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**Research Article**

# Capitalizing on Dementia Care Mapping in an Evaluation of a Montessori-Based Intervention for Individuals Living With Dementia

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## Abstract

**Background and Objectives:** Montessori-based interventions (MBIs) promote quality of life among older adults living with dementia. We used dementia care mapping (DCM) to evaluate the impact of a small-scale MBI. DCM is a systematic observation tool that records the behavior and mood/engagement of individuals living with dementia and can be used to improve quality of care and well-being.

**Research Design and Methods:** Pre- and post-intervention data from 15 care community residents compared (1) residents' range and types of behaviors, (2) their mood/engagement, and (3) staff behaviors that facilitated and impeded residents' personhood. In this mixed-methods study, deductive qualitative content analysis of DCM field notes further explored staff behaviors.

**Results:** Post-intervention, a significantly higher proportion of residents' behaviors had the potential to promote their well-being, although there was little change in mood/engagement while engaging in those behaviors. Post-intervention, there was also a significant increase in staff behaviors that facilitated, and a decrease in staff behaviors that impeded, residents' personhood. Furthermore, post-intervention, staff interactions with residents were more open-ended and inclusive. Although some staff behaviors still excluded residents, the exclusion was more benign than pre-intervention.

**Discussion and Implications:** DCM documented incremental changes toward person-centered care, and DCM field notes provided insight into missed opportunities for effective staff interactions with residents. Taken together, findings provide additional support for the use of MBIs and highlight the usefulness of DCM, especially its associated field notes, to help researchers and practitioners create environments that promote the personhood that individuals living with dementia deserve.

**Keywords:** Dementia care community, Personhood, Prepared environment

Interest in the quality of life of people living with dementia is not new (e.g., Kitwood, 1997; Kitwood & Bredin, 1992; Lawton, 2001; Sabat, 1998). Recent work on this topic is often conceptualized in the larger context of the person-centered care movement (Chenoweth et al., 2019; Mohr et al., 2021; Yasuda & Sakakibara, 2017). This movement accompanied the emergence of international policies to enhance the autonomy, rights, and quality of life for people living with dementia (e.g., Alzheimer Europe, 2013; Alzheimer's Society, 2018; Department of Health and Social Care, 2016; Downs, 2013; U.S. Department of Health and Human Services, 2016).

Underlying these efforts is the concept of personhood (e.g., Kitwood, 1997; Kitwood & Bredin, 1992; Love & Pinkowitz, 2013; Sabat, 1998). Kitwood's theory of personhood led to the development of dementia care mapping (DCM), a systematic observation tool and process to help improve the quality of care for individuals living with dementia (Brooker & Surr, 2005a, 2005b; Kitwood & Bredin, 1992). Kitwood's work is supported by conceptual models (e.g., Kaufmann & Engel, 2016; Kitwood, 1997; Lawton, 2001) and empirical findings of associations among personhood and well-being (e.g., Eritz et al., 2016; Lawton, 1994; Savundranayagam et al., 2016).

As evidenced by two reviews (Hitzig & Sheppard, 2017; Sheppard et al., 2016), for over three decades, practitioners and researchers have explored the efficacy of Montessori-based interventions (MBIs) for older adults living with dementia. At the heart of these interventions is the prepared environment (Burke, 1973; Douglas et al., 2018), which provides a framework to design interventions that promote person-centered care and personhood among individuals living with dementia.

Originally conceptualized for children, the key components of a Montessori-prepared environment map onto the psychological needs that promote personhood among individuals

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living with dementia. In a Montessori-prepared environment, the physical environment provides (1) a sense of belonging, (2) choice, (3) a variety of activities so that the user can pursue those of interest, (4) activities are conceptualized as "work," and (5) opportunities for individual and group interaction based on user's abilities and preferences (North American Montessori Teachers' Association, nd). The prepared environment conveys respect and value for every individual and their fundamental needs and is consistent with/can promote Kitwood's (1997) five overlapping psychological needs (i.e., comfort, identity, attachment, occupation, inclusion) that together promote a feeling of love and embodying personhood.

Despite its grounding in Kitwood's theory of personhood, with few exceptions (e.g., Roberts et al., 2015), researchers have not used DCM to evaluate MBIs. Further, staff behaviors that facilitate (i.e., personal enhancers) and impede (i.e., personal detractors) residents' personhood are not typically recorded/analyzed in DCM field notes. We addressed this gap by using DCM to document the impact of introducing a Montessori-prepared environment for individuals living with dementia in a care community. In addition to looking at traditional DCM components (i.e., group-level data of residents' behavior, mood/engagement, and personal enhancers and detractors by staff), we conducted deductive qualitative content analysis to examine individual enhancers and detractors to better understand staff's role in fostering/undermining residents' personhood.

## Method

### Participating Care Community

Data were collected prior to the onset of coronavirus disease 2019 (COVID-19) in the 30-person dementia care portion of a nonprofit, church-affiliated continuing care retirement community in southwestern Ohio. The U.S. Centers for Medicare & Medicaid Services' (nd) monthly overall rating for the community both pre-intervention (Spring 2016) and post-intervention (Spring 2017) was above average (4:5 stars), and the overall quality rating for both periods was much above average (5:5) stars. The Ohio Long-Term Care Consumer Guide (nd) reported a score of 84.34 (out of 100) for overall resident satisfaction with the community. The first author used the 72-item environmental audit tool (EAT; Fleming, 2011) to assess 10 environmental domains for individuals living with dementia. The overall EAT score was 59%; scores ranged from 0% to 100%, with higher percentages indicating a better environment (see Supplementary Material for more details).

### Recruitment and Participant Characteristics

#### Residents

After obtaining Institutional Review Board (IRB) approval (no. 01083) for resident and staff participation from the lead institution, residents' power(s) of attorney (typically a family member) was contacted about the resident's participation. Residents' assent was obtained prior to each resident-related activity. Twenty-two powers of attorney (POA) consented in writing for the resident to participate in the research. This consisted of 20 residents (two of whom each had two POAs). However, DCM observations were only conducted in the public areas of the care community during the observation periods. As such, not all residents for whom consent was obtained participated. Ultimately, 15 residents ($M_{age}$ = 79.1, standard deviation [*SD*] = 5.08, range = 78–93; 11 female; 12 White and 3 Black) participated in the research. Residents' average Dementia Rating Scale (DRS; Juirca et al., 2001) was 89.20 (*SD* = 27.46, range = 49–131), with scores lower than 123 indicating cognitive impairment. The resident with a score of 131 was an outlier; all other residents scored 120 or lower. The resident with the 131 DRS score was unable to sign a consent form due to cognitive and physical limitations; they provided assent in addition to their POA's consent.

#### Staff

Staff were informed about the research during mandatory staff meetings and signs posted in the staff lounge. In addition, at the beginning of each DCM session, staff were reminded that the DCM mapper was observing and documenting residents' behaviors in the public areas of the care community and, as part of the process, would write down staff's interactions with residents. Staff could opt out of any observation period. No identifying or demographic information was recorded for staff; their position at the care community (e.g., aide, nurse, activities staff, housekeeper, dietary aid) was recorded. For these reasons, the IRB did not require signed consent from staff.

#### *The staff intervention*

The MBI was developed over 9 months (January–September 2016) and fully implemented in October 2016. Guided by the concept of the prepared environment, a trained Montessori educator ("facilitator"; K.M.F.) restructured the physical and social environments at the care community. The two key components of the intervention were (1) creating the prepared environment and (2) staff training.

Creating the prepared environment began in January when K.M.F. conducted systematic observations of the residents and staff to determine what opportunities were being met/missed in the current environment. In March and April, all supplies and activities were inventoried. K.M.F. then organized all storage spaces within the multiuse common areas (e.g., kitchen, dining area, living room, courtyard), creating "theme" areas with readily available activities (e.g., sorting kitchen items; writing cards; cleaning; taking care of plants). In addition, by mid-April, K.M.F. recreated the activity calendar with open-ended activities that flowed into other activities, creating a daily routine that incorporated physical movement. An example routine was breakfast, followed by conversation time (with question/prompt cards); reading circle; lunch; going outside/gardening after lunch. Between mid-April and August, K.M.F. systematically conducted observations of residents and staff to inform the preparation of the environment and identify topics for staff training. K.M.F. continued to observe residents and inventory, organize, and label existing material so that they were accessible to residents and staff, and create new activity materials.

With respect to the social environment/staff training, early in the design/implementation process, separate group meetings were held with administration (January) and direct care staff (February). The purpose of the meetings was to introduce the upcoming MBI and the key elements of the Montessori method. Each meeting lasted approximately 1-hr; three staff meetings were held to accommodate the different shifts. In mid-April, the activity director (AD) was trained to create activity calendars using the new format (approximately 6 hr).

This training was repeated in May, when the AD was replaced due to a serious health condition. In May and June, K.M.F. worked weekly with staff one-on-one and in small groups (30-min sessions) to coach staff based on her ongoing observations. Coaching emphasized the staff's role in connecting residents with their choice of meaningful/purposeful activities that are readily available in their environment. This occurred for 3–5 hours a day (times were varied to ensure all shifts were covered) 3–5 days a week for approximately 5 weeks.

In July, September, and October 2016, staff participated in monthly, 2-hr training sessions on the Montessori philosophy and its use with older adults living with dementia; all staff were required to participate in the training. In November and December, the facilitator modeled and coached staff on how to introduce and facilitate activities (four, 1-hr sessions). At that time, the AD was provided a daily schedule; resident groups were created to plan intergenerational activities; and staff agreed to "ground rules" that reflected the Montessori values of respect, choice, independence, and failure-free activities. Staff also agreed to follow the activity calendar, offer more than one activity at a time, not have the television on during meals, and limit the use of television programming to residents' requests. Ultimately, the intervention was only partially implemented. Despite administrative support, this support was not translated into mandates for department heads to require direct care staff to implement the intervention. For example, staff were not always attentive during training, and there were occasions when staff engaged in activities (e.g., decorating pots and planting flowers) without including residents. Janssen et al. (2020) report on other implementation challenges surrounding the absence of respect, interdependence, meaningful activity, and structure.

## Instrument Used in Data Collection

DCM (Kitwood & Bredin, 1992) was used to systematically observe residents' behavior and mood/engagement while they were in the public areas of the care community. Consistent with DCM guidelines (version 8; Brooker & Surr, 2005a, 2005b, 2006), an advanced certified "mapper" (first author) observed as many as eight individuals at a time. During the observation period, every 5 min the mapper recorded one of 23 behavior category codes and a mood/engagement value for each resident to capture the main activity they were doing and their affect. There are 23 behavior category codes in the "DCM alphabet" (e.g., A = articulation, or interacting with others; F = food, or eating and/or drinking; L = leisure; Brooker & Surr, 2005a). Because one activity can consist of several behaviors, we used the DCM operational rules to assign one code for each behavior. DCM classifies behaviors into three categories. High-potential behaviors promote a sense of personhood and well-being and therefore should be encouraged. In contrast, the moderate potential behavior (i.e., "borderline," which refers to sitting and watching, without engaging) and low potential behaviors (i.e., "cool"—being disengaged or withdrawn; "unresponded to"—attempting to communicate but being ignored; and "withstanding"—repetitive self-stimulation) do not contribute to personhood and well-being. As such, staff should work to replace these behaviors with higher potential behaviors (e.g., "doing for self"—self-care; "expressive"—creativity; "vocational"—work-like activity; Brooker & Surr, 2005a, 2005b).

Consistent with the DCM 8 manual (Brooker & Surr, 2005a), DCM prioritizes high-potential behaviors (i.e., A, D, E, F, G, I, J, K, L, O, P, R, S, T, V, X, Y) over the moderate potential behavior (B "borderline"), and prioritizes B over low potential behaviors (C, U, W). B is only coded during an interval if no high-potential behaviors are observed. If multiple high potentials take place during the same interval, the behavior that lasted the longest is coded. N (sleep) is only coded if no other behaviors occur and does not receive a mood/engagement score.

Each behavior category code is assigned a mood/engagement value that ranges from −5 (very distressed/very extreme negative mood) to +5 (exceptionally positive mood and/or engagement); other coding options are −3, −1, +1, and +3. As per the DCM 8 manual (Brooker & Surr, 2005a), mood/engagement is scored categorically; the other coding options are −3, −1, +1, and +3. Specifically, mood is scored as either −5, −3, −1, +1, +3, or +5. In contrast, engagement is scored as either −1 (DCM does not distinguish levels of being withdrawn), +1, +3, or +5. When the mood and engagement scores are not the same, the most extreme value of the two is coded. If engagement is positive and mood is negative, the mood score takes priority. Finally, if mood or engagement changes during the 5-min observation interval, the mood/engagement that lasted the longest is coded.

In addition to recording behavior category codes and mood/engagement values, for each Kitwoods's (1997) psychological needs (i.e., comfort, identity, attachment, occupation, inclusion), DCM includes a description of staff behaviors that either promote (i.e., personal enhancers) or detract from (i.e., personal detractors) an individual's personhood. For each of the psychological domains, there are three to four types of enhancers and detractors; there are 17 enhancers and detractors in total. As part of the DCM process, field notes documented staff behaviors that facilitated and impeded residents' personhood. For example, staff who interacted with warmth, provided safety and security to a resident, and used a pace that matches the resident's needs, enhanced their comfort. In contrast, staff who withheld attention or failed to meet a resident's need, or "outpaced" a resident by talking too quickly, detracted from their comfort (Brooker & Surr, 2005a, 2005b).

A total of 5 hr and 20 min between the hours of 9:00 a.m.–12:55 p.m. were mapped both prior to and after the implementation of the intervention. Pre-intervention mapping occurred at the following times over 3 days: 9:00 a.m.–11:30 a.m. (March 7, 2016), 9:15 a.m.–11:25 a.m. (March 8, 2016), and 12:15 p.m.–12:55 p.m. (April 9, 2016). Post-intervention mapping in the same area occurred during the same times over 2 days (January 7 and January 13, 2017). This sampling frame was used for logistic reasons (to document behavior during the same time of day). Observing for 2, 3, or 4 hr is justified by Fulton et al. (2006), who found that shorter intervals are highly correlated with the original 6-hr observation interval.

After collecting pre-intervention data on the physical and social environment and assessing residents' level of cognitive functioning, pre/post-test intervention DCM data were used to compare (1) the range and types of behaviors (i.e., high, moderate, low potential), (2) residents' mood/engagement while performing these behaviors, and (3) staff's interactions with residents that enhanced and detracted from residents' personhood.

### Data analysis

Although the analysis of staff enhancers and detractors is based on the complete sample of pre- and post-intervention

DCM field notes for all 15 residents, a comparison of residents' pre- and post-intervention behavior and mood/engagement is based on the 10 residents for whom there were complete DCM ratings for each 5-min interval both pre- and post-intervention. The difference is that sleep was excluded from these calculations (in both the numerator and denominator) because sleeping (i.e., category "nod" in DCM) is not assigned a mood/engagement score. The exception is sleeping that is accompanied with restlessness or discomfort (Brooker & Surr, 2005a), which was not observed.

*Residents' pre- and post-intervention behavior*

Percentages were used to describe the proportions of behaviors in each category of high- and low/moderate-potential behaviors before and after the intervention. To determine whether there was an increase in the percentage of high-potential behaviors after implementing the intervention, residents' high-potential behaviors were divided by the total number of observed behaviors at the pre-intervention and post-intervention observation periods. The proportional data were analyzed in R (R Core Team, 2020) using a generalized logistic mixed model with phase (i.e., pre- vs post-intervention) as the within-subjects factor and resident as the random effect (see Figure 1). A likelihood ratio chi-square test compared the percentage of high-potential behaviors between phases.

*Mood/engagement*

The analysis of mood/engagement rating score data used a generalized linear mixed model with phase as the within-subjects factor, subject as the random effect, and the mean rating score for each resident at each phase as the response. Responses were weighted according to the number of observations made on each resident at each phase. The test comparing weighted high-potential behavior mean scores between phases was performed using a reduced model analysis of variance *F*-test.

*Content analysis of personal enhancers and detractors*

The DCM field notes of staffs' personal enhancers and personal detractors were analyzed using deductive qualitative content analysis (Elo & Kyngäs, 2008). A structured coding instrument was developed using DCM's operationalization of the five psychological needs (i.e., comfort, identity, attachment, occupation, and inclusion) that comprise personal detractors and personal enhancers. The second author developed the initial codebook, which was discussed and refined with the first author to fit the data. After deleting field notes that did not meet the DCM criteria of personal enhancers or detractors between staff and residents (e.g., the interactions involved resident-to-resident contact), remaining data were independently coded by the two authors, resulting in an initial 86.67% agreement across code applications (see Supplementary Table 1 for examples of staff behavior that enhanced and detracted from residents' personhood).

The nuanced conceptual boundaries and interconnectedness of discrepant codes were successively discussed in more detail between the two authors, culminating in full reconciliation and consensus (100% agreement). We utilized this approach to analysis because the first author's expertise in DCM was an asset to understanding DCM-coded content. To ensure trustworthiness, the authors recognize researcher reflexivity; the authors' personal values and experiences were kept distinct from the data collection, analysis, and interpretation. Therefore, related notes external to the project were documented separately through memos, so the authors could remain close to the specific research context.

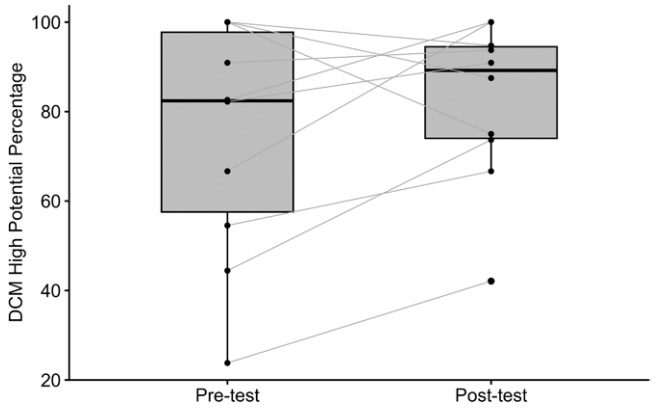


**Figure 1.** The percentage of high potential behaviors pre- and post-intervention.

## Results

### Residents' Pre- and Post-Intervention Behavior and Mood/Engagement Behavior

Table 1 presents the percentage of DCM observations in each behavior category before and after the implementation of the intervention. Residents' behavioral repertoire was fairly limited during both periods (i.e., of 23 possible categories, 9 were observed both pre- and post-intervention; 8 of the 9 were the same). Both pre- and post-intervention, seven of the observed behavior categories were high potential.

On average, 74.52% of behaviors observed pre-intervention were high-potential behaviors (*SD* = 26.41%) compared with 82.44% post-intervention (*SD* = 18.26%). This result is statistically significant (chi-square = 5.97; *df* = 1, *p* = .015). This difference was due primarily to increases in engaging in leisure activities, coming and going from the area, and decreases in passively watching others.

Pre-intervention, the weighted sample mean for high-potential behaviors was 2.83 (*SD* = .99), compared with a weighted mean of 2.25 post-intervention (*SD* = .77). This difference is not statistically significant $F = 1.68$, $df(1) = 1$, $df(2) = 18$; $p = .211$.

#### Mood/engagement

Residents' mood/engagement was very similar during the pre- and post-intervention observation periods. For both periods, during approximately one tenth of the observations, residents' mood/engagement was exceptionally positive; during almost half of the observations they demonstrated positive mood/engagement; during one third of the observations they were alert and focused on their surroundings (with no overt signs of positive mood/engagement); and during the remaining observations residents demonstrated small signs of negative mood/were withdrawn. There were no observations of considerable negative mood and/or disengagement or residents appearing very distressed.

### Staff Enhancers of and Detractors From Residents' Personhood

Table 2 presents the frequency of pre- and post-intervention personal enhancers and personal detractors documented

**Table 1.** Residents' Behaviors Pre- and Post-Intervention

| Residents' behavior (DCM code) | Percentage of behaviors | |
|---|---|---|
| | Pre-intervention | Post-intervention |
| High-potential behaviors | | |
| Doing for self (e.g., putting on a sweater; D) | 2% | 2% |
| Eating or drinking (F) | 15% | 19% |
| Physical activity/exercise (J) | 6% | 0% |
| Leisure (L) | 8% | 17% |
| Reminiscing (G) | 0% | 7% |
| Interacting with others (A) | 21% | 20% |
| Walking into/leaving the observational area (K) | 9% | 17% |
| Total high-potential behaviors | 61% | 82% |
| Moderate/low-potential behaviors and sleeping | | |
| Passively watching what is going on (B) | 19% | 12% |
| Withdrawn/unresponsive (C) | 7% | 4% |
| Sleeping (N) | 11% | 2% |
| Total low potential behaviors | 37% | 18% |
| Total behaviors accounted for[a] | 98% | 100% |

*Note*: DCM = dementia care mapping.
[a]The remaining behaviors included several instances of receiving care from a staff member and engaging in a religious activity.

**Table 2.** Staff Behaviors That Enhanced and Detracted From Residents' Personhood

| Personal enhancers and detractors | Frequency | |
|---|---|---|
| | Pre-intervention | Post-intervention |
| Personal enhancers | | |
| Comfort | 12 | 11 |
| Identity | 0 | 1 |
| Attachment | 2 | 2 |
| Occupation | 2 | 8 |
| Inclusion | 10 | 12 |
| Total personal enhancers | 26 | 34 |
| Personal detractors | | |
| Comfort | 2 | 3 |
| Identity | 2 | 0 |
| Attachment | 0 | 0 |
| Occupation | 5 | 1 |
| Inclusion | 13 | 3 |
| Total personal detractors | 22 | 7 |

during DCM. The most frequently occurring enhancers, both pre- and post-intervention, promoted residents' needs for "comfort" and "inclusion." With respect to personal detractors, pre-intervention staff most frequently missed opportunities to meet residents' needs for "inclusion" and "occupation." Pre-intervention, 54.17% (26 out of 48) staff behaviors were personal enhancers, compared with 82.93% (34 out of 41) post-intervention. This result is statistically significant (chi-square = 8.33, $df = 1$, $p = .004$). Post-hoc Fisher's exact test values indicated that changes in enhancers and detractors in "occupation" ($p = .035$) and "inclusion" ($p = .044$) were the chief contributors to the shift in staff behaviors.

In addition to an increase in the frequency of personal enhancers and a decrease in personal detractors post-intervention, field notes reflected differences in the structure and content of staff's pre- and post-intervention personal enhancers and personal detractors.

*Enhancers*

First, pre-intervention enhancers often focused on straightforward, concrete tasks or events at hand. Second, pre-intervention personal enhancers tended to be closed-ended questions that provided instrumental information, whereas post-intervention staff were more likely to be more attentive to residents' needs, ask open-ended questions, and engage residents in conversation. Third, post-intervention field notes revealed more staff-initiated conversations with residents.

To illustrate these differences, prior to the intervention, a housekeeper said to a resident "Floor is wet. Don't fall. Come this way" (coded in DCM as "comfort+"). In contrast, post-intervention field notes indicated increased instances of staff being thoughtfully attentive to residents' needs. As per the field notes, in one interaction, "noticing that a resident was struggling to open an individual box of cereal, an aide said 'Oh—I'll help you with that; they can be hard to open.' The resident responded 'Oh, thank you!,' and both smiled and laughed" (coded as occupation+). Presumably staff in both interactions intended to be helpful (hence the coding of both as positive), but the pre-intervention interaction lacked warmth and did not maximize the resident's safety (e.g., a warning was issued, but it could have been warmer and therefore more "comfort[ing]," in DCM coding). In contrast, post-intervention, the staff recognized what assistance was needed and provided that assistance ("facilitation," an enhancer of "occupation" in DCM coding). This illustrates the important role that the physical environment can have in shaping the social environment (i.e., staff communication), when urgency can override niceties.

In a second pre-intervention example, as reported in the field notes, a nurse aide asked a resident "'Have you had breakfast yet? Come over here and I'll give it to you.' The resident walked over to the table where the aide was standing." In contrast, post-intervention, a nurse said to several residents as they left the dining area "Did you eat a good breakfast?" Did you get enough to eat?," to which one resident responded "Every meal, every day!" Although both interactions were coded as "comfort+," the post-intervention interaction demonstrated more genuine affection and concern and comfort toward the resident, communicating the DCM enhancers of "warmth" and "holding" as "comfort, and created a relaxed atmosphere for the resident ("relaxed pace," another enhancer of comfort).

*Detractors*

In addition to a post-intervention decrease in frequency, there were changes in the structure and content of personal detractors as well. Specifically, many post-intervention behaviors that were observed and categorized by DCM as "detractors" were less egregious than pre-intervention detractors. The following examples demonstrate basic, everyday

interactions between residents and staff. For example, in a pre-intervention interaction, field notes documented:

> Two aides were sitting with residents at different tables in the dining area, talking about movies they [had] seen. A resident followed the conversation, turning her head from one staff member to the other. Neither staff involved her; this went on for 9 minutes. (coded as inclusion-)

In this example, a resident who deserved to be included in a conversation was ignored by two staff (i.e., this is operationalized as "ignoring" in DCM coding, which does not promote "inclusion"). In contrast, in a post-intervention interaction, field notes described that "during a smooth and efficient lunch service, aides and dietary staff did not talk much to residents, but there was a lot of smiling and it flowed really well." Although this interaction was also coded as "inclusion–," the difference in the two interactions was clearly received differently by the residents involved.

A more extreme example of a pre-intervention detractor occurred during a group exercise activity. Residents were arranged in a circle with the AD facilitating the group and three aides assisting. The AD selected a resident, who then chose an activity (e.g., stretch their arms, lift their legs) that the group would do three times:

> AD (to a particular resident): "You have to pick an exercise for the group to do."
> Resident: "I don't want to."
> Aide: "But you have to."
> Resident: "I don't want to. This is stupid."
> Aide: "But everyone has to."
> The resident then cocked his finger like a gun and pointed it to the other residents in the activity circle three times, saying "pow, pow, pow." The three aides looked uncomfortable while the AD had the group repeat the three "shots" 20 times (coded as occupation–).

This detractor demonstrates how not acknowledging a resident's preference can transform a routine activity into a forced and uncomfortable situation.

A final detractor example illustrates that, even post-intervention, staff can inadvertently interact with residents in ways that do not promote optimal dialogue. During a reading circle, the AD handed each resident an activity book so they could take turns reading one page out loud (per activity guidelines). In confusion, the AD gave some residents a book about the actor Gene Kelly and others a book about the origin of the chocolate chip cookie (detracting from residents' "occupation," or being involved in meaningful activity, by confusing the residents). Several residents corrected the AD, explaining that they all had to have the same book for the activity to work. Settling on the book about Gene Kelly, a resident read the post-story question "What would happen if your son or daughter dropped out of law school to study ballet?" Several residents responded, but the staff person did not encourage the conversation (coded "withholding attention") and rushed the residents' responses (coded "outpacing" them), both of which detracted from their comfort, and ultimately their personhood.

This was not an isolated event. For instance, there were flashcards about residents' school days, and music cards, where residents read a song name, a fact about the song, and then sang the song. Opportunities to reminisce about school days and the songs were also rushed (coded as "outpacing"). The AD misidentified the song "Happy Days are Here Again" with the theme from the TV show "Happy Days" (coded as "disempowerment," which detracts from "occupation") and resulted in confusion for some of the residents, who knew that this was not correct. These examples demonstrate that despite staff's well-intentioned efforts, a poorly implemented activity can detract from residents' personhood. In this instance, providing residents with inaccurate information disempowered residents, preventing them from using their abilities (detracting from occupation" as specified in DCM coding). This also highlights the importance of ongoing training and post-intervention monitoring.

## Discussion

Our findings indicated that residents engaged in a similar, fairly limited, range of behavior categories before and after the intervention. Nonetheless, following the Montessori-based environmental modifications and staff training, residents spent a greater proportion of their time in high-potential behaviors (e.g., eating, engaging in leisure activities, interacting with others), which promote well-being. They also spent a correspondingly smaller proportion of their time in low potential behaviors (e.g., passively watching, being withdrawn/unresponsive). In contrast, there was negligible observed change in residents' mood/engagement before and after the intervention. In part, this reflects residents' relatively positive mood/engagement prior to the intervention. Both high-potential behaviors and positive mood/engagement are essential components of promoting personhood and well-being among individuals living with dementia (Kitwood, 1997).

The increase in staff interactions that promoted (and decrease in interactions that detracted from) residents' inclusion and occupation after the intervention is promising. It is important to note that the substance of staff's language and nonverbal communication also changed. Post-intervention enhancers were more open-ended, inviting conversations with residents, rather than curt comments. Similarly, the detractors were less willful than the pre-intervention person detractors, which tended to be extreme (e.g., ignoring a resident who nonverbally expressed interest in joining a conversation, forcing a resident to participate in an activity).

The importance of nuanced changes in staff communication should not be overlooked. Using a coding scheme based on DCM, Savundranayagam et al. (2016) analyzed audio recordings between staff and residents living with dementia during routine care tasks over a 12-week period. Dyadic interactions were coded for person-centered communication and missed opportunities (similar to enhancers and detractors, respectively). They found that residents reacted positively to person-centered communication, and negatively when staff missed opportunities to engage in conversation. These findings are consistent with other research that supports person-centered and DCM-based interventions (Yasuda & Sakakibara, 2017).

It is important to acknowledge that each resident–staff interaction takes place in a specific environmental context, which can influence or interact with staff's behavioral and verbal interaction with a resident. For example, a potentially dangerous situation in which staff intervenes to prevent a resident from falling or hurting themself could result

in a communication that is coded as a detractor in DCM. In the absence of detailed field notes, these contextual nuances would not be captured in DCM.

Evidence of (some) favorable changes in communication patterns between staff and residents is encouraging. On the other hand, the post-intervention continuation of personal detractors provided concrete evidence of a need for further staff training. Nonetheless, we are optimistic about these findings, in part because they resulted from an intervention that was plagued with a variety of common implementation challenges (see also Janssen et al, 2020). Challenges included staff who did not respect residents; staff difficulty understanding the importance of fostering independence (to the extent possible)/healthy interdependence when necessary for residents living with dementia; providing opportunities for meaningful engagement; and structuring activities to foster residents' autonomy.

Ironically, the barriers that permeated this and other implementation efforts are in opposition of Montessori principles, and our work is consistent with other research that has documented both the challenges associated with, and the efficacy of, MBIs for people living with dementia (Bourgeois et al., 2015; Ducak et al., 2018; Hitzig & Sheppard, 2017). Although the use of these interventions to promote quality of life among individuals living with dementia is not new (e.g., Camp et al., 2004), framing these interventions in the context of person-centered care is more recent (Bourgeois et al., 2015; Douglas et al., 2018). Ducak et al. (2018) provide an overview of how MBIs align with the person-centered framework that underlies culture change. Clearly, there are synergies between MBIs and person-centered care that can be used in future research.

Although DCM was developed to be both a systematic method of observation and a process to improve the quality of care for individuals living with dementia (Brooker, 2005), many DCM users are practitioners who collect data for quality improvement, rather than research purposes (Barbosa et al., 2017). The underutilization of DCM as a research tool might reflect both methodological and practical challenges (Chenoweth et al., 2019; Surr et al., 2018, 2019). There is a concern that DCM does not have adequate validity, reliability and sensitivity, and the efficacy to improve the quality of care/life for residents of care communities (e.g., Cooke & Chaudhury, 2012; Thornton et al., 2004). Undeniably, DCM is time and labor intensive. Yet, both early (e.g., Brooker, 2005; Fossey et al., 2002; Sloane et al., 2007) and more recent (e.g., Barbosa et al., 2017; Chenoweth et al., 2019) research provides evidence that DCM can achieve both goals.

When used as an outcome measure, researchers typically report DCM summary statistics. For example, Chenoweth et al.'s (2019) systematic review identified five studies that used DCM as an outcome measure (Brooker et al., 2011; Chenoweth et al., 2009; Fossey et al., 2006; Goldberg et al., 2013; Li et al. 2017). All created composite measures that aggregated either specific behavior categories and/or mood/engagement ratings. Typically, personal enhancers and detractors also are reported as summary statistics, but researchers do not include the description of the nature and/or extent of staff behaviors that fostered, or hindered, interactions with residents (e.g., Chenoweth et al., 2009; Goldberg et al., 2013). Our deductive qualitative content analysis provided an intimate look at residents' in situ social interactions.

Our results revealed that it is far easier to make modifications to the physical than the social environment. Specifically, despite the incorporation of concrete, hands-on activities that engaged visual and sensory processing; activity stations geared to residents' needs and preferences; assigning roles to residents to promote community and occupation; implementing group and individualized activities that tap into procedural memories; encouraging instrumental activities of daily living; and staff training on how to incorporate the environmental modifications into their daily routine, staff resisted using the components of the intervention (see also Janssen et al., 2020). Thus, our findings provide powerful examples of how even small changes on the part of staff can result in more affirming interactions with residents.

As is always the case, our research is not without limitations. What started out as an outcomes evaluation evolved into a hybrid/process evaluation, in part due to the lack of buy-in from both mid-level administration and direct care staff, which prevented full implementation. These challenges have been identified by other researchers who are interested in promoting person-centered care (Chenoweth & Jeon, 2007; Douglas et al., 2018; Ducak et al., 2018; van de Ven et al., 2013). It is also the case that the research was conducted in one facility, and the sample was smaller than originally intended, given that DCM was only conducted in the public areas of the care community, where not all residents chose to spend time. As with other qualitative research, the purpose was not generalizability, although our findings might have some transferability, as evidenced by other similar findings (e.g., Bourgeois et al., 2015; Ducak et al., 2018; Hitzig & Sheppard, 2017). With respect to the potential replicability of the intervention, it would have been useful to employ the Framework for Reporting Adaptations and Modifications-Enhanced (FRAME) as recently used by Madrigal et al. (2023) to track modifications in Montessori-based activities implemented across multiple sites. A final limitation of this research is that the DCM data, including the field notes, are based on one DCM mapper. This prevented the collection of inter-rater reliability testing prior to data collection.

Despite these limitations, our findings make several contributions to the literature. First, they demonstrated that even a less-than-optimally-implemented MBI can result in incremental changes toward staff–resident interactions that are consistent with person-centered care and contribute to personhood among individuals living with dementia. Second, the exploitation of the field notes that were the basis for personal enhancers and detractors provided insight into missed opportunities for staff to interact effectively with residents. Findings from this and future research can contribute to the development of general staff training materials, and community-specific baseline data could be used as a foundation to build on existing strengths and target specific areas for improvement (Kitwood & Bredin, 1992). These findings also provide additional support for the use of MBIs and highlight the usefulness of DCM, including its associated field notes, to help researchers and practitioners create environments that promote the personhood that individuals living with dementia deserve.

## Supplementary Material

Supplementary data are available at *The Gerontologist* online.

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## Conflict of Interest

None.

## Data Availability

The data are available by request from the main author for replication purposes. The study reported in the manuscript was not pre-registered.

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