*DESIGN OF LIVING ENVIRONMENTS FOR
NURSING-HOME RESIDENTS:
INCREASING PARTICIPATION IN RECREATION ACTIVITIES¹*

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Nursing-home residents have frequently been characterized as unoccupied and disengaged. At the outset of the present study, most residents were to be found in their own rooms, not exhibiting gross motor behavior or social interaction, and not participating in appropriate activities. To modify residents' levels of participation with the environment, a manipulative area was provided in the lounge. Participation in the lounge averaged 20% on days when the activity was not available, but increased to a mean of 74% on days when equipment and materials were given and residents were prompted to participate. When prompts were withdrawn and materials were available only by request, mean participation fell to 25%. The findings demonstrate that manipulative activities can support a high level of participation with the environment, if residents are prompted to use equipment and materials.

DESCRIPTORS: geriatric patients, nursing-home residents, activities, prompt in nursing-home activities, recreation, participation, residential setting, response priming

In 1930, there were only a few nursing homes in the United States (Williams, Armstrong, Gunter, McCulloch, and Stiller, 1959). The growing number of aged persons has led to increased construction of care facilities. Moreover, the demand for institutional care of the aged is likely to continue unabated in the foreseeable future (United States Department of Health, Education, and Welfare, 1971).

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Expansion of care facilities has not been accompanied by the development of suitable activity programs for the elderly. Many nursing homes fail to provide recreational opportunities that could serve to maintain patients' social and motor skills. Of 45 Kentucky nursing homes responding to a mailed questionnaire, only 24 offered recreation for residents (Peters and Verhoven, 1970); another study in New York revealed that only 20% of nursing homes sampled had active recreation programs (Kurasik, 1965).

Although the nursing-home literature emphasizes the need for group activities (Gerletti, Crawford, and Perkins, 1961; Hardie, 1970; Kurasik and O'Connor, 1966) and cites specific activities believed to be appropriate for the aged (Fish, 1971; Routh, 1968; Shapiro, 1969), there have been few efforts to evaluate empirically the effectiveness of these program recommendations.

Lindsley (1964) called for direct observation and measurement of the behavior of the elderly, but few behavior analysts have attacked this problem. It is increasingly apparent that the design of environments and activities and the se-

lection of recreation equipment and materials have important effects upon the behavior of elderly people (McClannahan, 1973*a, b*; McClannahan and Risley, 1973*b*, 1975, *in press*). Moreover, the use of recreation to generate and maintain desired behavior has special implications for the institutionalized aged, for a growing body of evidence shows that continued inactivity can accelerate the degenerative processes associated with aging (Bonner, 1969; Comstock, Mayers, and Folsom, 1969).

In the present study, descriptive data on nursing-home residents' rates of verbal and motor behavior were collected before intervention. Subsequently, an activity was provided and levels of participation were compared: (1) when equipment and materials were given and residents were prompted to participate, (2) when equipment and materials were not available, and (3) when equipment and materials were available only by request.

METHOD

Subjects and Setting

The research was conducted in a 100-bed, proprietary, skilled-care nursing home located in a middle-income neighborhood. The building, constructed of brick, was about 4-yr old and offered both private and semi-private rooms. At the time of this study, all beds were filled and there was a waiting list of applicants.

The subject population ranged in age from 25 to 100 yr, with 76 to 80 the modal age group; residents under 50 yr of age were mentally retarded or severely disabled physically. Two-thirds of the residents were female, 73% received Medical Aid to the Aged, and 27% were private patients. All but 1% had received a medical diagnosis: cardiovascular diseases were the most common, accounting for some half of all diagnoses. Fifty-six per cent of the residents were ambulatory, sometimes with the assistance of a crutch or cane, 17% were confined to wheelchairs, 7% used walkers, and 20% were bedfast. On each of these variables,

the subjects conformed closely to the national averages for nursing-home patients (American Nursing Home Association, 1971).

Descriptive Data on Usual Activities

Before intervention, residents' usual activities were measured throughout the day. Every hour on the hour, from 7:00 a.m. to 7:00 p.m., observers toured the building, recording for each person: (1) location, (2) position/motion, (3) speech, and (4) participation in activities, or engagement with equipment, materials, or other persons.

Three trained observers studied the observation procedure, and then began taking data. When obtaining measures of interobserver agreement, the observers went in pairs and stood about 3 ft (0.9 m) apart. Observations in public areas were always made in a clockwise direction; when observing in residents' rooms, observers scored the person closest to the door first, and proceeded to the person farthest from the door.

Location. Residents could be found in several locations, such as rooms, halls, lounge, dining area, outdoors, or in the gerry-chair area (a room reserved for residents confined to geriatric chairs). The observers went to each location to record the number of persons within each previously defined area, except that they did not enter residents' rooms. In most cases, a walk past the door of a resident's room supplied the necessary information; it was felt that opening closed doors and entering rooms would constitute an unnecessary violation of privacy. This did not seriously affect data gathering, because most residents left their doors open and could be easily observed from the halls.

Position/motion. The position/motion measure was divided into six categories: sitting, standing, lying, walking, wheeling, and "other". The latter category included getting up, crawling, climbing, etc.

Speech. Speech was divided into seven categories; a resident could be recorded as not speaking, or as speaking to himself, to another resi-

dent, to a staff member, to visitors, to observers, or to "other" (e.g., talking on the telephone, or having conversations with dolls, animals, or persons not present). A person was recorded as speaking: (1) if he was engaged in verbal behavior, or (2) if he was visually attending, nodding, or smiling at another person who was speaking to him.

Participation. Participation was broadly defined as any form of appropriate engagement with equipment, materials, or other persons. The observers could either: (1) check a non-participation category, or (2) record in lay language the type of participation exhibited by the resident, e.g., sewing, watching television, blowing nose, making bed, putting on sweater, talking with visitor, or drinking coffee.

This definition of participation was broad enough to include almost any form of appropriate behavior. However, it did not include inappropriate responses such as stereotyped behavior, tantrums, smoking, or chewing tobacco.

Observer agreement. The activity-check data sheet used to record these observations is shown in Figure 1. Interobserver agreement on location was calculated by dividing the smaller total by the larger total for each location. Interobserver agreement on each of the other measures was assessed by dividing the number of agreements by the total number of agreements plus disagreements. Mean interobserver agree-

ment was 100% on location measures, 95% on position/motion, 96% on speech, and 93% on participation-nonparticipation. When write-in responses were categorized according to type of participation exhibited by the residents, mean interobserver agreement was 90% (see Cataldo and Risley, 1974, for further discussion of this measurement procedure).

Results

One day of observation (7:00 a.m. through 7:00 p.m.) was obtained during each week for eight weeks. For two weeks, the 13 hourly observations were all obtained on the same days; for the remaining six weeks, observations were spread across several days. Data were collected on weekdays, but not on Saturdays or Sundays. Means were calculated on each measure for each of the eight data-taking days, and these daily means were used to compute grand means across all eight data-days.

The location data indicated that, on the average, 54% of the residents were to be found in their own rooms, 16% in the lounge area, 10% in the dining hall, and 7% in the gerry-chair area; halls, outdoors, nurses' station, and lobby were occupied even less.

The position/motion data shown in Figure 2 indicate that, at any given time, most residents were sitting (63%) or lying (23%). Only 7 and 6% respectively were walking or stand-

Time	Location	Position/Motion						Speech							Participation	
		sitting	standing	lying	walking	wheeling	other	no speech	to self	to resident	to staff	to visitor	to observer	other	none	
10:00	Lounge	×						×							×	
		×									×					talking to aide
						×		×							×	
		×						×								eating candy

Fig. 1. Sample activity check data sheet.

ing. The "other" categories on the data sheet are not shown in Figure 2, either for position/motion or for speech, because those categories contained less than 1% of all observations.

Figure 2 also shows that, on the average, 87% of the residents were not engaged in social interaction. When they did interact, the recipient of interaction was most often another resident. Interactions directed toward self, staff, visitors, or observers accounted for only a negligible proportion of all observations.

The average per cent of residents participating per hour across all eight data-days was very stable, seldom rising above 40% or falling below 30%. The grand mean of these data was 36%; thus, only slightly more than a third of the residents were engaged in appropriate activity at any given time.

The types of participation most commonly observed are also shown in Figure 2, which displays the per cent of residents engaging in various activities during one randomly selected data-day. Of all persons recorded as participating during the day, 34% were engaged in food-related activities. Twenty-four per cent of those participating were engaged in social interaction, 14% watching television, 8% listening to the radio, and 8% reading or writing.

Although hourly time samples are not commonly used by applied behavior analysts, they were appropriate in this study: it took observers 35 to 40 min to go to each location and record their observations. Pilot investigation showed that, whether observations were made on the hour, half-hour, or quarter-hour, or whether all 13 observations were made on a single day or spread over several days, the data varied little. On none of the measures presented above did the means for each data-day vary by as much as 10%.

Taken as a whole, these data present a picture of nursing-home residents who are usually to be found in their own rooms, not exhibiting gross motor behavior, not engaging in social interaction, and not participating in any appropriate activity. These descriptive data document

the need for activity programs that maintain higher levels of participation with the environment.

Experimental Procedure

To assess participation in recreation activities, a manipulative area was created in the nursing-home lounge, and equipment and materials were made available to the residents on weekdays, from 10:30 to 11:30 a.m. Puzzles and

Fig. 2. Grand mean per cent of residents recorded as sitting, lying, walking, standing, or wheeling (upper panel); grand mean per cent of residents exhibiting no speech, or speaking to another resident, to self, to staff, to visitors or to observers (middle panel); per cent of residents engaging in various activities during one data-taking day (lower panel).

games of various types were displayed on shelves and, during the times that the area was open, residents could select any of these items and take them to a nearby work table or lounge chair. Participants could return one piece of equipment and select another at any time.

A time-sampling procedure was used to measure residents' participation. Every 3 min, observers stationed at the periphery of the area and about 6 ft (1.8 m) from one another, counted the total number of persons in the lounge and the number of persons engaged, or participating with the environment. These two counts permitted computation of the per cent of residents participating. Subsequently, the 20 data points obtained during each 1-hr session were averaged, to obtain mean per cent of residents participating per session.

The definition of participation was the same broad definition described earlier. Residents were scored as participating if they exhibited any form of appropriate engagement with equipment, materials, or other persons, such as watching television, talking to another resident, visually attending, nodding or smiling at another person speaking to him, eating or drinking, or taking medication. Again, inappropriate responses such as symptomatic behavior, tantrums, and chewing tobacco were excluded from the definition.

However, participation with recreation equipment was defined only as actively manipulating or scrutinizing the provided equipment. Thus, a resident might sit quietly and hold a puzzle, or glance at, and away from, a piece of equipment, and he would be recorded as not participating. With these elderly nursing-home residents, there appeared to be a clear and readily observable distinction between "doing something" and "doing nothing".

The four college-student observers were not informed of the purpose of the study. The observer-training procedure involved giving the observers a set of instructions, having them take data according to the instructions, and then giving them the instructions to re-read. This

was done for two sessions with each observer. Before beginning a session, the observers synchronized their stopwatches; they then moved about 6 ft (1.8 m) apart, and were cued by their stopwatches as to when to begin each count of attendance and participation. When taking data, the observers stood in the same location and scanned the lounge in a clockwise direction.

Interobserver agreement was calculated for each pair of observations by dividing the smaller by the larger per cent of residents participating. These 20 intrasession measures were then averaged to obtain mean interobserver agreement per session. Twenty-five reliability estimates were obtained during 71 sessions, with at least three estimates obtained during each condition. Mean interobserver agreement, across all conditions, was 90%.

Phase I. During the first four days of Phase I, the manipulative area was closed and equipment was not available; on the fifth day, the manipulative area was open. Subsequently, the "equipment-not-available" and the "equipment-given" conditions were alternated on a day-by-day basis, until Days 33 through 36, which were all "equipment-given" days.

As people entered the lounge during the "equipment-given" condition, they were given an opportunity to approach the display shelves and select a puzzle or game. If a resident entered the area but did not request or select recreation equipment (as was usually the case), he was sought out by the activity leader, who placed recreation equipment in his hands and prompted him to participate. Prompting consisted of inviting the resident to use the equipment, demonstrating how to use it, and, if necessary, assisting him in using it appropriately. Additional prompting was provided only when residents stopped using equipment or indicated that they wanted something else to do.

On days when the manipulative area was open, as well as on days when the area was closed, observers recorded the number of residents in the lounge area, and the number of residents participating.

Phase II. During the 35 days of Phase II, the manipulative area was open every day. In the "equipment-given" condition, the Phase-I procedure was followed. That is, if residents entered the area and failed to approach the display shelves or request equipment, the activity leader placed materials in their hands and prompted them to begin to use them.

In the "equipment-available" condition, however, residents were required to: (1) approach the display shelves and make their own selections; or (2) approach the activity leader and make a request, such as "I want something to work with", or "May I have the Q-bic puzzle?", or "Do you have something for me to do?" In the case of blind and/or nonambulatory residents, a verbal request was considered sufficient and an approach to the equipment or the activity leader was not required; for non-verbal residents, an approach response was considered sufficient to obtain equipment.

In Phase II, Days 1 through 4 were all "equipment-given" days; during Days 5 through 35, the "equipment-given" condition alternated with the "equipment-available" condition. In both conditions, residents who had previously obtained equipment were prompted whenever the activity leader saw that activity had ceased. Observers continued to record attendance and participation on days when equipment was given, as well as on days when equipment was available.

RESULTS

Phase I

Residents' levels of attendance in the lounge did not differ greatly between conditions; mean attendance in the lounge area was 19 for sessions when equipment was given, and 17 for sessions when equipment was not available.

There were marked differences in participation, however. Figure 3 shows that the mean per cent of residents participating averaged 74% during the "equipment-given" condition, but fell to 20% during the "equipment-not-

available" condition. Thus, placing materials in residents' hands and prompting them to use them more than tripled the mean per cent of residents in the lounge area who were engaged with their environment.

Phase II

During the second phase, the mean per cent of residents participating during "equipment-given" sessions remained stable; the grand mean for these days was again 74%. In the "equipment-available" condition, however, when residents were required to approach the display shelves and make their own selections, or approach the activity leader and request equipment, the grand mean per cent of residents participating was 25%, only slightly higher than the mean of the "equipment-not-available" condition in Phase I.

Again, attendance in the lounge varied only slightly between conditions. Mean attendance was 18 on days when equipment was given and 17 on days when equipment was available.

DISCUSSION

Previous studies have indicated that extended periods of inactivity and nonparticipation lead

MANIPULATIVE AREA
MEAN PERCENT PARTICIPATING

Fig. 3. Mean per cent of residents participating in the lounge. During Phase I, the grand mean was 74% on days when equipment was given, and 20% on days when equipment was not available. In Phase II, the grand mean was again 74% for the "equipment-given" condition, but only 25% for the "equipment-available" condition.

to loss of verbal and self-care skills and hasten the need for total nursing care in the elderly. The descriptive data presented above demonstrated that the present subjects exhibited low levels of participation, indicating a need for recreation programs that could maintain residents' appropriate social and motor behavior in an institutional environment.

As yet, there has been little applied research to determine the efficacy of different types of environmental arrangements for the aged. What kinds of activities can generate and sustain participation? How should activities and materials be organized and presented? What is the role of the care provider in maintaining appropriate engagement?

The present study examined nursing-home residents' participation in the lounge area of the care facility. Attendance in the lounge during the different experimental conditions was fairly constant, but participation varied markedly, depending upon the availability/unavailability of equipment and materials, and the method of making them available.

The data showed that engagement could be trebled by providing manipulative materials and prompting the residents to use them. This prompting procedure should be distinguished from other procedures that could reinforce nonparticipation. It should be noted that the activity leader's interactions with the residents were brief and materials-related, *e.g.*, "Would you like to use this?", or "Let me show you", or "Do it like this", or "Now, you try it". The activity leader did not use descriptive praise, and her interactions with the residents were limited to prompts. Although prompts were delivered when residents failed to initiate an activity, or when they ceased to engage in an activity, the prompting procedure did not appear to reinforce nonparticipation. Levels of participation remained high during Days 33 through 36 of Phase I, and Days 1 through 4 of Phase II.

This study demonstrated that prompting can effectively maintain residents' participation with

manipulative materials, and that merely making equipment available and waiting for residents to take the initiative in requesting, selecting, and using it results in low levels of participation. Thus, it appears that prompting of initial participation is an essential component of recreation programs for the institutionalized elderly. This is in marked contrast to research on materials and recreation activities with other populations (*cf.* Pierce and Risley, 1974; Quilitch and Risley, 1973; Twardosz, Cataldo, and Risley, 1974), where simply making materials and activities available was sufficient to engage people's participation. Much of the pervasive inactivity of the debilitated aged may well be a function of only a slight increase in the threshold of stimulation necessary to induce activity.

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