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Effects of Seating Arrangement on Affective Meanings and Group Interaction in Healthy Senior Citizens

Judith Ann Boughton
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EFFECTS OF SEATING ARRANGEMENT ON AFFECTIVE MEANINGS 
AND GROUP INTERACTION IN HEALTHY SENIOR CITIZENS

by

Judith Ann Boughton

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
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Effects of Seating Arrangement on Affective Meanings and Group Interaction in Healthy Senior Citizens

Judith Ann Boughton, M.S.
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Occupational therapists state that environmental factors (seating arrangements) influence behavior. This ex post facto study examined the effect of peripheral versus central seating arrangement on interaction (verbalizing and looking), affect, and group climate in 41 healthy senior citizens. Nine men and 32 women aged 62 to 83 participated in two collage activities (creative and imitative) in either a parallel/nonsharing group or a project/sharing group. Seating arrangement was added to an earlier study's independent variables (creative and imitative activities, and sharing and non-sharing groups). Dependent variables consisted of three factors of affective meaning from the Osgood Semantic Differential, evaluation, power, and action; three factors from MacKenzie's Group Climate Questionnaire, engagement, conflict, and avoidance; and verbalizing and looking. MANOVA analyses showed no significant differences in any of the dependent variables as a result of seating arrangement. Recommendations are made for research that examines environmental influences on behavior.
ACKNOWLEDGEMENTS

Without the help, support and effort of my family and colleagues this thesis and, indeed, this course of graduate study would not have been possible.

A special thanks is offered here to those within the Department of Occupational Therapy, particularly professors Doris A. Smith and David L. Nelson, whose guidance and encouragement supported the morale and effort put forth for the completion of this work. A particular thank you also goes to Jan Harbach for her special talents.

Occasionally Career Choices Utilize Practically All Time Invested: One Need Actually Learn! These Heroic Efforts Reward And Prepare You.

Judith Ann Boughton
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INTRODUCTION

Occupational therapists use purposeful activities, interpersonal behavior, and the environment as treatment modalities (Hassellkus, 1985; Hopkins, 1983; Johnson, 1983; Mosey, 1973). Therapists also focus on adaptation; on ways to enable the client to adapt to their human and nonhuman environment, as well as adapting or modifying the environment for the client's benefit (Cynkin, 1979; Reed, 1984; Reed & Sanderson, 1983). There are many references in occupational therapy literature to the use of the environment, its impact on the individual, and the need for more knowledge regarding this influence. Because there is little empirical support for these observations, research is needed. Kiernat (1985) addressed this need specifically for the elderly when she stated "more research is needed to further define environmental variables that influence the behavior of older people in a variety of settings and to determine which variables contribute most heavily to specific outcomes in activities of daily living and socialization" (p. 50).

Research by Nelson, Peterson, Smith, Boughton, and Whalen (1985) with healthy senior citizens as they made collages provided the opportunity to conduct an ex post facto analysis of one aspect of the environment, specifically the effect of peripheral and central seating position on the variables in their research. The dependent variables were affective meaning and interaction behavior (looking and vocalizing). The independent variables were group type (project/sharing and parallel/nonsharing) and activity (creative collage and imitative collage).

The review of literature includes the fields of occupational therapy,
anthropology, sociology, psychology, communication, and political science. Focal areas within these fields consist of research and discussion of the influence of behavior on the environment and the effect of the environment on behavior with an emphasis on seating arrangement or placement. Since groups, senior citizens, and purposeful activity (collage production) were part of the research design analyzed, these concepts are also included in the literature review.
REVIEW OF THE LITERATURE

Environment

In a book that identifies research methods for learning how people behave or react to environments, Zeisel (1981) identified three components of the environment: physical, administrative, and behavioral. The physical components included objects, places, relationships (between places such as walls and windows), and qualities (like light and sound). Under the second component, administrative, there are both informal and formal rules that guide interactions with environmental and/or social situations. The third component, behavioral, includes individual and group characteristics, activities, and the relationships that occur between people.

The following quotation from Zeisel (1981) identifies concepts and concerns similar to those included in this ex post facto study. He said that:

Observing behavior in physical settings generates data about people's activities and the relationships needed to sustain them; about regularities of behavior; about expected uses, new uses, and misuses of a place; and about behavioral opportunities and constraints that environments provide. (p. 111)

Environmental and Behavioral Interaction

Occupational therapy is one of the fields concerned with how the environment affects an individual's behavior (Barris, 1982; Dunning, 1970, 1972; Howe & Briggs, 1982; Kannegieter, 1980; Kiernat, 1985; Kohler, 1980; and Llorens, 1984). Barris stated that knowledge of person-environment interactions is necessary to establish that a clinic provides a therapeutic milieu.
Kannegieter reported, based on her research, that successful treatment resulted when both patients and staff were matched to behavioral settings that facilitated treatment goals. The setting for her research was the psychiatric ward.

Llorens (1984) discussed purposeful activity (which will be considered at greater length later in this literature review) as it is used to change an individual's environment. In other words, activity or occupation, specifically that which is purposeful in nature, is used by occupational therapists to cause modification of the environment.

Dunning (1970) compared the territorial instinct of animals to humans and said that occupational therapists should understand and use this instinct to improve the effective use of space. She proposed (1972) an environmental classification system that divided the environment into space, people, and task. This classification is similar to the variables identified in the present study; however, her area of concern was measurement of the interactions between outpatients and their home environments.

A model of an ecological system, provided by Howe and Briggs (1982), illustrated how individuals and their environment influence and shape each other. They proposed this model to help therapists plan patient goals to achieve function more appropriate for the patient's environment.

Kohler (1980) studied the effects of activity and the environment with a group of emotionally disturbed children. She recommended the evaluation of the components of activity and of the environment in order to create a more therapeutic milieu.

According to Kiernat (1985),

the environment plays a significant role in determining the behavior
of older people. The impact of life space, which includes all persons, objects, and milieu surrounding an individual, may equal or even surpass the effect of personal characteristics as a determinant of daily behavior. (p. 41)

The present study examined one aspect of the environment to determine its effect on the behavior of older people; that is, it looked at the influence of seating arrangement on interactions (looking and vocal behavior) and affective behavior.

Other disciplines discuss the reciprocal relationship of environment to behavior. Maxwell (1983), an anthropologist, divided the world into three sections: (1) the natural environment, (2) the interpersonal environment, and (3) the built (man-made) environment. He noted that "these environments influence our thoughts and behavior, which, in turn, influence our environments" (p. 267). This concept of reciprocity between environment and behavior is supported by Newcomb (1955), Rapoport (1982), and Studer (1970).

Canter and Kenny (1975) used the concept behavioral-setting to include all of the following: (a) physical settings, (b) roles, (c) relationships, and (d) activities. They reported that the physical environment gave clues that not only changed the communication flow between people, but that also altered the content of the conversation.

Proshansky, Ittelson, and Rivlin (1970) recommended that there be a unified theory on the nature of environment prior to effecting changes in behavior by the modification of the physical setting. In addition, they wrote that the complex phenomena involved with environmental research requires a multidisciplinary approach.

Leff (1978) stated that public behavior is continuously shaped by a combination of the physical setting and the patterns of expected social be-
behavior which are associated with it. The same people behave one way at a ball park and another way at church. Hall (1970), in a similar context, quoted Sir Winston Churchill as saying "we shape our buildings and they shape us" (p. 18), when he was discussing how individuals function in the House of Lords.

Crowding is another factor influencing interaction. Loo's (1977) study of crowding and its relationship to behavior considered such inside environmental factors as three dimensional area; architectural designs like windows, mirrors, and the number of doors; and furniture and its arrangement. She reported that individuals who were given solitary tasks while in close proximity to other people showed a reduction or elimination of interference (responsiveness) from them. That is, the effect of solitary activities "cocooned" individuals from the stimulus from others as if there was an architectural barrier between them. Thus, there was interference with interaction. She indicated that the behavior of some individuals on a crowded subway is an example of this response.

According to Ashcraft and Scheflen (1976), definitions of crowding vary. Insel and Lingren (1978) said crowding is influenced by attitude and so cannot be defined solely in terms of social density. However, attitude alone may be an inaccurate index to the effects of crowding. They also noted that affect or how one feels is conditioned by one's immediate experience. Affect was distinguished from personality traits in the following manner: Affect or mood could be directly caused by the environment and was temporary, while personality traits were "persistent and consistent affective patterns" (p. 39). The relationship of affect to the environment is a variable used in the present study and will be considered again.
Hall (1966) coined the term **proxemics** which he defined as "the study of man's transactions as he perceives and uses intimate, personal, social, and public space in various settings while following out-of-awareness dictates of cultural paradigms" (1974, p. 2). His *Handbook for Proxemic Research* (1974) listed 19 proxemic observation dimensions which are relevant to the present study. Included were sections on the body, affect, eye behavior, as well as on other sense receptors. Proxemic behaviors are based on situational factors. These are context, which is culturally specific; emotion or affect; and personality differences, which have cultural aspects. Of particular concern to the present study is context, which is subdivided into three areas: (1) the setting, which has material, spatial, and temporal parts; (2) the activity, which includes work, play, defensive activity, and language; and (3) the relationships in the social system, which include relative status, age, and sex. Another contribution from Hall (1966,1974) was his observation that the positioning of "semi-fixed-features" of the environment, such as furniture, influences behavior and that such effect is measurable.

Sommer (1969) worked with the concept of **personal space** which he defined as the area around an individual into which intruders were not welcome. Personal space is a culturally acquired, "daylight" phenomenon. Strangers and friends can be distinguished by their reaction to the loss of personal space. In his research he found personal space was greater with schizophrenic patients than with normal subjects. According to Sommer (1969), personal space interacts with individual distance to influence the (voluntary) distribution of people in social situations. Individual distance was affected by territorial behavior and population density. Intrusion into the personal space of individuals influences their behavior.
Apparently, room size also affects behavior. Sommer (1971) found that conversational distance varied inversely with room size. For example, with small rooms, people sat further away, almost against the walls; with large rooms, they moved chairs relatively close.

Research has linked environmental manipulation with patient improvement. Mehrabian (1976) reported that changes in the environment (for example, movement of furniture) corresponded to improvement in the behavior and mental health of psychiatric patients. He advocated a progression from lower to higher amounts of interaction with both the physical and social environment for patients who are recovering in a psychiatric hospital.

Ittelson, Franck, and O'Hanlon (1976) viewed the environment as emotional territory. They said:

the direct emotional impact of a situation is probably part of all environmental experience, but sometimes affect becomes the dominant mode of experience so that a certain environment is experienced solely in terms of the emotions and associations that one feels. (p. 204)

According to Russell and Mehrabian (1976), physical settings provoked emotions which then affected other behaviors. Leff (1973) believed that "the affective quality of experience arises from complex interactions involving cognition, physiological processes, and environmental input" (p. 84). Studies reported by Altman (1975) demonstrated that positive feelings were connected with closeness and negative feelings were associated with distance. However, he (Altman, 1975) also noted that "too much closeness often results in negative reactions, a moderate degree of closeness is facilitative of interpersonal relations, and too much distance sometimes has negative qualities" (p. 90). Insel and Lingren (1978) identified differences between men and women in spatial issues with men using greater distances. Men had more
negative reactions to high density situations, but invasion of one's body space caused an increase in anxiety in both sexes. The possible influence of a seating arrangement on affect is a part of this research (from the Nelson et al. study, 1985).

Haber (1982) studied spatial relations when subjects were given choices as to where they sat in college classrooms. Her results showed that the dominant group (dominant by race, culture, and/or religion) chose the spatial center of the room more often than marginals, who more often sat in the periphery. Gifford (1982) examined interpersonal distance and orientation choices in terms of "personal characteristics (sex, warmth, dominance), social situation (cooperative-competitive task, attraction toward the other, status relative to the other), and interactions among these variables" (p. 145). Attraction and cooperation, plus interaction between them, were found to be the most significant factors in determining interpersonal distance and orientation choices. With attraction, a cooperative activity, equal status, and a "warm" female with whom to interact, smaller interpersonal distances were chosen. When there were attraction, differences in status, and a competitive activity, then larger angles were found, that is, there was more side-by-side than face-to-face orientation.

The actual physical arrangement of seating is affected by one's need for personal space and by proxemic behavior. Ashcraft and Scheflen (1976) observed that furniture arrangements form boundaries that divide territories and spaces. Krovetz (1977) proposed furniture arrangements for schools that were conducive to different learning strategies. For example, in a teacher-centered classroom desks are in rows that face the teacher's position at the front of the class. Of particular interest to the present study is an examina-
tion of literature related to seating arrangements and its influence on behavior.

**Seating Arrangements**

Although occupational therapy has not traditionally studied where individuals sit in proximity to one another, it is concerned with positioning or seating in terms of physical functioning such as with individuals who have physical handicaps (Bergen & Colangelo, 1985; Farber, 1982; Hopkins & Smith, 1983; Pedretti, 1981; and Trombly, 1983). Other academic areas report that seating arrangements affect interaction or communication. As occupational therapists work with groups as well as with individuals to promote interaction (Tiffany, 1983), then the investigation of the effects of seating arrangements on group members could contribute information useful in the achievement of treatment goals that concern interaction.

Seating arrangements have been important since early in history. Emperors in ancient China sat on raised, gilded wood platforms in throne rooms (Meyer, 1981). In the fifteenth century, Malory [Caxton, 1485, edited by Cowen, 1969] wrote about the times of King Arthur and his round table. According to Warren (1903), "in his great hall Arthur had placed a huge table, made round in shape so that there should be neither head nor foot, a higher place nor a lower place. Arthur wished all who sat there to be equals" (p. 55). Sources who reported about the negotiations near the end of the Korean Conflict mentioned the influence of seating arrangements, specifically regarding table shape, seating orientation, and chair height (Joy, 1970; Vatcher, 1958).

Many studies of behavioral interaction have considered seating arrangements as a possible influence on behavior. A 1933 research project at
Western Electric Company (Turner, 1955) found that changing seating arrangements influenced production: work output was changed by which workers sat next to one another (side by side).

Mehrabian and Diamond (1971b) examined seating arrangement and its effect on conversation. Their results suggested a two-way relationship between liking and immediacy, that is, those who liked each other used more immediate positions (sat closer and/or oriented more directly to one another), and, when strangers were put in immediate positions, such placement encouraged them to communicate "liking."

Silverstein and Stang (1976) studied seating position and interaction with triads in a natural (nonexperimental) situation. They found that people with the most visual centrality (who were able to see more of the other person) talked most often. The amount of time people had known each other did not appear to influence how much they interacted.

Small-group behavior, based on research by Patterson, Kelly, Kondracki, and Wulf (1979), appeared to be moderately affected by seating arrangement. When people less directly faced one another, there was decreased involvement and increased discomfort.

Hendrick, Giesen, and Coy (1974) examined interaction in small groups in terms of interaction distance, orientation (how they were facing), and relative position (to one another) in space. They reported that people made accommodations in facial orientation, interaction distance, and position in accordance to others in the group.

The influence of furniture arrangement, props, and personality on social interaction was studied by Mehrabian and Diamond (1971a). Indirect orientations (e.g., seating side by side on a couch) produced fewer interactions.
and even inhibited social pairs where at least one member had a high affiliative tendency. Affiliative behavior is the amount of talking (determined by using several measurement indices) and of actions which project positive affect. The authors concluded from this study that the physical environment affected patterns of interaction.

The effect of social influence and seating position was examined by Russell, Firestone, and Baron (1980). They found that social reinforcement was more effective for individuals with an internal locus of control (more influenced by internalized values) when the formality of the seating position was congruent with the reinforcement's meaning. For example, more responses were given when a socially formal (sitting opposite) seating arrangement was matched with a formal reinforcement (i.e., the researcher told the subject verbally that the response given was correct).

Lott and Sommer (1967) studied seating placement and status. Compiling the information from three questionnaires and one experimental study, they published these results: (a) responses to two questionnaires that used diagrams of a rectangular table showed a higher status figure was placed at the head of the table; (b) responses on the third questionnaire which used diagrams of square tables indicated that individuals sat closer to peers than to either those of higher status or lower status, and (c) in the actual experiment, individuals sat at greater distance from people of higher or lower status than from their peers. The authors reported that the questionnaire responses paralleled the observed behavior in the actual experiment.

Osmond and Sommer (Hall, 1966, 1970) were concerned with increasing the interaction and involvement of patients in a large Canadian health and research center. With this goal in mind, Sommer studied communication pat-
terns in a natural situation at the facility. He observed interaction as it occurred in the hospital's cafeteria at 3 ft by 6 ft tables. His results indicated that the most communication took place between individuals at the corners of the table (at $90^\circ$ angles), that the next highest level of interaction occurred between those sitting side by side, and, finally, that the least conversation was observed between those sitting across from each other. Despite the limitations of the study which Sommer recognized (including the types of conversations, the relationship of the individuals, and the cultural background of those involved), Osmond used Sommer's information to set up small (size unspecified) tables and chairs in such a manner that patient interaction and involvement increased.

Osmond (Harrison, 1974) originated the terms sociopetal and sociofugal. Sociopetal described spatial arrangements that fostered face-to-face placement and interaction, while sociofugal described arrangements that promoted facing away from others, which often discouraged interaction. Harrison (1974) reported that different types of spatial arrangements offer a range of sociopetal to sociofugal features. For example, between individuals the most sociopetal arrangement is face to face; shoulders at right angles is less sociopetal; side by side facing in the same direction is even less likely to encourage interaction; and, back to back was the most sociofugal arrangement. Elements that inhibited or encouraged people to communicate in a fixed position in space are the shape of the table or placement of chairs, and where individuals sat in relationship to one another. Examples of variations in furniture include the use of a rectangular table and a horseshoe-shaped chair alignment without a table. Furthermore, Harrison discussed the use of side-by-side arrangements at a table for cooperative activities, corner
placement for conversation, and opposite side of the table arrangements for competitive tasks. The above information is especially relevant to the present study.

Both Sommer (1971) and Mehrabian (1976) did research on seating arrangements in libraries. Sommer found that when a collaborator sat down close beside an individual who was already seated at a library table, the majority of responses produced were defensive gestures and/or departure. Rarely were verbal responses made. Mehrabian suggested that seating be arranged to encourage better use of the environment. He said that chairs and tables could be set up in isolated units to facilitate study. Sommer supported this by advocating the use of arrangements that discouraged conversation.

Mehrabian (1976) made suggestions for the design of restaurants and bars. Side-by-side seating at bars was found to produce less conversation and most conversation at bars occurred at corners, so his designs had many corners. He also stated that the long mirrors over bars, which were designed to broaden the visual field, usually made patrons more self-conscious and reinforced their sense of isolation. The implication of this observation was that interaction was discouraged by mirrors.

Also according to Mehrabian (1976), the angle at which strangers sat influenced the amount of their interaction. Parallel or side-by-side sitting, as on a couch, resulted in little conversation, while face-to-face arrangements increased arousal and sociability. Angles greater than 90° between people decreased the positiveness of the communication. He recommended having smaller, more intimate furniture arrangements to encourage conversations. In summary, research indicates that seating arrangements definitely affect social interaction.
Groups

Three propositions regarding groups and the environment discussed by Altman (1971) have relevance for the present study. The three are: (1) active use of space and the environment by a group occurs simultaneously with and complements other modes of interaction and reflects the social-emotional or interpersonal status of the group; (2) groups employ the physical setting in an active, adaptive, coping manner as they work for viable or optimum levels of interaction (i.e., they are affected by and act upon the environment); and (3) active use of the environment in the management of interpersonal relationships may be anticipatory or reactive.

Canter and Kenny (1975) reported that spatial behavior (how people arrange themselves in space) varied with group composition and situation. According to Sommer (1971), under both natural and experimental conditions individuals have a preference for corner-to-corner placement for conversation. He also observed that individuals sitting at right angles could have eye contact or avoid it. The corner sitting was chosen over side-by-side positioning and in preference to sitting opposite one another.

Watson (1970) reported that positions chosen by individuals engaged in psychiatric group therapy reflected a form of nonverbal communication. German (1964), an occupational therapist, said that with her psychiatric patients, the ability to constructively interact within a group was an indication of their degree of adjustment.

A number of researchers examined the influence of roles on interpersonal distances. Canter and Kenny (1975) noted the influence of roles and also stated that spatial behavior was used to control interpersonal relation-
Altman (1975) mentioned the use of spatial zones as boundaries which allowed different degrees of openness. Accessibility changed as individuals moved closer or farther from each other. According to Watson (1970), leadership style affected interaction. For example, passive leadership resulted in members of the group interacting with those opposite themselves or in their line of vision more than with those next to them (at a table), while active leadership produced the opposite effect. Leaderless groups preferred sitting around one end of a table. Sommer (1969) observed that leaders usually sat either at the end of the table with group members close or opposite the largest number of members.

Hall (1966) described distances or zones he observed between individuals as being intimate, personal, social, and public distance. In a later publication Hall (1971) established eight categories of behavior within each zone:

1. Postural-sex identifiers: standing, sitting, squatting.
2. Sociofugal-sociopetal orientation: body angle or facing positions.
3. Kinesthetic factors or the potentiality for touch.
4. Touching.
5. Visual possibilities.
6. Thermal or heat cues.
7. Olfactory or smell cues.
8. Voice loudness (p. 61).

The size of the table used in the present study (from the Nelson et al. study, 1985) placed the group members side by side within intimate (6 in.-18 in.) to personal (1-1/2 ft-3 ft) distances by Hall's definition. Of the behaviors listed by Hall, the present study also considered visual possibilities in terms of the direction of the gaze (i.e., looking toward the task or toward other members of the group). Other researchers also considered visual behavior as a factor concerned with interaction. Altman (1975) reported that eye contact and interpersonal distance were a behavioral set because the closer the distance,
the less the eye contact. Both Altman (1975) and von Cranach (1971) linked eye contact and approach/avoidance behaviors. Two assumptions listed by von Cranach were concerned with gaze variables: "1. The absence of visual orientation co-varies with the absence of readiness to communicate; 2. the absence of visual orientation signals avoidance to communicate in the sender" (pp. 228-229). Altman wrote about research that showed more eye contact occurred in cooperative situations than in competitive ones. One of the independent variables in the present study involved cooperative activity in the project/sharing group versus individual (not competitive) activity in the parallel/nonsharing group.

Some studies of group behavior are concerned with the concept of privacy. According to Altman (1975), "privacy is an interpersonal boundary-control process, which paces and regulates interaction with others" (p. 11). Ashcraft and Scheflen (1976) discussed privacy in terms of unwritten rules that govern reaching for, looking at, and talking to different parts of the body of another person. They found that eye contact varied with the status of the people concerned, the culture of the individuals, courtship rituals, and whether those involved were friends or strangers. Altman (1975) reported that four behavioral mechanisms were used to obtain privacy: (1) verbal (the what) and paraverbal (the how) behavior, which included content and style; (2) personal space, which involved angle and distance; (3) territorial behavior, which included the use, possession, and ownership of areas and objects; and (4) cultural mechanisms, which involved customs, norms, and styles of behavior. The present study did not address privacy as such, but it viewed individuals in situations where the principles which regulated privacy may have had an influence on the dependent variables.
The spacing chosen by members of a group varied with the functional requirements of their task in work reported by Sommer (1971). His results showed that (a) with a cooperative activity subjects chose to sit side by side, to share materials; (b) with a competitive activity, they sat opposite one another and reported that eye contact stimulated competition; and (c) with separate tasks performed simultaneously, subjects chose to sit "catty-corner" (diagonally opposite) with the distraction from eye contact kept at a minimum. This information is relevant to the present study where subjects were seated side by side.

Occupational therapy has been involved in group work since the 1920s (Meyer, 1977) and interest in this treatment approach continues to the present time (Howe & Schwartzberg, 1986). From a survey of occupational therapists Duncombe and Howe (1985) reported that the majority responded that they led groups in treatment. Significantly more used activity groups than verbal groups, and the majority of the groups had fewer than ten members.

Howe and Schwartzberg (1986) proposed, in part, that individuals learn about their own capabilities and the role of the environment through structured activities and a structured environment. In context of a discussion on effects of environment on groups they wrote:

The group climate refers to the physical and social environment inside the group. A physical environment that is quiet and attractive, where members are comfortable, is conducive to informal communication. A seating arrangement where members can have face-to-face contact is essential for interpersonal communication. The physical climate is closely related to the social climate. The social climate determines whether members feel accepted, respected, or supported. (p. 9)

Research reported by Mehrabian (1976), Mehrabian and Diamond (1971b), and Sommer (1969) found that sitting at $90^\circ$ angles fostered interaction and face-to-face sitting position was associated with competition.
Groups exist at various developmental levels according to Mosey (1970a, 1970b). She stated that group interaction skills, at whatever stage, were an adaptive behavior. Mosey identified a sequential pattern of interaction which potentially related to five types of developmental groups: (1) a parallel group, where clients do individual tasks or purposeful activities; (2) a project group, with common (shared), short-term tasks; (3) an egocentric-cooperative group, where members select shared, long-term tasks to implement; (4) a cooperative group, where clients are concerned with each other's social-emotional needs while they do an activity; and (5) a mature group, where an appropriate equilibrium between personal need satisfaction and the shared activity output occurs. Level of sharing is one of the principal concepts that differentiate Mosey's groups. The Nelson et al. (1985) study, on which this present research is based, used parallel group and project group to describe the nature of the function or the type of sharing that occurred in the different groups (i.e., nonsharing or sharing).

Fidler (1969) described a "task-oriented" group and recommended it be used by occupational therapists for the treatment of psychiatric patients. She noted that social and cultural environments affect behavior.

DeCarlo and Mann (1985), both occupational therapists, studied the effectiveness of activity groups and verbal groups and their influence in improving self-perceptions of interpersonal communication skills. They found significantly more interpersonal communication skills with those individuals engaged in the activity group. The verbal group only discussed topics, while the activity group was also involved with collages, problem-solving, role-playing, games, and drawing. Mumford (1974) looked at verbal groups versus activity groups where one of the activities was making a collage and the
results showed a statistically significant increase in interpersonal skills in the activity group. The Mumford study, unlike the DeCarlo and Mann research, used normal adults, not psychiatric patients. Collages were also used in the Nelson et al. (1985) study. Shannon and Snortum (1965) utilized activity groups which took patients out of the hospital (a) to increase the desire of patients to become part of the community, (b) to express the therapist's trust in them, and (c) to decrease anxiety about return to the outside world. They stated that structured activities decreased threat to the group, while unstructured ones increased anxiety. The participants reported that the unstructured activities required more active responsibility by the group.

The present ex post facto investigation examined the interaction which occurred while individuals made collages either independently or as a group (i.e., nonsharing or parallel group vs. sharing or project group) in terms of the physical seating arrangements of the participants. The linear seating arrangement used by Nelson et al. (1985) facilitated observation (through a one-way mirror) and was an accommodation to the selected environment.

Of particular relevance to this study is research outside the field of occupational therapy which looks at patterns of interaction. The terms peripheral and central were selected from a study by Leavitt (1975), who conducted research on the effects of four written communication patterns on the performance of groups. He examined the influence of psychological conditions imposed by very structured communication patterns: Written communication patterns in a circle, a chain, a "Y," or a wheel design were imposed on subjects. The effects of such conditions on the behavior of the group members varied, and the behavior of individuals in the peripheral position differed from those in a central position. Leavitt reported that behavioral
differences found in these patterns were generally in the order from circle to chain, to "Y," and then to wheel. He stated that:

The circle, one extreme, is active, leaderless, unorganized, erratic, and yet is enjoyed by its members. The wheel, at the other extreme, is less active, has a distinct leader, is well and stably organized, is less erratic, and yet is unsatisfying to most of its members. (p. 294)

One of Leavitt's conclusions was that "the positions which individuals occupied in a communication pattern affected . . . the chances of becoming a leader of the group, one's satisfaction with one's job and with the group, the quantity of one's activity, and the extent to which one contributed to the group's functional organization" (p. 299).

The psychological conditions or emotional states induced by experimental situations such as those produced by Leavitt (1975) can be measured. One tool found useful for this purpose is the Osgood Semantic Differential (Leff, 1978; Mehrabian, 1980; and Snider & Osgood, 1969). Another method of evaluating social settings and their effect on behavior is through the measurement of group climate (MacKenzie, 1983). The Nelson et al. (1985) investigation, on which this study is based, employed both of these tools to measure affective responses of groups of senior citizens participating in activities.

Senior Citizens

Hasselkus (1985) addressed the role of occupational therapy with senior citizens and the influence of environment by writing:

the thrust of occupational therapy in geriatrics is to evaluate the impact of disease, aging, and social change on the work, play, and self-maintenance activities of the elderly. Occupational therapy intervention is aimed toward maximizing the older person's functional performance in basic living skills by remedial therapeutic activities, environmental modifications and/or adapted living techniques. (p. 146)
Kiernat (1985), an occupational therapist, stated that "the environment plays a significant role in determining the daily behavior of older people" (p. 41). She stated that life space equals or is even more a factor than personal characteristics. Life space encompasses the entire milieu as well as all the persons and objects around one. Kiernat also noted that the environment fostered or discouraged adaptive behaviors and socialization of senior citizens.

Nystrom (1974) examined activity patterns and leisure concepts among this population. She found no differences with age (60 to 90) when she analyzed the results of an activity index for frequency and variety of participation. Her subjects reported that social interaction and being a spectator were ways leisure was most often used. Those who responded to the activity index indicated that they engaged in both passive and active forms of activity.

Research with senior citizens has been conducted by other occupational therapists (Cooper, 1985; Cristarella, 1977; Gregory, 1983; Jackson, 1970; Johnson, 1983; Kirchman, Reichenbach, & Giambalvo, 1982; Maguire, 1985; Menks, Sittler, Weaver, & Yanow, 1977). Cooper and Cristarella both studied vision and the elderly. Cooper suggested the use of visual enhancement factors such as color contrast to counteract the effects of aging on vision. Recommendations were made by Cristarella to modify the environment to compensate for visual changes that affected function.

Gregory (1983) found that occupational behavior had a significant effect on life satisfaction with retirees. That is, they had to be doing meaningful activities that met personal or societal needs in order to adapt successfully to their environments.
Jackson (1970), Kirchman et al. (1982), and Menks et al. (1977) described different types of occupational therapy service delivery for the elderly in the community. Jackson discussed the role of the consultant to extended facilities and home health agencies. Kirchman et al. reported positive improvements from a preventive activities and service program for the well elderly; and Menks et al. established a psychogeriatric activity group in a rural area.

Johnson (1983) wrote that current activity levels and the level of involvement of the elderly with society relate more closely to previous behavior than to biological or psychological factors in aging individuals. She noted that work toward an improvement in mental, social, and physical activity along with maintenance of social interaction contributed to aging successfully. The present investigation looked at affect and the interaction of healthy senior citizens as they engaged in purposeful activity in a particular environmental setting in a specified type of group.

In a research project outside the field of occupational therapy, Lawton (1979) studied therapeutic environments for older individuals. Such an environment was defined as any physical or organizational structure that proposed to increase the functioning of an elderly person to counteract problems usually associated with aging. The environment needed to provide the chance both for social interaction and for privacy. Lawton stated that the psychological and social needs of individuals who are to function effectively within the environment are factors that should be considered in designing an appropriate physical setting. These concepts are relevant to the present research project.
As mentioned earlier, Llorens (1984) wrote that "the application of occupational theory operates when occupational therapists administer or prescribe purposeful activity to bring about change in the environment of the individual [the individual is an environment] or the environment within which the individual functions" (p. 30). The American Occupational Therapy Association's position paper on purposeful activities by Hinojosa, Sabari, Rosenfeld, and Shapiro (1983) defined purposeful activity as "tasks or experiences, in which the person actively participates" (p. 805). It also stated that "engagement in purposeful activity requires and elicits coordination between one's physical, emotional, and cognitive systems" (p. 805), and that "successful performance of purposeful activities . . . provides opportunities for individuals to achieve mastery of their environments" (p. 806).

Johnson (1983) reported that a main concern in working with senior citizens involved the decision-making process which too frequently was taken from the aging client. Through the use of purposeful activity, occupational therapists can replace or maintain some of the opportunity to make choices.

Occupational therapists such as Fidler (1981; Fidler & Fidler, 1963), Mosey (1970a, 1970b), and Cynkin (1979) also connected purposeful activity to group and individual behavior, and to the environment. Fidler discussed the interaction of the therapist, the client, and the activity or non-human object. She stated that the setting which encouraged participation with objects offered a realistic environment, and made the transition to a normal environment for psychiatric clients less difficult. Occupational therapists use the interpersonal relationships of the therapist, the client, and the group for treatment, along with an activity or an object. Cynkin focused on the
appropriateness of the activity to the client and the setting. She also stated that the manipulation of objects, individuals, and physical settings which facilitate activity is one of occupational therapy's treatment strategies. Mosey (1970b) suggested that purposeful activity involves an active response to stimulation related to the interest level and the value placed on the activity by the individual performing it. Feedback or an interaction system with human and nonhuman objects made up another facet of purposeful activity, according to Fidler (1981).

German's (1964) group approach to psychiatric clients supported the value of activity groups in occupational therapy. These groups used arts and crafts activities and interpersonal relationships to reach treatment goals. Placement in the group was based, in part, on the need to develop an appropriate way to cope with the environment in readjusting from hospital to community life.

Ittelson, Franck, and O'Hanlon (1976) held that purposeful action was important to environmental experience and could not be separated from it. These authors, who are not occupational therapists, suggested the creation and evaluation of an environment that would allow participants to do a variety of activities. Zeisel (1981) is another researcher who observed that environments could enable or constrain activity.

Canter and Kenny (1975) observed that "arrangement, in space as well as distance, is determined by activity" (p. 151). Both distance and the angle of orientation between individuals were significant influences on the performance of activities.

Complex or novel tasks, according to Mehrabian (1976), required concentration and hence, needed environments which provided low levels of
arousal or distraction to minimize frustration and failure.

Crowding (discussed earlier under Environment) was defined by Canter and Kenny (1975) as a situation where fewer and fewer activities could be accomplished easily and successfully. They differentiated between the amount and shape of space required to do a given activity and the use of space by individuals for interaction.

Activities in various general categories are utilized by occupational therapists. According to Fidler and Fidler (1983),

when verbal interaction or expression is difficult or impossible for the patient, creative and structured activities in occupational therapy provide opportunities to communicate problems and feelings. . . . Considerable study has been done in the use of creative arts in uncovering the unconscious and in helping the patient develop an awareness of some of his problems. Far less attention has been given the use of the more structured activities for this purpose, and yet these also offer numerous opportunities for communication and expression. (pp. 94-95)

Michelman (1971), an occupational therapist who was concerned about children's play, wrote about creative art expression as a universal form of symbolization. In her opinion "creative art experiences cultivate the senses. Such experiences promote tactile stimulation and sensory involvement for symbol formation and human health and encourage emotional outlet and purposeful achievement" (p. 286).

Tiffany (1983), when she wrote of occupational therapy implementation with psychiatric and mental health clients, noted that "freely creative . . . activities have long been employed . . . as a communication link with unconscious processes" (p. 297). Imitation is another category of activity which Tiffany included in an activity analysis format which she presented. Imitation was viewed as gradable from the basic level of immediate imitation to written or verbal instructions.
The Nelson et al. (1985) research, on which this study is based, examined affect and interaction as individuals engaged in both creative and imitative activities. The same senior citizens participated in both types: They chose a photograph of a collage which they then copied, and they made an original collage using the same types of materials.
HYPOTHESES

The purpose of the present ex post facto study was to investigate the influence of an environmental factor (seating arrangement) on the interaction and affect of senior citizens as they made collages. The production of collages was defined as a purposeful activity. The senior citizens worked either as a sharing group (project group) or as individuals (parallel/nonsharing group) who simultaneously performed a similar task. Two methods were used by each group to produce the collages. That is, the project group made two collages: one they created and one they imitated from a photograph. The parallel group did the same.

The independent variables from the Nelson et al. (1985) study were (a) imitative activity versus creative activity and (b) parallel group versus project group, also called nonsharing versus sharing. The imitative and creative activities were a repeated measure. The present investigation added seating arrangement to the independent variables. The senior citizens sat in a linear pattern along one side of a library table. Peripheral seating referred to placement in the line so that the individual had a neighbor on only one side. Central seating described the position of individuals with a neighbor on each side.

Dependent variables included measures of affect and social interaction. Healthy senior citizens responded to self-reports of affective meaning on the Osgood Semantic Differential (OSD). These were evaluation, potency, and activity. They also recorded impressions of the behavior of the group in which they participated on the Group Climate Questionnaire—Short form.
(GCQ-S). The dependent variables from the GCQ-S were engagement, avoidance, and conflict. Interaction was also measured by observers who monitored and recorded levels of interaction using visual regard and vocalization as the variables.

Since individuals in a central seating arrangement have close proximity to twice as many others as those seated in a peripheral location, a logical assumption is that there would be more opportunity for interaction. Therefore, more interaction is expected for those individuals in a central position. The type of group (i.e., project/sharing versus parallel/nonsharing) had a significant influence on interaction in the Nelson et al. (1985) study. It was predicted that seating arrangement would also result in significant differences in interaction. The influence should be reflected within each group as well as in a comparison between the two types of groups.

The present study used all of the above factors for analysis in terms of the peripheral or central seating arrangements of the participants. The null hypotheses proposed for this study were that there will be no significant difference in affect or interaction, as measured by three scales, related to a peripheral or central seating arrangement in a linear pattern as healthy senior citizens performed one creative activity and one imitative activity in terms of three variables: (1) participation in a project group, (2) participation in a parallel group, and (3) participation in a project group compared to a parallel group.
DESIGN AND METHODOLOGY

Subjects

Forty-one subjects (9 men and 32 women) with ages ranging from 62 to 83 participated in four to six person groups in the Nelson et al. (1985) study. They were recruited from senior citizen centers, exercise classes, and art classes in a relatively small Midwestern city.

Criteria for acceptance to the study included the following: good general health, adequate vision and hearing, basic reading ability, and willingness to participate. While random selection was not possible, the sample was representative of the criteria for acceptance.

Physical Setting

An occupational therapy treatment observation room in a university facility was the site for the Nelson et al. (1985) research. The room was rectangular (11-1/2 ft wide, 21 ft long, and 8 ft 8-1/2 in. high) and had an entrance door in one of the long walls near a corner. Two closet doors were on the far narrow wall from the entrance. A one-way mirror (framed in two 43-1/2 in. wide by 46-1/2 in. high sections, and 35 in. from the floor) was located on the wall to the right of the entrance. Two additional regular mirrors were fixtures on the opposite long wall (framed measurements were 27-1/4 in. high and 51-1/4 in. long at 6-1/2 ft from the floor). These mirrors were both at $30^\circ$ to $45^\circ$ angles to the wall from their base or lower edge. Under each slanted mirror was a wall-hung table or shelf. The one opposite the entrance, which was used for forms and pencils in the Nelson et al.
(1985) study, was 29 inches from the floor, while the other was 21-1/2 inches from it. Both tables were 20 inches wide and 5 feet long. The room had five double sets of recessed fluorescent lights, two wall-hung radiators, a speckled tan wall-to-wall carpet, a white tile ceiling, and concrete block walls painted beige with brown trim. There were no windows and all doors were closed during the experiment.

Four to six senior citizens sat facing the one-way mirror at a brown metallic table which was 42 inches wide and 10 feet long. They sat in armless metal or wooden chairs.

The observation room was to the right immediately before the door to the research area. Venetian blinds which covered the glass side of the one-way mirror were down with the slats open, that is perpendicular to it. An intercommunication system was used to transmit sound from the experiment room to the observers.

**Instruments**

Data from the three measures used in the Nelson et al. (1985) study were included in this ex post facto analysis. One was Osgood's Short-form Semantic Differential (OSD). This seven-point scale contains 12 paired opposites that are scored in terms of three types of affective meaning: evaluation, potency, and activity (Snider & Osgood, 1969). The evaluation factor contains pairs of words which relate to making judgments such as good-bad and sweet-sour. The factor of potency (called power by Nelson et al., 1985) requires ranking according to perceived strength or influence; for example, large-small and heavy-light. Activity (called action by Nelson et al.), as a
factor, involves assessing the amount of "doing" such as fast-slow (Osgood & Suci, 1969).

Second, the Group Climate Questionnaire (GCQ) measures the overall impressions a subject had of the group in which she or he has recently participated. The basis for group climate consists of behaviors found or expected in group behavior. Developed by MacKenzie (1983), it contains twelve items using a seven-point Likert scale rating items from "not at all" to "extremely." Three specific factors are considered: (1) engagement, or the importance of the group for the members, which relates to cohesion; (2) avoidance, or the tendency by any group member to evade problems or encounters; and, (3) conflict, or an examination of the difficult issues or interpersonal antagonisms perceived by a member as existing in the group.

Finally, subjects' interactions were noted by two trained observers. Model 100 Radio Shack computers were used to record behavior in two categories, vocalization and visual regard. Within the vocalization category observers recorded either no vocalization, vocalization, laughter, or both vocalization and laughter. Vocalization was defined as producing sound for communication as opposed to throat clearing or coughing. The visual regard or looking was subdivided into staring into space, looking at the task, looking at another person, or looking at both the task and person. "Task" components included collage materials, the working surface, and photographs of collages used in portions of the study. The subjects were observed for ten seconds with an additional five seconds for recording the two observations. Observer A watched subjects' #1, #2, and #3 in that order. Observer B looked at subjects' #4, #5, and #6. The subjects were seated along the far side of a large rectangular table with #1 to the far left and #6 to the far right as the sub-
jects faced the one-way mirror. Subjects were observed in the following manner: subject #1 was watched by observer A while subject #4 was observed simultaneously by observer B, then #2 by A and #5 by B and so forth. After the observation of subjects #3 and #6, the cycle of observation was repeated until 32 observations of vocalizations and of looking behavior were recorded for each subject.

A third observer (C) determined interrater reliability for six out of eight groups. This researcher alternated observations to establish reliability for observers A and B. Two activities (i.e., one creative and one imitative activity) were observed consecutively by observer A and C or B and C with a removable partition between them.

Data were collected in the following manner. Each subject was watched for ten seconds and one observation was recorded in each of the two areas (vocalization and looking) if at least one behavior was noted, without regard to additional occurrences or duration. Five seconds were allotted for recording. Time periods were established by low volume "beeps" from one of the three computers—one low toned beep for the first observation, one high beep for recording, two low for the second observation, two high for recording, and so forth. Sixteen units of three ten-second observations were recorded before a 4-1/2 minute break for observers in the observations was taken without stopping the activity. Following the break a second unit of 16 observations (three subjects/group) were recorded. Subjects received refreshments after the first activity in a separate room. The subjects returned to do their second activity with materials reset as they had been initially. Care was taken to have subjects return to the same seat assigned at the beginning. After the break the same procedure was used for data collection.
Regardless of the number of subjects per group, the total number of observations per subject was the same.

**Procedures**

The study was conducted when four to six subjects were present, but not with fewer subjects. Subject distribution was equal between observers with an even number of subjects. The third subject was assigned to the observer whose reliability was being verified when five subjects engaged in the activity.

After entering the research room, subjects drew a numbered, color coded card. The colors paired them for an introductory activity. The number determined seating position along one long side of a rectangular library table. This randomized seating order counteracted arrival order, seating position preference, and preferences arising from familiarity of one subject to another. The preceding step was applied to the original Nelson et al. (1985) study specifically to randomize seating for the purpose of the present study. This was the extent of control of the variables concerning seating. It was possible for subjects to get up to obtain materials, to observe others' projects, and to remain standing either in their original place or elsewhere.

Healthy senior citizens were randomly assigned to one of two types of groups: a parallel activity group \( (n = 22) \) or a project activity group \( (n = 19) \). As described by Mosey (1970a), parallel groups by definition involve little or no sharing, while project groups by definition share in the activity. Each group made two collages. One collage was copied from a photograph of a collage selected by the subject(s) and is referred to here as an imitative activity. Two sets of photographs of six different collages were available.
from which they were to choose one. The parallel activity group chose from photographs of collages that were made on one half of a single railboard sheet (18 in. by 24 in.), while the project group selected photographs of collages made on three whole (36 in. by 24 in.) joined sheets of railboard. Another collage was done without a model to copy and was labeled creative. Instructions were given from a script. The subjects were directed to make a collage using any or all of the materials. An explanation of collage was given. Materials available for all collages were of the same type, and their placement on the table was the same for each group.

Counterbalancing was used for the type of group considering the day of the week (Monday or Friday) and for the order of creative or imitative activity, that is, some parallel groups met on Monday, others on Friday; with both groups, the creative activity went first for half, and second for the rest.

An occupational therapist was involved with recruitment and transportation. Subjects were informed of their rights and their consent to participate was obtained. Explanations of what was required of the subjects and of what materials were available were given by the occupational therapist who followed a memorized script. The occupational therapist also encouraged subjects to work within the predetermined time of approximately 26 minutes, while she kept her interaction with subjects to a minimum. An introductory activity required that subjects spend five minutes in talking with their partners (their color card paired partner) and then each subject introduced his/her partner to the whole group.

After the introductions the activity began. Two observers seated behind a one way mirror recorded two behaviors (one vocalization behavior,
and one regarding behavior) per subject, as described under Instruments.

After each activity (creative and imitative), subjects filled out the Osgood Semantic Differential and the Group Climate Questionnaire-Short form. They were first given brief descriptions of how to use them.

All 41 subjects did both a creative and an imitative activity, with 22 participating in the parallel groups and 19 participating in the project groups.

Questions arising during the activities were briefly answered by the occupational therapist who had been instructed to minimally assist the subjects.

Data Analysis

Data from the Nelson et al. (1985) study were analyzed in terms of (a) normal distribution, (b) possible order effects, and (c) possible sex differences. No significant differences were found. Next a two-way analysis of variance with one repeated measure was done for each dependent variable. In the present study, a third independent variable was added (peripheral seating vs. central seating) and the data were reanalyzed. Completed on each dependent variable was a 2 x 2 x 2 analysis of variance with one repeated measure (peripheral vs. central, parallel vs. project, and creative vs. imitative—the latter is a repeated measure). The dependent variables were as follows: from the semantic differential, (a) evaluation, (b) power, and (c) action; from the Group Climate Questionnaire, (d) engagement, (e) avoidance, and (f) conflict; and from the interaction observations, (g) looking at other(s), (h) vocalizing, and (i) laughing. SPSS MANOVA was employed with alpha for all statistics established at .05.
RESULTS

Statistical analysis resulted in not being able to discount any of the three null hypotheses. That is, on each of the dependent variables, there was no significant difference between those senior citizens in a peripheral seating arrangement as compared to those in a central location in a linear pattern. The dependent variables were (a) evaluation, (b) power, and (c) action; (d) engagement, (e) avoidance, and (f) conflict; and (g) looking at other(s), (h) vocalizing, and (i) laughing. In addition, there were no statistically significant interactions between seating arrangement and the other independent variables (i.e., parallel vs. project groups and creative vs. imitative activities). See Tables 1, 2, and 3 for a summary of all scores.

The interrater reliability was calculated by the percent of agreement found with each of the intervals. In all instances this was above 80%.
Table 1
Results on Semantic Differential

<table>
<thead>
<tr>
<th>OSD Factor</th>
<th>Group</th>
<th>Activity</th>
<th>Peripheral</th>
<th>Central</th>
<th>$F(1,37)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Parallel</td>
<td>Creative</td>
<td>17.0</td>
<td>6.3</td>
<td>18.6</td>
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<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>20.5</td>
<td>4.1</td>
<td>19.1</td>
</tr>
<tr>
<td>Project</td>
<td>Parallel</td>
<td>Creative</td>
<td>19.3</td>
<td>3.7</td>
<td>17.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>19.5</td>
<td>5.7</td>
<td>19.4</td>
</tr>
<tr>
<td>Power</td>
<td>Parallel</td>
<td>Creative</td>
<td>13.6</td>
<td>9.3</td>
<td>13.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>16.4</td>
<td>5.7</td>
<td>12.6</td>
</tr>
<tr>
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<td>14.4</td>
<td>6.6</td>
<td>13.4</td>
</tr>
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<td></td>
<td></td>
<td>Imitative</td>
<td>14.9</td>
<td>7.3</td>
<td>14.7</td>
</tr>
<tr>
<td>Action</td>
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<td>3.9</td>
<td>13.9</td>
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<tr>
<td></td>
<td></td>
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<td>3.7</td>
<td>13.1</td>
</tr>
<tr>
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<td>Parallel</td>
<td>Creative</td>
<td>15.4</td>
<td>4.3</td>
<td>14.5</td>
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<td></td>
<td></td>
<td>Imitative</td>
<td>15.5</td>
<td>3.8</td>
<td>16.4</td>
</tr>
</tbody>
</table>

Note. In parallel groups, $n = 14$ in central sitting and $n = 8$ in peripheral. In the project group, $n = 11$ in central and $n = 8$ in peripheral. All subjects completed both creative and imitative collages.

*aOSD = Osgood Semantic Differential

*p > .05

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Table 2
Results on Group Climate Questionnaire

<table>
<thead>
<tr>
<th>GCQ² Factor</th>
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<th>Activity</th>
<th>Sitting Arrangement</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Peripheral</td>
<td>Central</td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Engagement</td>
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<td>Creative</td>
<td>50.8</td>
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<td></td>
<td></td>
<td>Imitative</td>
<td>50.6</td>
<td>12.2</td>
<td>46.6</td>
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<td>Project</td>
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<td>52.1</td>
<td>6.4</td>
<td>49.6</td>
</tr>
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<td></td>
<td></td>
<td>Imitative</td>
<td>54.9</td>
<td>6.4</td>
<td>52.8</td>
</tr>
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<td>Conflict</td>
<td>Parallel</td>
<td>Creative</td>
<td>37.1</td>
<td>1.9</td>
<td>38.6</td>
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<td></td>
<td></td>
<td>Imitative</td>
<td>41.9</td>
<td>4.1</td>
<td>39.2</td>
</tr>
<tr>
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<td>Project</td>
<td>Creative</td>
<td>37.4</td>
<td>3.9</td>
<td>40.5</td>
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<td>Avoidance</td>
<td>Parallel</td>
<td>Creative</td>
<td>57.0</td>
<td>5.6</td>
<td>53.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>58.4</td>
<td>12.4</td>
<td>56.8</td>
</tr>
<tr>
<td></td>
<td>Project</td>
<td>Creative</td>
<td>56.5</td>
<td>5.2</td>
<td>59.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>62.6</td>
<td>8.6</td>
<td>58.8</td>
</tr>
</tbody>
</table>

Note. In parallel groups, n = 14 in central sitting, n = 8 in peripheral; project groups n = 11 in central, n = 8 in peripheral. All subjects completed both creative and imitative collages.

²GCQ = Group Climate Questionnaire

*p > .05
Table 3
Results on Interaction Scale

<table>
<thead>
<tr>
<th>Factor</th>
<th>Group</th>
<th>Activity</th>
<th>Peripheral</th>
<th>Central</th>
<th>F(1,37)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Laugh</td>
<td>Parallel</td>
<td>Creative</td>
<td>1.4</td>
<td>0.7</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>1.1</td>
<td>1.1</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Project</td>
<td>Creative</td>
<td>2.9</td>
<td>3.4</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>2.9</td>
<td>4.2</td>
<td>2.9</td>
</tr>
<tr>
<td>Talk</td>
<td>Parallel</td>
<td>Creative</td>
<td>8.1</td>
<td>5.8</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>7.6</td>
<td>6.5</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>Project</td>
<td>Creative</td>
<td>18.9</td>
<td>5.4</td>
<td>17.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>19.5</td>
<td>6.2</td>
<td>18.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Creative</td>
<td>20.5</td>
<td>8.1</td>
<td>15.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>20.5</td>
<td>7.1</td>
<td>16.5</td>
</tr>
<tr>
<td>Look at Other</td>
<td>Parallel</td>
<td>Creative</td>
<td>31.9</td>
<td>2.0</td>
<td>31.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>31.8</td>
<td>0.7</td>
<td>31.9</td>
</tr>
<tr>
<td></td>
<td>Project</td>
<td>Creative</td>
<td>31.9</td>
<td>0.4</td>
<td>32.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imitative</td>
<td>31.9</td>
<td>0.4</td>
<td>31.8</td>
</tr>
</tbody>
</table>

Note. Parallel groups n = 14 for central, n = 8 for peripheral. Project groups n = 11 for central, n = 8 for peripheral. All subjects completed both creative and imitative collages.

a"Look at Other" refers to regarding another individual.

b"Look at Task" refers to regarding any part of the task, objects used, or the table.

*p<.05
DISCUSSION

Within the parameters of this study, seating arrangements did not appear to influence interaction. Chances for a Type II error are low since the means are frequently not in the hypothesized direction.

The finding of statistically significant differences in verbal and nonverbal social interaction between parallel and project groups in the Nelson et al. (1985) study supports the belief that sharing (as in the project group) results in more communication than nonsharing. This result indicates that the statistics utilized were sensitive enough to discern such relationships.

However, sample size was relatively small for the seating arrangement analysis and, consequently, may have been a factor in the results. See Table 4 for the distribution of subjects. The number of subjects per group did correspond to the number generally found in groups led by occupational therapists (i.e., under ten) in the Duncombe and Howe (1985) study.

One variable which may have influenced the inability to discount the three null hypotheses was the tendency of a few of the subjects to get up from their chairs and walk to different positions around the room/table to get materials. Observations and recordings of their behavior continued regardless of their specific location (i.e., subject #1 remained subject #1, whether in a chair or walking around). The design of the study did not allow for differentiating between walking or standing interactions and sitting ones. Most of the senior citizens remained sitting for the majority of their activities. In future studies the type and amount of moving during activities could be measured in relation to different seating positions.
Table 4
Distribution of 41 Subjects

<table>
<thead>
<tr>
<th>Seating Arrangement</th>
<th>Peripheral</th>
<th>Central</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel</td>
<td>8</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>Project</td>
<td>8</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>25</td>
<td>41</td>
</tr>
</tbody>
</table>

Note. There were four parallel and four project groups.

Different seating arrangements could be studied both with healthy senior citizens and others in terms of interaction and the occupational therapy practice of using purposeful activity with groups. In addition to the linear pattern, these could include sitting at $90^\circ$ angles, sitting on opposite sides of a table, and sitting in a circle (Harrison, 1974; Mehrabian, 1976; Sommer, 1969).

The review of literature indicates that the physical environment influences interaction. This study could be replicated with modifications to the setting, such as using a room with windows (Sommer, 1969), and/or a larger room where subjects could sit farther from the one-way mirror. Mehrabian's (1976) comments about mirrors (over bars) may be relevant to the interaction found in the Nelson et al. (1985) study. Informal observations made during
the Nelson et al. research indicated that the senior citizens engaged in the collage activities generally tended to avoid looking into the mirror. Those who did look at the mirror did so initially when they were told observers were behind it and a few senior citizens looked at it during the experiment, apparently to look at others sitting removed from themselves.

If the elderly in the Nelson et al. (1985) study had chosen their own seating arrangement (i.e., which chair in the line of chairs on one side of a rectangular table they would occupy), the data on interaction might have reflected a difference between those in central and those in peripheral positions. Sommer (1969) considered personal choice a factor in the relationship between location in the physical setting and type of participation.

Studies similar to the Nelson et al. (1985) research could measure interaction and behavior with regards to the influence of crowding. Affect and interaction in a specified density in seating arrangement could be analyzed in terms of the amount of success subjects experience in an activity. This would correspond to Canter and Kenny's (1975) concept of crowding, cited earlier, where less success and a lower number of activities were associated with a more crowded situation.

Leff (1978) reported that the use of the Osgood Semantic Differential for environmental as well as other types of research tended to limit a study to the three dimensions of evaluation, potency, and activity, where, in actuality, more or fewer dimensions could exist.

Hall (1970) wrote that how individuals feel toward each other at a particular time directly affects how much space they establish between themselves. Though the senior citizens in the Nelson et al. (1985) study were assigned seats with limited spatial variations possible, they were neither
close friends nor spouses to each other. Their informal conversations indicated a minimal degree of acquaintance among some of them (e.g., members of the same exercise or foreign language class). This prior acquaintance may or may not have influenced how they felt toward each other at the time of the experiment, and hence, their interaction. The amount of space between subjects and how they feel toward one another are variables that could be measured in future studies.

The collage activities in the Nelson et al. (1985) study were appropriate with regard to visual problems associated with aging (Cooper, 1985; Cristarella, 1977). There were few visual problems related to this activity. One subject who spontaneously reported problems seeing had forgotten her glasses. Another senior citizen used her own magnifying glass. The researchers placed magnifying lenses on the table for use by anyone who needed one.
CONCLUSION

The Nelson et al. (1985) research on affect and interaction with healthy senior citizens as they participated in a collage activity provided an opportunity to examine the effect of seating arrangement on the same variables. Data analysis in the original study resulted in significantly more interaction in the project/sharing group when compared to the parallel/nonsharing group. There were no significant differences between the creative collage activity and the imitative collage activity. No significant differences were found in affective meaning between either the groups or the activities. The present ex post facto study added the independent variable of seating arrangement to the analysis. No significant differences were found between those in a peripheral seating position and those in a central position in interaction or affective meaning.

Despite the lack of significant results, there are numerous variables related to environmental variations that should be studied. Many of these variables identified in the literature review and discussion section are particularly important to occupational therapists who espouse the use of purposeful activity with groups of senior citizens in particular environmental situations to achieve specific treatment goals.
BIBLIOGRAPHY


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