Engelman, Altus, and Mathews (1999) evaluated a procedure to ensure that staff checked in with elderly residents in a nursing home and offered activity choices. We report findings of a replication, with some additional components, to increase appropriate activity engagement among 5 residents (aged 77 to 83 years) with severe dementia. Evaluated in a concurrent multiple baseline design across participants that incorporated partial withdrawal phases, activity engagement increased for 3 participants, with modest improvement for 1 other participant. The 4 responders all engaged in a wider variety of activities during intervention.

Key words: elderly, dementia, nursing homes, engagement, activities

Dementia is an umbrella term for a number of neurodegenerative disorders, including Alzheimer’s disease. Worldwide, 35.6 million elderly people lived with dementia in 2011 and, by 2050, 115.4 million may be affected (World Health Organization, 2012). Because the problems associated with dementia affect the individual’s ability to live independently and may preclude family members from caring for the individual, many of these individuals reside in nursing homes. Elderly people who live in nursing homes typically exhibit low levels of activity engagement, which are associated with declines in verbal and self-care skills (McClannahan & Risley, 1975), increased problem behaviors (Cohen-Mansfield, Marx, & Werner, 1992), and reduced positive affect (Moore, Delaney, & Dixon, 2007). Although applied behavior analysts have developed effective procedures for improving socially significant behaviors in a range of other populations, their application with the elderly has been sparse (Trahan, Kahng, Fisher, & Hausman, 2011).

Engelman, Altus, and Mathews (1999) showed that a check-in procedure increased appropriate activity engagement for all five residents of a dementia care facility who participated. The procedure included (a) staff checking in (making personal contact) with residents at least every 15 min; (b) providing praise if the resident was appropriately engaged in an activity; and (c) if he or she was not engaged, providing a choice between at least two activities. LeBlanc, Cherup, Feliciano, and Sidener (2006) also used a choice procedure to increase engagement of three men with dementia and reported increased activity engagement. Although their procedure did not include staff check-in or praise, leisure items were selected after extensive preference and engagement assessments to bolster the desirability of the choices. Although it is certainly useful, detailed preassessment of activities may limit wide application due to low staffing or limited staff training. In contrast, the check-in procedure requires no formal assessments, although informal preference assessments may be helpful and more feasible for staff. The purposes of our study were to add to the extant literature regarding behavior-analytic interventions for
individuals with dementia and to conduct a systematic replication and extension of the check-in procedure.

**METHOD**

**Setting and Participants**

The study was conducted in three adjoining living areas of a facility that housed 24 individuals with dementia. Joseph was 83 years old and had a diagnosis of vascular dementia. Molly, Paige, and Heather were 77, 83, and 81 years old, respectively, and had diagnoses of dementia of the Alzheimer's type. Geoff was 81 years old with a diagnosis of unspecified dementia. Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) scores were 2 for Joseph; 0 for Molly, Paige, and Heather; and 3 for Geoff (scores under 10 indicate severe cognitive impairment). All participants were ambulatory and had limited verbal behaviors. Participants were selected because they usually were sedentary and did not engage with leisure activities.

**Behavioral Definitions and Measurement**

*Appropriate engagement* was defined as (a) engaging with or attending to recreational material or material connected with daily-living activities in a way that served its intended purpose, or (b) taking part in a group activity either by carrying out the activity or orienting to the activity. *Inappropriate engagement* was defined as manipulating recreational or daily-living activity materials in a way that did not serve their intended purpose (e.g., tearing magazines) or engaging in problem behavior (e.g., aggression).

Sessions lasted 70 min and occurred weekdays, 10:00 a.m. to 12:00 p.m. or 2:00 p.m. to 4:00 p.m., outside scheduled physical care or mealtimes, and randomly alternated between morning and afternoon. A modified 30-s time-sampling procedure allowed the observer 20 s to locate the participant and prepare to observe, 3 s to observe current behaviors, and 7 s to record. If engagement was recorded, the activity was noted. The number of different activities was tallied within and across sessions. Participants were observed sequentially, with each participant observed once every 2.5 min for 10 min. The observer did not record for the next 5 min. The sequence of observation was changed to a different random order after each 15-min cycle and recording restarted. Observational intervals were omitted from analyses if a participant was in the bathroom or was not located for a scheduled observation.

*Interobserver agreement.* Interobserver agreement data were collected for at least 30% of sessions for each participant. An agreement was scored if both observers recorded the same type of engagement; otherwise a disagreement was scored. Interobserver agreement was calculated by dividing the number of agreements by the total number of agreements plus disagreements and converting the result to a percentage. Mean agreement across participants was 93% (range, 87% to 97%) during baseline and 96% (range, 92% to 100%) during intervention.

**Procedure**

Check-in was evaluated with a concurrent multiple baseline design across participants. We also incorporated a withdrawal phase (i.e., return to baseline) with Joseph and Molly. Before data collection, we provided information about the study to family and staff members and gained informed consent. We also discussed with them each participant’s preferences among the types of activities and leisure materials available at the facility. We did not introduce any new activities during the study.

*Baseline.* Group activities (e.g., games), daily-living activities (e.g., food preparation), and activity materials (e.g., crafts) were available, but materials were not necessarily placed within reach of the participant. Staff did not receive any instructions, but were aware of the purposes of data collection.

*Check-in.* The researcher checked in with every participant in rotation every 15 min for
60 s each during the 5-min break from recording engagement. If a participant was appropriately engaged at the start of their check-in time, the researcher provided 60 s of behavior-specific praise and individual attention. If the participant was not engaged or inappropriately engaged, the researcher held out materials relevant to two different preferred activities in front of the participant and asked him or her to pick one. If, due to the nature of an activity (e.g., group singing), tangible materials could not be offered, then the participant was asked to choose between two activities. Participants’ choices were defined by verbal or physical expressions of preference for one activity (e.g., saying the name of, pointing at, or reaching for the activity).

If the participant made a choice, the researcher immediately provided the necessary materials or guided the participant to the activity with praise for choosing. The researcher then used a verbal, gestural, or model prompt if the participant did not engage with the activity. If both activities were chosen, both were provided. If the participant did not make a choice within 30 s or indicated that he or she did not want to engage in activities, the researcher placed some leisure materials within reach. Data collection commenced after all participants had received their first check-in.

Staff training. A direct-care staff member with 5 years of experience received written instructions for conducting the check-in procedure, after which the researcher modeled the procedure and invited questions. The staff member practiced using role-play and received immediate feedback on her performance during a 30-min training session. Subsequently, the staff member implemented the procedure with Joseph, Paige, and Geoff. Molly, who moved to hospital care, and Heather, whose data had not demonstrated benefits from the intervention, did not participate further. Follow-up observations for Paige and Geoff were conducted 2 and 5 weeks after staff training. Joseph did not participate in the follow-up phase because he also had been moved to hospital care.

Treatment Integrity

During 20% of intervention sessions, the components (i.e., check-in, participant engaged and praise given, or participant unengaged and choice offered) were scored as occurring or not occurring by a second observer. Treatment integrity was calculated by dividing the number of correct occurrences by the number of check-ins scheduled and converting the result to a percentage. Treatment integrity was 100%.

RESULTS AND DISCUSSION

Figure 1 depicts the percentage of time samples in which participants were appropriately and inappropriately engaged across sessions. Joseph displayed low levels of appropriate engagement during the initial baseline phase (range, 0% to 12%). Appropriate engagement immediately increased when check-in was initiated (range, 22% to 83%). These effects were replicated when the intervention was withdrawn and then reintroduced.

Molly also displayed low levels of appropriate engagement during baseline (range, 0% to 22%). Appropriate engagement increased when the check-in procedure was instituted (range, 14% to 47%). Subsequent baseline and intervention sessions showed similar effects, although engagement was more variable in the second intervention.

For Paige, appropriate engagement was observed between 0% and 50% of observations during baseline. Sessions with relatively high engagement during baseline (Sessions 15 and 21) resulted from Joseph handing her the activity materials that he had selected at check-in. Levels of appropriate engagement were generally higher during check-in with Paige (up to 67%), except in comparison to Sessions 15 and 21.

Heather maintained low levels of appropriate engagement through baseline (range, 0% to 7%) with no change during the check-in procedure. Geoff’s engagement was zero during 25 of 30 baseline sessions. During Sessions 15 and 31,
another participant shared materials, producing higher (up to 31%) engagement. Geoff was more consistently engaged during his 13 check-in sessions, with 11 nonzero data points.

Levels of appropriate engagement were maintained in the staff handover conditions with Joseph, Paige, and Geoff. All participants (except Heather) engaged with a wider variety of...
available activities during check-in sessions than during baseline (Figure 2).

We did not find reasons for variability in levels of engagement within procedural phases for participants. Analyses, not reported here, showed no effect of time of day. Across participants and sessions, mean appropriate engagement increased from 5% in baseline to 27% with intervention, compared with increases from 41% to 81% in Engelman et al. (1999) and 39% to 85% in LeBlanc et al. (2006). Despite higher absolute levels of engagement with check-in reported in previous studies, the relative increase from baseline to check-in of 440% in our study still may be socially significant. Overall, mean inappropriate engagement across all participants was reduced from 5% during baseline to 1% during check-in. In contrast, the participants in Engelman et al. exhibited <1% inappropriate engagement in baseline and none during intervention. A variable that may account for lower appropriate engagement and higher inappropriate engagement in the current study was the difference in participants’ overall impairment, as indicated by MMSE scores. The range of MMSE scores for participants in the Engelman et al. study was 4 to 19 and was 7 to 17 in LeBlanc et al., compared with 0 to 3 for our participants. Therefore, all our participants were more severely impaired than any of those in studies with which we compared results.

The check-in procedure we used was not an exact replication of that described by Engelman et al. (1999). First, albeit informally, we obtained staff and family opinions regarding participants’ preferences before intervention. Second, if participants did not choose either activity offered, materials for at least one activity were left within reach. Third, if participants selected an activity but did not engage with it, they were prompted. Any or all extensions to the check-in procedure may have affected the findings (e.g., placing leisure materials within reach of participants at the start of the 70-min observation session may have increased engagement without

![Figure 2. Number of activities with which participants engaged during baseline and intervention sessions.](image-url)
requiring the check-in every 15 min). Component analyses would be helpful in defining the essential facets of the procedure.

Another limitation was that the check-in procedure did not become part of the regular routine in the facility. The same outcome occurred following Engelman et al. (1999; reported in Altus, Engelman, & Mathews, 2002). Altus et al. (2002) speculated that facilities prefer not to invest in staff training, despite the check-in procedure being quite simple. A further possibility is that monitoring activity engagement among participants was not a requirement for facility accreditation; therefore, there were no external contingencies operating to measure and enhance activity levels.

Our data show that the check-in procedure may be beneficial for some participants with advanced dementia. Individuals who do not respond to a universal intervention, such as check-in, may require a more intensive individualized function-based approach (e.g., LeBlanc et al., 2006).

REFERENCES


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