A majority of older participants had a diagnosis of either probable or possible Alzheimer's disease (86%), while the rest had a diagnosis of possible vascular dementia (14%). Scores on the Mini-Mental State Exam (MMSE) (Folstein et al 1975) ranged from 5 to 25 ( $M = 14.57$ ,  $SD = 5.09$ ), indicating minimal to severe cognitive impairment. Fifteen children from the facility's on-site child

care center also took part in the study, with parental consent. Children provided assent for each IGP session. Children ranged in age from 2 ½ to 5 years.

## Screening

All older participants were administered the Myers Menorah Park/Montessori Assessment System (MMP/MAS) (Camp et al 1999; Orsulic-Jeras et al 2000). The MMP/MAS is a qualitative measure that assesses one's ability to perform seven Montessori-based activities, based upon current cognitive, sensory, motor, and social functioning. Examples of such activities include: searching for coins hidden in a tub of grain; scooping and transferring golf balls; transferring cotton balls with tweezers; sorting photographs into categories (Living or Not Living; Happy or Not Happy); sorting shapes of different types and sizes; and arranging objects in order according to their lengths.

The MMP/MAS was used to determine which types of Montessori-based activities would be most appropriate for older participants during the intergenerational Montessori-based activities programming. In addition, the MMP/MAS was administered to each of the children participating in the study. This was done to determine the types of Montessori-based activities that they could successfully engage in, and this information was used to create matches between older-adult/child dyads and the activities that would be the focus of their IGP work.

## Materials and procedures

At study entry, older participants were randomly assigned to one of two groups, based upon what order they would receive treatment. Group 1 received the 6-month control condition of regular unit activities programming first, followed by 6 months of intergenerational Montessori-based treatment. Group 2 received the 6-month intergenerational Montessori-based treatment first, followed by the 6-month control condition of regular unit activities programming. Independent samples t-tests revealed no significant differences between Groups 1 and 2 in age and MMSE score at study entry. Chi-square analyses also showed no significant differences between Groups 1 and 2 in gender, type of dementia diagnosis, and education level.

### Treatment and control conditions

Intergenerational Montessori-based activities programming functioned as the treatment condition. Activities paralleled those described earlier in the Camp et al (1997) study. Treatment took place on the unit and was scheduled to fit within

the pre-existing unit activity schedule. During treatment, two to five older adult-child dyads worked together, with each dyad usually working on three different Montessori-based activities during a session. Each treatment session lasted a total of 20 min. The goal of Montessori-based intergenerational programming was for the older adult and child to work together on activities, with minimal assistance from research staff.

A typical interaction between an older adult and child included cooperative completion of Montessori-based activities while informally socializing with each other. Higher functioning older adults typically demonstrated and explained the activities to their child, and then assisted the younger child of their dyad in completing the activities. Researchers gave these residents practice in the procedure of demonstrating and explaining activities before pairing older adults with children.

In those instances where cognitive deficits (usually combined with expressive communication difficulties) precluded residents from readily demonstrating and explaining the activities, we found that treatment programming still could be implemented. In these cases, lower functioning older adults tended to either work in parallel with children or were given assistance by older children during activities so that activities could be cooperatively completed by the dyad members. Research staff functioned primarily to facilitate interactions between dyad members, as needed. This included selecting appropriate Montessori-based activities, introducing the older adult to the child, and transitioning from one Montessori-based activity to the next.

Regularly scheduled unit programming functioned as the control condition. Regular unit programming consisted of a range of individual, small, and large group activities led by unit activities staff. Such activities included exercise, discussion groups, singing, gardening, and on occasion, special religious programming.

### Observational data-outcome measures

#### Myers Research Institute Engagement Scale (MRI-ES)

The MRI-ES (Judge et al 2000; Orsulic-Jeras et al 2000) was used to assess the type and duration of engagement exhibited by older adults as they participated in both regularly scheduled unit activities and intergenerational Montessori-based activities. Researchers observed each older participant's engagement for periods of 5 min while they participated in activities, either standard activities programming or IGP programming. The duration of engagement types (described next) observed during each 5 min observation window was

recorded electronically using a hand-held event recorder. The duration of engagement could range from 0 to 300 s for each type of engagement in each observation window.

The MRI-ES evaluates five different types of engagement through direct observation: constructive engagement (CE), passive engagement (PE), active engagement (AE), self-engagement (SE), and non-engagement (NE). CE was defined as any motor or verbal behavior that was observed directly relating to the activity in which an older adult was participating (eg, talking to their child partner in IGP, handling materials related to activity). PE was defined as listening or looking behavior that was observed directly relating to the activity in which an older adult was participating (eg, watching or listening to their child partner in IGP). AE was defined as any motor or verbal behavior that was observed in an older participant in response to the environment, but not focused on the activity (eg, talking to others while ignoring their child partner and/or the activity at hand, handling non-activity related materials). SE was defined as any motor or verbal behavior that was observed in an older participant in response to themselves, but not focused on an activity (eg, picking at buttons on clothing, picking at teeth, etc while ignoring the activity). NE was defined as any observed behavior that indicated lack of attention to external stimuli (eg, staring off into space, keeping eyes closed, sleeping).

Observations of older participants engagement in activities were conducted 2 days a week, at three different times of day: (a) before intergenerational Montessori-based activities, (b) during intergenerational Montessori-based activities (while “control” participants were taking part in regular unit programming), and (c) after intergenerational Montessori-based activities. Researchers observed each older participant’s engagement for periods of 5 min while they participated in activities at each of these three times of day.

### Design

Data were analyzed using a  $2 \times 2 \times 3$  mixed model ANOVA design. This involved the between-subjects factor of Group (Group 1 received 6 months of regular unit programming first, then 6 months of Montessori-based intergenerational programming, while Group 2 received 6 months of Montessori-based intergenerational programming first, followed by 6 months of regular unit programming). Two within-subject factors also were involved: Programming Type (treatment of intergenerational Montessori-based activities programming vs. control of regular unit activities programming) and Time of Observation (before, during, and after the time when

intergenerational Montessori-based activities programming took place).

## Results

For each older participant within each type of programming, a mean score was calculated for all observations taken before, during, and after the time programming occurred. Thus, each older participant had six scores for each kind of engagement observed: scores for before, during, and after the participant received the control condition of regular unit programming, as well as scores for before, during, and after the participant received the treatment of intergenerational Montessori-based programming. The Group effect was used to determine whether the order in which participants received treatment or control programming influenced outcomes. To guard against Type I error when interpreting results, only significance levels  $\leq 0.01$  are reported.

### Effects on engagement

An overarching finding was that during IGP, the predominant form of engagement displayed by older adults with dementia was CE, followed by PE. Other (more negative) forms of engagement were relatively nonexistent during IGP. During regular activities programming, CE was rarely observed, with negative forms of engagement predominating. This pattern is demonstrated in the large number of significant Programming Type  $\times$  Time of Observation interactions. Means and standard deviations associated with results on the MRI-ES are shown in Table 1.

### Constructive engagement

A multivariate approach to repeated measures ANOVA revealed significant main effects for Programming Type ( $F(1,12) = 456.97, p \leq 0.001$ ) and Time of Observation ( $F(2,11) = 209.93, p \leq 0.001$ ). However, these main effects were subsumed by a significant Programming Type  $\times$  Time of Observation interaction ( $F(2,11) = 208.62, p \leq 0.001$ ).

Post-hoc paired samples t-tests were conducted to compare CE elicited by intergenerational Montessori-based activities programming to that of regular unit activities programming at each observation time. More CE was observed during the intergenerational Montessori-based activities programming compared to that of regular unit activities ( $t(13) = 22.90, p \leq 0.001$ ). Thus, residents with dementia were more constructively engaged with activities during the intergenerational Montessori-based programming than regular unit programming. No significant differences in CE



**Table 1** Mean (SD) duration of observed engagement in seconds as a function of type of programming and time of observation

Type of Engagement	Time of Observation	Type of Programming	
		Intergenerational Montessori-Based Activities Programming	Regular Unit Activities Programming
CE	Before	0.00 (.00)	0.03 (0.12)
	During*	265.34 (23.13)	55.02 (42.64)
	After	0.49 (1.81)	0.20 (0.75)
PE	Before	59.29 (37.64)	67.18 (33.24)
	During*	31.45 (19.55)	96.97 (41.27)
	After	75.44 (40.76)	74.43 (39.53)
AE	Before	70.90 (63.35)	66.26 (61.55)
	During*	0.61 (0.90)	42.91 (24.35)
	After	90.98 (54.69)	78.52 (57.58)
SE	Before	36.52 (31.33)	40.32 (37.44)
	During*	1.42 (1.70)	46.46 (35.59)
	After	33.71 (33.13)	51.96 (32.58)
NE	Before	76.90 (56.95)	62.08 (39.55)
	During*	1.18 (4.41)	48.83 (32.32)
	After	33.01 (32.27)	41.25 (25.31)

**Note:** \* indicates that Intergenerational Montessori-based activities programming significantly differs from regular unit activities programming,  $p \leq 0.001$ .

were found for programming type in the “before” or “after” time periods.

### Passive engagement

Repeated measures ANOVA using a multivariate approach on PE indicated a significant main effect for Programming Type ( $F(1,12) = 15.18, p \leq 0.005$ ). Again, this main effect was subsumed in a significant Programming Type  $\times$  Time of Observation interaction ( $F(2, 11) = 19.83, p \leq 0.001$ ). Post-hoc paired samples t-tests revealed that residents with dementia showed less PE during intergenerational Montessori-based activities program than during regular unit activities programming ( $t(13) = 6.55, p \leq 0.001$ ). Both types of programming showed similar amounts of PE in the “before” and “after” time periods.

### Active engagement

Repeated measures ANOVA using a multivariate approach on AE showed a significant main effect for Time of Observation ( $F(2,11) = 41.30, p \leq 0.001$ ). Again, this effect was mitigated by a significant Programming Type  $\times$  Time of Observation interaction ( $F(2,11) = 30.84, p \leq 0.001$ ). Follow-up paired samples t-tests showed that residents with dementia exhibited less AE during intergenerational Montessori-based activities programming than during regular unit activities programming ( $t(13) = 6.62, p < 0.001$ ). No significant

differences were found between programming types in the “before” or “after” time periods.

A significant Group  $\times$  Time of Observation interaction also was found ( $F(2, 11) = 9.13, p \leq 0.005$ ). Follow-up independent samples t-tests, adjusted for inequality of variances, indicated that Group 1 (individuals who had received regular unit activities programming first, then intergenerational Montessori-based activities programming) tended to show less AE in the “after” time period than Group 2 (individuals who had received intergenerational Montessori-based activities programming first, followed by regular unit activities programming), though this effect only approached statistical significance ( $t(4.43) = 2.53, p \leq 0.06$ ).

### Self engagement

A significant Programming Type  $\times$  Time of Observation interaction was found for SE using a multivariate approach to repeated measures ANOVA ( $F(2,11) = 11.59, p \leq 0.002$ ). Post-hoc paired samples t-tests indicated that less SE was observed in residents with dementia during intergenerational Montessori-based activities programming than regular unit activities programming ( $t(13) = 4.70, p \leq 0.001$ ). No significant differences were found between programming types in the “before” and “after” time periods.

### Nonengagement

A multivariate approach to repeated measures ANOVA showed a significant main effect for Time of Observation ( $F(2, 11) = 12.56, p \leq 0.001$ ). Again, this main effect was mitigated by a significant Programming Type  $\times$  Time of Observation interaction ( $F(2,11) = 6.72, p \leq 0.01$ ). Follow-up paired samples t-tests revealed that older participants showed significantly less NE during intergenerational Montessori-based activities programming than regular unit activities programming ( $t(13) = 5.56, p \leq 0.001$ ). No significant differences were found between programming types in the “before” and “after” time periods.

## Discussion

The conclusions to be drawn from this study are relatively straightforward. IGP between older residents with dementia and younger children can be successfully developed using Montessori-based activities as the interface between dyads. This approach enabled long-term care residents with dementia to be successfully engaged in one-to-one dyads with preschool children, even for older adults with more advanced cognitive deficits. This approach elicited higher levels of positive (ie, constructive) engagement and lower

levels of negative (ie, merely passive or non-activity focused) engagement in long-term care residents with dementia than standard activities programming.

In addition, over the time frame of this study, there were no significant main effects for Group and only one factor interacting with group reached significance for only one form of engagement (AE). To the extent that the study was conducted over twelve months, these results imply that any decline in overall function among older adult participants during this time frame was not reflected in their ability to be positively engaged during IGP. Longer time frames for similar IGP between children and persons with dementia would have to accommodate changes in cognitive and physical functioning in both older adults and children. However, the use of Montessori-Based Dementia Programming®, combined with updated data gathering using the MMP/MAS to keep matching members of dyads over time, holds promise for being able to accommodate such changes.

Research using Montessori-Based Dementia Programming®, of which this IGP was one example, has consistently shown that this approach to providing activities for persons with dementia creates better levels of engagement than standard activities programming (Camp et al 1997, 2004; Judge et al 2000; Orsulic-Jeras et al 2000; Rose et al 2003; Camp and Skrajner 2004; Camp 2006; Plautz and Camp, in press). Indeed, this study showed that residents, on average, were constructively engaged for almost 5 times longer during intergenerational Montessori-based activities compared to regular unit activities programming (265 s vs. 55 s). Persons with dementia (as well as preschool children) are especially sensitive to their immediate environments. We believe that environments that provide structure, order, meaningful social roles and the chance to display competence are associated with lower levels of problematic behavior than less structured and less stimulating settings (eg, Williams et al 1995). However, it is important to remember that work must be done ahead of time to thoughtfully prepare activities that match participants (eg, Hayes 2003).

Future studies in this area will address some of the limitations of the current study. For example, while the MRI-ES assessed engagement in older adults during IGP, it did not assess interaction per se (eg, number and type of verbalizations, demonstrations, feedback and direction given to children, etc.). More fine-grained analyses of the types of interactions occurring between older adults with dementia and children in the context of Montessori-based activities is needed. In addition, the focus of the current study was on whether older adults with dementia would be more engaged

during IGP than during regular (non-IGP) activities. Future research should examine engagement of children during IGP activities using the MRI-ES or an equivalent instrument, as well as analyzing the types of interactions between children and adults with dementia during such programming. IGP provides mutual benefit to children and adults, as well as achievement of goals by all participants, and this should be documented (eg, Kuehne 2003).

Another task is to determine whether effects produced in the present study are due to the use of Montessori-based activities per se, IGP per se, or their combination (as was the case in the current research). For example, the same participants could be taking part in Montessori-based activities that do and do not involve IGP, as well as non-Montessori-based activities that do and do not involve IGP.

Finally, we wish to formalize the means of determining whether a person with dementia should take the role of presenter of a lesson or an alternative role when interacting with a young child. This is needed to strike the balance between providing a role in which a person with dementia can succeed and preventing infantilization from taking place (Salari 2002).

## Notes

This research was supported by grant R21 MH57851 from the National Institute of Mental Health (C Camp, PI). The authors wish to extend their sincerest thanks to the staff and residents of Menorah Park Center for Senior Living, and to the staff and children of the FUNdamentals Child Care Center of Menorah Park, as well as the children's parents. This project was truly an intergenerational effort.

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