

THE BEHAVIORAL ECOLOGY OF OLDER PERSONS
IN INSTITUTIONAL HOUSING

A Thesis
Presented to
the Faculty of the Department of Psychology
University of Houston

In Partial Fulfillment
of the Requirements for the Degree of
Master of Arts

By
Mary Ann Parris Stephens
Fall, 1978

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With the completion of this thesis, I find it tempting to take full credit for the work accomplished. But a realistic appraisal of the process reminds me that many others were involved in important ways.

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With the growing number of relatively healthy and active older persons in our society, there has been a corresponding increase in the demand for institutional housing to meet their needs. Planners and managers of such facilities do not have sufficient objective data about institutional living on which to base programmatic and design decisions. The purpose of this study was to document the everyday behavior of institutionalized older persons in its everyday social and physical contexts.

A total of 34 residents were selected from two institutions for the actively retired. In individual interviews conducted at the end of the day, subjects reported their behavioral activities for that day, the places where those activities occurred, and the other persons with whom they interacted. Interviews were scheduled so that data from seven days (a composite week) were obtained for each subject.

The findings revealed that the behavioral repertoires of these elderly residents were somewhat docile and restricted in range. Large portions of their daily activities were performed alone, and when socially interactive behaviors occurred, they most often involved other residents. Three institutional settings--the private residential quarters, the dining hall and the central lobby--accounted for all but a small part of the

residents' time. Although residents spent almost two thirds of their time in their own rooms, neither social isolation nor behavioral monotony were found there. Institutional size (number of residents) did not appear to have a significant effect on the social participation of residents (e.g., number of activities performed and time spent in social interaction). Other environmental factors, location of residents room and type of setting in which behavior occurred, did exert strong influences on a wide variety of behavior patterns.

The daily activities of the residents, the settings they used, and the other people with whom they interacted demonstrated marked similarities across both institutions and different age groups. These ecological data make a contribution to psychology's task of documenting the natural distribution of behavioral phenomena. These data not only provide an objective, quantitative base for making many practical decisions which face environmental designers and agents of behavioral change, but they also add to the general knowledge about aging and behavior.

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CHAPTER I

INTRODUCTION

The primary purpose of this study is to clarify some of the behavioral and environmental aspects of the daily lives of elderly persons residing in homes for the aged. The everyday behavioral activities of such persons are described as they appear in their physical and social contexts. The secondary purpose of this research is to evaluate the generalizability of an interview technique designed to record molar behavioral phenomena for its use in geriatric settings.

The following sections will present (a) background information, (b) the need for a more complete understanding of the complex behavioral relations in institutional life, (c) an overview of the behavioral ecological perspective and its value for uncovering these relationships, (d) instruments and procedures employed in the investigation, and (e) an assessment of data quality. Findings represent categorizations and descriptions of the residents' daily activities, the settings in which they take place and whether the activities were performed alone or with others. These activities are examined in greater detail in the context of institution size and in the context of the most

commonly used institutional settings. Undermanning theory and the major findings regarding institution size and social participation are discussed briefly with the presentation of the results bearing on these issues. Accompanying the presentation of findings centered on the major settings are some theoretical notions regarding the behavior of older people in institutional housing. Finally, some general findings concerning the site specificity of behavior are reported.

Aged Persons and Institutional Housing

One of the clearest trends occurring in Western Society is the aging of the population, or the steadily growing number of persons who live to old age. Improvements in such technologies as medicine and agriculture have not only made it possible for many people to live longer, but they have also made it possible for these older people to enjoy relatively high standards of health. In more agrarian times, when a person became too old and too incapacitated to work, he relied on members of his family to house and care for him. With a more urbanized and mobile society has come the virtual extinction of the extended family unit. One of the most serious implications of the extended family's disappearance for aged persons is reflected in the increasing demand for housing and care facilities (Beauvoir, 1972). Housing the elderly has become an urgent and difficult problem that is likely to increase in

magnitude as the elderly portion of the population continues to increase in size.

Institutional housing provides one alternative for meeting the housing needs of elderly persons. At one time, institutions for the aged served as little more than warehouses for the incapacitated. More recently, many institutions have been designed with the explicit goal of providing means by which relatively healthy older persons can maintain maximally independent life styles.

The effects that housing arrangements of this kind have on the elderly are not clear. The literature is replete with accounts of the institutionalized elderly as disoriented, disorganized, withdrawn, and apathetic. These characteristics are frequently attributed to the singular effect of institutional life. Systematic research on the influence of institutional housing on the psychological and behavioral functioning of older people has recently begun to appear.

Marcoen and Houben (1975) investigated various properties of behavior of aged persons living in individualized and collective housing. They found that the behavior of persons living in individualized housing, as compared to those living in collective housing, was significantly more varied, more active and more independent in the course of the day. The investigators noted the possibility that certain types of persons may select one form of housing

over the other and that the differences may not all be institutionalization effects.

In an investigation of medical and behavioral changes occurring in new residents during the first month after admission to a home for the aged, Rodstein, Savitsky and Starkman (1976) found evidence to suggest that the initial month is a period of extreme stress. More than half the subjects displayed physical or emotional problems or both. The major patterns of emotional reaction were characterized as anxiety, aggressiveness and depression.

The long-term psychological effects of institutional housing on elderly residents were investigated by Tobin and Leiberman (1976). In a comprehensive longitudinal study, they monitored psychological changes in individuals from the time they made the decision to enter an institution until they had lived in the institution from one to two years. For a wide range of psychological variables, the most trauma occurred from the time the individual decided to move into the institutional housing until the actual move was made. During this time, the elderly individual became increasingly unhappy, helpless and less dominant in his relations with others. The initial one or two month period after institutionalization served as a period of adjustment and there appeared to be no further decrements in emotional responsiveness during this time. Later, most residents returned to psychological patterns

similar to the ones they displayed before deciding to leave independent living in the community. One of the most notable findings obtained through this investigation is that institutional living is accompanied by remarkable stability in psychological functioning.

While the studies reported by Rodstein, Savitsky and Starkman (1976) and Tobin and Leiberman (1976) shed light on the psychological impact of institutional housing on the aged, they do not address the issue of functional performance, or what the residents do during their daily lives. In order to achieve a more complete understanding of institutional life, it is not only important to document affective and attitudinal variables, but it is also necessary to provide an account of the residents' behaviors.

Hitch and Simpson (1972) obtained data on the daily activities of residents in three homes for the aged in order to evaluate the impact of certain architectural and policy differences between the homes. Data were obtained through direct observation of residents and from interviews conducted with head staff members and residents. Twenty-four observations were conducted in which the researchers walked through an institution noting the location of each resident and what he was doing. Head staff members were asked to rank each resident and each resident was asked to rank himself on many of the same variables

being observed directly, e.g., mobility, housework, reading, and watching television. Little agreement was found to exist between data obtained by these two methods.

Spasoff, Kraus, Beattie, Holden, Lawson, Rodinburg and Woodcock (1978) administered a multifaceted survey to residents of homes for the aged at one month and again at one year after institutionalization. Findings indicate that at each data collection period, residents reported increased dependency accompanied by low levels of activity. Approximately one third of the residents surveyed reported being less involved in social and recreational activities at the later times. At the end of the year, more residents reported their major activity as sitting, lying, or doing nothing at all. Similar to the findings reported by Tobin and Leiberman, fear and anxiety were highest just prior to the move to the institution.

In the studies reported by Hitch and Simpson (1972) and Spasoff, et al. (1978) attempts were made to assess the everyday behaviors of institutionalized elderly people. The limitations imposed on these findings result from the simplicity of the concepts and methods employed in obtaining the data. For example, the observation strategy used by Hitch and Simpson was restricted to a short checklist of activities recorded at 24 points in time for all subjects. Consequently, these observations provided only brief cross sectional snapshots of the residents' behavior.

rather than detailed or complete accounts of behavioral configurations. In both investigations, staff members and/or residents were asked to rate or to make estimations regarding the quantity of various resident performance dimensions. The dimensions surveyed were global in nature, such as involvement in recreational activities and extent of television watching. The veracity of such retrospective estimations is problematic as is evidenced by the low agreement obtained between reported and observed phenomena. Environmental factors and their potential influence on behavior were generally ignored. Behaviors tended to be assessed as though they functioned independently from the physical surroundings and from other behavioral phenomena. Behavioral ecological relations are complex phenomena and cannot be adequately assessed through simplistic questionnaire techniques. Likewise, brief and infrequent observational reports are inadequate for documenting behavioral complexities. Furthermore, any account of behavior which fails to take account of environmental contextual variables is likely to lead to confusing and limited interpretations.

As yet, there has been little research directed at a comprehensive understanding of institutional life at the level of behavior. Such knowledge would be useful to persons involved in planning for geriatric institutions, e.g., behavioral change agents and architects and designers.

Recently, geriatric behavior has received increased attention from applied behavior analysts. Cautela (1969) advocates the use of classical conditioning techniques to improve the learning of elderly people and to increase their levels of activity. Lindsley (1964) suggests using operant learning principles for developing and maintaining appropriate behaviors in the institutionalized aged. Lindsley recognizes that the types of alternatives required to support aged behavior cannot be determined until the number, range and degree of behavioral deficits are documented. He emphasizes the need for observation and documentation of behavior displayed by elderly persons.

Reports of behavioral interventions conducted by behavior analysts have begun to emerge in the literature (McClannahan and Risley, 1974, 1975; Newkirk, Feldman, Bickett, Gipson, and Lutzker, 1976). While baseline data were obtained prior to the interventions in order to assess their impacts, no systematic attempt was made to assess behaviors other than those which were targeted for change.

Willems (1977c) describes the potential dangers involved when intruding in behavioral systems. Because behaviors and their associated contexts are inextricably linked, tampering with any part of such a system is likely to affect other parts of that system. This argument suggests that as much knowledge as possible should be

obtained about a behavioral system so that the impact of an intervention can be more fully anticipated. Such a broad view of behavior and its complexities could be useful to behavioral change agents in both the planning of their intervention strategies and in the assessment of their impacts.

Architects and designers of housing for the elderly have become aware of the impact that their structures have on the behavior of the residents. Gelwicks and Newcomer (1974) suggest that the quality of housing environments is particularly important for older persons because these persons are often the least likely to adapt to their environments, to adjust to them, or to leave them. Lawton (1974, 1975a, 1975b) goes further to propose that older people are likely to be lacking in physical stamina as well as financial and social resources. Due to such decrements in competency, the older person is generally more sensitive to variations in the physical environment. Similar environmental press and needs theories regarding aged persons have been put forth by Kahana (1975) and Schooler (1976). All three theoretical points of view underscore the importance of environmental factors in the optimal functioning of the elderly.

Carp (1976) investigated certain long-term effects of institutional housing on elderly people. He found that the major determinants of satisfaction with institutional living

were the qualities of the physical environment. Lawton (1978) demonstrated that changes in several environmental characteristics of the dwelling unit, such as size and general atmosphere were accompanied by improvements in overall well-being and greater participation in activities. Such findings point to the importance of careful planning and design of geriatric living arrangements.

Lang, Burnette, Moleski, and Vachon (1974) state that one of the objectives of architectural design is to create spaces which provide for activity patterns that allow building users to meet their goals. The authors further suggest that it is important to understand the complex system of behavioral components which occur in a setting. Without such an understanding, it is easy to design for ongoing but inappropriate patterns of behavior. One unit of analysis suggested by Lang, et al. for studying human spatial behavior is the activity system. This unit is composed of a series of behavioral episodes having the same contextual arrangements. In other words, an activity system describes the stream of behavior associated with a given setting.

There is little information regarding such activity systems in geriatric institutions. For example, little is known about the social and behavioral performance patterns associated with major institutional settings (e.g., lobbies, halls), the importance of physical distance on

setting utilization, and the residents' needs for privacy (Lawton, 1974). Perhaps a comprehensive assessment of the activity systems that occur in existing facilities could assist designers in creating new living environments more appropriate to the behavioral needs of the elderly.

The Behavioral Ecological Perspective

The need for a more comprehensive understanding of the complex environment-behavior relations which constitute institutional life has been illustrated and the lack of such existing knowledge has been traced to the simplistic concepts and methods employed in most investigations. These problems are not unique to the study of geriatric behavior, but can be readily translated to the study of almost any arena of human behavior. The behavioral sciences have traditionally conceptualized behavior in simplistic terms and have investigated these phenomena with equally simplistic methods. Little attention has been given to the contextual arrangements in which behavior occurs. Such formulations are not only naive but do little to advance our understanding of person-environment relations.

In his analysis of the crisis of confidence in social psychology, Elms (1975) argues that the lack of complexity in our formulations about human social behavior is one of the primary reasons for this crisis. He notes that the most influential theories have been sweeping one-factor

or two-factor propositions that have attempted to account for a wide range of behavior without acknowledging its complexity. Consequently, these theories have not fared well when put to empirical tests.

The behavioral ecological perspective proposed by Willems both recognizes and emphasizes the intricate complexities inherent in human behavior. Several distinguishing features of this social systems model have been delineated by Altman (1973). According to Altman, the model conceptualizes behavior as a changing and dynamic phenomenon which functions at many levels. Furthermore, the relations between persons and their environments have a mutual and dual impact. That is, not only do environments act on persons, but persons also act on environments. Due to this reciprocity which exists between persons and settings, behaviors cannot be adequately understood apart from their intrinsic relationships with environments. These distinguishing features of the model have prompted Altman to characterize the social systems (ecological) model as the most fruitful of the current approaches to person-environment relations.

Behavioral ecology is first and foremost a perspective, a point of view, on how the world of human behavior functions. The rest of this section provides an overview of some of the defining characteristics of behavioral ecology as it has been developed by Willems (1977a, 1977c) as well

as some implications of this perspective for the conduct of behavioral research.

For the behavioral ecologist, the study of human behavior is a central concern. In other words, what people do overtly, rather than what they think, feel or perceive receives primary emphasis. The study of behavior is emphasized because behavior represents the mediation of person-environment relations. It is through behavior that an individual interfaces with or makes long-term adaptation to the environment. Behavior also provides a means by which the person modifies the environment.

Greater emphasis is placed on the study of molar phenomena than on the study of more molecular ones. The behavioral ecologist accepts complicated, intact phenomena as the arena for his investigation. These molar phenomena are studied as holistic units rather than being reduced to their elements because it is assumed that these molar units cannot always be adequately understood at simpler levels.

One of the primary concerns of behavioral ecology is documenting the distribution of behavioral phenomena in nature, i.e., recording the range, intensity and frequency of everyday molar behaviors as they occur in the investigator-free environment. Many other writers have advocated the use of this strategy for developing a more comprehensive understanding of the phenomena under

investigation (Barker, 1969; Craik, 1970; Elms, 1975).

Such documentation not only provides information regarding the quantity of a given behavior in a given locale, but it can also point out fallacies in existing beliefs regarding that behavior. Elms (1975) suggests that when an area of human behavior attracts the attention of researchers, it would be desirable to collect objective information about the natural distribution of the phenomena in order to formulate more adequate hypotheses and to design more appropriate research.

Because behavior always occurs in a physical context, where behavior occurs is always important. Behavioral ecology places a great deal of emphasis on the transactional nature of organisms and environments, with behavior being the major interface between them. Behavior is not totally determined by the physical environment, nor does it function independently of the environment. Lang, et al. (1974) and Moos (1973) note that behavior necessarily occurs in a physical context which may impose many major physical constraints on behavior and serve to determine many patterns of behavior.

Closely related to the issue of behavior-environment linkages is the prediction of behavior from place. Barker (1968) suggests that place-behavior systems have such strong principles of organization and constraint that their standing patterns of behavior remain essentially the same

even though individuals come and go. Stated more strongly, the principles which govern site specific behavior allow predictions to be made from the setting in which an individual is located to the patterns of behavior he exhibits there. This viewpoint results in two important implications. First, behavior is largely determined by the setting in which it occurs. Second, changing the environmental setting will result in changes in behavior. Third, in order to account for the congruence of behavior and environment and the principles which govern them, researchers must begin to identify the physical settings that are involved with behavior and the purposes for which these settings are being used. Identifying such contextual arrangements is important because variations in physical settings are associated with variations in performance.

Although the use of systems concepts and theories in behavioral ecology is still primitive, these concepts provide a means of conceptualizing the complex interrelations found in human behavior. They also point to the system-like regularities which are characteristic of behavior-environment relations. Ecosystem principles embody some important implications for interventions into ongoing systems. Since many social, physical and biological systems function as integrated wholes, even the most positively motivated interventions into these interdependent systems can lead to many kinds of unanticipated effects,

many of which are negative and pernicious. The behavioral ecologist is concerned with learning how to monitor and understand the network of influences in such systems so that the effects of an intervention can be assessed more fully in advance.

The issue of habitability, or what kinds of environments are fit to inhabit, is another concern of behavioral ecology. This issue receives a great deal of attention not only because it provides important information for environmental designers and engineers, but because these efforts may lead to some basic theoretical understandings as well.

While the behavioral ecological perspective does not prescribe a single set of methods, its tenets provide implications for the conduct of behavioral research. It has been stated that not only are the traditional concepts of behavior oversimplified, but the methods and strategies employed to study behavior are generally inadequate to represent the complexity of the phenomena being assessed (McGuire, 1973). In other words, it is not so much that we have focused on the wrong variables, but that our methods have not allowed us to properly account for the complexity of their organization. Behavioral ecology, with its emphasis on complex regularities and interdependencies between organisms, behavior and environment, is largely naturalistic in its methodological orientation. Since

understanding the complexity of everyday behavior is the central focus, naturalistic methods, as opposed to experimental ones, are preferred.

Naturalism in methodology refers to the activities of the investigator rather than the properties of the phenomena being investigated. Willems (1969) has proposed a two-dimensional space for representing the kinds of activities that an investigator engages in while conducting his research. The first dimension refers to the degree of the investigator's influence upon, or manipulation of, antecedent conditions of the behavior being studied. The second dimension refers to the degree to which units are imposed by the investigator on the behavior being studied. If each of these dimensions is viewed as ranging from high to low, naturalistic methods tend toward the low-low quadrant of the two-dimensional space. In essence, these methods permit the investigator to study phenomena which he has neither produced nor brought about.

The emphasis on naturalistic methods generally precludes the use of experimentation. In fact, the ecologist would argue that the researcher of behavior should manipulate only that which is necessary to answer his question clearly. This argument stems primarily from the assumption that holding experimental conditions constant while manipulating a limited phenomena is a figment of the experimental laboratory which often produces a distorted

picture of the phenomena under investigation. Chapanis (1967) notes that the major advantage of the experiment-control-constitutes its major weakness for solving practical problems. He points out that experiments control extraneous variables, while behavior in the real world is subject to all sorts of uncontrolled variation. Consequently, events which occur within the contrived conditions of the experiment are not typical of those which occur in everyday, ongoing environments.

A further weakness of the laboratory experiment for studying person-environment relations is the reactive arrangements they create. Proshansky (1976) argues that the laboratory environment cannot substitute for reality and when subjects know that the situation is contrived, the phenomena being investigated are invalidated. To circumvent the problems of reactivity and artificiality, Proshansky has delineated three methodological requirements. First, the investigation should preserve the integrity of the person-environment units as much as possible, a task which isolated and piecemeal studies have great difficulty in achieving. Second, the phenomena should be studied in their natural contexts. Finally, intrusions by the investigator should be minimized so that distortions of the naturally occurring units can be kept to a minimum. These methodological requirements seem to

suggest a field-naturalistic approach to the study of environment-behavior relations.

In general, behavioral ecology is not concerned with simple cause and effect models. There is less concern with experimental control than with documenting the patterns of relationships between properties of physical settings and activities which occur within them. The research methods required for such a task must be able to account for incredible complexity in behavior. The behavioral ecological perspective is clearly more descriptive than analytic, and the ecologist believes that through such an orientation, more adequate theories of human social behavior will be developed.

The behavioral ecological perspective appears to hold great promise for providing needed knowledge about the daily lives of institutionalized elderly persons. This perspective offers a means by which the complexities of behavior appearing in institutional housing environments can be described and classified. Such a comprehensive understanding could not only contribute to the formulation of more appropriate propositions about geriatric behavior, but could also assist behavioral and environmental change agents in the planning of more effective intervention strategies.

Purposes of the Investigation

The purposes of the present investigation are twofold. The primary purpose is to provide an analysis of the contexts in which behavior takes place in institutions for actively retired persons. The second purpose is to test the adequacy of a data collection strategy for documenting ecologically relevant variables in geriatric settings.

The orientation of the study is ecological; that is, its central concern is with the distribution, range and frequency of everyday behaviors in the naturally occurring environment. The study documents the daily activities of institutional residents, the settings they enter, and the types of persons they encounter. The activities of interest are molar in nature; that is, they represent integrated behavioral events recorded at the level at which people usually describe their daily routines (e.g., "making the bed," "eating breakfast"). The locations and social arrangements of these activities are also recorded. These descriptive data are then used to provide answers to a number of theory relevant questions.

The lack of such data in the existing literature is partly a function of the methodological difficulties involved in obtaining ecological data. The direct observation of behavior is costly and in many instances prohibitive where large quantities of data are required. Questionnaires and other similar survey techniques usually

provide data too simplistic and too fragmented to represent ongoing behavior accurately. In addition, these methods usually suffer from inaccurate magnitude estimations on the part of respondents.

The present study provides an opportunity to evaluate the quality of data obtained through an interview technique designed to record molar phenomena. This technique was initially developed for monitoring over time the behavior of spinal cord injured persons recently discharged from a comprehensive rehabilitation program. These physically disabled persons lived in the community at large and the primary purpose of data was to provide knowledge about the long term process of rehabilitation. The evaluation of the interview technique in this study provides a limited test of the method's generalizability to different settings and different kinds of research questions.

For each subject the interviews produce a protocol of the day's behavioral events, the locations in which those events took place, and the other people with whom the target person interacted. This protocol, the Activity Record, permits the reporting of a wide range of activities occurring at many levels. The interviewer's involvement in recording of these activities is kept to a minimum. These procedures are largely naturalistic in that the investigator does not alter or manage any antecedent stimulus conditions. Environmental conditions are free to

vary as usual. In addition, there is little attempt to impose units on the phenomena under study. Although two general criteria for reporting activities are given to subjects, measurement restrictions placed on the documentation of the phenomena are minimal.

In summary, the present study focuses on what life is like for actively retired persons in institutional housing. It documents and describes what happens in those daily lives rather than proving or disproving theory-derived hypotheses. The study also evaluates a method for describing and classifying the behaviors of persons in their everyday environments--one which is cost effective and yields large amounts of data.

The information provided by this study fills a void in the literature on geriatric institutional housing. The study provides a detailed account of the complex system-like behavioral regularities that comprise daily life for active older persons living in such facilities. Everyday behavior is documented in a holistic fashion and with methods which maximally preserve the integrity of these naturally occurring phenomena. Behaviors are recorded and analyzed in terms of the physical and social contexts in which they took place. Such complex concepts of behavior and complex methods for its measurement present a more comprehensive picture of institutional living than is currently available in the literature. From this extensive data base, it is

possible to begin answering both pragmatic and theoretical questions about the behavior of these older persons.

CHAPTER II

METHOD

This chapter presents a detailed description of the methods employed in conducting the present study. Major characteristics of both institutions and subjects are discussed, as well as the instrument used for collecting data and its functions. Procedures employed for time sampling and conducting interviews with subjects are reported. An assessment of data quality, both in terms of coding reliability and reporting accuracy, is provided, and general strategies for the analyses of the data are also discussed.

Sample

Institutions

Two institutional housing facilities (hereafter called Institution I and Institution II) located in Houston, Texas, were used in the study. These facilities were chosen for their similarity on a number of variables, including level of state licensing for services, average age of residents, average monthly cost per resident, and general architectural arrangement. Both institutions were licensed to provide minimal care to residents and each required its residents

to be fully ambulatory and relatively independent in maintaining their own health status. According to information provided by institutional personnel, the average age of residents in Institution I was 79 years and the average age in Institution II was 81 years. Residents in each institution paid comparable monthly rates. Each facility employed a full time activity director and organized activity programs were available to all residents on a voluntary basis.

Both facilities were multi-story dwellings with single occupant rooms fanned out from a central lobby area. Private residential quarters were located on either side of an extended hallway. The residents' rooms varied in size, but almost all contained facilities for food storage and preparation, a sitting area for visitation, and bath facilities.

One of the primary differences between the two institutions was in the number of residents they housed. Institution I had 80 residents and Institution II had 240 residents. This difference in the number of residents was accompanied by corresponding differences in the size of the physical facilities.

Subjects

Twenty subjects from each institution were selected for participation in the study. In each institution, the director reviewed a roster of residents' names and

eliminated those who were either ill at the time, somewhat disoriented, or who might be unduly intimidated by being asked to participate in a research study. From the remaining list of names, the subjects were chosen randomly. (The researcher coded names by number and then selected numbers by the use of a random number table).

Participation in the study was solicited by the researcher on an individual basis. All subjects were Caucasian. The mean age of subjects in the sample from Institution I was 76.92 years and in the sample from Institution II the mean age was 78.56 years. In each institution, the sample included 15 female and 5 male subjects. The 3:1 ratio of women to men is similar to the overall ratio seen in the institutional population. The researcher determined from informal interviews with subjects that they were taking no medications which would inhibit their participation in the study.

Complete data were obtained on 34 subjects, 17 in each institution. The female:male ratio remained unchanged. Three subjects were unable to complete the study due to illness which occurred after the study was initiated, and three took unexpected trips out of town.

Collection of the Data

Description of the Activity Record

The Activity Record is an instrument designed to allow for the recording of molar behavioral events in their physical and social contexts. The instrument is used by a researcher in a face to face interview in an attempt to have the subject reconstruct the events of that day. The researcher fills out the record and his or her only other involvement is the asking of simple clarifying questions (see Appendix A for a copy of the Activity Record, and Appendix B for guidelines for interviewers). Other than this minimal intervention, the researcher records the information exactly as it is reported by the subject.

This interview procedure is a modification of a technique developed by the Behavioral Ecology Research Team at the Texas Institute for Rehabilitation and Research, in Houston, Texas (Willems, 1976a, 1976b, 1977a, 1978a, 1978b; Widmer, 1978). The technique was originally designed as a means by which the behavior of spinal cord injured patients recently discharged from comprehensive rehabilitation would be monitored over time. The use of similar procedures in this study provides an evaluation of their adequacy in a different subject population and in a different setting.

The Activity Record documents time-anchored activity units, the location(s) in which they occurred, and other

persons actively engaged in the activity with the reporting subject. The instrument is able to record events which occur simultaneously and which are said to be overlapping in time. The measures obtained through the use of the Activity Record are described more fully below.

Activity unit. These molar events are recorded at the level at which people generally describe and define their daily behavioral routines, e.g., grooming, eating a meal, taking a nap. The criteria for an activity unit are as follows:

1. It must be performed for at least 5 minutes.
2. It must be described in behavioral terms, i.e., what the person is doing overtly rather than what he is thinking or feeling.
3. It must be relatively independent of other activities, i.e., it must stand alone as a discrete event. It must represent the smallest unit which cannot be readily refined into more specific units and must have consistency and integrity of its own.

Time. There are no gaps of time not allocated to some activity unit. The beginning time of each new activity unit is intended to represent the ending time of the previous activity. The beginning time of the first unit is designated as the time the subject awakened on that day.

Setting. This is a short description of the location(s) in which the activity occurred, e.g., dining hall, private

quarters, patio. At least one location is recorded for each activity unit and an activity may take place in more than one location.

Other persons. This is a description of person(s) who were actively engaged in the activity with the subject. This refers to persons who were participating in the activity with the subject rather than merely being present at the time of its occurrence.

Functions of the Activity Record

The Activity Record was designed to provide the following functions:

1. It provides a means by which molar events can be recorded. The subject is able to place his own descriptions on his activities rather than being restricted to choosing from a preselected set of labels.
2. It provides an unobtrusive measurement for the assessment of behavior. Although subjects' ongoing behaviors are interrupted by the interview, the remainder of the time they are free to engage in activities as they normally would.
3. It provides a means for recording behavior over long time periods, for many days or even weeks.
4. It provides a means for recording the entire day's activities, from the time of awakening until the evening interview.
5. It provides a means by which unusual or infrequently occurring events can be recorded.

6. It is relatively efficient in terms of the amount of information (the daily activities of 34 persons or 238 days of institutional life) per amount of research effort required (seven 10-15 minute interviews with each subject).

7. It provides a set of procedures in which the primary responsibility for data collection is placed on the researcher rather than the subject. Such an arrangement helps to insure a more complete data set by reducing the requirements placed on subjects.

Procedures

Individual evening interviews were conducted with 34 subjects on seven separate occasions over a five week period. The face-to-face interviews were conducted in the institutions after 6 p.m. and included information on those activities which occurred between 6 a.m. and 6 p.m. on that day. An Activity Record was recorded for each subject on each weekday, Monday through Sunday. For each institution, seven interview days were randomly drawn without replacement. In this manner, a composite week was obtained for each subject. Data collection resulted in 34 representative weeks of institutional life, or 238 complete Activity Records. The records contain over 4000 separate behavioral units.

In order to minimize subject confusion, each subject was provided with a calendar on which scheduled interview

days were indicated. Subjects were told that it was not necessary for them to wait in their rooms for the interviewer to arrive but rather to go about their normal activities and the interviewer would locate them.

Four female university students ranging in age from 23 to 32 years served as interviewers. Each interviewer was assigned five subjects in each institution for whose interviews they were responsible throughout the entire data collection period. Although this strategy risked interviewer bias, the benefits in terms of subject confidence and cooperation were judged to outweigh the costs of such a risk.

Data Quality

Coding Categories

The relatively unstructured format of the Activity Record permits wide variation in the recording of behavioral events. In order to convert these data to quantifiable form, it is necessary to provide some common category system. Three category schemes were developed, one each for the coding of settings, other persons and activity units.

Little interpretation was required for assigning codes to settings and other persons. A list of all reported setting names and other person types was created from the protocols after the data collection period had terminated.

The assignment of code numbers to these entries was based on distinctions which people ordinarily make between locations (such as private quarters, lobby and dining hall), and between other person types (such as grandchild, friend and minister). A three digit code was assigned to each setting in such a way that the first digit indicated whether the setting was located inside or outside the institution; the second digit provided a broad description of a class of settings such as public areas, specialized meeting rooms; and the third digit indicated the particular room in question. The same category system was used for coding settings in both institutions. A two digit code was assigned to each different other person reported in a similar manner, with the first digit indicating whether the person was associated with the institution or not, and the second digit indicating the particular category of person in question. This procedure resulted in a total of 34 setting codes (19 from intra-institutional settings and 15 from extra-institutional settings) and 11 person codes (four from intra-institutional persons and seven from extra-institutional persons). The person codes included a code number for events in which the target subject engaged in an activity alone. A list of all category labels and their corresponding codes is provided in Appendix C.

There was greater variation in the reporting of activity descriptors, and a greater degree of interpretation was required in the assignment of codes to these entries. For these reasons, it was necessary to develop a coding scheme for activity descriptors in a more systematic way. The procedure began with the creation of a list of activity descriptors reported throughout the data collection period. The resulting list contained each different activity descriptor, with obvious redundancies eliminated.

Two naive sorters were instructed to place activity descriptors into categories which reflect (a) the primary behavior described, and (b) the function that the behavioral event served (e.g., taking care of one's health needs or exercising one's body). The total number of categories to be achieved was not specified. For more specific instructions to sorters, see Appendix D.

The molarity of the activities reported seemed to depend on the perceptions of the subject reporting. As a consequence, there was a wide variation in the complexity of activity descriptors reported. For example, the descriptions ranged from the relatively molecular, such as "Eating" and "Grooming," to the highly molar and complex, such as "Working in the Gift Shop" and "Doing Volunteer Work at the Hospital." The former represent relatively discrete activities and the latter represents units comprising many highly related behavioral events which

have not been separated meaningfully by the reporting subject. No specific instructions were given to sorters regarding the conceptual level of the coding categories. However, the levels of conceptualization were indirectly controlled through the behavioral criteria used by the subjects for reporting activities. The primary purpose of this sorting task was to prepare a concise list of activity categories which would include all reported activity descriptors and at the same time retain important distinctions in the lives of the subjects. Eighteen activity categories were generated in this way.

Coding Reliability

Before the coding categories could be used, it was necessary to ascertain whether they could be assigned reliably to the raw data. Ten percent (24) of the protocols were randomly selected. The protocols were coded independently by three persons, two who were responsible for the major portion of the coding used in the analyses, and one who was only marginally familiar with the study. The protocols included 427 activity descriptors, each of which was coded three times, once by each coder. The weighted agreement rate was computed by the following formula:

$$\% \text{ agreement} = \frac{K \cdot A_1 + (K-1)A_2 + (K-2)A_3}{K \cdot N}$$

where K = number of coders, N = number of activity

descriptors being coded, A_1 = number of agreements when K coders agree, A_2 = number of agreements when K-1 coders agree, and A_3 = number of agreements when K-2 coders agree. The weighted agreement score for assigning codes to activity descriptors was 97.0%. The agreement score when all coders agreed was 94.15%.

Reporting Accuracy

Before the data can be interpreted with confidence, an estimate of the subjects' reporting accuracy must be made. Two procedures were used for assessing data quality: direct observation and mutual reports.

Direct observation. One very strong procedure for assessing reporting accuracy is through the comparison of reported behavior with the recorded observation of independent observers. The extent of this investigation, both in number of subjects and in length of reporting periods, severely limited this approach. Reporting periods covered a 12-hour span and the average length of an activity unit was approximately 46 minutes, which meant that relatively few activities could be observed per hour of observation. This problem was complicated by the fact that most subjects spent a large amount of time in their private quarters where observations would not only be socially awkward but could create reactive arrangements which would disturb the very phenomena being assessed. Such an effect would render an assessment of accuracy problematic.

In order to minimize the problem of reactivity, a subject who typically spent a large proportion of her time outside her private quarters was selected for observation. She was told that the researcher would like to spend a part of the day with her, following her as she engaged in her daily routine. She was informed that the researcher would be making occasional notes regarding the activities, but no mention was made that the time of events was to be recorded. The observation covered a 250-minute period during the morning hours in which nine complete activity units were observed. At the end of the day, the interview was conducted as usual by the interviewer.

Three structural agreement rates were computed. The first (Rate 1) involved a minute-by-minute comparison of the units appearing on the two protocols during the observation period. Activity units were counted as agreeing if the activity descriptors were comparable, if the locations were identical, and if the times reported were approximately the same. If the units were not in agreement, the earliest beginning time was subtracted from the latest ending time to obtain the total time covered by these units, and the difference was recorded as minutes of disagreement. If they were judged to be in agreement, the beginning and ending times were examined. The beginning times of the two units were subtracted and the ending times were likewise subtracted. The sum of these two

differences provided minutes of disagreement. Minutes of disagreement were subtracted from total time to find minutes of agreement. The percentage agreement was calculated by the following formula:

$$\% \text{ agreement} = \frac{\text{minutes of agreement}}{\text{total time}} \times 100$$

Agreement Rate 1 between the observer's record of events and the subject's report of those same events was 79.8% (see Table 1 for all agreement rates).

The second assessment (Rate 2) involved the following considerations. One aspect of the instructional set given to each subject required reporting only those activities which lasted for at least 5 minutes. Consequently, reported times tended to be in clock times which are multiples of five. In other words, if an activity actually began at 5:43, it would be reported as beginning at either 5:40 or 5:45. In no instance were time anchors reported in any other manner. This meant that the procedure for calculating Rate 1 imposed an unusually stiff penalty for this reporting style.

Rate 2 takes into account this reporting style by allowing a 5 minute period of disagreement at the beginning and/or at the ending of an activity unit to be counted as agreement time. For example, if one protocol recorded an activity unit as beginning at 7:00 and the comparison protocol recorded the same unit as beginning at 7:10, only

Table 1
 Agreement Rates for the Comparison of Interview and
 Observational Records and for the Comparison
 of Mutually Reported Activities

Subject's reports compared with referent	Agreement rates (in percent)		
	1	2	3
Direct Observation	79.8	82.4	85.1
Mutually reported activities	74.3	83.7	79.4

5 minutes of disagreement would be counted. Other than this 5 minute adjustment period, Rate 2 was computed the same as Agreement Rate 1. Agreement Rate 2 between the direct observation and the reported activities was 82.4%.

Rate 3 was not based upon beginning and ending times, but rather upon the time duration of the unit. For each unit in the comparison, the beginning time was subtracted from the ending time and this difference constituted the total time reported by a given subject for that activity unit. The shorter length of time, whether from the observation or the Activity Record, represented the minutes of agreement between the two modes. Percentage agreement was calculated by the same formula as was used in Rates 1 and 2. Agreement Rate 3 between the observer's record and the subject's report was 85.1%.

Mutual reports. Because the expense required to adequately assess data quality through direct observation was prohibitive, an alternate procedure was also used. This procedure compared the protocol entries of two or more subjects reporting the same activity.

Subjects were asked to report the names of other subjects in the study when they participated in an activity with the reporting subject. Units with other subjects' names listed as another person were later identified and an attempt was made to locate the corresponding unit in the protocol of the mentioned subject. The criteria for

agreement were the same as in the comparison of the observational record and the reported activities. If the two subjects reported similar activities occurring in the same location, and if each reported the other as another person, the time anchors of these units were compared.

It should be noted that this procedure constitutes a strict test of agreement. For example, one subject might report that "Watching TV" began at 5:00 and the subject whom he reported as another person in that activity might have reported the same activity as beginning at 5:15. The 15 minutes of disagreement could have been due to reporting error on the part of one or both subjects. It is also possible that each subject reported accurately the time he began watching TV. In the format of the Activity Record, the fact that the second subject joined the first subject in TV watching 15 minutes after the first subject had begun to watch TV cannot be ascertained. Instead, the second subject is coded as another person in the first subject's activity which began at 5:00. In other words, the second subject is represented as being involved in the first subject's activity for its entire duration, even though he was present for only part of it. Due to these limitations inherent in the format of the Activity Record, the sources of disagreement cannot be satisfactorily identified.

A total of 178 mutually reported activity units were identified. These represent approximately 4.4% of the

4089 units reported. The three procedures for computing agreement rates between the direct observation and the Activity Record were again used in the comparison of the mutual reports. Agreement Rate 1 (a minute-by-minute analysis of exact beginning and ending times of activity units) was 74.3%. Rate 2 (an analysis incorporating a 5 minute margin for reporting error at the beginning and end of activity units) was 83.7%. Rate 3 (an analysis of the length of activity units) was 79.4%.

These estimates of reporting accuracy, while limited in scope, suggest that persons can report in a day-end interview the molar activities of their day with a reasonable degree of accuracy. These results are especially encouraging considering the retrospective nature of the Activity Record.

All six agreement rates, three computed for the direct observation comparison and three computed for the comparison of mutual reports, cluster around 80%. This figure is comparable to those reported for other self-monitoring procedures (Nelson, 1977). These agreement rates also suggest that this set of interview procedures can be generalized with a relatively high level of confidence from its original target population (spinal cord injured persons) and noninstitutional settings to elderly persons residing in institutions.

Analysis of the Data

Data from each of the major categories (activities, other persons and settings) were analyzed along several dimensions: (a) occurrence--the number of discrete performances of an activity, interactions with other persons, or entries into a setting, (b) duration--time spent in an activity, setting or in interaction with another person, (c) population--the number of subjects entering a category at least once, and (d) distribution--the way in which categories are ranked in terms of occurrence, duration and population.

Because the bulk of the activities (approximately 90%) took place within the institutions and on their grounds, the primary analyses were conducted on the data recorded for activities which took place in these settings. This strategy limited the number of activity codes to 16, the number of other person codes to 9, and the number of setting codes to 19.

These major categories were analyzed for each of the institutions, for the younger and older subjects irrespective of institutional affiliation and for all subjects in the sample. Subjects were divided into age groupings through the use of a median split. Subjects in the younger group ranged in age from 60 to 77 years and subjects in the older group ranged in age from 77 to 90

years. Because the presentation of findings is extensive, statistical procedures will be discussed in the following chapter as they are employed.

CHAPTER III

RESULTS AND DISCUSSION

The data reported in this chapter are presented in five sections. The first section presents summary data of several global dimensions for subjects belonging to three classifications. The next three sections discuss more detailed data regarding categories of activities, other persons, and settings. The final section is devoted to a presentation of some of the setting dependent behavioral relations which center around the institutions and some of their more commonly used settings.

All data are presented in the time frame of the data collection period, referred to here as a week. The reader should recall that an Activity Record was completed for each subject on seven different days over a five week period, resulting in a composite week. This time frame included only daytime hours (6 A.M. to 6 P.M.) and does not technically qualify as a week. It would not be accurate to draw conclusions about a 168 hour week on the basis of findings presented here. Although the 84 hours per subject constitute only one half the time in an actual week, they include the times of day when the majority of residents are most active.

It should be noted that all time entries are presented in minutes. A total of 5040 minutes were recorded for each subject, although some subjects accumulated slightly more than this amount due to the reporting of overlapping activity units. These overlapping units were included in the analysis of the activity data, but, because they provided redundant information for these categories, they were excluded from the analyses of other persons and settings.

Summary Subject Data

The purpose of this section is to present descriptors of several global dimensions of subject performance, rather than any inferential analyses. In a later section, however, certain differences between institutions are tested.

Table 2 displays the pace, or the mean number of activities performed by subjects in the major subject classifications of institutions, age groups and all subjects in a sample. Standard deviations (SD) and maximum and minimum values are also reported for each of these classifications. In all tables, values for means and standard deviations were rounded up to the nearest tenth of a unit. The minimum reported by a single subject per week was 77 and the maximum was 162. The subject who reported the minimum value was a member of the older age group and a resident of Institution I, while the subject who reported

Table 2
 Pace: The Mean Number of Activities
 Performed Per Subject

Group	Minimum	Maximum	Mean	SD
Institution				
I	77	130	101.9	16.4
II	81	162	113.7	19.9
Age Group				
I (63-77 yrs.)	81	162	111.1	21.6
II (77-90 yrs.)	77	130	104.0	16.0
All	77	162	107.6	19.0

the maximum value was a member of the younger age group and a resident of Institution II. It is interesting to note that the subjects in Institution I responsible for the minimum and maximum values were both members of the older age group. The differences between the means of the two institutions and between the means of the two age groups for pace are only slight. In a later section in this chapter, institutional differences are explored more fully. It is apparent that wide variations exist in the number of activities that subjects performed. Approximately 68% of the total sample reported between 88.3 and 126.4 activities during the reporting period.

Diversity, or the average number of different types of activity performed per subject, is presented in Table 3. In the analysis of intra-institutional activities, two activity categories were deleted. Category 11, which refers to vehicular transportation, was eliminated because it does not occur within the institutions. Category 18 (miscellaneous) was also eliminated because only one activity unit of this type was recorded. Thus, the analysis included a total of 16 activity categories. No subject performed activities of every type. The greatest diversity in activity types was displayed by a subject of the older age group who resided in Institution I. The least diversity was displayed by a subject who also resided in Institution I, and belonged to the older age

Table 3

Diversity: The Mean Number of Types of Activities
Performed Per Subject

Group	Minimum	Maximum	Mean	SD
Institution				
I	6	15	10.9	2.1
II	8	14	11.2	1.4
Age Group				
I (60-77 yrs.)	8	15	11.1	1.7
II (77-90 yrs.)	6	14	11.0	1.8
All	6	15	11.1	1.8

group. The differences between the means of groups within subject classifications are small; Institution I with 10.9 and Institution II with 11.2, and Age Group I with 11.1 and Age Group II with 11.0. Standard deviations indicate that the values displayed by individual subjects cluster tightly around the mean values. The average subject from the total sample participated in approximately 69% of the activity types generated by all subjects.

Table 4 presents the average time spent in the performance of activities. The consistency in the minimum values reported can be explained in terms of the five-minute reporting rule given to subjects. For all subjects, a mean of 46.0 minutes was reported per activity unit. This figure is comparable to the times reported by Stuart (1973) for the average time spent in the performance of behavioral units obtained through self-reported diaries.

Figure 1 displays the frequency distribution of durations for activity units. The distribution is positively skewed, with approximately 84% of all reported activities lasting less than one hour. For those activities, the number of units are rather evenly distributed across the three intervals.

Activity codes 1 (sitting or standing idly), 2 (resting or sleeping) and 7 (reading, watching television or listening to the radio) can be combined to form a new category called physically inactive behavior. The mean

Table 4
Mean Number of Minutes Spent
Performing an Activity

Group	Minimum	Maximum	Mean	SD
Institution				
I	5	345	49.1	9.4
II	5	240	41.1	6.1
Age Group				
I (60-77 yrs.)	5	285	43.3	8.3
II (77-90 yrs.)	5	345	46.8	9.2
All	5	345	46.0	8.8

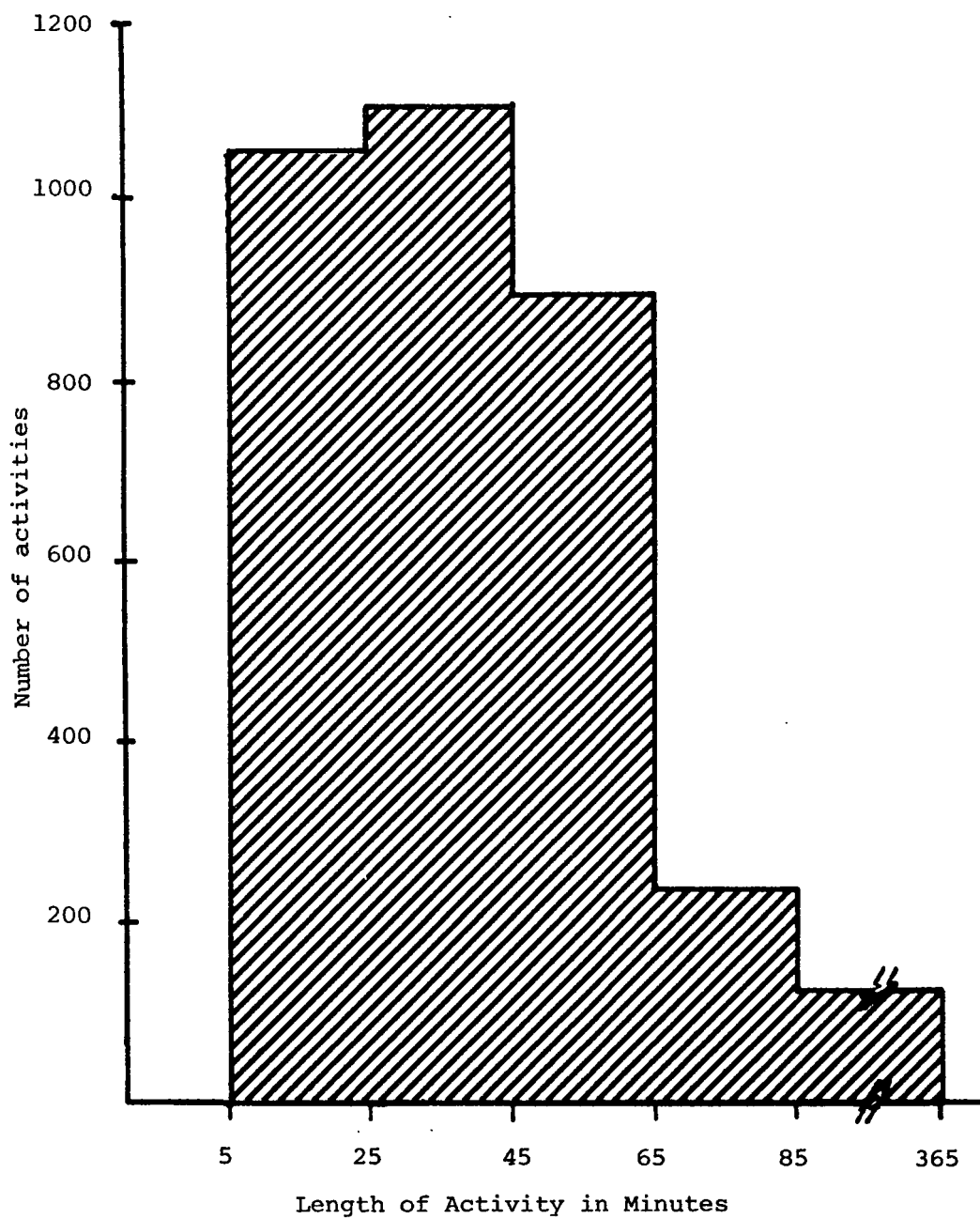


Figure 1
Frequency Distribution
of Activity Duration

number of occurrences of these behaviors is reported in Table 5. The difference between the minimum and maximum values of 7 and 50 is quite large. The two subjects responsible for these values were both residents of Institution I and were both members of the older age group. The differences between the means of Institution I with 31.42 and of Institution II with 35.1 and between the mean of Age Group I with 34.4 and of Age Group II with 32.1 are not great. The number of physically inactive behaviors reported by the majority of subjects range between 23.1 and 43.4 activity units.

Table 6 displays the average time spent in the performance of these physically inactive behaviors. The difference between the minimum time of 335 minutes and the maximum time of 3595 minutes is a factor of ten. Subjects responsible for these values were both residents of Institution I. The subject who reported the maximum value was not representative of other subjects in the sample along this dimension. This particular subject was newly retired from her career and had lived in the institution for approximately two months. She was enjoying her new opportunity to sleep late in the mornings and to watch television in the afternoons. Because of her somewhat unusual life-style, she contributed in an unrepresentative fashion to the means of the two groups of which she was a member (Institution I and the younger age group). This

Table 5
Mean Number of Physically Inactive
Behaviors Performed Per Subject

Group	Minimum	Maximum	Mean	SD
Institution				
I	7	50	31.4	12.1
II	23	47	35.1	7.6
Age Group				
I (60-77 yrs.)	17	47	34.4	9.9
II (77-90 yrs.)	7	50	32.1	10.5
All	7	50	33.2	10.1

Table 6
 Mean Time in Minutes Spent in Physically
 Inactive Behaviors Per Subject

Group	Minimum	Maximum	Mean	SD
Institution				
I	335	3595	1903.7	894.3
II	1015	2620	1724.7	473.8
Age Group				
I (60-77 yrs.)	705	3595	1806.4	740.5
II (77-90 yrs.)	335	3420	1822.1	701.9
All	335	3595	1814.2	710.5

case illustrates a limitation in the use of small samples. When sample sizes are small, individual contributions are weighed more heavily. In such cases, caution should be exercised in the interpretation of the findings.

Table 7 presents the mean number of socially interactive behaviors (i.e., the number of activities performed in which other persons were reported as active participants). The subject who reported the fewest number of such interactions was a resident of Institution I and a member of the older age group. The subject who reported the greatest number was a resident of Institution II and a member of the younger age group. The subject who reported the maximum value of 87 engaged in over seven times as many socially interactive behaviors as the subject who reported the minimum value of 12. However, the deviation scores suggest that most values cluster in a relatively small interval centered around the overall mean of 42.8 activity units.

For every activity unit the subject reported any other people actively involved in the activity with him. These other persons were later classified into 10 types of people. In conducting the analysis of intrainstitutional data, two categories of other persons--category 24 (lawyers and bankers) and category 25 (retail merchants)--were eliminated because these persons did not appear. The results reported here include eight categories.

Table 7
Mean Number of Socially Interactive
Behaviors Per Subject

Group	Minimum	Maximum	Mean	SD
Institution				
I	12	71	39.2	17.5
II	25	87	46.4	15.3
Age Group				
I (60-77 yrs.)	19	87	47.7	17.4
II (77-90 yrs.)	12	58	37.9	14.7
All	12	87	42.8	16.6

Table 8 presents the mean number of different kinds of other persons encountered by subjects. The maximum value reported by any subject in the older age group was six, whereas at least one subject in every other subject classification reported the maximum number possible. It is apparent that a high degree of variability exists among subjects along this dimension.

The average time spent in the performance of these socially interactive behaviors is presented in Table 9. For the average subject in the total sample, 1903.3 minutes or approximately 31 hours per week were spent engaging in such activities. This represents an average of slightly more than 4.5 hours per day or approximately 37% of the time in a reporting day. Subjects in Institution I display more variability along this dimension than subjects in Institution II.

The average number of settings entered by subjects is reported in Table 10. The number of settings entered by a subject can be regarded as an index of his mobility or movement about the institution. Using this index, subjects in Institution II range more widely during their daily routines than subjects in Institution I. Several subjects in Institution I entered fewer settings than the minimum value in Institution II. Most subjects in the total sample entered between 88.4 and 122.1 settings.

Table 8
Mean Number of Types of Other Persons
Encountered by Each Subject

Group	Minimum	Maximum	Mean	SD
Institution				
I	1	8	5.7	1.7
II	2	8	5.0	1.7
Age Group				
I (60-77 yrs.)	2	8	5.8	1.9
II (77-90 yrs.)	1	6	4.8	1.4
All	1	8	5.3	1.7

Table 9
Mean Time in Minutes Spent in Socially
Interactive Behaviors Per Subject

Group	Minimum	Maximum	Mean	SD
Institution				
I	550	4565	2006.6	1051.6
II	1090	2470	1800.0	401.6
Age Group				
I (60-77 yrs.)	550	3505	2000.4	687.8
II (77-90 yrs.)	695	4565	1806.2	892.5
All	550	4565	1903.3	790.8

Table 10
 Mobility: Mean Number of Settings
 Entered Per Subject

Group	Minimum	Maximum	Mean	SD
Institution				
I	76	127	101.1	16.4
II	92	136	115.5	20.8
Age Group				
I (60-77 yrs.)	78	136	110.9	22.0
II (77-90 yrs.)	76	132	105.7	17.8
All	76	136	108.3	19.9

A total of 18 setting categories are included in the analysis of intrainstitutional data. Table 11 presents environmental diversity, or the average number of different types of settings entered by subjects. Subjects responsible for both minimum and maximum values were members of the younger age group, although the one who reported the minimum value resided in Institution II and the one who reported the maximum value resided in Institution I. The average number of setting types entered by subjects in the total sample was 9.2, which represents 51.1% of all institutional setting types available.

Table 12 displays the average time spent in a setting. The uniformity in the minimum values is a function of the instructional set given to subjects regarding the criteria for reporting an activity unit. The means of groups in all subject classifications demonstrate remarkable similarities. The maximum values were reported by subjects who engaged in lengthy, job-like activities such as working in the gift shop.

The results presented in this section provide descriptions of various dimensions of the subjects' daily routines, their activities, the settings they enter and their social involvements. On a wide range of behavioral variables (e.g., pace, diversity, physical inactivity), social variables (e.g., socially interactive behaviors) and environmental variables (e.g., mobility, environmental

Table 11
 Environmental Diversity: Mean Number of
 Setting Types Entered Per Subject

Group	Minimum	Maximum	Mean	SD
Institution				
I	5	13	10.2	2.2
II	4	12	8.3	3.1
Age Group				
I (60-77 yrs.)	4	13	10.1	2.3
II (77-90 yrs.)	5	12	8.9	2.1
All	4	13	9.2	2.8

Table 12
Mean Time Spent in a Setting Per Subject

Group	Minimum	Maximum	Mean	SD
Institution				
I	5	345	81.5	9.8
II	5	240	79.7	5.9
Age Group				
I (60-77 yrs.)	5	285	77.1	9.5
II (77-90 yrs.)	5	345	84.1	8.8
All	5	345	80.6	9.3

diversity) the mean performance patterns displayed by subjects in both institutions and in both age groups were highly similar. While the dimensions examined here are global in nature and while subjects within groups often varied widely, the agreement in average performances across all subject classifications is very strong.

Activities

The 16 intrainstitutional activity categories were analyzed for both frequency of occurrence and duration. The categories were then ranked along several dimensions in order to indicate the ordinal nature of the categorical data. It should be noted that these rankings do not necessarily reflect even increments in the quantity of the category represented. Rather, they reflect the relative rank of a given category.

Table 13 presents the rank order of activity categories based on the number of activities recorded in each category. These ranks are reported for institutions, age groups and for all subjects in the sample. The Spearman rank correlation coefficient (r_s) was computed for institutions and age groups to assess the extent to which rankings in one group are similar to rankings in the other independent group. Where categories were tied for a rank, the correction for tied scores was employed (Hays, 1973). The Spearman rank correlation provides a coefficient for

Table 13
Rank Order of Activities: Number of
Activities of a Given Type

Category	Institution		Age Group		All
	I	II	I	II	
Food preparing, eating	1	1	1	1	1
Idle pastimes	2	2	2	2	2
Health care, grooming	3	3	3	3	3
Verbal interaction	5	4	4	5	4
Resting, sleeping	4	6	5	4	5
Housekeeping	6	5	6	6	6
Sitting, standing idly	8	9	7	8	7
Handwork, hobbies	9	7	8	7	8
Written communication	11	8	10	9	9.5
Gross motor activities	7	10	9	10	9.5
Group recreation	10	11	11	11	11
Classes, meetings	12	13	12	13	12
Job-related activities	13	14	13.5	12	13
Brief activities	14	12	13.5	14	14
Assisting others	16	16	15.5	16	15
Buying, selling	15	15	15.5	15	16

ordinal data comparable to a linear correlation coefficient. A high degree of agreement was found in the ranking of these activity categories both between institutions ($r_S = .95$) and between age groups ($r_S = .99$). In other words, there is a great deal of consistency or generality in the relationship between frequency of activities and types.

The three categories of food related activities, idle pastimes (reading, watching TV) and health care activities appear to be uniform in the frequency of their occurrences across institutions and age groups. Figure 2 shows the percentage of activities of these types performed in an average subject's day. Eating and personal hygiene are activities which are vital to the maintenance of health. Such activities represented respectively 19.5% and 15.3% of all activities performed within the institution. Idle pastimes can be viewed as more discretionary in nature. These activities represented 16.8% of all intrainstitutional behaviors. When combined, these three highest ranked activity categories account for 50.9% of all activities performed within the institution. The remaining 13 categories, which comprised the other half of all intra-institutional activities, represented a wide variety of behaviors. Despite the relative infrequency of their occurrence, remarkable agreements exist across subject classifications.

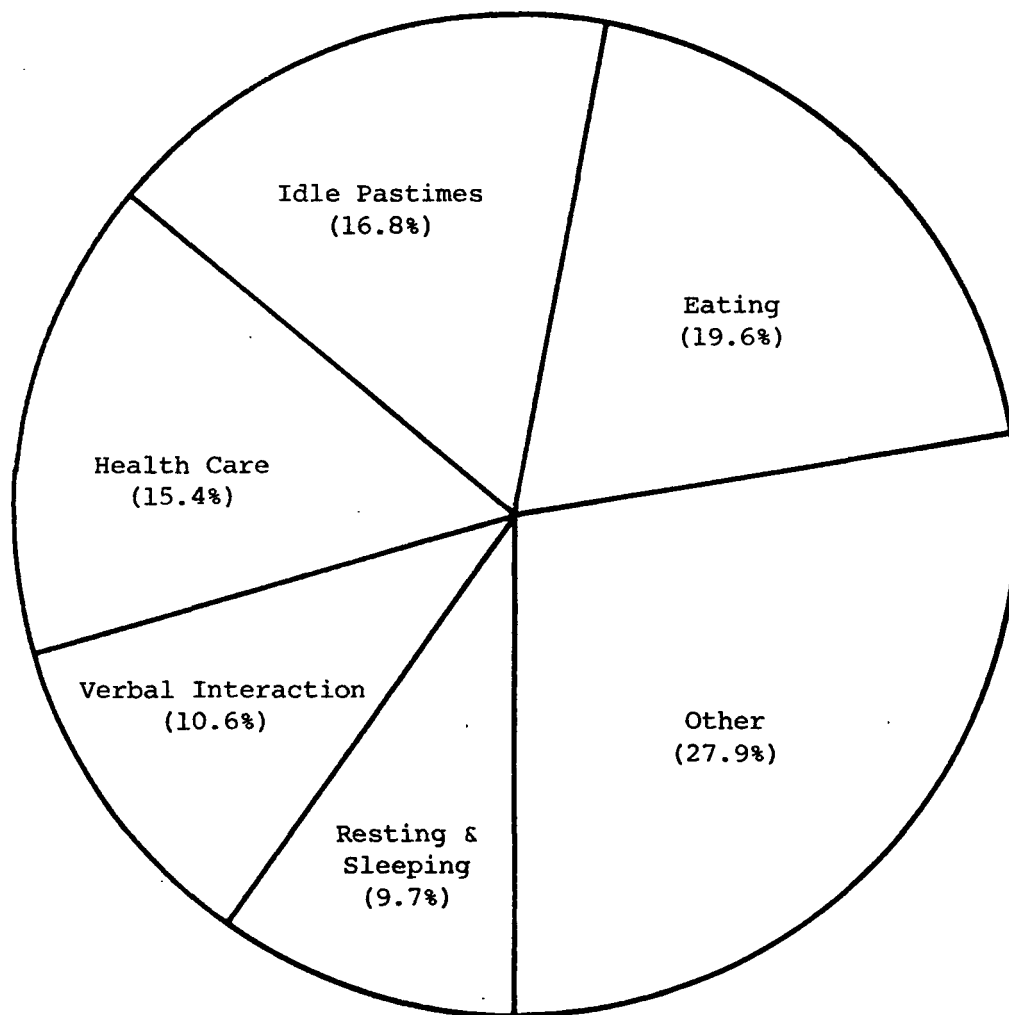


Figure 2

Most Frequently Occurring Weekly Activities

The rank order of activity categories based on population (i.e., the number of subjects reporting a type of activity at least once), is displayed in Table 14. The Spearman rank correlation coefficient for these categories between institutions is .92 and between age groups is .97. These correlations indicate a high degree of agreement among groups in the rankings.

The first five activities listed in the table were reported at least once by all subjects in the sample. Consequently, all are tied for the first rank. This ranking can be viewed as an index of the popularity of an activity type across persons. It is interesting to note that of the five most popular categories, three are more or less requirements for life. The two more discretionary activities, verbal communication and idle pastimes, are not physically demanding activities. Subjects also displayed a tendency toward personal involvement in domestic tasks. Although residents in both institutions had access to maid service for heavy cleaning and maintenance service for repairs, housekeeping activities (cleaning room, repairing tape recorder, washing clothes) ranked high in both occurrence and population dimensions. Despite institutional affiliation and age group membership, participation in these activities was widespread.

In Table 15, activity categories are ranked on the basis of time spent performing activities of a given type.

Table 14

Rank Order of Activities: Number of Subjects
Performing Activities of a Given Type

Category	Institution		Age Group		All
	I	II	I	II	
Resting, sleeping	3	3	3	3	3
Health care, grooming	3	3	3	3	3
Verbal interaction	3	3	3	3	3
Idle pastimes	3	3	3	3	3
Food preparing, eating	3	3	3	3	3
Housekeeping	6	8.5	6.5	7	6
Gross motor activities	7	8.5	9	6	7
Sitting, standing idly	9	6.5	6.5	8.5	8
Written communication	10	6.5	8	8.5	9
Handwork, hobbies	12	10	10	10	10
Classes, meetings	8	12	12.5	11	11
Group recreation	11	13	11	12.5	12
Brief activities	13	11	12.5	12.5	13
Job-related activities	14	14.5	14	15	14
Buying, selling	15	14.5	15	14	15
Assisting others	16	16	16	16	16

Table 15
 Rank Order of Activities: Time Spent in
 Activities of a Given Type

Category	Institution		Age Group		All
	I	II	I	II	
Idle pastimes	2	1	1	1	1
Food preparing, eating	3	2	2	2	2
Resting, sleeping	1	3	3	3	3
Verbal interaction	4	5	4	5	4
Health care, grooming	5	4	5	4	5
Handwork, hobbies	6	6	7	6	6
Housekeeping	9	7	6	7	7
Written communication	12	8	9	8	8
Job-related activities	7	11	11	9	9
Group recreation	8	12	8	12	10
Sitting, standing idly	10	9	10	10	11
Gross motor activities	11	10	12	11	12
Classes, meetings	13	13	13	13	13
Brief activities	14	14	14	14	14
Assisting others	15	16	15	16	15
Buying, selling	16	15	16	15	16

Once again, the agreement among rankings for all subject classifications is high. For institutions, the Spearman rank correlation coefficient is .91 and for age groups it is .96. Although there are slight variations in the ranking of the first three categories across subject classifications, the same three categories occupy the first three ranks in all groups. For the total sample, idle pastimes occupied 18.7% of the average subjects' time per week, food related activities occupied 16.3% and resting or sleeping occupied 14.8%. All totaled, these three activity categories accounted for 49.8% of time in the average subject's week.

In all the rankings of activity categories presented here, idle pastimes and food related activities receive high ranks. Such data indicate that these kinds of activities not only occurred with high frequency, but they also occupied large portions of the residents' time and were universal in their occurrence across persons. These rankings also indicate that although health care activities occurred frequently, they do not account for large amounts of time. On the other hand, the occurrence of resting or sleeping was relatively infrequent, but these activities were rather lengthy compared to other activities.

Despite slight variations in the ranking of activity categories on the dimensions of occurrence, population and duration, there is a marked agreement across subject

classifications on any single dimension. The rank orderings of categories suggest that subjects display somewhat limited repertoires of behavior. Large portions of the behaviors they exhibit are limited to only a few categories, and only a few categories account for large amounts of their time. But the regularity and uniformity with which these categories of behavior occur are most notable.

The findings reported here would be more interpretable if comparisons were made to the everyday activities of a different population. Perhaps the most appropriate comparison group for the present sample would be that of middle aged and/or noninstitutionalized adults. Unfortunately, no normative data on the daily activities of such persons is presently available. However, data similar to that obtained in the present study are available for a small sample of college students with a mean age of 22.6 (Stuart, 1973). Differences in the time samples used in Stuart's investigation and in the present study make strict comparisons between the two data sets problematic. Stuart collected data from the students over a 24-hour period for each of the five weekdays (Monday through Friday). While the present study included only 12 hours in a reporting day, all seven days of the week were represented. These differences should be kept in mind in the comparisons between the two groups.

Activity types which appeared in both the college students' weeks and in the weeks of the elderly subjects were identified and compared. Table 16 displays the percent of activity types common to both students and residents which took place in a week. The elderly persons displayed larger percentages of their total weekly behaviors in all but one of these common activity types--assisting others. While only 13.8% of the students' weekly activities were physically inactive, 30.7% of the elderly subjects' weekly activities were so characterized. In addition, the activity types common to both groups accounted for 89.6% of all the elderly persons' activities per week, and they accounted for only 50.9% of the students' weekly activities.

This evidence suggests that when compared to the activities of college students, the percent of the elderly subjects' behaviors which were physically idle is much greater. It is also evident that the range of activities is more restricted for the elderly subjects than for the college students. In other words, fewer activity types accounted for larger portions of the elderly persons' weekly activities than of the weekly activities of the college group. While these comparisons can only be made in a very general sense, they provide additional information about the nature of activities engaged in by institutionalized elderly persons, and they suggest

Table 16
Percent of Activity Types Occurring Weekly for College
Students and Institutionalized Elderly Persons

Activity Types	Students ^a	Elderly
Food preparing, eating	11.3%	19.6%
Idle pastimes	7.0%	16.8%
Health care, grooming	10.0%	15.4%
Verbal interaction	7.1%	10.6%
Resting, sleeping	4.9%	9.7%
Housekeeping	4.9%	8.0%
Sitting, standing idly	1.9%	4.2%
Handwork, hobbies	.9%	4.1%
Meetings	1.2%	1.0%
Assisting others	1.6%	.1%

^aStuart (1973).

that the behavioral lives of these older persons are more docile and restricted.

Other Persons

It should be recalled that a companion is recorded as an other person for an activity unit if that person was actively engaged in the activity with the reporting subject. For example, a subject could have reported a companion as an other person in the activity, taking a walk, if he perceived that they were performing the activity together. On the other hand, an activity recorded as being performed alone does not necessarily indicate that other people were not present. For instance, a subject might have reported watching TV in the lobby as an activity he engaged in alone. It is highly likely that other people were present while the reporting subject watched TV; but the subject did not perceive them as being actively involved in this activity with him. These distinctions should be kept in mind in the interpretation of the data presented in this section.

A total of eight categories of other persons who actively participated with reporting subjects were analyzed and ranked along the same dimensions as the activity categories. A ninth category, alone, indicated activities in which no other people were involved. Table 17 presents the rankings of these categories based on the frequency of

Table 17
 Rank Order of Other Person Types: Number of
 Interactions with Other Persons
 of a Given Type

Category	Institution		Age Group		All
	I	II	I	II	
Alone	1	1	1	1	1
Other residents	2	2	2	2	2
Administrative staff	3	5	3	3	3
Friends	5	3	4	5	4
Other family members	6	4	6	4	5
Children, grandchildren	4	6	5	6	6
Medical personnel	7	7.5	7	7.5	7
Clergy	8	9	8	9	8
Cleaning staff	9	7.5	9	7.5	9

their occurrences. From Table 17, it is apparent that similarity in the assignment of ranks exists for the various subject classifications. The Spearman rank correlation coefficient for the agreement of these ranks between institutions is .84 and between age groups is .92. The category alone ranks first, indicating that many intrainstitutional activities did not involve other persons as active participants. Of all reported activities, 49.8% were categorized by the reporting subject as being performed alone. When socially interactive behaviors occurred, 79.3% involved other residents and 6.7% involved institutional personnel. The remaining 14% of these socially interactive activities involved people who were not affiliated with the institution.

Other person categories are ranked on the basis of population (i.e., the number of subjects entering a category at least once) in Table 18. These ranks demonstrate somewhat lower agreement between subject classifications. For institutions, $r_S = .71$, which is significant at the .05 level; for age groups, $r_S = .82$, which is significant at the .01 level. A greater number of activities were performed with extrainstitutional friends than with family members (Table 17). In contrast, a greater number of subjects encountered family members than friends (Table 18).

Table 18
 Rank Order of Other Person Types: Number of
 Subjects Interacting with Other
 Persons of a Given Type

Category	Institution		Age Group		All
	I	II	I	II	
Alone	1.5	1.5	1.5	1.5	1.5
Other residents	1.5	1.5	1.5	1.5	1.5
Administrative staff	3	4	3.5	3	3
Children, grandchildren	4	8	5	7	4
Other family members	5.5	5	6.5	4.5	5.5
Friends	5.5	3	3.5	4.5	5.5
Medical personnel	7	8	6.5	9	7
Clergy	8	8	8	7	8
Cleaning staff	9	6	9	7	9

In Table 19, other person categories are ranked according to the time spent with other person types. The Spearman rank correlation coefficient between the ranks of institutions is .80 and between the ranks of age groups is .96. These data suggest that an average subject spent 62.5% of the total institution time per week in activities categorized as being done alone. Of the time spent in socially interactive activities within the institution, 90% was spent with other residents.

In general, the rankings of other person categories did not display as much consistency or generality across subsamples as did the rankings of activity categories both within and across dimensions. The greatest uniformity is seen in the ranking of the categories of alone, other residents and administrative staff. These three categories occupy the first three ranks for all dimensions. These data indicate that many activities were performed and a great deal of time was spent without the active involvement of other persons. They further suggest that when other persons were actively involved in an activity with a reporting subject, they were likely to be persons affiliated with the institution (other residents or staff).

Subjects appear to have only limited contacts with persons who are not affiliated with the institution, such as family members and nonresident friends. Table 20 presents the average number of activities performed with

Table 19

Rank Order of Other Person Types: Time Spent
with Other Persons of a Given Type

Category	Institution		Age Group		All
	I	II	I	II	
Alone	1	1	1	1	1
Other residents	2	2	2	2	2
Administrative staff	3	5	3	3	3
Other family members	5	4	5	4	4
Friends	6	3	4	5	5
Children, grandchildren	4	6	6	6	6
Clergy	7	8	7	7	7
Medical personnel	8	9	8	9	8
Cleaning staff	9	7	9	8	9

Table 20
 Mean Number of Activities Performed With Other
 Persons Not Affiliated With the Institution

Group	Minimum	Maximum	Mean	SD
Institution				
I	0	11	5.1	1.2
II	0	10	4.5	1.4
Age Group				
I (60-77 yrs.)	0	11	5.9	1.0
II (77-90 yrs.)	0	10	3.6	1.6
All	0	11	4.8	1.3

these noninstitutional others. These data include both intrainstitutional and extrainstitutional activities. In every subject classification, at least one subject had no contacts with persons from outside the institution. The average subject from the total sample participated in 4.8 activities per week with such persons. This figure represents 1.9% of the activities he or she engaged in per week.

In Table 21, the average time spent in activities with extrainstitutional persons is shown. The maximum time spent with these persons by a single subject was 745 minutes or 12.4 hours per week. Although the difference between the means of the two institutions is small, the difference between the means of the age groups is substantial. Apparently, the older subjects are more isolated from noninstitutional persons than the younger ones. The average subject from the total sample spent 210.7 minutes or 3.5 hours per week engaging in activities with persons not associated with the institutional facility. However, it should be emphasized that the research protocol included only those activities which occurred between 6 A.M. and 6 P.M. It is highly likely that many contacts with noninstitutional persons would take place in the evenings and would therefore not be documented in these findings. These limitations should be considered in the interpretation of the results.

Table 21
 Mean Time in Minutes Spent in Activities With Other
 Persons Not Affiliated With the Institution

Group	Minimum	Maximum	Mean	SD
Institution				
I	0	745	227.6	15.2
II	0	500	193.8	12.3
Age Group				
I (60-77 yrs.)	0	745	247.4	16.4
II (77-90 yrs.)	0	500	174.1	11.0
All	0	745	210.7	13.8

The evidence reported in this section indicates that, for the times of day sampled, subjects lead somewhat isolated life-styles as residents of geriatric institutions. They are not only isolated from one another but they are also isolated from persons belonging to the community at large. Findings such as these underscore the relative importance of persons affiliated with the institution in the social lives of the residents.

Settings

The 18 intrainstitutional setting categories were analyzed and ranked in the same manner as the activity and other person categories. Table 22 shows the rank ordering of settings based on the number of times they were entered. Agreement between these rankings is high for institutions ($r_s = .85$) and for age groups ($r_s = .84$). The assignment of the first three ranks to private quarters, dining hall and central lobby is consistent across subject classifications. Of all activities performed within the institution, 54.3% occurred within the residents' own rooms. Taken together, these private quarters, dining hall and central lobby accounted for 85.4% of all intrainstitutional activities. In other words, 16.6% of the settings available constituted the scenes for 85.4% of the activities performed within the institution. The remaining 83.4% of the settings accounted for only a small fraction of activities. For the

Table 22
Rank Order of Settings: Number of
Entries into a Setting Type

Category	Institution		Age Group		All
	I	II	I	II	
Private quarters	1	1	1	1	1
Dining hall	2	2	2	2	2
Central lobby	3	3	3	3	3
Yard/patio	4	4	5.5	4	4
Auditorium	5	9	5.5	6	5
Gift shop	6	5	4	9.5	6
Hallways	7	7.5	8	5	7
Other resident's room	10	6	9	7	8
Laundry	8	7.5	7	9.5	9
Small lobby	11.5	10	11	8	10
Office	9	13.5	10	15	11
Games	11.5	13.5	13.5	11	12
Arts and crafts	14.5	12	15	13.5	13.5
Health center	17	11	16	12	13.5
Library	13	18	12	16	15
Chapel	14.5	15.5	17	13.5	16
Beauty shop	16	15.5	13.5	17	17
Undifferentiated	18	17	18	18	18

total sample, seven settings were entered less than one time per week by the average subject.

In Table 23, settings were ranked according to the number of subjects who entered them at least once during the data collection period. This dimension for ranking can be conceptualized as an index of preference for a given setting across subjects. From this index, it is apparent that private quarters and dining hall are the most preferred settings across all subject classifications. Every subject in the sample entered each of these settings at least once. These findings are not surprising in that these settings serve as the location for behavioral events necessary to daily life, such as grooming and hygiene, sleeping and eating. From the 18 setting categories, seven can be designated as public areas. These settings include the central lobby, small lobbies, dining hall, hallways, library, auditorium, and yard/patio. They are public in that they are relatively open settings which are available to all subjects on an unscheduled basis and which have no single set of behaviors associated with them. It should be noted here that in both institutions, the dining hall and library were used for a multitude of purposes including art displays, card games and sing alongs. Of these public settings, four (dining hall, central lobby, auditorium and yard/patio) ranked among the most popular. These settings were not only likely to foster a wide variety of

Table 23
 Rank Order of Settings: Number of
 Subjects Entering Setting Type

Category	Institution		Age Group		All
	I	II	I	II	
Private quarters	1.5	1.5	2	1.5	1.5
Dining hall	1.5	1.5	2	1.5	1.5
Central lobby	3	3	2	3	3
Auditorium	5	8	5.5	5	4.5
Yard/patio	6	5	8.5	4	4.5
Other resident's room	7	5	5.5	6.5	6.5
Hallways	8	5	5.5	6.5	6.5
Laundry	10	7	8.5	8	8.5
Office	4	12	5.5	9	8.5
Small lobby	13.5	10	14	10	10.5
Gift shop	11.5	11	10.5	11.5	10.5
Library	9	18	10.5	16.5	13
Beauty shop	11.5	13.5	12	14	13
Health center	17	9	14	11.5	13
Arts and crafts	13.5	13.5	14	14	15
Chapel	16	15	17	14	16.5
Games	15	16.5	16	16.5	16.5
Undifferentiated	18	16.5	18	18	18

activities, but they were also likely to facilitate social activities. The ranking of setting categories was similar for institutions ($r_S = .73$) and for age groups ($r_S = .87$) both of which are significant beyond the .005 level.

Table 24 presents the ranking of settings according to the amount of time spent by subjects in each setting type. The Spearman rank correlation coefficient for institutions is .75 and for age groups .79. These figures indicate relatively high agreement in the rank ordering of these categories. Once again, private quarters, dining hall and central lobby occupied the first three ranks. These rank assignments are consistent across institutions and age groups. Private quarters alone accounted for 61.5% of the average subject's time per week. Private quarters, dining hall and central lobby combined, accounted for 78.9% of this time frame. The remaining 21.1% of the time can be accounted for by other settings both within the institution and beyond it.

Table 25 displays the rank order of settings based on the relative duration of activities performed within them. For this dimension, frequency and duration measures were combined to obtain the average amount of time taken for activities occurring in a given setting. Settings in which relatively lengthy activities took place are indicated by a rank of one. The gift shop attained a relatively high rank because subjects in the sample served both as

Table 24

Rank Order of Settings: Time Spent in Setting Type

Category	Institution		Age Group		All
	I	II	I	II	
Private quarters	1	1	1	1	1
Dining hall	2	2	2	2	2
Central lobby	3	3	3	3	3
Gift shop	4	6	4	5	4
Auditorium	5	9	5	6	5
Yard/patio	6	4	8	4	6
Other resident's room	9	5	7	8	7
Small lobby	11	7	13	7	8
Laundry	12	8	6	12	9
Arts and crafts	8	10	9	10	10
Games	10	12	14	9	11
Library	7	18	10	14	12
Hallways	15	13	15	11	13
Beauty shop	14	14	11	15	14
Health center	16	11	16	13	15
Office	13	16	12	17	16
Chapel	17	15	17	16	17
Undifferentiated	18	17	18	18	18

Table 25

Rank Order of Settings: Relative Duration of
Activities Performed in a Setting Type

Category	Institution		Age Group		All
	I	II	I	II	
Arts and crafts	2.5	3	1	4	1
Library	4	18	3	2	2
Beauty shop	5.5	2	3	3	3.5
Gift shop	2.5	12	5.5	1	3.5
Auditorium	7.5	8.5	7	6	5.5
Games	10.5	1	8	7	5.5
Private quarters	9	7	9.5	8	8.5
Small lobby	13	5	16	5	8.5
Health center	1	10.5	5.5	9.5	8.5
Undifferentiated	5.5	15	3	15	8.5
Dining hall	10.5	6	12	9.5	11
Central lobby	7.5	14	9.5	13	12
Other resident's room	12	10.5	11	12	13
Laundry	16	8.5	13	14	14
Yard/patio	14	13	17	11	15
Office	15	17	15	18	16
Chapel	18	4	14	16	17
Hallways	17	16	18	17	18

customers and storekeepers. The activities of storekeepers contributed heavily to this measure because they were extremely lengthy. The three most commonly used settings (private quarters, dining hall and central lobby) rank in the middle ranges along this dimension. Such findings indicate that activities occurring in these settings were not uniformly lengthy nor brief. The reader should recall that only daytime hours were sampled.

There is little agreement in the assignment of these ranks for institutions. The Spearman rank correlation coefficient for institutions, $r_s = .05$, is not statistically significant. However, agreement is much higher for age groups ($r_s = .61$, significant at the .01 level). These data suggest that age may not be an important factor in determining the time configuration of behavioral events that take place in various settings.

In general, intrainstitutional settings displayed high levels of consistency across all subject classifications. Rankings along the dimensions of frequency, population and duration point to the relative importance of a small number of settings in the lives of the subjects. Private quarters, dining hall and central lobby, respectively ranked highest with regard to the number of times they were entered, the number of subjects who entered them and the amount of time subjects spent in them. While subjects had a large number of settings available to

them, they appeared to confine the bulk of their daily activities to only a small number. Such findings suggest that these settings served as the focal points for a large part of institutional life and could provide important insights into its nature.

Setting Dependent Behavior

Results reported in this section focus on certain contexts in which behavior took place. The first subsection deals with the context of institution size and social performance differences between residents from the two institutions. These differences are examined in light of findings from previous research conducted in communities, schools and churches of varying sizes. An account of several important behavioral relations centering around the three most commonly used institutional settings is presented in the next subsection. The relevance of these findings to some theoretical notions regarding institutional geriatric behavior is emphasized. In the final subsection, some general findings regarding the site specificity of behavior are reported.

Institutional Differences

The importance of social participation by the residents of geriatric institutions has been noted by many writers (Cautela, 1972; McClannahan & Risley, 1975; Tobin & Leiberma, 1976). Considerable evidence has

accumulated to suggest that institution size or number of persons comprising the institution has a profound influence in social performance. Barker (1960, 1968) proposed a theory of motivation which emphasizes the importance of the number of persons participating in a behavior setting. In brief, the theory suggests that smaller settings exert greater claims on occupants to work harder and to do greater and more important work. Due to the presence of fewer people, smaller settings possess forces which act on individuals to perform a wider variety of activities and to become less sensitive to and less evaluative of differences between people. Each person in the setting has greater importance, more responsibility, greater self-identity and greater insecurity. Because each person is critical in the maintenance of the setting, he or she experiences more frequent successes and failures. Additional persons are often needed to reduce the demands on setting occupants. Consequently, there are fewer and less strict standards for admission to small settings. In short, some of the principles which govern individual participation in the setting appear to be related to the number of persons who inhabit it.

One of the most important aspects of Barker's theory of undermanning is that small, undermanned settings appear to be products of small institutions and that large, overmanned settings result from large institutions

(Bechtel, 1974). The primary research bearing on this theory has been conducted in communities, institutions and organizations of varying sizes. Barker (1964) demonstrated that community size is related to participation in a broad range of activities. He found that the smaller communities tend to foster a higher degree of participation by adolescents in work, church and in nonschool activities. As part of an extensive investigation of the effects of school size on the social participation of high school juniors, Gump and Friesen (1964) found that although large and small school students engaged in the same number of behavior settings, small school students participated in a wider variety of extracurricular activities. In addition, a larger portion of small school students held positions of importance and responsibility. These students also held a central position in a wider variety of school activities than did their large school counterparts.

Individual participation by members of varying sized churches was found to follow many of the same patterns documented in the study of schools. Wicker (1969) demonstrated that members of small churches participated in more kinds of activities, maintained more leadership roles, spent more time in church activities, attended church more often and contributed more money to the church.

These findings appear to converge in such a way as to suggest that institution size is an important determinant

of individual social participation. Further, they suggest that the same principles operate in a wide variety of institutions and organizations.

In a comprehensive discussion of planning for geriatric institutions, Lawton (1975b) notes that since many elderly persons come to planned housing with the explicit aim of curing their loneliness, social participation should be included as a positive goal for housing. While Lawton presents findings obtained through informal observations in geriatric institutions of varying sizes, he points out that no systematic investigations have yet been conducted to study these issues.

Bennett and Eisendorfer (1975) note in their review of the literature on ecological factors and geriatric institutional life that size variables have been confounded with other important dimensions such as quality of care and cost per day. Consequently, institution size has not emerged as a clearly definable influence.

The two institutions employed in this study, while comparable on many important characteristics, differed in size. Institution I housed 80 residents and Institution II housed 240. Although the findings obtained from these two groups can provide no definitive answers, they do provide some useful preliminary insights upon which future investigations could be based.

A total of eight social participation variables similar to those employed in the community, school and church size investigations were identified. Differences between the mean performances of subjects who resided in the two institutions were tested for statistical significance with the use of a t test for independent samples.

The most notable finding was that no statistically significant differences were found between institutions for any of the performance dimensions tested. The dimensions tested are listed in Table 26 along with their t values. These findings indicate that no significant differences existed between the social performance patterns of subjects who resided in the large and small institutions. These data suggest that for the two institutions under investigation, size was not an important factor in the subjects' patterns of social participation. Rather, subjects who resided in both institutions demonstrated marked similarities on all social performance dimensions examined.

Commonly Used Settings

It has been reported earlier in this document that about 90% of all activities reported occurred within the institution or on its grounds. It has also been reported that three institutional settings--private residential quarters, dining hall and central lobby--accounted for approximately 80% of the average resident's time per week.

Table 26
 Social Participation Variables Tested for
 Significance of Differences
 Between Institutions

Variable	<u>t</u> value
Number of activities performed	.01 NS ^a
Number of types of activities performed	.31 NS
Number of settings entered	.37 NS
Number of types of settings entered	.23 NS
Number of social interactions engaged in	.13 NS
Time spent engaging in social interactions	.73 NS
Number of activities performed in extrainstitutional settings	.09 NS
Time spent in extrainstitutional settings	.53 NS

^aNS = nonsignificant at $p \leq .05$

Of this 80%, 61.5% of his or her time was spent in private quarters, 13.6% was spent in the dining hall and 4.9% was spent in the central lobby. The value of these settings for providing a more adequate understanding of institutional life cannot be overlooked.

In the existing literature regarding geriatric behavior in institutional housing, the amount of time that residents spend in their own rooms and what they do there has received considerable attention. Cautela (1972) suggests that when residents restrict their behavior to their own rooms or wards, they begin to display certain behavioral deficits. The argument continues that these deficiencies often interfere with the individual's social attractiveness which in turn results in the individual's becoming further isolated, both socially and physically.

McClannahan and Risley (1975) noted in their observations of elderly residents in a nursing home facility that most residents were found to be in their own rooms, not exhibiting gross motor movements, not engaging in social interaction and not displaying appropriate activities. One aspect of their strategy for increasing behavioral interaction was to get the residents out of their rooms and into the lounge area where manipulative recreational materials were made available.

Implicit in both these reports, one theoretical and one empirical, is the assertion that activities which

are likely to occur in other settings of the institution are more desirable than those which are likely to occur in the residents' own rooms. The results reported in this subsection describe some of the behavioral patterns which center around the most frequently used institutional settings.

Table 27 displays the rank order of settings based on the number of physically inactive behaviors which occurred in each location. In each institution, private quarters served as the site of the largest number of these low level activities, which include resting, sitting idly and watching television. For the total sample, 87.9% of all physically inactive behavior reported occurred in the residents' rooms. The setting which ranks second along this dimension, central lobby, accounted for only 4.1% of these behaviors. It appears that these activities which make few physical demands on the individual occurred in large numbers in the residents' private quarters and occurred only infrequently in other institutional settings.

Table 28 presents settings ranked according to the rate at which activities occurred within them. This table reflects findings which are the inverse of those presented in Table 25. The setting occupying the first rank is the setting which displayed the greatest number of activities performed per minute. Private quarters rank in the middle ranges along this dimension with one activity being

Table 27

Rank Order of Settings: Number of Physically
Inactive Behaviors Performed

Category	Institution		All
	I	II	
Private quarters	1	1	1
Central lobby	2	2	2
Auditorium	3	4.5	3
Dining hall	5	3	4
Small lobby	4	10	5
Chapel	6	4.5	6
Library	8.5	6	7
Beauty shop	7	9	8.5
Other resident's room	8.5	8	8.5
Health center	12	7	10
Yard/patio	10	12	11
Office	11	11	12
Laundry	14.5	13	13.5
Undifferentiated	13	14	13.5
Arts and crafts	14.5	16	15
Gift shop	16	15	16
Games	18	17	17
Hallways	17	18	18

Table 28
 Rank Order of Settings: Rate of Activities
 Performed per Minute

Category	Institution		All
	I	II	
Hallways	2	2	1
Chapel	1	14	2
Office	4	1	3
Yard/patio	5	5	4
Laundry	3	9	5
Other resident's room	7	7	6
Central lobby	12	4	7
Dining hall	9	12	8
Private quarters	10	11	9
Small lobby	6	13	10.5
Undifferentiated	14	3	10.5
Health center	18	8	12
Auditorium	11	10	13
Games	8	17	14
Gift shop	17	6	15
Beauty shop	13	16	16
Library	15	18	17
Arts and crafts	16	15	18

performed approximately every 50 minutes. Hallways rank first with a rate of one activity every 16 minutes and the arts and crafts room ranks last with one activity being performed every 80 minutes. From this evidence, it appears that relatively low rates of performance were associated with the behavioral pattern in private quarters. However, in the other two settings which occupied large portions of the residents' time (the dining hall and central lobby), the activity rate was almost identical to that occurring in the residents' rooms. Apparently the rate of activity displayed by subjects was relatively consistent in the three major institutional settings where large amounts of their time were spent. Furthermore, these findings suggest that when compared to activity rates which occurred in other institutional settings, the rates displayed by the three major settings lie in the middle ranges. Although the residents' activity rates are sometimes lower and sometimes higher, there appears to be a moderate rate which manifested itself in the private residential quarters, in the dining hall and in the central lobby.

The private rooms seemed to serve as the source of a wide variety of behavior for the subjects. Figure 3 illustrates the diversity of activity types which occurred in this setting. Every activity category which appeared in the institution as a whole was represented to some extent

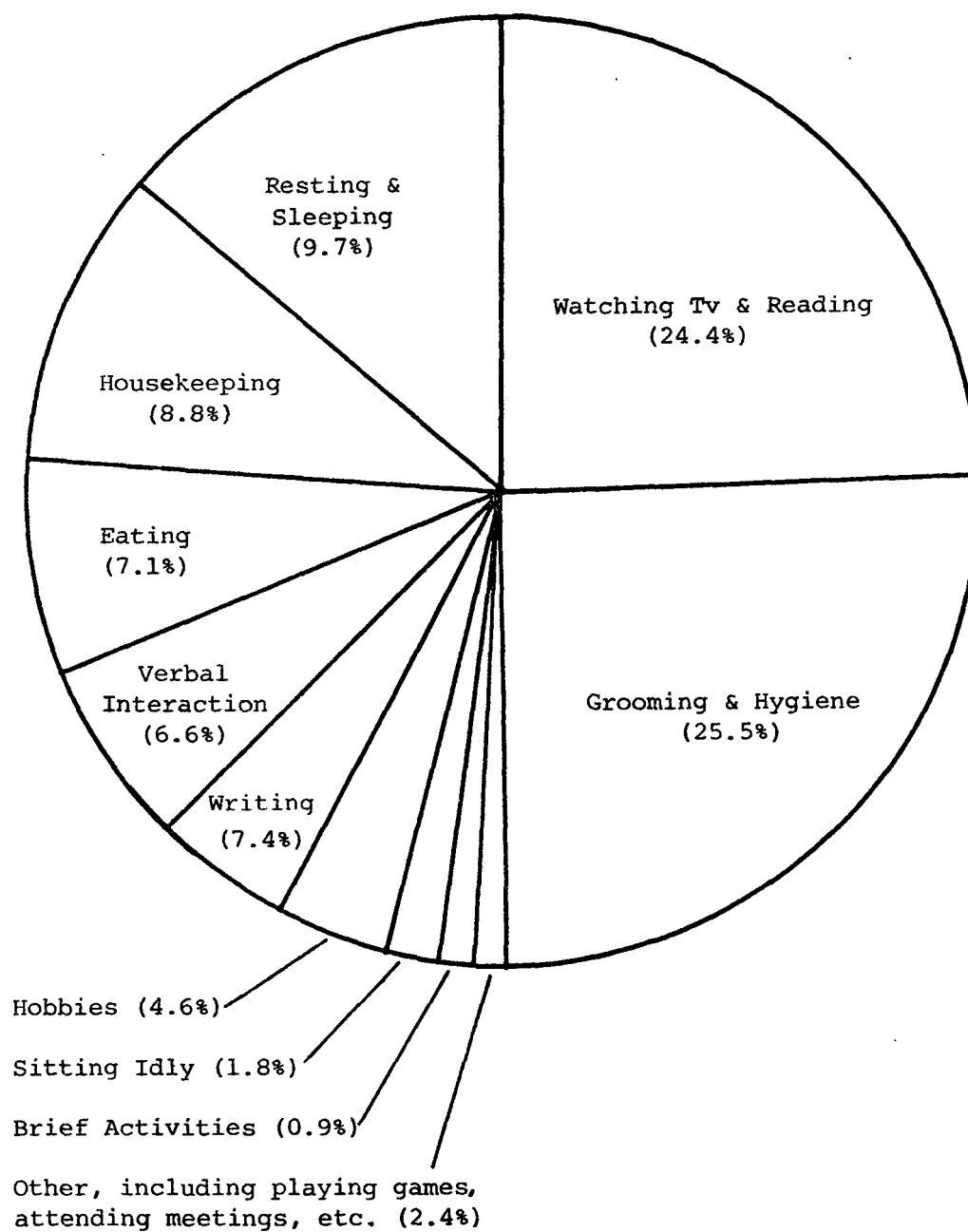


Figure 3

Diversity of Activities Occurring in
the Private Residential Quarters

in the residents' rooms. These findings did not hold for any other setting. The average subject engaged in 8.18 (SD = 1.29) different activity types in his own room. In contrast, the diversity of activity types which occurred in the central lobby was much lower. Figure 4 illustrates this finding. In this setting, an average of 2.6 (SD = 1.6) different activity types were recorded.

Table 29 presents the ranking of settings based on the number of activities which involved other persons as active participants. Of all such socially interactive behaviors recorded, 34.6% took place in the dining hall and 26.7% took place in the residents' rooms. Only 12.8% occurred in the central lobby. All totaled, these settings accounted for almost three quarters of all social encounters. In general, it appears that settings in which subjects spent large portions of their time were those where socially interactive behaviors occurred in large numbers. In particular, the private residential quarters accounted for a large percentage of these social activities and did not appear to create social isolation for individuals.

It is possible that the use of certain institutional settings by individuals is related to the location of the individual's room within the institution. This could be a particularly important factor in old age where physical mobility is often a problem (Lawton, 1974). To test this proposition, the distance in linear feet was calculated

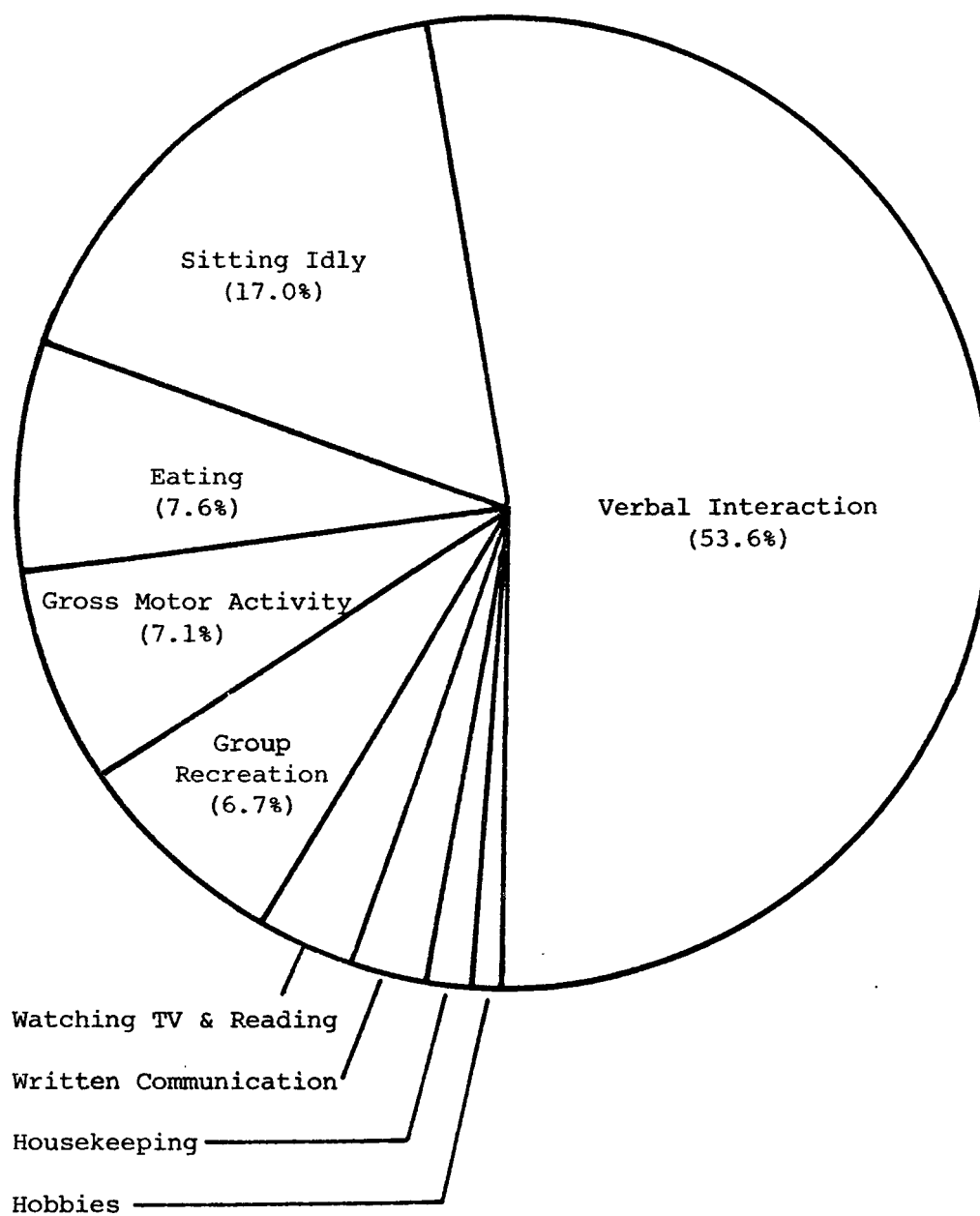


Figure 4

Diversity of Activities Occurring in
Central Lobby

Table 29
 Rank Order of Settings: Number of
 Socially Interactive Behaviors
 Performed in a Setting Type

Category	Institution		All
	I	II	
Dining hall	1	2	1
Private quarters	3	1	2
Central lobby	2	3	3
Gift shop	5	5	4
Auditorium	4	6	5
Other resident's room	7	4	6
Yard/patio	9	8	7.5
Office	6	14	7.5
Games	8	12	9
Hallways	10	9	10
Small lobby	12	10	11
Health center	15	7	12
Arts and crafts	14	11	13
Beauty shop	13	15.5	14
Library	11	17.5	15
Laundry	17	13	16
Chapel	17	15.5	17
Undifferentiated	17	17.5	18

from the entrance of an individual's living quarters to a point centrally located in the major lobby. When elevators were used by residents to reach the lobby, a constant value of 10 feet was added irrespective of the floor upon which his room was located. A Pearson product-moment correlation coefficient (r) was computed to test the relationship between this distance and the total amount of time an individual spent in the lobby. In Institution I the correlation coefficient describing this relationship is $r = .47$ (significant at the .05 level for a two-tailed test) and in Institution II $r = .74$ (significant at the .001 level for a two-tailed test). These data suggest that the farther a subject's room was located from the lobby, the more time he or she spent there. In addition, the relationship became stronger when the size of the physical facility became larger. To state the relationship another way, subjects whose rooms were relatively close to the lobby actually spent less total time there than subjects whose rooms were located at greater distances from the lobby. This could be due to the amount of time and energy required for travel between the lobby and one's room. For those living at greater distances, this expenditure is greater. It is possible that when these persons arrived in the lobby, they tended to stay there for longer periods of time in order to minimize their effort. Alternatively, it is possible

that persons who lived closest to the lobby experienced more incidental social encounters than other residents living farther away. It may be that more people were likely to pass by the close rooms and interact with those residents. Consequently, these persons spent less time in the lobby area where social activities frequently occurred.

In summary, the findings reported here suggest that while the private residential quarters were associated with high levels of physically inactive behaviors, they were also associated with a wide variety of activity types and high levels of social interaction. The dining hall, which displayed a relatively restricted range of activity types, accounted for one third of all social encounters. A relatively high level of physically inactive behavior was associated with the central lobby as well as a restricted range of activity types and relatively low levels of social activity. These three settings had almost identical rates of activity which fell in the middle ranges when compared to the activity rates displayed by other institutional settings. In addition, the distance from an individual's room to the central lobby was positively related to the amount of time an individual spent in this setting. As the physical size of the facility increased, the strength of this relationship increased.

General Issues

Results reported in this subsection focus primarily on the importance of environmental factors in the behavioral

patterns displayed by settings. This subsection deals with the complementary behavioral relationships that settings often exhibit.

In order to demonstrate the amount of variance in a setting's performance patterns that can be accounted for by the setting itself, each subject's data were randomly assigned to one of two groups. Likewise, pairs of these data, with one member of each pair drawn from each newly created group, were generated. Three performance patterns which occurred in the private residential quarters were examined for each subject. This procedure presumably created two independent groups of subjects. Because individual difference variables had been randomly distributed across both groups, the subjects shared nothing in common except the setting in which they exhibited the performance patterns in question. A Pearson product-moment correlation coefficient (r) was computed to test the relationship existing between the performance patterns displayed by subjects in each group. The correlation coefficient indicated the amount of variance in behavior accounted for by the environmental component.

The three performance patterns which occurred in private quarters and which are examined in this manner and their resulting correlation coefficient (r) are shown in Table 30. From this table, it is apparent that the private quarters exercised a significant influence on

Table 30
 Site Specific Performance Patterns Found
 in the Private Residential Quarters

Performance Pattern	<u>r</u>	<u>p</u> ^a
Number of activities	.43	.05
Number of social interactions	.49	.01
Number of kinds of activities	.58	.01

^aP = level at which correlation coefficient attained statistical significance.

the amount, diversity and social nature of the activities that occurred there. This setting also exerted an influence independent of individual differences attributed to subjects who exhibited the behaviors.

In a further attempt to demonstrate the importance of settings in behavior irrespective of the kinds of people who inhabit them, subjects with certain behavioral characteristics were identified. Subjects who displayed extremely large amounts of time engaging in social interaction and those who displayed extremely small amounts were selected. This procedure resulted in five high socializers and five low socializers.

It was reasoned that persons displaying different kinds of personal characteristics might utilize settings in different ways. This proposition was examined by testing the significance of differences in mean performances displayed by high and low socializers on several dimensions. First, the two groups were examined for differences in the number of activities they displayed in each of the three major institutional settings. Second, the groups were examined for differences in the number of social interactions they displayed in those settings. Since subjects were originally divided into the two groups on the basis of differential overall social performance, it was expected that their social interaction patterns in various settings would also differ. The statistical procedure used to test

the significance of differences between the two groups was a t test for independent samples.

Table 31 presents the performance dimensions tested in this manner along with their resulting t values. No statistically significant differences were found between high and low socializers for any of the variables tested. These findings indicate that even when personal behavioral characteristics of subjects are taken into account, no significant differences emerge between groups in the performance dimension tested. In other words, subjects did not differ significantly along these dimensions in their use of the major settings despite their differences in a given personal characteristic.

Another way to conceptualize the importance of physical settings in behavior is to compare the amount of variation in a given behavior displayed by settings and by persons. If the variation across settings is greater than the variation across persons, it can be reasoned that the behavior is more sensitive to setting differences than to person differences. A test of this assertion was conducted by calculating for each setting the proportion of socially interactive behavior to all behaviors occurring in that setting and by calculating for each person the proportion of socially interactive behavior he or she exhibited to all his or her behaviors. Settings and subjects from the two institutions were analyzed separately.

Table 31
 Setting Performance Patterns Tested for
 Significance of Differences Between
 High and Low Socializers

Performance Pattern	<u>t</u> value
Private Quarters	
Number of activities performed	.20 NS ^a
Number of social interactions	.76 NS
Central Lobby	
Number of activities performed	1.07 NS
Number of social interactions	1.41 NS
Dining Hall	
Number of activities performed	.16 NS
Number of social interactions	.79 NS

^aNS = nonsignificant at $p \leq .05$.

The range between the highest and lowest proportion scores for settings and persons are presented in Table 32, along with the variance in proportions for settings and persons. In both institutions, the range scores for settings are much larger than those for persons. Furthermore, in Institution I, the variance in proportions for settings is approximately seven times greater than that for persons; and in Institution II, variance is 10 times greater than that for persons.

These findings indicate that socially interactive behavior varied more with settings than with persons. The differences in range and variation between settings and persons is dramatic. This evidence supports the assertion that settings account for more variation in behavior than do persons.

Finally, it should be noted that the behavior patterns exhibited by settings are often complex and interrelated. That is, a setting which is associated with one kind of behavior may also be associated with another kind of behavior. To test this proposition, a Pearson product-moment correlation was employed to test the relationship between the number of physically inactive behaviors a setting displayed and the number of social interactions it displayed. A correlation coefficient of .59 (significant at the .01 level for a one-tailed test) expresses this relationship. These findings suggest that settings

Table 32
Range and Variance in Socially Interactive
Behavior for Settings and Persons

Group	Range	Variance
Institution I		
Settings	1.00	.15
Persons	.53	.02
Institution II		
Settings	1.00	.13
Persons	.36	.01

in which social encounters were likely to occur are also settings in which these physically inactive behaviors were likely to occur. Apparently, in settings where social activity was likely to take place, subjects engaged in many low level behaviors which could be easily interrupted.

To summarize the results presented in this subsection, there is evidence to suggest that environmental factors play a large role in behavior. In particular, the setting in which an individual is performing exerts a high degree of influence on the performance patterns that emerge there. The setting is often capable of exerting such an influence on behavior despite certain personal characteristics of the occupants. Furthermore, the patterns of behavior displayed by settings are not simple. Rather, these patterns may be more representative of a class of behaviors than of any single type of behavior.

CHAPTER IV

SUMMARY AND CONCLUSIONS

This chapter summarizes and integrates the findings of the study and discusses their implications. A summary of the major findings regarding the daily round of institutional life is presented with some speculative comments. The generalizability of the findings is discussed by examining the nature of the data and limitations imposed by characteristics of the sample, and by comparing the present findings with those reported by other investigators. The generalizability of the Activity Record as a method for obtaining behavioral data and some limitations inherent in this technique are also discussed. These discussions are followed by some general marks about the study's implications.

Summary of Findings

The present study suggests that these geriatric institutions not only provided residents with the essentials for living, such as meals and housing, but they also served as sites for most of the residents' daily behavioral activities, and they provided the base for the residents' social lives. One-half of all reported activities were performed by subjects without the active involvement of

other persons. When socially interactive behaviors did occur, they most often involved other residents and residents and institutional staff members.

Three activity types -- preparing and eating food, health care, and idle pastimes -- constituted a core of activities about which other kinds of activities were centered. In general, the more discretionary activities were physically inactive in nature. When compared to those of college students (Stuart, 1973) the activity patterns of these elderly residents are considerably more docile and restricted in range.

Residents used only a small number of settings on a regular basis. The private residential quarters, dining hall, and central lobby accounted for all but a small portion of the residents' time per week. The private quarters, which were associated with large amounts of physically inactive behavior, were also associated with a wide variety of activity types and with relatively large amounts of social interaction. Although the diversity of activities displayed in the dining hall was restricted, this setting accounted for over one third of all socially interactive behaviors. Relatively large amounts of physical inactivity occurred in the central lobby, along with relatively high levels of social activity. All three settings displayed moderate rates of behavior (measured in behavior per unit time) when compared to the rates which occurred in other

settings. Utilization of the central lobby was positively related to the distance between a resident's room and the lobby area. Furthermore, the strength of this relationship increased with the size of the physical facility.

In general, findings for activities, other persons and settings demonstrated marked similarities across both institutions and age groups. Contrary to evidence obtained in communities, schools and churches, the size of the geriatric institution (number of residents) did not have a significant effect on a wide range of social participation variables. It is possible that the difference in the number of persons each institution housed was not of sufficient magnitude for the effects of size to be manifested. It is also possible that differences between the institutions (other than size) served to moderate the effects of the size variable. For these reasons, a number of institutions varying in size should be studied to overcome distinctive characteristics of particular institutions and to obtain more definitive conclusions about the relationship between the size of geriatric institutions and the social participation of the residents.

The present study also provides evidence to suggest that environmental settings play an important role in behavior. Both when general individual differences among setting occupants were taken into account and when certain specific personal characteristics were analyzed, settings

appeared to exert strong differential influences on many behavior patterns. The findings strongly suggest that behavior is more sensitive to differences among settings than to differences among persons, i.e., there is more behavioral variability across settings than across people.

The patterns of behavior exhibited by settings are not simple. For instance, settings which displayed high levels of physical inactivity also displayed high levels of socializing. These findings suggest that settings often host complex configurations of interrelated activities which may be most appropriately described as classes of behavior.

The findings suggest that the daily lives of elderly persons residing in institutions are generally insulated from the community at large and from other persons within the institution. Most of their activities occur in a small number of settings and many require little physical exertion to perform. The findings also point to the importance of environmental factors as influences on behavior and they further support the argument that one of the best ways to predict an individual's behavior is to know where he or she is.

Generalizability of Findings

The issue of generalizability is an important one in all research and it is also an issue which can be addressed in many ways. In this section, generalizability is discussed

both in terms of the extent to which the sample data are representative of the phenomena they symbolize and in terms of the extent to which the findings are representative of phenomena outside those sampled.

The nature of the methods and procedures employed in the present study enhance the argument for generalizability. Because naturalistic methods interfere only minimally with the phenomena being studied, the data they generate are more representative of the phenomena they symbolize than data generated by more intrusive methods. Stated differently, because naturalistic methods serve only as a filter for recording phenomena, they minimize distortions of the phenomena. Consequently, the data obtained are more representative of the naturally occurring events than data obtained through less naturalistic means (Willems, 1969).

External validity refers to the extent to which evidence found in a given study can be generalized to persons, settings, conditions and times not included in that study. One strategy for assessing external validity is to explicate distinguishing characteristics of the sample which could restrict the findings to other populations. The institutions examined in the present study provided only minimal care to residents and their major functions were to provide housing, meals and recreational opportunities. These facilities were also similar architecturally in that each had all dwelling units housed within a single

structure accessed through a single door in a central lobby. The subject population was comprised of fully ambulatory and relatively healthy, active persons whose ages ranged widely. Generalizing from the findings presented in this study to the behavior of less able older persons and/or older persons residing in different kinds of housing arrangements, such as nursing homes, retirement center cottages or individualized housing should be done with caution. It should also be recalled that the data collection period included only daytime hours and care should be exercised in generalizing the findings beyond this time frame.

However, within the range of institutions, subjects and times sampled, the present findings demonstrate high levels of generalizability. Subjects in both institutions displayed highly similar patterns in terms of the activities they engaged in, the settings they visited and the types of persons with whom they interacted. They also displayed no significant differences on a wide range of social participation variables. This kind of evidence strengthens the case for the findings' generalizability, in that they reduce the likelihood that the documented phenomena are unique to a single institution. The same logic can be applied to age groups. Remarkable agreement in performance patterns was exhibited by residents in both the older and the younger age groups for activities, other persons and

settings. This evidence indicates that the obtained findings are not age specific but rather apply to a wide range of ages in older persons.

Another way in which the issue of external validity can be addressed is by comparing the present findings with those reported by other investigators. Hitch and Simpson (1972) and Spasoff et al. (1978) obtained data through different methods regarding many aspects of institutional living. By direct observation, Hitch and Simpson documented an average of 51.3% of institutional residents sleeping or sitting idly in each observation. Through data obtained by questionnaires administered to residents, Spasoff et al. reported that approximately 41% of the residents reported "doing nothing" as their primary activity. While the results reported in the present study can not be easily translated into comparable figures, they do indicate that 30.6% of the average resident's weekly activities and 35.9% of his or her time can be characterized as physically idle. All three studies converge to suggest that institutionalized elderly persons engage in many activities which are not physically demanding. In addition, Spasoff et al. reported that most of the useful tasks performed by residents involved some form of housework although their investigation did not attempt to quantify this variable. Findings from the present study indicate that housekeeping tasks were performed frequently and were reported at least one time by all but two subjects.

While limited in scope, the findings reported by other investigators help to substantiate the present findings as ones which are not specific to the present sample. The findings from other investigations also help to illustrate the gaps in knowledge about geriatric behavior that evidence accumulated in the present study can help to fill.

Generalizability of the Method

One purpose of this investigation was to evaluate the adequacy of an interview technique for collecting behavioral data in geriatric settings. Since the technique was initially developed for use with a different population functioning in a different setting and for answering different kinds of research questions, its assessment in the present study constitutes one test of its generalizability. In its development, data obtained through the use of this interview conducted by telephone contact were shown to be comparable to data obtained through self-recorded diaries (Widmer, 1978). Findings from the present study indicate that the quality of data generated by the Activity Record when used in geriatric institutions was high when strict comparisons were made between these data and those obtained through mutually reported activities of subjects. In addition, the resulting agreement scores compare favorably with those of other self-monitoring procedures (Nelson, 1977).

Two modifications in the Activity Record were made based on recommendations made by Widmer (1978). The first modification involved the use of overlapping activity units which permitted the recording of simultaneously occurring activities. This format eliminates the necessity for a subject to choose a single primary activity when he or she had been performing more than one activity at a time.

The second modification was made in the criterion for recording other persons as part of an activity unit. Originally, other people were coded as companions if they were within hearing distance of the reporting subject. This procedure allowed wide variations in reporting styles which resulted in low reliability scores for this measure (Widmer, 1978). In the present study, persons were recorded as part of an activity unit if they were actively involved in the event with the reporting subject. While no direct test of the new measurement procedure's reliability was conducted, these "other person" entries were used to identify mutually reported units for assessing overall data quality. With the exception of a very small number, the "other person" entries for such mutual reports were accurately recorded. This informal assessment suggests that the new criterion for reporting social involvement yields a more reliable measurement. It should be noted, however, that while gains have been made in reliability, the new reporting criterion eliminates certain kinds of potential

information. It is possible for people to have been present when the reporting subject was performing an activity but because they were not actively involved in the activity, they were not recorded as an other person. This format, then, does not allow for any clear assessment of social isolation, or times when there are no other people in the subject's presence. In essence, while the definition of "other persons" has become more refined, the category of "alone" has become more encompassing and perhaps more ambiguous.

The two primary metrics associated with the Activity Record are frequency (occurrence) and time (duration). The relationship between these measurement units was estimated for categories of activities, other persons and settings by use of the Pearson product-moment correlation. The mean correlation coefficient for activity categories was .82, for other person categories, it was .71 and for setting categories, it was .79. Similar correlations between the frequency and duration measures for behavioral data obtained through direct observation have been reported by Alexander (1978) and Wiener (1978). These relatively high correlations indicate that the two measures share large portions of variance, and to a large extent, provide redundant information. This evidence suggests that it would be possible to retain one of these units and eliminate the other. Because frequency data can be more quickly obtained, it

would probably be more desirable to maintain occurrence as a unit and eliminate duration. Such an attempt to make the procedure more cost effective would make longitudinal monitoring of behavior more feasible.

Subjects participating in this study demonstrated high levels of cooperation with and interest in data collection. The interviewers felt that conducting the interviews in person, as opposed to telephone contacts or by mail, helped to facilitate rapport between the interviewers and the subjects, who were all strangers at the start of the data collection period. Because many subjects came to view the interviewers as friends, a major concern of the researcher was to keep subjects aware that the personal contacts they were experiencing by participating in the study would be limited to only a few visits. The calendars which were supplied to each subject not only helped to reduce confusion about the interview schedule, but they also served to remind subjects how many interviews were left.

It should be noted that the Activity Record is more generic than a single reporting technique. Rather, it constitutes a means by which behavioral data are collected by having subjects report their own behavior. The reporting techniques have included self-recorded diaries (Stuart, 1973), interviews conducted through telephone contact (Widmer, 1978) and face to face interviews used in the present study. The Activity Record appears to be a reliable

tool for use in a variety of settings and for answering a variety of research questions. It has been shown to generalize to institutional and noninstitutional settings, to the general population and to more specialized populations such as the elderly and the physically disabled, and to problems of both a medical and nonmedical nature (Stuart, 1973; Widmer, 1978; and the present study). It has also been shown to elicit high levels of subject cooperation and interest, factors which are very important in conducting psychological research. Due to its versatility and relatively low cost for implementation, the Activity Record holds great promise for documenting naturally occurring behavioral events and it constitutes an important step in the development of such technologies.

General Remarks

The findings regarding geriatric institutional living reported in this investigation bear directly on many of the central issues that confront planners and managers of these housing facilities. Often, environmental and policy changes are made on the basis of institutions and subjective impressions rather than on the basis of objective empirical evidence. For example, Lawton (1974) noted that the "sitting-and-watching" syndrome of residents is distasteful to many administrators. Many have removed chairs from those areas where the syndrome frequently occurs and have

prohibited loitering in those locations. Evidence from the present investigation strongly suggests that settings which foster high levels of physical inactivity also foster high levels of social interaction. It can be argued on the basis of these findings that to discourage one of these behaviors in a setting could reduce the probability of occurrence of the other. In other words, to prevent the occurrence of physically inactive behavior in a setting, such as sitting and watching in the lobby, would likely reduce the amount of social activity that takes place there.

The decision to build either single or multiple occupant rooms is often controversial among designers of geriatric housing. Lawton (1974) reported that for many residents, private spaces are a desirable option. Whether they currently resided in single or multiple occupant rooms, a large majority of the residents preferred single rooms over shared ones. Spasoff et al. (1978) reported that the lack of privacy was a major complaint for elderly persons who shared their dwelling units with other persons. The controversy surrounding the issue of single versus multiple occupant rooms appears to be based primarily on the absence of empirical evidence about the effects that these living arrangements have on the behavior of residents. While the present study did not include multiple occupant rooms, the single occupant rooms did not appear to be associated with behavioral deficits. While residents spent

large portions of their time in their own rooms, they also engaged in a wide variety of behaviors there, and they engaged in large amounts of social activity.

These issues illustrate only a few of the many practical questions which can be answered by such a descriptive data base. These data have direct implications for the work of environmental designers, psychologists and social workers, as well as persons more directly involved with the day to day operations of institutional housing. Not only do these data provide an objective, quantitative base for making practical decisions, but they also make a contribution to the literature on aging and behavior.

The interpretation of the evidence presented here illustrates a long standing deficiency in the discipline of psychology. While behavioral phenomena for a specialized segment of the general population were documented carefully and extensively, the lack of similar data for other groups of people to which the present findings could be contrasted limited meaningful interpretations. For example, on the basis of the present findings alone, it is difficult to discern whether the lives of these elderly persons are rich or sparse, active or passive. Such questions can be answered satisfactorily only through the comparison of findings obtained from different groups. This study underscores the need for descriptive data on

the behavior of persons from many segments of the general population so that meaningful comparisons can be made.

Psychology has accumulated very little knowledge about the natural distributions of behavioral phenomena. Barker (1965) noted that a search for the phenomena as they occur unaltered by the techniques of search and discovery is a central concern for the natural and physical sciences. Handbooks and encyclopedias in these disciplines attest to the success of these efforts. Barker (1965) states:

I read, for example, that potassium (K) ranks seventh in order of abundance of elements and constitutes about 2.59% of the igneous rocks of the earth's crust; that its compounds are widely distributed in the primary rocks, the oceans, the soil, plants and animals; and that soluble potassium salts are present in all fertile soils. The fact that there is no equivalent information in the literature of scientific psychology (about playing, about laughing, about talking, about being valued and devalued, about conflict, about failure) confronts psychologists with a monumental incompleted task (p. 6).

The data of this study can be viewed as a small contribution toward the completion of the task that Barker has described for psychology. Clearly, more research is required to attain a complete understanding of geriatric behavior in institutional housing. For instance, data on older persons living independently in the community, less able older persons living in institutions with different architectural features (e.g., cottages, multiple occupant dwelling units, etc.) would be valuable in reaching this end. While limited

in scope, the present findings represent a significant beginning toward achieving and understanding of the ecological behavioral relations that constitutes institutional living for active older persons.

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APPENDIX A
Activity Record Form

APPENDIX B

General Instructions for
Conducting the Interview

Guidelines for Interviewers

The primary stimulus for obtaining the desired information must lie with the target person himself. In general, the information is recorded by the interviewer as it is reported by the target person. The interviewer serves as a gatekeeper during the interview, screening out the irrelevant information, e.g., "my wife went shopping", and providing prompts to assist the target person reconstruct the events of his day. Some general guidelines for prompting are suggested below:

1. The focus must always be on the target person, on what he/she is doing and not what others around him are doing unless they are actively involved in the activity.

2. It is critical that information regarding the smallest activity unit be ascertained at the time of the interview. Detailed information can later be aggregated into larger units, but it is impossible to obtain greater detail beyond the interview. Below are some questions which you can ask yourself and/or the target person in order to obtain the greatest detail possible:

- (1) "What other more specific activity units might comprise the globally reported unit?" For example, the target person might report that he was "getting ready to go to breakfast". Ask him to specify what activities were involved in "getting ready", e.g., grooming and hygiene, dressing.

(2) "Were any activities required to get from the previously reported activity to the next?" Ambulating is a transitional activity and one which is often omitted by the target person.

(3) If more than one activity is reported to have taken place at the same time entry, ask the target person, "What were you doing primarily?" For example, if "visiting" and "listening to music" were reported simultaneously, it may be that the music only provided the background and "visiting" was the principal activity.

However, it may be that the two activities were equally salient with respect to the overall events occurring at that time. When this occurs, record the beginning and ending times for each of the activities since they may not have taken place in exactly the same time frame.

3. Be as descriptive as possible in recording the data. If it is not clear as to what the target person was actually doing, ask him to elaborate.

APPENDIX C
Coding Categories for Activities,
Other Person Types and Settings

Activity Types

- 01 Sitting, Standing idly. Doing little else but watching or waiting.
- 02 Resting, Sleeping. Lying in bed.
- 03 Health care, Grooming. Behaviors involving care of self either for reasons of health or reasons of appearance; including professional treatment or diagnosis, e.g., having eyes examined, getting a shot.
- 04 Housekeeping. Maintenance and upkeep of the physical surroundings; including items and locations of personal ownership and of institutional ownership.
- 05 Verbal interaction. Activities such as speaking to or talking with a group.
- 06 Written communication. Communication activities involving reading and writing; including typing, copying, paying bills, and studying.
- 07 Idle pastimes. Activities such as reading, watching TV.
- 08 Handwork, Hobbies. Involves gross and fine muscular movement of the hands, often performed sitting down.
- 09 Buying, Selling. Business related activities involving the exchange of money for goods or services performed on a face-to-face basis.
- 10 Food preparing, Eating. Includes food related activities.
- 11 Vehicular transportation. Includes the use of motorized transportation.

- 12 Classes, Meetings. Includes activities where sitting and listening are dominant; however, occasional active participation of the target person may be involved.
- 13 Assisting others. Involves behavioral assistance to someone else in the performance of an activity.
- 14 Brief activities. Involves a series of low level behaviors none of which met the five-minute criterion; including messing around, gathering things to leave.
- 15 Job-related activities. Activities comprising a large group of behaviors which extend over two hours; those activities which constitute a single activity resembling a job.
- 16 Group recreation. Involves group participation in game or pastime; usually involves rules for participation, e.g., card games.
- 17 Gross motor activities. Requires involvement of entire body, e.g., walking.
- 18 Miscellaneous.

Other Person Types

Institutional Others

- 10 None (alone)
- 11 Other Residents
- 12 Staff
- 13 Maintenance and Cleaning Personnel

Non-institutional Others

- 20 Children and Grandchildren
- 21 Siblings (and in-laws), Nieces, Nephews, Parents
- 22 Friends and Acquaintances
- 23 Nurses, Doctors, and Dentists
- 24 Bankers, Lawyers, Insurance Men
- 25 Retail Merchants and Clerks
- 26 Ministers, Priests, Nuns

Intra-Institutional Settings

Residential Quarters

- 110 Resident's Own Room or Private Quarters
- 112 Other Resident's Room

Public Rooms

- 120 Major Lobby Area
- 121 Minor Lobby Area
- 122 Hallways
- 123 Dining Hall
- 124 Library
- 125 Auditorium and Large Chapel
- 126 Outside (on grounds at the institution)

Specialized Services and Uses Room

- 130 Arts and Crafts Room
- 131 Game Room
- 132 Laundry Room
- 133 Beauty Shop
- 134 Gift Shop
- 135 Health Care Center
- 136 Small Chapel and Prayer Room

Other

- 140 Administrative Offices
- 150 Undifferentiated (exact location cannot be determined)

Extra-Institutional Settings

Outside

- 210 Streets, Roads, and Parking Lots
- 211 Sidewalk
- 212 Parks and Outdoor Recreational Areas

Other Residencies

- 220 Home of Family Members
- 221 Home of Non-family Members

Professional Service Settings

- 230 Medical and Dental Offices
- 231 Hospital and Nursing Homes
- 232 Non-medical Professional Services (banks, law, insurance)

Businesses

- 240 Retail Stores, Shopping Centers (Where money is exchanged for goods)
- 241 Restaurants
- 242 Beauty Shop
- 243 Hotel

Community Institutions

- 250 Schools, Learning Centers
- 251 Funeral Home and Cemetary
- 252 Church

APPENDIX D
Instructions to Sorters
Of Activity Descriptions

Instructions to Sorters

The primary goal of this task is to create a comprehensive set of categories for classifying reported activities. You need not be concerned with the actual number of categories created. Rather, it is more important that the set which is created includes all reported activity descriptions being sorted.

Sort the activity descriptions into categories using the following criteria for sorting:

1. The category should reflect the primary behavior involved in the description, i.e., it should preclude other behaviors. Ask yourself: "What behavior is being performed?"

2. The category should reflect the purpose or goal of the activity being performed. Ask yourself "What function does this activity serve?" Here, function does NOT refer to the subjective or internal experiences of the target person derived from the activity, e.g., pleasure or fun. Rather, it refers to the objective functions involved in the activity, e.g., taking care of one's bodily needs, playing games with others.