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Effects of check-in interval on active engagement in people with dementia

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Abstract

Social isolation and a lack of engagement in activities are common among people with dementia living in residential care. The check-in procedure, in which staff approach a resident to offer a choice of activities and praise engagement every 15 min, is effective in increasing engagement. However, the schedule effects of the check-in procedure have not been previously evaluated. We assessed whether the check-in procedure was effective with an extended check-in interval of 30 min. We found that the procedure remained effective with a leaner schedule and that engagement persisted above baseline levels between check-in interactions. Staff reported that the intent to increase engagement was valuable and that the procedure was easy to implement. We discuss our findings in the context of participatory interventions for dementia and the potential role of organizational factors in the adoption of evidence-based procedures in dementia care.

KEYWORDS
check-in procedure, dementia, engagement, major neurocognitive disorder, social validity

1 | INTRODUCTION

Many studies have shown that prompts, contingent praise, and choice can increase activity engagement in older adults in residential care. The check-in procedure designed by Engelman et al. (1999) comprises approaching a person every 15 min and, if the person is engaged, providing praise for engagement. If the person is not engaged, they are offered a choice between two activities; the assistant praises the participant for their choice and provides the selected activity. Engelman et al. showed that check-ins increase engagement in people with moderate and severe dementia. Engstrom et al. (2015) found that the check-in procedure increased the number of activities in which people with dementia engaged and decreased inappropriate engagement. Despite these findings, both Engelman et al. and Engstrom et al. reported that the procedure did not continue to be implemented by staff after the end of their studies.

Several factors influence the likelihood that an intervention might continue beyond its initial introduction. For example, the high level of turnover in staff caring for older adults is highly correlated with deficiencies in the quality of care and the occurrence of problem behavior (Lerner et al., 2014). The continued implementation of behavioral programs becomes challenging with a constantly changing workforce. Second, the acceptability of an intervention (i.e., social validity) affects its potential for uptake by frontline caregivers. For example, Landreville and LeBlanc (2010) found that older adults' ratings of the acceptability of pharmacological intervention (risperidone), differential reinforcement, and direct interaction were affected by the severity of the verbal aggression targeted for intervention. However, the literature offers mixed results on the link between perceived social validity and staff uptake (Snodgrass et al., 2018). For example, Baker and LeBlanc (2011) found no differences in staff-reported acceptability of behavioral, pharmacological, and sensory interventions in nursing care. Kennedy (2002) argued that maintenance is a key indicator of social validity. However, in the residential dementia care context, organizational contingencies may be more relevant to continued program implementation than social validity per se. For example, various studies have identified heavy workloads and understaffing as key drivers of care workers retention (see a recent review by Thwaites et al., 2023). This evidence is consistent with our informal interactions with frontline staff while managing supervised practica in residential settings many years. Specifically, ease of implementation has been often mentioned as a factor for age care worker compliance and management buy in and top-down adoption.

A potential approach to facilitate staff adoption of the check-in procedure might be to use a leaner check-in schedule, provided that its effectiveness remains unaffected. Our study aimed to evaluate the procedure with 15-min and 30-min check-ins. We also asked staff to rate the social validity of each of these procedural variations to determine whether a leaner schedule had an impact on staff acceptability.

2 | METHOD

2.1 | Participants and setting

Our participants were three women diagnosed with a major neurocognitive disorder. Margaret was an 81-year-old woman diagnosed with Alzheimer's disease with comorbid depression and psychotic symptoms. She scored nine on the Mini-Mental State Examination (MMSE; Folstein et al., 1975), indicating severe cognitive impairment. Margaret was able to communicate in full sentences and could mobilize with support. Judy was a 95-year-old woman with a diagnosis of unspecified dementia. She scored three on the MMSE (indicating severe impairment), was diagnosed with dysphasia and had experienced a left temporal frontal stroke. Judy was ambulatory but had impaired language comprehension and generation. Louise was a 78-year-old woman with a diagnosis of unspecified dementia, severe anxiety, and depression. She was ambulatory with a walker and had unimpaired vocal verbal behavior. Louise scored eight on the MMSE (indicating severe cognitive impairment).

Participants lived in homes in a nursing home village with between 15 and 25 residents, each with a communal lounge and dining area. Staff hosted 1-h sessions three times a week (e.g., physical exercise, nail painting, watching

films). We conducted our sessions outside these times. Staff responsible for activities (different from care staff and not involved in our study) were assigned to each house and rotated houses every 3 months. We conducted sessions in the communal areas of the home.

2.2 | Materials and equipment

An iPhone 6 with the app "IntervalTimer"™ was used with headphones attached to record each 10-s interval. The application vibrated or buzzed when the 10-s interval was finished. We used activities already available in the nursing home, including bingo, balloons, coloring, word searches, music through headphones, books, and magazines. To select items to be included, we asked the participants and their caregivers what they enjoyed from the items available in the home.

2.3 | Measurement and interobserver agreement

2.3.1 | Direct observation

We recorded appropriate engagement, defined as physically interacting with or orienting towards leisure materials and objects associated with daily living routines in a way that serves its intended function (e.g., reading a magazine, coloring in a picture, or putting rubbish in the bin). We did not include interacting with other residents as appropriate engagement except when interacting with activity materials (e.g., discussing a magazine with someone else while screening through its pages). We measured appropriate interaction with 10-s partial interval recording. Intervals were paused during the delivery of the intervention (check-in procedure) and restarted afterward. We also measured choice in each check-in (recorded as percentage of trials), defined as verbally or physically expressing preference for one item over another (e.g., saying "puzzle" or nodding towards the puzzle).

A second observer recorded the target response in 30% of sessions. We scored an agreement if the two observers both scored a response or both scored no response in that interval. We calculated interobserver agreement (IOA) by dividing the number of intervals in which both observers agreed by the total number of intervals in the session and dividing by 100. The mean IOA was 98% (range 79%–100%). A second observer measured procedural integrity in 27% of all sessions by recording whether the first author implemented each step of a task analysis of the procedure. Procedural integrity was 100% across all steps and sessions. Task analysis available from the authors upon request.

2.4 | Procedure

2.4.1 | Baseline

No environmental changes were implemented during baseline. Staff were asked to refrain from changing any routines or activities. Baseline sessions were 30 min in duration.

2.4.2 | Check-in procedure

We randomly allocated the first session of the intervention phase for each participant to comprise either 15-min or 30-min check-ins. After that, we alternated between the two check-in schedules. We identically conducted check-

ins across sessions; only the duration between check-ins varied (15 or 30 min). During a check-in, the first author approached the participant. If a participant was engaged with an activity during a check-in, we provided praise and engaged in the activity with the participant for 60 s (e.g., "Good job with that puzzle, I think this piece might go here"). The topography of praise was selected for each participant based on the phrasing and tone typically used by staff in the care home.

If they were not engaged in an activity, we offered them a choice between two activities (e.g., "Would you like a magazine or a puzzle?" while presenting the two objects). If the participant made a choice, the first author provided praise (e.g., "Good choice, this puzzle looks like a good one"). If, after 5 s, the participant had not started to engage with the activity, we first provided a model prompt (e.g., we demonstrated putting two puzzle pieces together). If no engagement occurred after 5 s, we provided a gestural and verbal prompt (e.g., pointing to the puzzle pieces and saying, "Put these two pieces together"). If, after 5 s, the participant had not engaged with the activity, we provided a physical prompt (e.g., taking the participant's hands and guiding them to connect the puzzle pieces and put one puzzle piece in the other).

If the participant chose both activities, we gave them both and selected one at random for which to prompt engagement. If a participant did not engage with a selected item after we had delivered the prompting hierarchy or made no choice, we waited for 30 s, then left the items with them and walked away (e.g., "I will just leave these here in case you change your mind"). We could offer two given activities multiple times within a session. However, the two activities offered in a check-in always differed from those offered in the previous check-in.

2.5 | Experimental design

We used a multiple baseline across participants with an embedded multi-element design (Wacker et al., 1990). Baseline sessions were 30 min in duration, and intervention sessions were 60 min in duration. We conducted sessions between breakfast and lunch (9–11.30 a.m.) and lunch and dinner (1 and 4 p.m.) on weekdays.

2.6 | Social validity

We provided a social validity questionnaire to staff at the end of the study. The questionnaire comprised a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). We designed the questionnaire to assess the social validity of addressing engagement in people with dementia, the ease of the check-in procedure, and the likelihood that it would continue in use.

3 | RESULTS

Figure 1 shows the percentage of intervals in which appropriate engagement was observed across baseline and intervention sessions when we implemented 15-min or 30-min check-ins. Appropriate engagement was low for all three participants during baseline (range 0%–6% for Margaret, 0% for all baseline sessions for Judy, and a range of 0%–44% but with a mean of 6% for Louise). When we implemented the check-in procedure, there was an immediate increase in the percentage of intervals in which engagement was observed for all three participants. For all three participants, there was little difference in the effect of the check-in schedule on engagement. Margaret was engaged in a mean of 65% of intervals (range, 12%–87%) during 15-min check-ins and 59% of intervals (12%–86%) during 30-min check-ins. Judy was engaged in a mean of 31% of intervals (4%–55%) during 15-min check-ins and 24% of intervals (4%–53%) during 30-min check-ins. Louise was engaged in a mean of 85% of intervals (66%–100%) during 15-min check-ins and 76% of intervals (41%–98%) during 30-min check-ins.
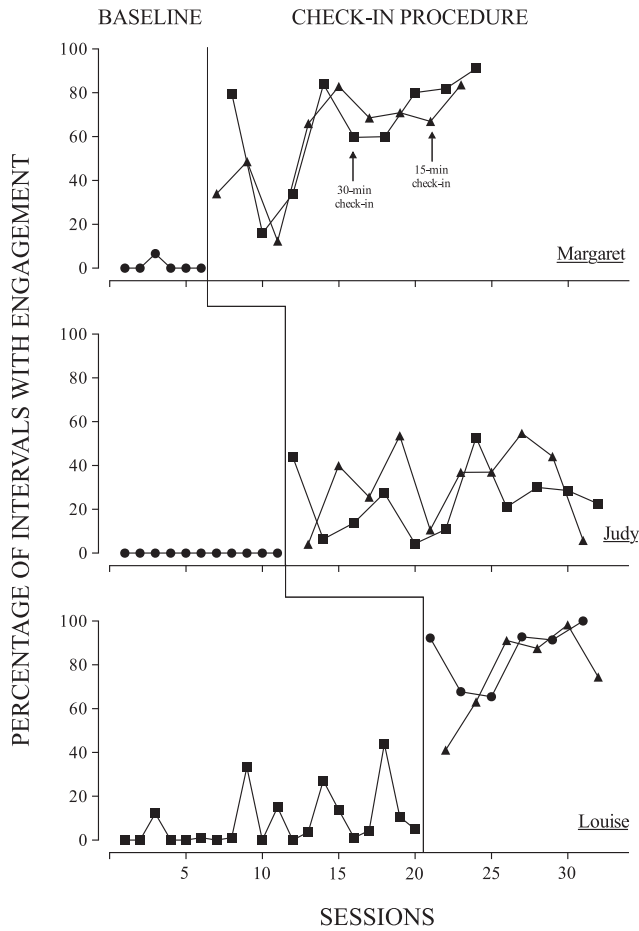
FIGURE 1 The percentage of intervals in which activity engagement was observed across the three participants. Triangles represent 15-min check-ins and squares represent 30-min check-ins.

3.1 | Within-session analysis

Figure 2 shows the means and standard errors in the percentage of intervals in which engagement was observed within each session (i.e., in 5-min bins following the delivery of each check-in). During 15-min check-ins, Margaret's engagement remained stable between a mean of 67%–71% of intervals across the 5-min bins (i.e., she continued engaging with the activity in the 15 min between each check-in). When the check-ins were every 30-min, she was engaged for a mean of 73% of intervals in the first 10 min following a check-in, but her engagement decreased to between a mean 45% and 53% of intervals until the next check-in. Judy showed the most marked decreases in engagement after a check-in. During 30-min check-ins, the mean percentage of intervals in which she was engaged decreased from 76% 5 min after the first check-in, to a mean of 56% after 10 min.

Similarly, when check-ins were every 15 min, her engagement decreased from a mean of 37% of intervals in the first 5 min to 14% in the second 5 min after the check-in. Louise's engagement decreased in the time following a check, but more gradually. There was little difference in the mean percentage of intervals in which she was engaged across 5-min bins following 15-min and 30-min check-ins (e.g., 85% and 82% 10 min after a check-in when check-ins were 15 and 30 min, respectively).
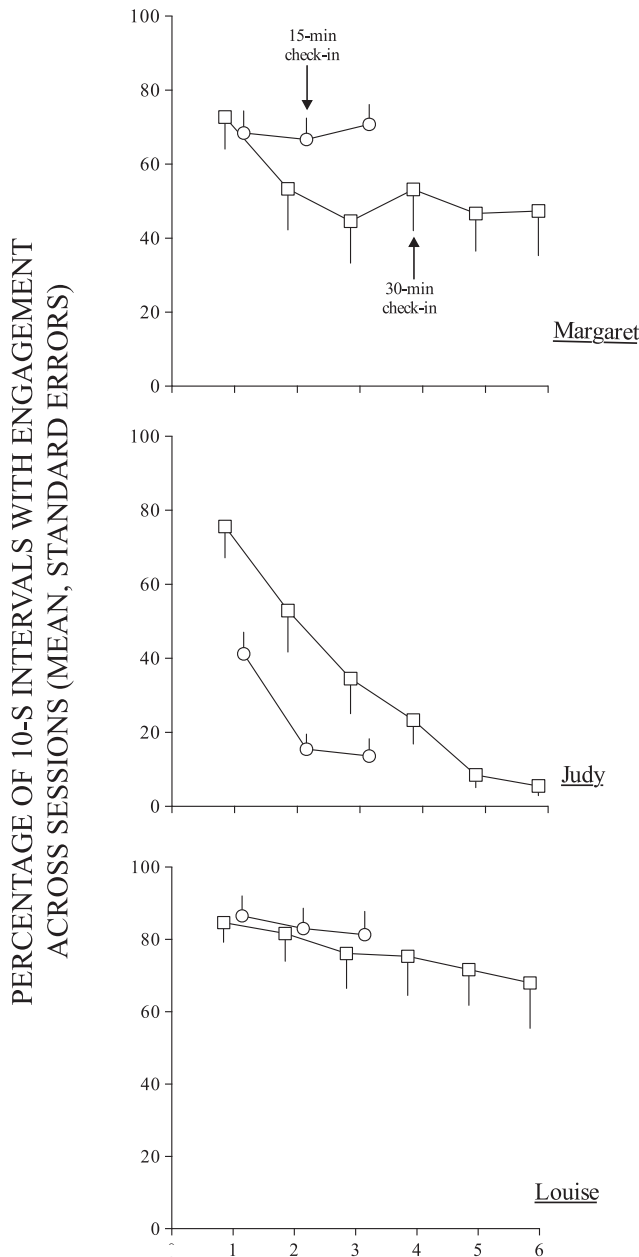
FIGURE 2 Within-session analysis of engagement (means and standard errors) in successive 5-min bins following each check-in. Circles represent 15-min check-ins and squares represent 30-min check-ins.

3.2 | Choice

Figure 3 shows the percentage of trials (check-ins) in which participants were not engaged and chose an activity, were not engaged but did not choose an activity, or were already engaged and therefore received praise. All three participants were more likely to be actively engaged in another activity when we conducted 15-min check-ins (50%, 16%, and 58% of trials for Margaret, Judy, and Louise, respectively) compared to 30-min check-ins (25%, 0%, and 50% of trials for Margaret, Judy, and Louise, respectively). The check-in schedule (15 vs. 30 min) did not affect
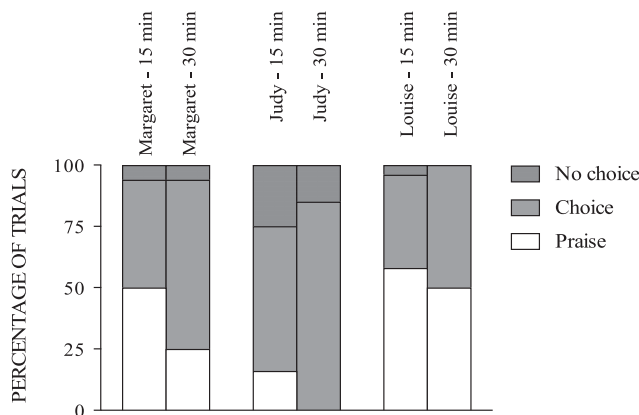
FIGURE 3 The percentage of trials in which each participant made a choice, did not make a choice, or was already engaged in an activity and therefore received praise across the two check-in schedules.

whether Margaret was likely to make a choice. However, both Judy and Louise were slightly more likely to make a choice when the time between check-ins was longer (no choice in 25% and 15% of 15-min and 30-min trials respectively for Judy, and no choice in 5% and 0% of 15-min and 30-min trials respectively for Louise).

3.3 | Social validity

Three staff members (out of five approached) completed the questionnaire about the acceptability of the check-in procedure. All three *agreed* or *strongly agreed* that it was important to increase engagement and involve staff in increasing engagement. They also all *agreed* or *strongly agreed* that participants' engagement was desirable during the study and that they thought participants enjoyed participating.

4 | DISCUSSION

We evaluated whether the check-in procedure, in which staff interact with people with dementia, offer and prompt activity engagement at 15-min intervals, was as effective when delivered every 30 min. We found little difference across the two schedules (a very small difference in engagement, but small enough that it is unlikely to be meaningful, and only in two of the three participants). Therefore, we found that check-ins delivered every 30 min were just as effective as those delivered every 15 min. Concerning the percentage of intervals with engagement following each check-in, we found that for two participants, engagement declined faster after 30-min check-ins (although the difference between the check-in schedules was negligible for one of these two participants). For our third participant, engagement declined similarly following 15- and 30-min check-ins (Judy), but was more likely to be higher immediately after a 30-min check-in than a 15-min check-in.

Our findings corroborate previous studies showing that engagement in people in residential care is low (e.g., Ice, 2002). We found the least engagement in baseline and the most modest increase during the check-in procedure for Judy. We hypothesize that this may have been at least in part due to her higher cognitive impairment compared to the other two participants. For example, Schroll et al. (1997) found that individuals with lower MMSE typically showed lower engagement in activities of daily living across 400,000 nursing home residents in five countries. For Judy, the check-in procedure was generally less effective. She was the least likely to make a choice when offered and the least likely to be engaged. Moreover, her engagement declined more quickly post check-in, and her

engagement increased the least overall. Further research should evaluate factors that might increase the effectiveness of the check-in procedure for people with relatively high cognitive impairment. The types of the activities offered the duration of each check-in interaction are obvious candidates.

The causes of minimal activity engagement in people with dementia remain largely unexplored. Lack of engagement may result from limited stimulus control of available activities or inadequate sensitivity to putative reinforcers (Baltes & Barton, 1977). Skinner (1983) suggested that physical changes (e.g., hearing or sight loss) might adversely affect the reinforcing value of some activities (e.g., listening to music or reading a book). Deficits in stimulus control may include the ability to attend to or discriminate stimuli. For example, Manuel et al. (2019) found that people with dementia were less likely to sustain attention than people without dementia during neuropsychological testing. Therefore, one explanation of the findings of our within-session analysis might be that low attention to task stimuli results in low post-check-in engagement. However, further exploration through applied and translational research would be needed.

An alternative account is that the activities were differentially preferred for each participant. We did not select the activities based on a preference assessment but simply used what was available in the home. Although using what is available might be analogous to how staff would use the check-in procedure, we may have further increased engagement through using confirmed preferred activities. Additionally, some activities are of longer or shorter duration by nature of what they are. For example, a reader can engage with a newspaper for an hour, but a simple wordsearch takes only minutes to complete. We found that for two of our three participants, the longer time between check-ins resulted in a higher likelihood of making a choice; a motivating operation may have been in place for a new activity. Therefore, by increasing the variety of available activities, it might be possible to avoid satiation.

The rationale for evaluating a leaner schedule of check-ins was to determine whether it would remain an effective intervention while requiring a reduced implementation effort. Engelman et al. (1999) and Engstrom et al. (2015) reported that staff members failed to implement the check-in procedure following the completion of the study, suggesting either a lack of social validity or competing contingencies for staff behavior.

In addition to a need to further explore social validity with direct consumers of the intervention (i.e., staff and people with dementia), there is a need to explore interventions to strengthen organizational contingencies for staff to spend time interacting with residents. The latter requires evaluating the social validity of the intervention for the indirect consumers of the intervention (see Ferguson et al., 2019 for a discussion of social validity). For example, Davison et al. (2019) found that staff in residential care homes reported a lack of time reserved for interacting with residents. If the organizational contingencies don't support the continued use of an intervention, it is unlikely to be implemented, regardless of whether staff find it socially valid. Therefore, following our demonstration of the effectiveness of a leaner schedule, further research is needed to explore factors that might increase the social validity and continued use of the check-in procedure. At a minimum, the current analysis provides important evidence for managers that might be interested in implementing evidence-based approaches to mobilize resident engagement while protecting staff time and cost.

In addition to considering the social validity of the intervention for staff, it is important to ensure that acceptability for direct consumers (i.e., people with dementia) is captured. In particular, there are two elements of the check-in procedure that we used that warrant consideration of social validity. First, we did not collect data on the most commonly successful prompts in our hierarchy. Anecdotally, we did not need physical prompts, however there may be concerns moving forward regarding the appropriateness of physical prompts with older people. Similarly, praise may be seen as infantilizing for older adults. Although both tactics have been shown to be effective in supporting people with dementia (e.g., Trahan et al., 2014), we echo previous calls for more systematic evaluation of adaptations to behavioral tactics that increase their social validity for this population (e.g., Sharp et al., 2023).

An additional aspect requiring attention in future research in this area involves the adoption of participatory intervention and research processes. In the narrow context of the current analysis, it seemed more practical to evaluate a single procedure that would be amenable to all eligible residents, despite dementia severity. Therefore, our procedures did not allow for resident active participation in the selection of items and activities in lieu of or as a

preamble to preference assessments. However, various studies have shown that individuals with dementia, particularly clients in early-stage dementia, can effectively assert their preferences directly or cooperatively when interacting with a trusted carer or confidant (Span et al., 2017).

Overall, the check-in procedure effectively increased engagement in our three participants. Our results suggest that the schedule of check-ins can be extended to 30-min intervals. Nevertheless, we advise monitoring the procedure's impact on engagement, as some individuals may need more frequent check-ins. Specifically, the schedule of the check-ins could be personalized according to the baseline duration of engagement with preferred activities. Second, whenever possible, the activities offered should include those generally preferred by people with dementia, namely gross motor, social, and affective activities (Park & Kim, 2022; Virues-Ortega et al., 2012). Caregivers should select activities based on the individual's preferences, promoting continuous engagement following a check-in interaction. Finally, a variety of activities should be available from which to choose to account for the devaluation of preference over time.

CONFLICT OF INTEREST STATEMENT

The Authors declares that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

The data supporting this study's findings are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

All procedures involving human participants followed the ethical standards of the institutional and/or national research committee and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

INFORMED CONSENT

We obtained informed consent from all participants in the study.

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