Activity situations on an Alzheimer's disease special care unit and resident environmental interactions, time use, and affect

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Abstract

Routine activity situations on an Alzheimer's disease (AD) special care unit were examined with respect to residents' social and physical environmental interactions, time use, and apparent affect. Using a computer-assisted observational tool, observers recorded prevailing activity situations and corresponding behaviors and affects of seven residents every 10 minutes, from 8:00 AM to 8:00 PM, across four days. Although meals/snacks and some activity groups were positively associated with use of physical objects and engagement in activities, residents were predominantly environmentally disengaged, inactive, or without positive affects during the most prevalent activity situations of background media, downtime, and television. Findings suggest that routine activity situations may act as potent environmental influences on the quality of life (QOL) of people with AD and mediate the effectiveness of other environmental interventions undertaken on their behalf.

Key words: activity situations, Alzheimer's disease, quality of life

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Introduction

It is widely recognized that social and physical environments can profoundly influence the quality of life (QOL) of older adults with Alzheimer's disease (AD) and related dementias.[1-5] Although architectural and other environmental interventions have been associated with important health and behavioral outcomes for persons with AD,[6-9] much environmental research is inconclusive and limited in usefulness. These problems have been attributed, in part, to the atheoretical nature of many environmentally oriented studies, as well as to methodological challenges inherent in measuring the environment and its impact on outcomes of interest.[7,8,10] For this naturalistic case study, a conceptual framework was therefore developed that integrated concepts from environmental and QOL theorists with relevant research findings to best identify and measure key variables of interest. The study sought to examine associations among routine activity situations on an AD special care unit (SCU) and how seven residents with moderate to severe AD occupied their time across the day, interacted with other persons and physical environmental elements, and exhibited a range of affective expressions.

Conceptual framework

In Brod, Stewart, and Sands' dementia-specific model of QOL, the social and physical environment is identified as a primary determinant of QOL.[2] In conjunction with individual characteristics and factors, this model poses that the environment influences everyday behaviors,

including positive behaviors such as participation in meaningful activities or relationships and problematic behaviors such as agitation and distress. The environment also influences persons' functional capacities in mobility and activities of daily living (ADLs). In turn, everyday behaviors and functional capacities affect QOL, or how individuals with AD experience and evaluate their life circumstances across five domains: positive affect, negative affect, feelings of belonging, self-esteem, and aesthetics.

Although Brod et al. distinguish important determinants of QOL,[2] their model can be enhanced by more extensive environmental theorizing. In the ecological model of aging and adaptation, Lawton and Nahemow posed that adaptive behavior and positive affect result when environmental demands, or presses, for performance approximate older adults' levels of competence.[11,12] Environmental presses that slightly exceed a person's competency levels support new learning, positive novel experiences, and attainment of maximum potential. Environmental demands that are somewhat below a person's competency levels support relaxation, as well as exercise, enjoyment, and maintenance of existing skills and interests. Maladaptive behavior and negative affect occur in situations of extreme imbalance, when an environmental press so greatly exceeds an individual's competency level that considerable stress results, or is so greatly beneath it that boredom and atrophy of skills result.

Hasselkus' work builds on the ecological model of adaptation and aging by suggesting that the environmental press experienced by people with AD hinges on the activities that take place in specific architectural spaces.[13,14] In an adult day care program, Hasselkus found that architectural spaces like dining or activity rooms became places where clients with AD were meaningfully occupied, or alive occupational places, only when staff facilitated them doing things there or engaging with others in ways that tapped their remaining competencies and unique identities.[14] Thus, what may be most critical in caregiving environments is not solely who is present or the therapeutic design of the physical environment, but rather, how effectively staff design and enact routine activity situations to exploit the therapeutic potential of extant social and physical environmental features. Consistent with this idea, QOL has been associated with environments that support experiences of meaningful time use by people with AD across the day, including helping them participate in activities that sustain their functional capacities, sense of belonging, positive interactions with others, emotional well-being, and personhood.[3,15]

Application to the study

The concepts of activity situation and environmental press were integrated in this study with Brod et al.'s[2] emphasis on the environment as a major determinant of dementia-specific QOL. Activity situations were conceptualized as environmental determinants of QOL created by the actions of facility-based care givers and other personnel, consisting of routinely occurring chunks of time characterized by opportunities to participate in some kinds of activities, but not others, by people with AD. The environmental presses of activity situations were assumed to be manifested in two observable behavioral patterns in people with moderate to severe AD: environmental transactions, or actual interactions with other people or physical environmental features in close proximity; and time use, or participation in positive and problematic behaviors across the day. Observations of environmental transactions were assumed to illuminate the extent to which an activity situation supported persons' capacities to act on social and physical environmental affordances, or possibilities for action that define relationships between actors and their immediate environmental niches.[16,17] Observations of time use were assumed to illuminate the extent to which an activity situation compensated for persons' impairments, supported their preferences, and enabled exercise of intact functional capacities. In turn, environmental presses of specific activity situations were seen as influences on QOL, as manifested in relative proportions of positive affects (e.g., interest and pleasure) versus negative affects (e.g., anger, sadness, anxiety/fear) or absence of all emotional expressions.[18,19]

Four questions were asked:

- What general behavioral patterns characterize residents' uses of social and physical environmental affordances, time use, and apparent affect?
- What is the prevalence of each activity situation across the day?
- What characterizes the environmental press of each activity situation as gauged by residents' patterns of using social and physical environmental affordances and spending time?
- What associations exist among specific activity situations and residents' apparent affect?

Procedures

Study participants

All seven residents living at the selected study site were participants in the study, each of whom had a diagnosis of AD or a related dementia (Table 1). One resident required physical assistance to walk on the SCU and perform mobility tasks; the remaining six could do so independently or

Table 1. Description of study participants	
N	7
Age	X = 81; Range = 76 – 91
Ethnicity	Caucasian = 7
Sex	Female = 4; Male = 3
Education[a]	X = 13.6 years; Range = 12 – 21 years
Marital status	Widowed = 3; Married = 2[b]; Partnered =1
Religion	Protestant = 6; Jewish = 1
Self-performance in physical functioning and activities of daily living[c]	
Bed mobility	Mode = 0; Range = 0
Transfers	Mode = 0; Range = 0 – 4
Walk in room	Mode = 0; Range = 0 – 3
Walk in corridor	Mode = 0; Range = 0 – 3
Locomotion on unit	Mode = 0, 1; Range = 0 – 3
Locomotion off unit	Mode = 1; Range = 0 – 4
Dressing	Mode = 4; Range = 1 – 4
Eating	Mode = 1; Range = 1 – 4
Toilet use	Mode = 4; Range = 1 – 4
Personal hygiene	Mode = 4; Range = 1 – 4
Bathing	Mode = 4; Range = 2 – 4
[a] Educational levels unavailable on two participants; [b] Participants were married to each other; [c] From the Minimum Data Set, Section G, self-performance rating: 0 = independent; 1 = supervision; 2 = limited assistance; 3 = extensive assistance; 4 = total dependence.	

with supervision. All residents were rated as most independent with eating, yet totally dependent with dressing, bathing, toileting, and hygiene.

Selection and description of the study site

The local Area on Aging was contacted to identify facilities with AD SCUs and no recorded deficiencies in care. The selected site, which was part of a for-profit life-care community, housed seven residents and was chosen because of its many social and physical environmental features identified as desirable for SCUs.[9,20,21] Desirable social features included dedicated staff for the unit; a restraint-free policy; a policy ensuring daytime outdoor access; and a well-established activity program offering music, exercise, various word and memory games, and religious devotion. Desirable physical features included private bedrooms and bathrooms; common areas of a kitchen, living room, activity space, and outdoor patio and gardens; a homelike quality to décor, furnishings, and the dress of staff; and exit controls consisting of a camouflaged door, locking device, and opening to a safe area. Design features to support way-finding and spatial orientation consisted of directional carpeting, personalized entrances to and furnishings in bedrooms, picture cues for bathrooms, and a well-demarcated wandering path outdoors. Prosthetic supports included handrails, raised toilet seats and grab bars in bathrooms, chairs as rest spots, and raised garden beds. Commonplace objects filled the SCU, including food and cooking and eating implements in the kitchen; a television and VCR in the living room; and puzzles, games, cards, books, magazines, balls, videotapes, plants, and writing materials throughout the living areas. Sensory stimulation and aesthetic features included artwork, a hanging mobile, an ambient sound maker, and attractive gardens and patio area.

Data gathering

Data were collected with the Activity in Context and Time (ACT), a computer-assisted observational tool designed to record environmental correlates of the time

use and apparent affect of people with AD (Appendix A).[22] The ACT encompasses nine observational domains, three of which are environmental in nature: activity situations, physical environmental affordances, and social environmental affordances. Based on extensive preliminary observations at the study site, six mutually exclusive and exhaustive activity situations that prevailed from 8:00 AM to 8:00 PM each day were identified: background media, television, meals/snacks, activity groups, ADLs, and downtime. Physical environmental affordances were determined by making an exhaustive list of physical environmental features that could be handled, manipulated, attended to, or otherwise intentionally used by residents (e.g., utensils, televisions, clothing, picture books), then reducing that list into broad conceptual categories. Social environmental affordances encompassed all persons commonly present on the SCU.

Four of the ACT's domains recorded time use in positive behaviors and included gaze, position and movement, participation in conversation, and participation in activity. These domains allowed positive behaviors to be hierarchically ordered with respect to levels of environmental engagement and requirements for progressively greater functional capacities and/or compensatory environmental support for performance to occur. An engaged gaze absent of any other positive behavior was presumed to reflect the lowest level of engagement and to require the lowest level of individual functioning and/or compensatory environmental support. An engaged gaze occurring simultaneously with purposeful walking was presumed to reflect a comparatively higher level of environmental engagement and, likewise, to require greater functional capacities and/or compensatory environmental supports. An engaged gaze occurring along with walking, conversational exchanges, and participation in activities was presumed to reflect the highest level of environmental engagement and to require the highest level of functional capacities and/or compensatory environmental support. One domain of the ACT also recorded time use in problem behaviors and incorporated existing measures of agitation, behavioral distress, and resistance to care.[23] Whether residents spent time in positive or problem behaviors, it was assumed that the prevailing situation allowed or promoted their behaviors.

The final domain of the ACT measured apparent affect using Lawton et al.'s Apparent Affect Rating Scale.[18,19] Positive and negative affect, two of Brod et al.'s vital dimensions of QOL experiences, were consequently recorded. Across all domains, weighted kappa coefficients indicated excellent interobserver reliability (mean = 0.89; range = 0.65 to 0.99).

Observations were conducted with hand-held computers programmed with the Observer Software system (*http://www.noldus.com*) in public areas of the SCU. An instantaneous sampling strategy[24] was used in which data were collected on each participant every 10 minutes from 8:00 AM to 8:00 PM across four nonconsecutive days. A complete observation string included one code entry for each domain. For example, an observational string of "Resident A" could be as follows:

- Environmental domains: formal meals, no social interaction, and interaction with eating implements;
- Time use domains: engaged gaze, sitting, no conversation, eat/drink (positive behaviors) and no agitation/distress (problem behaviors); and
- Apparent affect: interest.

With this strategy, 72 complete observations composed of 648 individual codes were produced on each resident daily.

Data analysis

Mean proportions were computed for the time each participant was observed in specific codes associated with each of the ACT's nine domains. Goodman-Kruskal gamma correlation coefficients were derived from mean proportions of time. This analysis examined the strength of associations between each of the six activity situations and codes in all other domains. The Wilcoxon Signed-Rank test was used to account for correlations that may occur when examining repeated measurements within subjects. Lastly, all complete observation strings were computed to determine each participant's demonstrated ranges of functional capacities, as evidenced by simultaneously occurring positive behaviors and positive affective expressions.

Results

General behavioral patterns

Averaged across all residents and study days, residents were not observed to interact with social affordances in 87 percent, and with physical affordances in 71 percent, of all observations, respectively (Table 2). Residents thus appeared asocial for 10.5 hours out of a 12-hour day, and noninteractive with their physical environs for 8.5 hours. Residents demonstrated an engaged gaze 60 percent of the time, or approximately seven hours daily, and an unengaged gaze or closed eyes 40 percent of the time, or approximately five hours daily.

Table 2. Mean proportions of time distribution in each observational domain			
Observational domain and corresponding codes			**Mean (SE)**
Environmental domains	Activity situations	Background media	0.322 (0.038)
		Downtime	0.226 (0.049)
		Television	0.211 (0.018)
		Meals and snacks	0.161 (0.011)
		Activity groups	0.062 (0.007)
		Basic activities of daily living	0.018 (0.003)
	Social environmental affordances	No interaction	0.869 (0.012)
		Interactions with others	0.073 (0.012)
		Interactions with staff	0.058 (0.008)
	Physical environmental affordances	No interaction	0.706 (0.022)
		Interactions with eating/drinking/kitchen materials	0.151 (0.019)
		Interactions with electronic media	0.068 (0.018)
		Interactions with clothing	0.024 (0.006)
		Interactions with all other objects	0.017 (0.004)
		Interactions with paper/print materials	0.016 (0.004)
		Interactions with furniture/fixed architectural features	0.010 (0.005)
		Interactions with two or more objects simultaneously	0.008 (0.004)
Time-use domains	Positive behavior: Gaze	Engaged gaze	0.603 (0.044)
		Eyes closed	0.320 (0.056)
		Unengaged gaze	0.077 (0.020)
	Positive behavior: Position and movement	Sitting	0.795 (0.054)
		Purposeful walking	0.133 (0.027)
		Lying down	0.072 (0.038)
	Positive behavior: Conversational exchanges	No participation in conversation	0.912 (0.020)
		Participation in conversation	0.088 (0.020)
	Positive behavior: Participation in tasks and activities	No participation in activity	0.743 (0.027)
		Participation in eating/drinking	0.137 (0.015)
		Participation in all other activities	0.099 (0.022)
		Participation in activities of daily living	0.016 (0.003)
		Participation in two or more activities simultaneously	0.006 (0.002)
	Problematic behaviors: Agitation, behavioral distress, or resistance to care	No evidence of problematic behaviors	0.997 (0.0028)
		Evidence of problematic behaviors	0.003 (0.0028)
Quality-of-life domains	Apparent affect	Interest	0.548 (0.043)
		No affective expression	0.388 (0.046)
		Anger, sadness or depression, anxiety or fear	0.044 (0.016)
		Pleasure	0.021 (0.005)

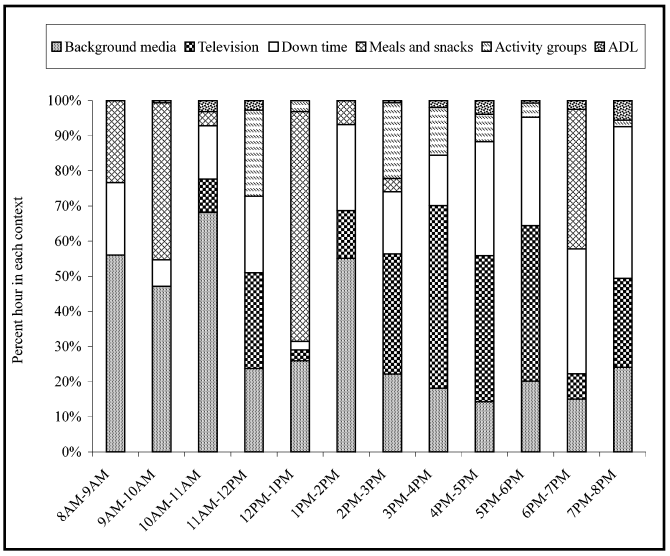

Figure 1. Hourly distributions of time corresponding with six activity situations averaged over four days.

Residents engaged in walking 16 percent of the time, for a daily average of just under two hours. Conversational exchanges were observed 9 percent of the time, for a daily average of 65 minutes. Active participation in activities or tasks was observed 26 percent of the time, or approximately three hours daily. Problem behaviors as well as pleasure, anger, sadness, anxiety, or fear were rarely observed. Although residents evidenced interest 55 percent of the time, they also showed an absence of affect 39 percent of the time, or for approximately 3.5 hours daily.

Computations of complete observation strings showed that three participants demonstrated the highest functional capacities measured by the ACT: the ability to sustain an engaged gaze while simultaneously purposefully walking, participating in conversation, and participating in another activity. The remaining four participants demonstrated capacities to sustain an engaged gaze while walking and conversing but not engaging in another activity, or conversing and engaging in another activity but not walking. Although expressions of pleasure were rare, only one participant was never observed to demonstrate pleasure.

Prevalence of activity situations and associated environmental presses and affects

The prevalence of each activity situation according to percent total observations and mean total daily time was as follows (Table 2, Figure 1):

- Background media: 32 percent, or 3 hours 50 minutes;
- Downtime: 23 percent, or 2 hours 47 minutes;
- Television: 21 percent, or 2 hours 31 minutes;
- Meals/snacks: 16 percent, or 1 hour 55 minutes;
- Formal activity groups: 6 percent, or 26 minutes; and
- ADLs: 2 percent, or 8 minutes.

Measures of association are reported in Tables 3, 4, and 5. Because problem behaviors occurred less than 1 percent of the time, associations of activity situations with this domain could not be computed.

When background media prevailed on the SCU, residents' interactions with physical affordances were highly unlikely, especially with electronic media and food-related materials (Table 3). Consistent with this finding, residents were also highly likely to sit with their eyes closed, unengaged in activities, and absent of all affect (Tables 4 and 5).

During downtime, residents were highly unlikely to focus on or interact with physical affordances, especially food-related materials (Table 3). However, residents were highly likely to walk around the SCU and also lie down. A weak positive association was found with conversational exchanges, whereas a strong negative association was found with participation in other activities or tasks (Table 4).

During television times, residents were unlikely to engage with staff and highly likely to orient toward the television set (Table 3). Although residents tended to remain seated, however, there was no indication that they actively watched shows and movies put on for them given the absence of positive associations with engaged gaze and participation in activities (Table 4).

During meals and snacks, residents were highly likely to use eating implements, sit with an engaged gaze, and consume their food and drinks mostly independently (Tables 3 and 4). Low levels of staff interactions were consistent with observations that staff mainly situated residents around tables, placed food and drinks before them, and subsequently provided only occasional encouragement to eat. Notably, in a social dining context, residents were highly unlikely to interact with each other. Although highly likely to show interest, residents were also as unlikely to show pleasure as they were anger, sadness, anxiety, or fear (Table 5).

Although a weak finding, residents did not tend to interact with other persons, especially other residents, during activity groups. Similarly, no associations were found with conversational exchanges. Residents were

Table 3. Associations among daily activity contexts and social and physical environmental affordances						
Daily activity contexts	**Background media (n = 604)**	**Downtime (n = 414)**	**Television (n = 397)**	**Meal/snack times (n = 301)**	**Activity groups (n = 117)**	**Basic activities of daily living (n = 34)**
Social environmental affordances						
No social attention or interaction	0.070 (0.051)[a]	-0.177 (0.083)	0.217 (0.136)	0.302 (0.176)	0.368 (0.138)	-0.860 (0.055)
p value	0.469[b]	0.109	0.156	0.156	**0.047**	**0.016**
Social attention to or interaction with others	0.051 (0.144)	0.210 (0.226)	-0.012 (0.127)	-0.833 (0.118)	-0.640 (0.178)	-0.743 (0.257)
p value	0.688	0.297	1.000	**0.016**	**0.031**	**0.031**
Social attention to or interaction with staff	-0.202 (0.149)	-0.223 (0.153)	-0.633 (0.178)	-0.002 (0.208)	-0.186 (0.228)	0.942 (0.023)
p value	0.375	0.297	**0.047**	0.813	0.766	**0.016**
Physical environmental affordances						
No interaction	0.691 (0.085)	0.554 (0.112)	-0.000 (0.206)	-0.852 (0.059)	-0.541 (0.097)	0.174 (0.321)
p value	**0.016**	**0.016**	0.938	**0.016**	**0.016**	0.563
Interaction with eat/drink/kitchen	-0.838 (0.061)	-0.874 (0.101)	-0.929 (0.057)	0.983 (0.005)	-0.094 (0.209)	-0.597 (0.275)
p value	**0.016**	**0.016**	**0.016**	**0.016**	0.813	0.063
Interaction with electronic media	-1.000 (0.000)	-0.583 (0.285)	0.812 (0.145)	-1.000 (0.000)	-0.296 (0.295)	-1.000 (0.000)
p value	**0.016**	0.063	**0.031**	**0.016**	0.297	**0.016**
Interaction with clothing	0.213 (0.242)	-0.189 (0.266)	-0.454 (0.263)	-0.584 (0.221)	-1.000 (0.000)	-0.500 (0.323)
p value	0.391	0.469	0.109	0.078	**0.016**	0.063
Interaction with paper materials	0.244 (0.267)	-0.588 (0.267)	-0.729 (0.176)	-1.000 (0.000)	-0.251 (0.357)	-0.715 (0.285)
p value	0.359	0.063	**0.031**	**0.016**	0.375	**0.031**
Interaction with all other objects	-1.000 (0.000)	-0.620 (0.194)	-1.000 (0.000)	-0.766 (0.234)	0.970 (0.008)	-0.377 (0.394)
p value	**0.031**	0.063	**0.031**	0.063	**0.031**	0.125

[a] Mean and standard error of the Goodman Kruskal Gamma correlation statistic; [b] p values are from the Wilcoxon Signed Rank test; Bold p values are < 0.05; p values of 0.016 indicate all residents evidenced reported trends; p values of 0.031 indicate six residents evidenced trends; and p values of 0.047 indicate five residents evidenced trends. p values greater than 0.125 are non-significant and indicate less than four residents evidenced trends.

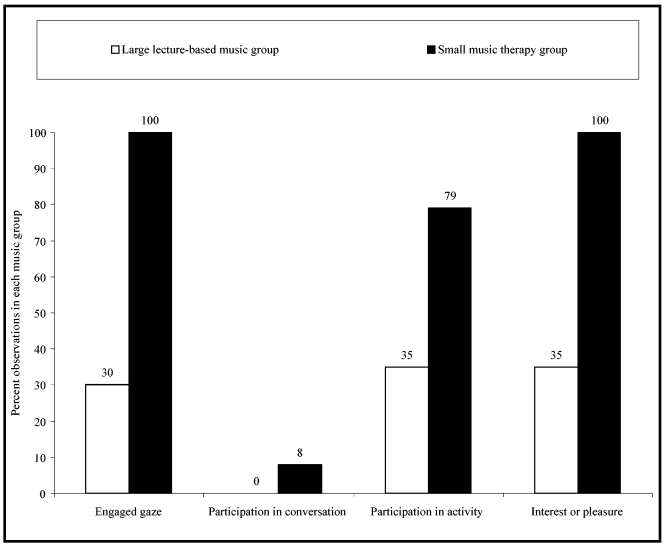

Figure 2. Total observations corresponding to positive behaviors and affect in two types of formal music groups.

highly likely to use "other objects" such as adapted musical equipment or game materials, as well as to sit and participate in activities that were being actively facilitated by group leaders (Table 4). No positive associations were found, however, with engaged gaze. This inconsistency is explained by differences between large lecture-based music appreciation groups that were open to all members of the life-care community and small therapeutic music groups for residents with AD. In the former, residents slept or had an unengaged gaze 70 percent of the time; in the latter, they were constantly engaged, participatory, and showed interest or pleasure (Figure 2).

During ADLs, residents were highly likely to interact with and have conversational exchanges with staff. A weaker, but still significant, association was found with participation in activities (Tables 2 and 3).

Discussion

Observations of environmental transactions suggest that the SCU's object-rich, homelike, personalized, accessible, and attractive environs was, by itself, insufficient to evoke frequent intentional uses of physical affordances by residents; likewise, the mere presence of staff, other residents, or visitors seemed insufficient to evoke many social exchanges. Time use observations further suggest that although all residents could engage in multiple levels of positive behaviors simultaneously, they only infrequently exercised their fullest functional capacities. Similarly, whereas all residents evidenced interest, and all but one evidenced pleasure, limited emotional well-being characterized their days. Analysis of how staff and other personnel implemented routine activity situations helps to explain these findings.

The most enabling environmental presses occurred when staff managed activity situations in ways that continually supported residents' positive behaviors and affect. ADL times and some activity groups constituted such situations. During ADLs, staff prompted conversations with residents and, to a lesser extent, facilitated their participation in grooming activities they could neither self-initiate nor self-execute. During some activity groups, staff provided special materials and adapted performance demands to compensate for residents' impairments and enable their participation in relatively difficult activities like making music, playing games, or taking communion. In both situations, residents thereby received needed environmental supports to enact activities that would have exceeded their competency levels, had they been left to their own devices. Additionally, in the small therapeutic music groups, residents' pleasurable experiences appeared to be maximized along with their participation in music-making activities.

A somewhat less enabling environmental press occurred during meals and snacks, which staff initially set up such that residents could use some of their functional skills but only infrequently interacted with them afterwards. Once situated around a table with food and drinks, residents relied largely on their own motivations and skills to use objects, eat, drink, and sustain interest. Notably, however, residents rarely interacted with one another and, in a finding parallel to that reported by Lawton et al.,[18] rarely exhibited pleasure. Thus, how staff conducted food-oriented times appeared sufficient to support residents' nutritional intake, self-feeding skills, and interest, and yet also insufficient, without other strategies such as those developed by Zgola,[18,25] to support their concurrent use of multiple functional skills with pleasurable dining experiences.

The least enabling environmental presses occurred in the large lecture-based music appreciation groups, background media, and television times: activity situations that together comprised slightly more than six hours daily. In contrast to the small therapeutic music groups that seemed to enliven residents, the music appreciation groups seemed to put them to sleep. Activity setup consisted of caregiving staff escorting residents to a room that had been arranged with rows of chairs in a classroom style. Implementation consisted of a group facilitator playing a video of an orchestral piece, lecturing on music theory, and rarely interacting with residents. This same style of setup and implementation was apparent in background media and television times. With background media, staff created opportunities for residents in

Table 4. Associations among daily activity contexts and time-use domains						
Daily activity contexts	**Background media (n = 604)**	**Downtime (n = 414)**	**Television (n = 397)**	**Meal/snack times (n = 301)**	**Activity groups (n = 117)**	**Basic activities of daily living (n = 34)**
Gaze						
Engaged gaze	-0.478 (0.082)[a]	0.167 (0.149)	-0.168 (0.171)	0.801 (0.079)	0.230 (0.156)	0.219 (0.298)
p value	**0.016**[b]	0.219	0.469	**0.016**	0.219	0.719
Eyes closed	0.521 (0.062)	-0.132 (0.165)	-0.022 (0.159)	-0.807 (0.069)	-0.287 (0.171)	-0.488 (0.246)
p value	**0.016**	0.375	1.000	**0.016**	0.156	0.109
Unengaged gaze	0.063 (0.168)	-0.155 (0.133)	0.245 (0.206)	-0.829 (0.149)	-0.208 (0.229)	-0.530 (0.313)
p value	0.813	0.578	0.297	**0.031**	0.531	0.219
Position/movement						
Sitting	0.409 (0.085)	-0.875 (0.033)	0.555 (0.185)	0.990 (0.010)	1.000 (0.000)	-0.180 (0.316)
p value	**0.016**	**0.016**	**0.047**	**0.016**	**0.016**	0.891
Purposeful walking	-0.190 (0.072)	0.728 (0.049)	-0.422 (0.174)	-0.957 (0.043)	-1.000 (0.000)	0.253 (0.333)
p value	**0.031**	**0.016**	0.078	**0.016**	**0.016**	0.891
Lying down	-1.000 (0.000)	1.000 (0.000)	-1.000 (0.000)	-1.000 (0.000)	-1.000 (0.000)	-1.000 (0.000)
p value	**0.016**	**0.016**	**0.016**	**0.016**	**0.016**	**0.016**
Participation in conversation						
No participation in conversation	0.079 (0.117)	-0.276 (0.080)	0.266 (0.168)	0.271 (0.164)	0.599 (0.225)	-0.710 (0.096)
p value	0.688	**0.031**	0.156	0.219	0.078	**0.016**
Participation in conversation	-0.079 (0.117)	0.276 (0.080)	-0.266 (0.168)	-0.271 (0.164)	-0.599 (0.225)	0.710 (0.096)
p value	0.688	**0.031**	0.156	0.219	0.078	**0.016**
Participation in activity						
No participation in activity	0.858 (0.045)	0.788 (0.093)	0.029 (0.220)	-0.912 (0.028)	-0.629 (0.056)	-0.548 (0.149)
p value	**0.016**	**0.016**	0.938	**0.016**	**0.016**	**0.016**
Participation in activity	-0.858 (0.045)	-0.788 (0.093)	-0.029 (0.220)	0.912 (0.028)	0.629 (0.056)	0.548 (0.149)
p value	**0.016**	**0.016**	0.938	**0.016**	**0.016**	**0.016**

[a] Mean and standard error of the Goodman Kruskal Gamma correlation statistic; [b] p values are from the Wilcoxon Signed Rank test; Bold p values are < 0.05; p values of 0.016 indicate all residents evidenced reported trends; p values of 0.031 indicate six residents evidenced trends; and p values of 0.047 indicate five residents evidenced trends. p values greater than 0.125 are non-significant and indicate less than four residents evidenced trends.

Table 5. Associations among daily activity contexts and relative emotional well-being domains						
Daily activity contexts	**Background media (n = 604)**	**Downtime (n = 414)**	**Television (n = 397)**	**Meal/snack times (n = 301)**	**Activity groups (n = 117)**	**Basic activities of daily living (n = 34)**
Apparent affect						
Interest	-0.446 (0.086)[a]	0.107 (0.150)	-0.221 (0.164)	0.829 (0.062)	0.086 (0.129)	0.140 (0.226)
p value	**0.016**[b]	0.688	0.469	**0.016**	0.469	0.891
No affect	0.509 (0.057)	-0.141 (0.154)	0.112 (0.168)	-0.803 (0.078)	-0.277 (0.153)	-0.454 (0.261)
p value	**0.016**	0.4690	0.688	**0.016**	0.156	0.188
Anger, sadness, or anxiety/fear	-0.367 (0.277)	-0.249 (0.283)	0.127 (0.280)	-0.796 (0.149)	-0.259 (0.351)	-0.402 (0.381)
p value	0.219	0.406	0.688	**0.031**	0.438	0.125
Pleasure	-0.463 (0.286)	-0.103 (0.333)	0.166 (0.270)	-1.000 (0.000)	-0.407 (0.378)	-0.675 (0.325)
p value	0.156	0.625	0.438	**0.031**	0.125	0.063

[a] Mean and standard error of the Goodman Kruskal Gamma correlation statistic; [b] p values are from the Wilcoxon Signed Rank test; Bold p values are < 0.05; p values of 0.016 indicate all residents evidenced reported trends; p values of 0.031 indicate six residents evidenced trends; and p values of 0.047 indicate five residents evidenced trends. p values greater than 0.125 are non-significant and indicate less than four residents evidenced trends.

the common living area to listen to soothing music on the stereo. During television times, staff created opportunities for shared generational experiences through watching shows like "I Love Lucy." Once having created these situations, however, staff-resident interactions were not likely, and residents' subsequent disengagement and failure to participate in the activities to which they had been given access were likely. In effect, therefore, although these situations each had an activity-oriented veneer, they functioned more as containers in which residents could be safely placed and monitored, but not necessarily meaningfully engaged.

Missed opportunities to support residents' transactions with others, time use in positive behaviors, and fullest possible use of their functional capacities are suggested by other findings as well. Residents appeared asocial approximately 10.5 hours out of each 12-hour day and, aside from brief ADL sessions, tended to have conversational exchanges only during downtime. These findings could suggest that staff did not view residents' social connections as important, or that how they carried out many activity situations had the unintentional effect of suppressing residents' conversational inclinations. Similarly, engagement in walking occurred mainly during downtime, suggesting that residents self-initiated walking and facility-based efforts to exercise their ambulatory capacities might not have been systematically undertaken.

It is important to stress, however, that an alternative explanation of these findings may exist: that is, the staff most highly valued keeping residents calm and free from agitation and distress and were expert at doing so. Indeed, across all activity situations, residents spent next to no time in problem behaviors associated with agitation, behavioral distress, and resistance to care, a valued outcome in dementia care.[26] This outcome may be attributed to the effectiveness of staff in attending to early signs of distress and intervening when agitation did occur, as well as to design features of the SCU that have been associated with reduced agitation.[9]

When viewed altogether, however, residents' patterns of environmental interaction, time use, and affective expressions convey only marginal QOL. On the one hand, the environmental presses of some activity groups perhaps helped residents attain their fullest performance potentials (if only momentarily), and meals and snacks allowed them to use many, but not all, of their functional capacities. On the other hand, the environmental presses of the most prevalent activity situations may have promoted isolation and boredom, hence, disuse and possible

atrophy of their skills. Moreover, although negative affects and agitation were rare, pleasure was also rare as residents' affects shifted mainly between interest and an absence of affect indicative of disengagement.

Theoretical and clinical implications

The activity situations that prevail each day on AD SCUs may be pivotal environmental determinants of the QOL experienced by residents, as well as the therapeutic effectiveness of other social and physical environmental interventions. Although families and staff often prefer noninstitutional environments with homelike and personalized ambiences, mixed findings pertaining to the therapeutic effectiveness of such environments have been attributed to variations in staff training and activity programming.[6,27,28] This study provides further evidence that a noninstitutional, homelike physical environment is, by itself, insufficient to maximize residents' QOL. The study also underscores that the skillfulness of staff in reducing problem behaviors may have few decisive QOL benefits if daily programming does not effectively optimize positive behaviors and emotional vitality. Variations in the environmental presses of specific activity situations suggest further that simply surrounding residents with activities insures neither their meaningful time use nor that their remaining functional capacities will be tapped and optimally maintained.

Ultimately, much remains unknown about how people with AD, and those who care for them experience daily life in dementia care facilities, especially as related to the impact of routine activity situations in organizing, giving shape to, and having multiple effects—intended or unintended, stated or unstated—throughout the day. For example, putting residents in activity situations that induce their passivity raises the possibility that the legitimate needs of staff for respite may be driving programming, yet in an underground fashion that serves neither staff nor residents well. This study also raises questions about the role of activity situations in creating an optimal balance between calming environments that minimize distress and enlivening environments that enable meaningful time use. As Lawton and others have noted, training staff to support the preferences of people with AD to do some things and not others enhances the satisfaction of staff with their work and its quality.[18,19] Perhaps most importantly, therefore, attention must be paid to how therapeutically designed, beautiful, and homelike architectural spaces can best be transformed into alive occupational spaces,[13,14] as well as to what personal and institutional contributions and commitments are needed to make such transformations a reality.

Limitations

Owing to this study's small sample size, lack of a control group, and correlational design, all interpretations of activity situations as having possible causal influences on residents' behavior and affect must be regarded as exploratory. As a naturalistic case study, associations of activity situations with other variables cannot be generalized to other SCUs. All durations of time were derived from 10-minute intervals and are approximations only. The instantaneous sampling strategy coupled with observations in public areas only may have underestimated problem behaviors. The sampling strategy may also have overestimated affective states such as interest and no affect and underrepresented affective events such as pleasure or anger.

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Appendix A. Domains and Codes: The Activity in Context and Time©

Environmental domains

1. Domain: Activity situations

Codes:

1.1. Downtime: absence of any other activity situation due either to no other situation occurring or because the resident left the situation that was occurring.

1.2. Activities of daily living: a staff intervention focused on direct assistance with mobility, toileting, dressing, hygiene, eating, and medications.

1.3. Background media: a staff-initiated enrichment that consists of playing the radio or music in the absence of any other enrichment, activity program, or staff intervention.

1.4. Television: a staff-initiated enrichment that consists of situating residents to watch movies or shows on television in the absence of any other enrichment, activity program, or staff intervention.

1.5. Activity groups: scheduled music groups; craft, game, or exercise groups; devotional services. Also coded when two activity contexts occur simultaneously.

1.6. Formal meals and snacks: regularly scheduled meals and snacks throughout the day.

(Note: residents must be in the immediate proximity of the activity situation for that situation to be coded.)

2. Domain: Social environmental affordances

Codes:

2.1. No sustained visual attention to or social interaction with another person.

2.2. Sustained visual attention to or social interaction with staff member.

2.3. Sustained visual attention to or social interaction with another resident, a family member, a visitor, or more than two people.

3. Domain: Physical environmental elements

Codes:

3.1. No interaction with any physical environmental feature.

3.2. Interaction with clothes.

3.3. Interaction with electronics (e.g., television, radio, stereo).

3.4. Interaction with objects associated with meals and eating or drinking.

3.5. Interaction with paper, pictures, or print materials.

3.6. Interactions with any other objects or features of physical environment.

(Note: *interaction* refers to any sustained visual attention toward or intentional handling, carrying, manipulation, reliance upon, or instrumental use of a physical environmental feature such as a hand-railing or free-standing object such as a piece of silverware).

Person-centered domains

4. Domain: Time-use (positive behavior)—Gaze

Codes:

4.1. Engaged gaze: indicates some level of intentional involvement with, or awareness of, others or the physical environment.

4.2. Unengaged gaze: indicates a wakeful state yet no sustained intentional involvement or attention to the environment.

4.3. Eyes closed: corresponds with dozing and sleeping.

5. Domain: Time-use (positive behavior)—Position and movement

Codes:

5.1. Lying/reclining.

5.2. Sitting.

5.3. Standing, walking: used to record instances of self-initiated, purposeful walking about or exploration of the environment in the absence of agitation or behavioral distress.

6. Domain: Time-use (positive behavior)—Participation in conversation

Codes:

6.1. No participation in conversation.

6.2. Participation in conversation.

(Note: *conversation* encompasses sustained efforts to communicate, regardless of whether communication is primarily coherent, incoherent, or nonverbal.)

7. Domain: Time-use (positive behavior)—Participation in activity

Codes:

7.1. No participation in activity.

7.2. Participation in activity.

(Note: *participation in activity* is evidenced by positive, sustained, and intentional engagement in some activity or task.)

8. Domain: Time-use (problem behaviors)—Agitation, behavioral distress and resistiveness to care*

Codes:

8.1. No evidence of agitation or behavioral distress.

8.2. Evidence of agitation/distress.

Quality-of-Life Domain

9. Domain: Apparent affect**

Codes:

9.1. No affective expression is apparent.

9.2. Interest.

9.3. Pleasure.

9.4. Anger, anxiety/fear, or sadness/depression.

* Indices of agitation and behavioral stress were adopted from Zimmerman and Sloane's quality of life indicators.[26]

** Affect measures are from Lawton's Apparent Affect Rating Scale.[22,23]