NATIONAL BUREAU OF STANDARDS REPORT

10 401

TERRITORIALITY, PROXEMICS, AND HOUSING

Technical Report to the

Department of Housing and Urban Development

On Housing Performance Criteria

U.S. DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards[1] was established by an act of Congress March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau consists of the Institute for Basic Standards, the Institute for Materials Research, the Institute for Applied Technology, the Center for Computer Sciences and Technology, and the Office for Information Programs.

THE INSTITUTE FOR BASIC STANDARDS provides the central basis within the United States of a complete and consistent system of physical measurement; coordinates that system with measurement systems of other nations; and furnishes essential services leading to accurate and uniform physical measurements throughout the Nation's scientific community, industry, and commerce. The Institute consists of a Center for Radiation Research, an Office of Measurement Services and the following divisions:

Applied Mathematics—Electricity—Heat—Mechanics—Optical Physics—Linac Radiation[2]—Nuclear Radiation[2]—Applied Radiation[2]—Quantum Electronics[3]—Electromagnetics[3]—Time and Frequency[3]—Laboratory Astrophysics[3]—Cryogenics[3].

THE INSTITUTE FOR MATERIALS RESEARCH conducts materials research leading to improved methods of measurement, standards, and data on the properties of well-characterized materials needed by industry, commerce, educational institutions, and Government; provides advisory and research services to other Government agencies; and develops, produces, and distributes standard reference materials. The Institute consists of the Office of Standard Reference Materials and the following divisions:

Analytical Chemistry—Polymers—Metallurgy—Inorganic Materials—Reactor Radiation—Physical Chemistry.

THE INSTITUTE FOR APPLIED TECHNOLOGY provides technical services to promote the use of available technology and to facilitate technological innovation in industry and Government; cooperates with public and private organizations leading to the development of technological standards (including mandatory safety standards), codes and methods of test; and provides technical advice and services to Government agencies upon request. The Institute also monitors NBS engineering standards activities and provides liaison between NBS and national and international engineering standards bodies. The Institute consists of the following technical divisions and offices:

Engineering Standards Services—Weights and Measures—Flammable Fabrics—Invention and Innovation—Vehicle Systems Research—Product Evaluation Technology—Building Research—Electronic Technology—Technical Analysis—Measurement Engineering.

THE CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY conducts research and provides technical services designed to aid Government agencies in improving cost effectiveness in the conduct of their programs through the selection, acquisition, and effective utilization of automatic data processing equipment; and serves as the principal focus within the executive branch for the development of Federal standards for automatic data processing equipment, techniques, and computer languages. The Center consists of the following offices and divisions:

Information Processing Standards—Computer Information—Computer Services—Systems Development—Information Processing Technology.

THE OFFICE FOR INFORMATION PROGRAMS promotes optimum dissemination and accessibility of scientific information generated within NBS and other agencies of the Federal Government; promotes the development of the National Standard Reference Data System and a system of information analysis centers dealing with the broader aspects of the National Measurement System; provides appropriate services to ensure that the NBS staff has optimum accessibility to the scientific information of the world, and directs the public information activities of the Bureau. The Office consists of the following organizational units:

Office of Standard Reference Data—Office of Technical Information and Publications—Library—Office of Public Information—Office of International Relations.

---

[1] Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D.C. 20234.
[2] Part of the Center for Radiation Research.
[3] Located at Boulder, Colorado 80302.

NATIONAL BUREAU OF STANDARDS REPORT

NBS PROJECT		NBS REPORT
4213401	July 1971	10 401

TERRITORIALITY, PROXEMICS, AND HOUSING

Technical Report to the

Department of Housing and Urban Development

On Housing Performance Criteria

by

William G. Mather, III
Technical Analysis Division, IAT

U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

ACKNOWLEDGEMENT

The author appreciates the direction, advice, and assistance provided by the project leader, Dr. Robert Wehrli, Chief, Building Systems Section, Building Research Division.

TABLE OF CONTENTS

1. INTRODUCTION

> "As long as man must live in a world of walls, furniture, doors, and fences, there is good reason to study how they influence his behavior."
>
> Robert Sommer, 1959:258

1.1 The Two-Year Project

This review is one of a series of publications of research conducted by the National Bureau of Standards into the performance concept for the design of buildings. One part of this effort is the Two-Year Project for Housing Performance Criteria Development. Among the research topics covered in this Project are: durability of built elements, site criteria, personal sanitation, and the subject of this report -- territoriality.

The aim of the overall effort is to give human parameters more consideration in the design of building requirements than has been given in the past. Traditionally, building regulatory codes have been prescriptive in nature, specifying the methods and materials to be used in construction. The performance approach, on the other hand, aims at specifying building requirements in terms of the results expected, leaving the builder freedom to be more innovative -- to choose among the sets of methods and materials which are capable of satisfying the desired performance standard.

Since the performance of housing must be satisfactory to the requirements of the user, the first step in the performance approach is the identification of human needs, capabilities, and activities. Once these have been described, attributes of housing which may help to satisfy them can be derived. Then these performance attributes must be

translated into requirements and criteria in a form which will be meaningful and useful to a builder. Finally, procedures and tests must be developed for evaluating the construction in terms of the specified criteria.

1.2 Purpose and Plan of the Territoriality Review

The first step in the performance statement development process is the identification of the human parameters which are believed to interact with the housing environment. This report is an exploratory review of research into the human need for territoriality and associated concepts, to see whether pertinent performance criteria can be generated.

The basis of this effort is a literature review of approximately 100 items dealing with housing, territoriality, proxemics, the body buffer zone, and privacy. These references are listed in the Bibliography. The material in the literature was organized and synthesized as presented in Chapters 2 and 3. Bearing in mind the limitations discussed below, the author, in Chapter 4, has derived requirements for housing which may help meet the human needs under discussion. Because of the present state of the science of human territoriality, these are presented not as full-fledged performance statements, but as requirements suggested for further consideration by the research and design communities.

1.3 Importance of this Study

Very little is known about the ways in which people use space, and even less is ever applied in a systematic fashion to the design of the spaces people use. The situation is especially regrettable with regards to that designed space in which we spend so much of our time, particularly in our formative years -- the home. Some built environments

have fared relatively better. For example, the Department of Defense has specified for many years that man-machine systems designed for military use must contain a human factors analysis. Constance Perin (1969:11) suggested that the "larger living environment could do with such objectives and the funding to achieve them." Further, she proposed that "any aspect of the built environment which Federal funds assist should include qualitative, behavioral studies to complement the quantitative, demographic research previously thought to have been sufficient."

Human territorial behavior has been receiving increasing scientific attention lately. Indeed, as Altman (1970:5) states, "While not unequivocably established, there is a gradually accumulating body of evidence that social needs for dominance and status, abnormal psychological conditions, interpersonal compatibility, etc., are associated with use of space and with territorial phenomena." Since territoriality interfaces with so many other aspects of behavior and is also inextricably bound to the environment, it seems to be a logical place to start an analysis of behavior-environment phenomena.

1.4 Limitations to the Study

The major reasons for caution in attempting such an analysis at this time are that so little research has been done about human territoriality, and that what has been done has for the most part looked at behavior-environment situations other than in the household. Most of the research which has been conducted into human territoriality and proxemic behavior has been carried out either in staged, laboratory-

type situations, or with abnormal populations such as mental patients or sophomore psychology students. Extrapolations must therefore be made from the research that has been conducted in these somewhat related areas, and this can rarely be done without a loss in validity. Further, much of what has been written about human territoriality is theoretical and is based upon the author's speculations and unsystematic observations. The value of such work lies mainly in its provocative stimulation, and the behavioral principles suggested or deduced must be given careful evaluation.

In addition to these limitations caused by the nature of the body of research are further strictures imposed by the nature of man. Generalizations cannot be made about human spatial needs which will apply to all people all of the time. Research has clearly shown that spatial needs and activities vary throughout the population by such parameters as sex, ethnicity or regionalism, personal values, temperament, previous experience, and household composition and stage of the life cycle. On the other hand, people's needs are not infinitely varied, they can be categorized, and suggestions can be made concerning their alleviation.

2. DEFINITION OF TERRITORIALITY AND BRIEF HISTORY OF RESEARCH

2.1 Definition

Sidney Brower (1965) defines territoriality as "a tendency on the part of organisms to establish boundaries outside their physical confines, to lay claim to the space or territory within these boundaries and to defend it against outsiders."

There are several important concepts presented in this statement. First, territoriality applies to all classes of organisms -- man as well as other animals. Second, territories are defined by boundaries, whether indicated by the stakes of a miner's claim or the roars of a Howler monkey. Third, these boundaries are under surveillance by the inhabitant and trespassers are defended against. Not all territorial defense takes place at the territorial boundaries, however. C. R. Carpenter (personal communication) states that some primates, such as the baboon, defend not the periphery, but rather core areas within the territory.

A distinction should be made here between the concepts of territory and home range. Ardrey (1966a: 210) and others apply the term "home range" to the area covered by an animal's foraging activities, reserving the term "territory" for the smaller, defended areas within this range. These core areas may be particular feeding areas and favorite resting or sleeping locations.

For human beings, Gelwicks (1970: 149) defines home range as being "... that series of linkages and settings traversed and occupied by the individual in his normal activities." Some people's home ranges

cover large and nonpropinquant areas of the earth's surface, says Stea (1970: 139), citing the example of some elderly people who migrate seasonally between New York City and Miami.

In addition to the geographically located range and territory, each individual carries around with him his own "personal space bubble" or "body-buffer zone." This concept refers to the distance which a person customarily attempts to keep between himself and other persons. As with territory, unwanted intrusions into one's body buffer zone generally provoke a fight or flight reaction. The study of "micro-space as a system of bio-communication" has been termed "proxemics" by Edward T. Hall (1963b: 422).

2.2 Non-Human Research

According to the splendidly comprehensive review of non-human vertebrate territoriality by Carpenter (1955), the concept of territory was introduced as early as 1622 by ornithologist Francis Willugby, who wrote about the male nightingale's seizing, occupying, and defending his "Friehold." It took nearly 300 years, however, before the concept of territory became established in the field of animal behavior by the publication of H. Eliot Howard's Territory in Bird Life in 1920 (Carpenter, 1955). Since this slow emergence of the territorial concept in studies of the behavior of birds, the concept has been applied to a wide variety of creatures, including fish, reptiles, rodents, ungulates, non-human primates, and man.

John B. Calhoun has been studying rodents and other small mammals for 25 years. He has found that as these animals forage in the wild, the number of good-gathering responses they make per unit of area decline with the distance from their home, following the familiar bell-

shaped normal curve (Calhoun, 1966). The resources available towards the periphery of a home range would then be very inefficiently used by a population, unless individual's home ranges overlapped. Since evolution tends to favor the development of animals which make the most efficient use of resources, there would be a tendency towards overlapping of ranges. As this occurs, individual animals would have more frequent contact with their closer neighbors, and lesser contact with the more distant ones. Increased contacts could lead to the formation of groups, built around a dominant animal. Calhoun postulates that such groups would contain an average of 12 adults, and states that compact groups of this size are found in "a host of species as divergent as the Norway rat, howler monkeys, or man in his more primitive state as represented by the bushmen of the Kalahari Desert." (Calhoun, 1966: 53). Ranges of neighboring groups tend to overlap, and if members of adjoining groups should become inordinately attracted to a particular place, a "behavioral sink" may develop.

With this resulting manyfold increase in population density over the optimum, many behaviors become abnormal. "Prominent among these are nearly total dissolution of all maternal behavior, predominance of homosexuality, and marked social withdrawal to the point where many individuals appear to be unware of their associates despite their close proximity." (Calhoun, 1966: 54). He concludes that, "... the physical configuration of the environment, including the prevalance of stimuli which might elicit responses, can increase the likelihood either of an animal following a solitary way of life or, on the other hand, of it joining with its fellows in large massed groups even

when much nearby similarly structured space remains relatively unused." (Calhoun, 1966: 57). When it comes to man, however, many additional factors confound the situation. Man's cultural tool kit, so much larger and more diversified than that of other animals, includes more mechanisms both for developing behavioral abnormalities and coping with them.

C. R. Carpenter was a pioneer in the naturalistic study of territory in the non-human primates, including howler monkeys, spider monkeys, squirrel monkeys, orangutans, gibbons, and rhesus monkeys. From his own extensive research and reviews of the work of others, he has made these inferences (hypotheses) about the functions of territoriality in animals: Territoriality spaces or disperses a species population, limits or regulates population by limiting breeding, ensures adequate space per se, prevents overpopulation, exposes nonterritorial elements of a population to predation, affords protection against predation, reinforces dominance and selective breeding of the "strong," is advantageous for subordinate animals, affects rate of gene flow in a population and hence may affect rate of evolution, facilitates establishing of animal breeding territories for migratory animals (economy), stimulates breeding behavior, stimulates spawning in fish. facilitates and perhaps ensures breeding for some species, reinforces dominance statuses, reduces sexual fighting and killing, reinforces monogamy, increases inbreeding in groups, protects nest and young, reinforces integration of groups, regulates size of groups, provides security and defense, provides psychological advantage and favorably affects motivation,

increases accessibility and availability of food, localizes waste disposal in some species, reduces stress ("flight distance"), protects against despotism, protects against interference with orderly nesting cycle, provides song center for birds, provides attraction area for female bird ready to mate, reduces rate of spread of diseases and parasites, warns away trespassing animals, and inhibits or prevents parasitism (Carpenter, 1955).

2.3 Research on Human Territoriality

Since man is a creature of evolution, studies of other animals can add insights to his own nature. The relevance of such studies needs, however, to be tempered by both knowledge of the complexities added by man's culture and the realization that the animals studied today have undergone evolutionary changes since man passed through on his way to becoming human.

V. C. Wynne-Edwards (1964) cites important differences in population control methods between man and animal. While most animals seem to maintain fairly stable population levels, man has shown a long-term increase. Both man and animal use social behavior patterns, including territoriality, to control or influence their growth. In addition, population density and growth in many animals is regulated partially by biological means -- internal responses to population pressures, and predators. Furthermore, their social control mechanisms appear to be innate, automatic, while man has conscious control over his breeding. Finally, man has been able to continuously increase his food supply, and control over his numbers has passed from the group to the individual.

So, with differences such as these between the behavioral repertoires of man and other animals in mind, and noting that for example, psychologists are finding difficulties in transferring research findings on the domesticated white laboratory rat to his wild brown Norway first cousin; we must recognize that we can extrapolate only so much about ourselves from the study of territory as practiced by our phylogenetic relatives, and realize that the best subject for the study of territoriality in man is man.

In addition to the complexities added to the situation by man's culture are others caused by differences between the various cultures of the world. It was such differences which the anthropologist Edward T. Hall observed in the social use of space by Americans and the people they encountered overseas which led him into the study of proxemic behavior -- the way in which people structure their micro-space. From his early, unstructured observations of cross-cultural differences in interpersonal speaking distance preferences, office space layouts, and house and yard spatial relations (Hall, 1959), Hall and his followers have developed systematic, quantified, and experimental approaches to the scientific study of proxemic behavior (Hall 1963c, 1966, 1968; Watson and Graves 1966).

Paralleling Hall's cross-cultural studies has been Robert Sommer's situational research into the ecology of small discussion groups (1959, 1961), study hall territoriality and privacy (1966b), and classroom arrangements (1967a). Psychologist Sommer became interested in environmental engineering when he was asked to help find out what

was wrong with the design of a ward for elderly women at a Canadian state hospital. Although the ward had recently been redecorated and was regarded by the staff as being a showcase, the women's mental state seemed unchanged. After lengthy observation, Sommer discovered that it was the antiseptic, orderly appearance of the place which was at fault. Chairs had been placed side-by-side in neat rows along the wall or facing outward in four directions around a pillar -- sociofugal arrangements which gravely hindered social interaction between the patients (Sommer 1969).

Taking another approach, Irwin Altman and his collegues have studied the ecological context of behavior-environment interaction, particularly of small groups of people under the stress of isolation (Altman and Haythorn, 1967). An ecological approach to the study of human behavior has also been developed by the human ecology school of sociology (Lyman and Scott 1967; Pastalan 1970). The sociological ecologists, however, study social and physical interrelationships in terms of the community -- a level of integration which is above that of the scope of this paper. In the next chapter is presented a discussion of the results of that research into human territoriality which is believed to be the most relevant to housing performance.

3. APPLYING THE CONCEPTS OF TERRITORY AND PROXEMICS TO HOUSING

3.1 Relationship of the Dwelling Unit to Its Surroundings

Robert Ardrey has advanced a "castle-and border" interpretation of animal territory: "There is the castle or nest or heartland or lair to provide security, and, just as important, the border region where the fun goes on." (Ardrey, 1966a: 170). As the howler monkey clans raucously challenge each other across the borders of their territories each morning, so does Snuffy Smith's wife Loweezy spar with her comic strip neighbor across the gossip fence. On the larger scale, also, geographers have remarked about differences in life styles and attitudes between people living in the core of a country and on its frontiers (Prescott, 1965).

Lot boundaries are more aggressively defended in some cultures than others. In the U. S., neighbors have relatively free access to each other's goods -- borrowing sugar, lawn mowers, etc., -- and children can often play across yards unhindered. In middle-class England, however, for one's children to play with a neighbor's can require a written invitation (Hall, 1960: 44). In Mexico we note broken bottles cemented into the tops of the walls around many house-lots.

Specifications of territories helps to reduce conflict in our crowded, urban world. A major function of territory is to keep people out of one another's way. Invasion of territory without permission has been institutionalized to the extent that it is codified as a crime --

trespassing. The question becomes one of where not only the formal, but also the informal boundaries are recognized to be, and also what levels of sanctions are involved against their trespass. Some people do not become worried about the presence of a stranger in the neighborhood until he is actually banging on their door, while among some ethnic groups the mere appearance of an outsider on the street will put an entire block on the defensive.

A household may indicate the limits of its claimed territory by setting out hedgerows, fences, or flower beds, similar to the marking of boundaries by animals (Sommer, 1966a: 61). The defense of one's house-lot generally relies on passive mechanisms such as fences and nameplates. In this country, some people push the defense of their boundaries so vigorously that they attempt to extend them beyond their lawful limits by, for instance, putting trash cans, folding chairs, or sawhorses in the street to reserve "their" parking space. Lines of demarcation between public and private areas vary from one society to another both in location and in the methods used for marking them, states Rapoport (1969: 80): "The compound in India, or the Mexican or Moslem house, put the threshold further forward than the Western house does, and the fence of the English house puts it further forward than the open lawn of the American suburb.

The lot itself is by no means an homogenous territory. Different parts of the lot and their associated features carry with them (in the eyes of the particular society) differing types and levels of use, privacy, and surveillance. In the stereotypical American Town, the

front yard is arranged for display to one's neighbors and passersby, while the backyard is structured more for the pleasure of the occupants. The backyard is typically exposed only to the upper stories of the neighbor's houses and to a relatively infrequently traveled alley. Members of the household feel freer to adopt more relaxed modes of dress and behavior in the backyard than in the front. In addition, certain portions of the lot, such as the parking space and children's play areas, have special significance, and unaccustomed noises coming from such areas will place the household on immediate alert.

Research has recently indicated that changes which have been occurring in the territories of children may be associated with increases of stress levels in the family. As Gelwicks (1970: 156) points out, "Fewer children today have the opportunity of digging a tunnel or building a hut on a vacant lot. Our playgrounds are structured and unchangeable under penalty of the law." The upper floors of high-rise apartments are found to be associated with higher stress levels in women who lose both companionship with and control over their children playing on the grounds or in the streets many floors below.

The distances between adjacent or neighboring territorial cores (dwelling units) seem to be associated with differences in social relations. Boalt and Janson (1956) postulated that," ...the probability of social interplay between two object will be a J-shaped curve as a function of the distance between the objects." People tend to have more frequent, lasting, and intensive contacts with their closer neighbors, with the contacts decreasing as the distance increases.

Attitudes may also be associated with distance. Wilner, et al (1952) report that the attitudes of white women living near Negroes in an integrated housing project expressed more favorable attitudes toward Negroes than did white women who lived farther away, but in the same project.

Flachsbart (1969) discusses a study by Roy Blumhorst, of Marina City, a twin-tower apartment complex in Chicago, which indicates that the J-curve hypothesis may not function for very short distances. At Marina City, although apartment doors were often as close to each other as six inches, the residents placed a high value on maintaining social distance between each other. "Social distance expressed the fact that neighbors were careful not to become too friendly for fear of developing unpleasant relationships." (Flachsbart, 1969: 414). Helping to maintain social distance were such architectural features as the fact that the lobby was designed not as a community gathering place but as a waiting room, resident approval by intercom was required before a visitor could enter the premises and the provision of few recreational facilities.

3.2 The Interior of the Dwelling Unit

a. Space in General

> "Biologists speak of studying organisms in their natural habitat; human ecologists attempt to study the organization of people in natural communities: these same questions about distribution and density can also apply to the classroom situation. The arrangement of students is a function of such factors as room density, the nature of the activity, the instructor's method of teaching, and the physical dimensions and shape of the room." (Sommer, 1967a: 490)

So too, we may consider the household ecology, and on two different levels: the dwelling unit and the room or activity-space unit. Within the dwelling unit, the spatial distribution of the inhabitants at any particular time may be related to the internal physical arrangement, group composition, and activities. Within a room, the distribution would be related to the size and shape of the room, the types and arrangements of objects in it, and characteristics of the people and of the activities they are engaged in. It is with this milieu that the rest of this chapter is concerned.

Not all human spatial needs are tangible, nor are they all expressed in a rational, functional way. Vere Hole (1971: 10) cautions that,

> "there are a number of less tangible needs involving such factors as the status of individual members within the family group, or the status of the family vis a vis the world outside the home. In luxury housing this may take the form of conspicuous consumption of space (the living room becoming a range of rooms called the morning room, drawing room, study, library, ballroom, etc.), but in low cost housing with restricted floor areas, the symbolic use of space is still evident. The fact that certain spaces within the house are not intensively used does not necessarily imply that they are redundant or unimportant from the user point of view: he may have deliberately organized the pattern of his activities to maintain a dichotomy between the functional or utilitarian and the ceremonial or symbolic spaces in the house."

b. Types of Territories within the Dwelling

The two major kinds of psychological and physiological needs for which the dwelling unit provides fulfillment are:

(1) Procreation, nurture, and private daily events. These take place in the most private, secluded areas of the home. (In the middle class suburban homes studied by Seeley, et al. (1963) -- the second and third floors.)

(2) Rest, relaxation, and family interaction. These normally occur in more public areas -- living room, den, recreation room, and home workshop.

On the basis of the degrees of privacy and rights to access, three types of territory were differentiated by Seeley, et. al. (1963):

(1) The "stage" or display space, much like a store window, used for formal entertaining -- living room, dining room, recreation room.

(2) Areas of preparation, before coming "on stage" -- kitchen, pantry.

(3) Private areas -- area of the bedrooms and bathrooms, where the family can relax en deshabile.

When there is more than one bathroom in the house, the residents may treat one as a "show" bathroom, to be used by guests, and the others as more utilitarian. Different amounts of space and different types and quality of fittings would be found in each type.

c. Privacy and Rights of Access

In this review, privacy is considered to be both "the right of the individual to decide what information about himself should be communicated to others and under what conditions," (Pastalan, 1970: 89), and also as the right to "insulation from the stimuli emitted by other humans." (Studer and Stea, 1966: 135). Conflicting roles and activities in a household, however, lead naturally to situations incompatible with the desires for privacy. For example, although parents may wish

to be by themselves in quiet isolation, they must nevertheless still be able to supervise their children and overhear what they are doing. If the parents' and children's activities are so incompatible as to preclude their taking place in the same room, they should be located in adjacent rooms, with a door between permitting intermittent surveillance.

Some houses have direct access from the front door into the living room, and traffic must go through the living room to reach other areas of the house. This intrusion into the living room may be unwanted at times; for example, when an overnight guest is sleeping on the living room couch, or when a salesman comes calling.

d. Possessiveness

People feel a need both to stake out their own personal territories and to be identified with certain objects. Few people can move into a house or even an apartment without personalizing it by at least changing the color of the walls. Similarly, even though a family moves across the continent, as soon as their furniture and bric-a-brac is arranged in the new setting, they feel at home. Newlyweds work out early which easy chair and which half of the bed "belongs" to whom. Dressing areas, closets, chests of drawers, and sewing, hobby, or shop space will be named -- even towels are labeled "his" and "hers".

Sommer (1969) and Gelwicks (1970) discuss territorial possessiveness among people in mental hospitals and institutions for the aged. Residents of such places value highly having their "own" chair in the

dayroom and place at the dining table. Since, as Gelwicks states (1970: 155), "Aging in its later stages is a process of closing out life's options," the elderly need to have the opportunity to be able to structure their micro-environment as much as possible to help retain their identity.

Even in public areas people can often carve out territorial niches for themselves. Sommer (196) and his collegues observed the ways in which people reserved seats in university library study halls and airports by leaving "territorial markers" -- books, coats, briefcases, umbrellas, etc. Hoboes, flower vendors, and street-corner gangs each have their own turf in the city.

e. Population Density and Crowding

Population density has been associated by some writers with psychosomatic symptomatology, neurosis, psychosis, juvenile delinquency, alcoholism, and alienation. The problem, says Sommer (1966a) is to factor crowding out from "associated phenomena including low income, inadequate food, lack of education, social prejudice, etc."

Population density and crowding must be considered on two different levels -- crowding of people in buildings, and crowding of buildings and people on the land. In this country, the density of different types of dwellings is usually controlled by zoning ordinances. Rosenberg (1968) believes that much more benefit to society would be derived from lowering the density of living space within the dwelling than the density of site space. This section is concerned only with the density of people within a dwelling unit.

Agan and Luchsinger (1965) discuss space and occupancy standards for housing around the world. They found standards ranging from 24 square feet per person in Hong Kong to 185 square feet per person in England. It should be noted that floor space per person is not always a reliable indicator of crowding, as the total living space, including (especially in the tropics) patios, gardens, and roofs, must be considered.

Hall (1963b) reports Chombart de Lauwe's studies of the consequences of over-and under crowding in French working-class families, published in 1969. De Lauwe found that:

> 'When there is less than 8 to 10 square meters per person, social and physical disorders double. Between 8 square meters and 14 square meters per person, pathology is at a minimum. Above 14 meters, there is an increase again. Chombart de Lauwe's explanation of the latter finding is that these statistics came from upwardly mobile homes, where the parents were more interested in status symbols and getting ahead than in the family. Hence, they isolated their children in separate rooms, and did not pay enough attention to them." (Hall 1963b:433).

Since individual distance with middle and working class Frenchmen is considered by Hall to be less than that in the U. S., these data should not be imposed unchanged upon this country.

Rosenberg (1968) reports that the incidence of infectious disease is about the same in New Zealand apartment dwellers as it is in squatters living in the same amount of floor space. He believes that in the slums of this country, as floor space becomes more crowded, adults become more aggressive, spending less time in social interaction, and the children therefore become more aggressive and/or more withdrawn.

Loring (1956) analyzed the relation between 14 housing items and the incidence of social disorganization, defined by a variety of problems

reported in social case work and court records. Households with reported problems were matched with control households, and were found to be associated with a smaller average number of rooms per family both at the time of the survey and over the preceding 10 years, a smaller number of heated rooms, less total floor space at present and during the previous 10 years, less heated space, and poorer scores on an environmental quality index than did the controls. No significant differences were found between the 2 groups of households for such items as the presence of a bath, a dwelling unit maintenance index, the area of the largest common room, a deterioration index, the number of common rooms, and a structure maintenance index. Each of the factors which were found to be associated with social disorganization is related to density within the dwelling unit and in the neighborhood. Loring (1956: 166) believes the research suggests that: "The density relevant to the systems here observed is social density, definable in terms of social or cultural roles simultaneously acting in a given physical space."

Jonathan Freedman (1971), however, states that he has found no significant evidence that density adversely affects humans. His study, which is currently in progress, indicates that, while men become harsher, more competitive, and like each other less in cramped quarters, women's reactions to crowding are strongly positive, and mixed groups are not affected.

f. Proxemics and Personal Space

While territory is a stationary area in which the individual moves around, personal space is carried around by the individual. The

term proxemics has been used by Watson and Graves (1966: 971) to mean "the study of how man structures microspace, how he relates physically to other persons with whom he is interacting, and what is communicated by these physical relationships." Hall has elaborated a typology of interpersonal distances involved with social intercourse among "noncontact, middle-class, healthy adults, mainly natives of the northeastern seaboard of the United States." (Hall 1966: 116). Each of Hall's four distance zones are divided into two phases, near and far:

(1) Intimate distance -- from contact to 18 inches. There is intense sensory involvement between people at this distance, and the use of this distance in public is not regarded as proper by the group described above.

(2) Personal distance -- 1 1/2 to 4 feet. The outer boundary of this zone is the limit of physical domination. In the near phase you can "get your hand on" the other person, while in the far phase you keep him at "arm's length."

(3) Social distance -- 4 to 12 feet. Impersonal business is conducted within this zone. People who work together use the close phase of 4 to 7 feet, while more formal matters are discussed at a distance of 7 to 12 feet, and people can more easily drift in or out of a group. Hall (1964a: 48) observes that a husband home from work "often finds himself sitting and relaxing reading the paper at 10 or more feet from his wife."

(4) Public distance -- 12 to 25 feet (close phase), 25 feet or more (far phase). This distance is outside the circle of involvement, and a more formal style of speaking is used. "Thirty feet is the distance that is automatically set around important public figures." (Hall 1966: 124).

Most of the activities which take place within the dwelling unit occur within the first three of Hall's distance zones. Lovemaking and consoling takes place within the intimate distance. Conversation around the dinner table involves the personal distance. This distance of up to 4 feet is the outer fringe of the body buffer zone, or personal space bubble, which should not be infringed upon by an intruder unless he intends to interact with the person. In the dwelling unit, for example, traffic lanes should be arranged in order not to impinge upon the space bubbles of people engaged in other activities. Many activities occur within the social distance range of 4 to 12 feet. Furniture in living rooms is usually found to be spaced such that conversation takes place toward the far phase of this zone. This spacing also aids co-acting individuals -- two or more people who are each engaged in his own activity but remain within the same general area.

4. HOUSING PERFORMANCE STATEMENTS

The goal of this study is the development of a set of performance statements for U. S. housing, derived from an analysis of research on territoriality. These statements follow the format developed in E. O. Pfrang's Guide Criteria for HUD's Operation BREAKTHROUGH housing project. This format provides four parts for each performance statement-requirement, criteria, test, and commentary. The requirement contains the essence of the statement presented in a qualitative fashion, the criterion is the quantitative element, and the test is a means of measuring satisfaction of the criterion, while the commentary provides supplementary material.

The requirement portion of the performance statement is not intended to be taken as a commandment, but is rather suggestive in nature, providing general coverage to the human need. The criteria set a specific, measurable level of building performance, based upon scientific or egnineering data. The test provides a means of verifying the building's compliance with the specifications set by the criteria. Most of the performance statements on the following pages are incomplete, as criteria and tests have yet to be developed. It is hoped that they can be added during the continuing dialogue with the scientific, design, and construction communities.

The statements which follow are keyed to the various built elements of the dwelling as presented in the Guide Criteria matrix presented on the next page. To this list have been added categories for elements outside the structure, such as the site, the lot, and community open space.

Built Elements		Attributes								
		Structural Serviceability	Structural Safety	Health and Safety	Fire Safety	Acoustic Environment	Illuminated Environment	Atmospheric Environment	Durability/Time Reliability (Function)	Spatial Characteristics and Arrangement
		1	2	3	4	5	6	7	8	9
Structure	A									
Interior Space Dividers: Walls and Doors, Inter-Dwelling	B									
Interior Space Dividers: Walls and Doors, Intra-Dwelling	C									
Interior Space Dividers: Floor-Ceiling	D									
Exterior Envelope: Walls, Doors and Windows	E									
Exterior Envelope: Roof-Ceiling, Ground Floor	F									
Fixtures and Hardware	G									
Plumbing	H									
Mechanical Equipment, Appliances	I									
Power, Electrical istribution, Communications	J									
Lighting Elements	K									
Enclosed Spaces	L									

C. Surfaces

Requirement: Surfaces should be capable of being decorated by users in a wide variety of styles, materials, colors, textures, etc.

Criteria

Test

Commentary: This will give satisfaction by facilitating territorial marking -- permitting the inhabitants to put their own stamp on the dwelling, indicating to others who it belongs to, and helping the resident to feel more comfortable. This can also help to satisfy an apparent human need for diversity in the environment.

C. Interior Doors

Requirement: Bedroom doors and latches should be so constructed and hung that they can be left ajar, or nearly closed but not fully latched.

Criteria

Test

Commentary: Seeley, et. al. (1963) observed that not quite latching the bedroom door permits the needed degree of privacy within the room without giving the rest of the family the feeling of being locked out.

E. Windows

Requirement: Windows and lights should be located such that they enable easy surveillance of territory surrounding the dwelling unit, especially important areas such as the garage or parking space and the children's play area.

Criteria

Test

Commentary

E. Exterior Windows and Walls

Requirement: Housing, especially public housing, old-aged communities, etc., which is built for a population which includes significant numbers of people with certain Mediterranean or Hispanic cultural background should accommodate their preference for facing the dwelling inwards rather than outwards to the public. Exterior walls should therefore be left relatively blank, to keep passers-by from seeing into the interior of the living unit.

Criteria

Test

Commentary: See Carp's (1970) discussion of high-rise apartments for the aged in San Antonio, Texas.

L. Enclosed Spaces

Requirement: The layout of "living" or socializing spaces should enhance the placement of furniture, especially chairs and couches, to facilitate comfortable speaking distances.

Criterion: In a large lounge, the distance may be about 5 feet between conversants.

Criterion: In smaller, more intimate rooms such as an American living room, this distance may usually be increased to 7 to 10 feet.

Test: Observation of room plan, based on the type and use.

Commentary: See Hall, 1964a; Sommer, 1962a, 1969: 58-73.

L. Enclosed Spaces

Requirement: The dwelling should provide, through the arrangement of spaces, enclosures, and furnishings, for the establishment of three types of social space:

(1) Public display.

(2) Preparatory.

(3) Private.

Criteria

Test

Commentary: See section 3.2.a.

L. Enclosed Spaces

Requirement: The dwelling should provide each member of the household with his own, easily identifiable, sleeping, storage, and working or playing spaces.

Criteria

Test

Commentary: See Seeley, et. al., (1963). This helps to accommodate the possessive nature of the need for territory, with regards to both space and objects.

L. Enclosed Spaces

Requirement: Traffic-flow lanes should be arranged such that people moving about the dwelling will not infringe upon the personal space needs of the other members of the household engaged in their own activities.

Criteria

Test

Commentary

L. Enclosed Space

Requirement: At least one bathroom (or half-bath) should be located so guests can easily reach it from the public areas of the dwelling without having to traverse the private areas.

Criteria

Test

Commentary: See Seeley, et. al., (1963).

L. Enclosed Spaces

Requirement: The spatial design should recognize the human needs for sociopetal space in certain areas, to facilitate socializing activities; and for sociofugal space in other areas, to enhance individual privacy and to accommodate people working on different tasks in the same spatial environment.

Criteria

Test

Commentary: See Section 3.2.

L. Enclosed Spaces

Requirement: Kitchens should be large enough to accommodate other members of the household without discommoding the cook.

Criteria

Test

Commentary: Although a small kitchen may save the housewife steps, "it also puts her in an aggressive spatial reltionship with every other member of the family whenever they enter the door, and particularly when they are underfoot when she is trying to prepare a meal." (Hall, 1960a: 42). Even though the kitchen be located outside of the main traffic lanes it will still function as a people magnet, attracting children and husbands.

L. Enclosed Spaces

Requirement: Layout of the various activity spaces should permit one to be able to "get away from it all" in a location he could call his own for the time being, away from other sights and sounds.

Criteria

Test

Commentary: See the section on privacy (3.2.c.).

The Lot

Requirement: The need to mark the boundaries of one's territory so that other people can easily recognize them should be accommodated when designing lots for single-unit dwellings. Boundary-marking could be accomplished by fencing, plantings, garage wall, or by readily apparent logic (half-way between adjacent buildings, for example).

Criteria

Test

Commentary: See section 3.1.

The Lot

Requirement: Plan, contour, and vegetation should not impede surveillance of the lot, especially of special areas such as play space, parking space, and lot boundaries.

Criteria

Test

Commentary: See Section 3.1.

Site

Requirement: The design of the relationship between the dwelling and its surroundings should take culturally based preferences and customs into consideration.

Criteria

Test

Commentary: Some people like an open site plan, while others may prefer a house-lot configuration which faces inwards upon itself to provide seclusion for family activities.

Open Space

Requirement: In multi-family developments, such as planned neighborhoods and new communities, some of the open space should be left relatively unstructured, even wild, and the residents should be not only permitted, but encouraged to adapt it to their own desires.

Criteria

Test

Commentary: Children, especially, need some territory which they can call their own, in which they can dig holes and build camps. People also need diversity in their perceptual environment, and dislike having everything planned for them.

5. SUGGESTIONS FOR FURTHER RESEARCH

Territoriality in humans is an established psychological and cultural fact. The most pressing need is for research conducted in the housing environment. By far, most of the territoriality-oriented research discussed in this report has been conducted in other situations. There is ample room for both laboratory experimentation and simulation and field observation of proxemic behavior in the dwelling unit. Surveys are probably not so adequate as simulation and observation, because the environmental phenomenon "tends to affect people from beyond the focus of awareness." (Sommer 1966a: 67). Longitudinal studies are needed, to reveal the long-term dynamic interplay.

Since territoriality is a part of the human behavioral system, it should be considered in system terms, says Altman (1970: 20). It should be considered not only as a resultant, but also as a determinant of behavior. Because it is bound up in a system, careful work needs to be done to factor it out, to control for it among other factors operating. Studies of crowding, for example, need to factor out the effects of confinement, and studies of the effects of crowding in our central cities must consider education, diet, disease, prejudice, and the abominable nature of the physical environment. Again, a study aimed at understanding deviant behaviors in the community could factor out the part which territoriality plays in them.

Most of the writing on cross-cultural differences in territoriality has been based upon casual observation. Although some experimentation has been conducted, it has been very limited and somewhat artificial.

Experimental procedures such as those developed by Sommer could easily be used to test the cross-cultural comparisons made by Hall. Systematic analysis of cultural differences will help to delineate the different types of territoriality and the ways in which they vary.

Many of the studies in human micro-ecology have been of situations involving confinement, such as mental hospitals and old age homes (Sommer, 1959: 259; 1967b: 151). "Studies of human interaction in fields or courtyards are practically nonexistent (Sommer 1959: 259)." Not much is known yet about how differences in site plan, for example, affect behavior.

Within the dwelling unit, research is needed into the interaction of territoriality with other interpersonal processes such as cooperation, conflict, and compatibility. It may be possible to establish a matrix of optimum spatial arrangements for each user-situation mix. Patterson (1968: 358) cautions, however, that other factors such as esthetics also act to govern the placement of furniture in the home, and may override consideration of the optimum conversation distance, for example. Research could help to establish the existence of a space bubble or buffer zone around groups, similar to that already demonstrated for individuals (Patterson, 1968: 358-9).

Along with changes in the coverage of research in human territoriality are needed improvements in methodology and technique. Hall (1963c) has developed a system for observing and recording proxemic behavior, and this system has been used by Watson and Graves (1966). A much-needed augmentation to this method is the use of photography, especially slow-motion moving pictures coupled with a stop-frame projector for micro-analysis.

In survey research, one of the most important problems is the establishing of a value system. Gelwicks (1970) believes that the amount of use may be in many cases a poor criterion of value to the user. "The value of a balcony, for example, may be quite high even if the statistics indicate it is rarely used. What value can be placed on three minutes of fresh air on the balcony after a heated family argument?" (Gelwicks, 1970: 159). Instruments such as Osgood's Semantic Differential Technique can be useful here.

6. BIBLIOGRAPHY

Agan, Tessie, and Elaine Luchsinger

1965 The House: Principles, Resources, Dynamics. New York, Lippincott Co.

Alexander, Christopher

1969 Major Changes in Environmental Form Required by Social and Psychological Demands. Ekistics, 28(165): 78-85.

Altman, Irwin

1970 Territorial Behavior in Humans: An Analysis of the Concept. In: Leon A. Pastalan and Daniel H. Carson (eds.), Spatial Behavior of Older People. Ann Arbor, University of Michigan Press. pp. 1-24.

Altman, Irwin, and W. W. Haythorn

1967 The Ecology of Isolated Groups. Behavioral Science, 12(3): 169-182.

Altman, Irwin, and E. E. Lett

1970 The Ecology of Interpersonal Relationships: A Classification System and Conceptual Model. In: J. E. McGrath (ed.), Social and Psychological Factors in Stress. New York, Holt, Rinehart, and Winston.

Ardrey, Robert

1966a The Territorial Imperative. New York, Atheneum.

1966b Man is a Territorial Animal. Life, Sept. 2

Bachelard, Gaston

1964 The House Protects the Dreamer: The Phenomenology of the Dwelling. Landscape, 13(3): 28-33.

Balint, Michael

1945 Friendly Expanses - Horrid Empty Spaces. International Journal of Psychoanalysis.

Blake, R.R., Rhead, C. C., Wedge, B. and Mouton, J. S.

1956 Housing Architecture and Social Interaction. Sociometry, 19: 113-139.

Boalt, Gunnar, and Carl-Gunnar Janson

1956 Distance and Social Relations. Acta Sociologica, 2:73-97.

Brower, Sidney N.

1965 The Signs We Learn to Read (Territoriality, The Exterior Spaces). Landscape, 15 (1): 9-12.

Byers, Paul

1964 Still Photography in the Systematic Recording and Analysis of Behavioral Data. Human Organization (Spring).

Calhoun, John B.

1962 Population Density and Social Pathology. Scientific American, 206(2): 139-148.

1966 The Role of Space in Animal Sociology, Journal of Social Issues, 22(4): 46-58.

Carp, Frances M.

1970 The Elderly and Levels of Adaptation to Changed Surroundings. In: Leon A. Pastalan and Daniel H. Carson (eds.), Spatial Behavior of Older People. Ann Arbor, University of Michigan Press. pp. 162-181.

Carpenter, C. R.

1955 Territoriality: A Review of Concepts and Problems, Paper presented at the Second Conference on the Evolution of Behavior, Sponsored by the National Research Foundation.

Cavan, Sherri

1963 Interaction in Home Territories. Berkeley Journal of Sociology, 8: 17-32.

DeLong, Alton J.

1970 The Micro-Spatial Structure of the Older Person: Some Implications of Planning in the Social and Spatial Environment. In: Leon A. Pastalan and Daniel H. Carson (eds.), Spatial Behavior of Older People. Ann Arbor, University of Michigan Press. pp. 68-87.

Dosey, M. A., and Meisels, M.

1969 Personal Space and Self-Protection. Journal of Personality and Social Psychology, 11: 93-97.

Felipe, Nancy

1966 Interpersonal Distance and Small Group Interaction. Cornell Journal of Social Relations, 1 (1): 59-64.

Felipe, Nancy, and Robert Sommer

1966 Invasions of Personal Space. Social Problems, 14 (2): 206-214.

Flachsbart, Peter G.

1969 Urban Territorial Behavior. Journal of the American Institute of Planners, 35 (Nov.): 412-416.

Freedman, Jonathan

1971 Abstract of his research findings on the effects of crowding on humans. Behavior Today, 2(12).

Gelwicks, Louis E.

1970 Home Range and Use of Space by an Aging Population. In: Leon A. Pastalan and Daniel H. Carson (eds.), Spatial Behavior of Older People. Ann Arbor, University of Michigan Press. pp. 148-161.

Goffman, Erving

1963 Behavior in Public Places: Notes on the Social Organization of Gatherings. New York, the Free Press of Glencoe.

Griffin, Robert M., Jr.

1969 Ethological Concepts for Planning. Journal of the American Institute of Planners, 35 (1): 54-60.

Gutman, Robert

1966 Site Planning and Social Behavior. Journal of Social Issues, 22(4): 103-115.

Hall, Edward T.

1955 The Anthropology of Manners. Scientific American, 192 (4): 84-90.

1959 The Silent Language. Garden City, Doubleday.

1960a The Language of Space. Landscape, 10 (1): 41-45.

1960b The Silent Language in Overseas Business. Harvard Business Review, 38: 87-96.

1962 The Madding Crowd; Space and its Organization as a Factor in Mental Health. Landscape, 12(1): 26-29.

1963a Quality in Architecture - An Anthropological View. Journal of the American Institute of Architects (July).

1963b Proxemics: The Study of Man's Spatial Relations. In: Iago Galdston (ed.), Man's Image in Medicine and Anthropology. New York, International Universities Press, Inc.

1963c A System for the Notation of Proxemic Behavior. American Anthropologist, 65 (5): 1003-1026.

1964a Silent Assumptions in Social Communication. Disorders of Communication, 42: 41-55.

1964b Adumbration as a Feature of International Communication. American Anthropologist, 66 (6, pt. 2): 154-163.

1965 Territorial Needs and Limits. Natural History, 74: 12-19.

1966 The Hidden Dimension. Garden City, Doubleday.

1968 Proxemics. Current Anthropology, 9: 83-108.

Haythorn, W. W., and I. Altman

1967 Together in Isolation. Transaction, 4(3): 18-22.

Hediger, Heini P.

1961 The Evolution of Territorial Behavior. In: S. L. Washburn (ed.), Social Life of Early Man. New York, Aldine. pp. 34-57.

Heyman, M.

1964 Space and Behavior: A Selected Bibliography. Landscape, 13(3): 4-10.

Hole, Vere

1971 Unpublished report to the Building Research Divison, National Bureau of Standards. Garston, Watford (England), Building Research Station.

Horowitz, Mardi J.

1965 Human Spatial Behavior. American Journal of Psychotherapy, 19 (1): 20-28.

Horowitz, Mardi J., D. Duff, and L. Stratton

1964 The Body-Buffer Zone: An Exploration of Personal Space. Archives of General Psychiatry, 11: 651-656.

Kuhn, Michael

1968 Researches in Human Space. Ekistics, 25 (151): 395-398.

Lawton, M. Powell

1970 Planners Notebook: Planning Environments for Older People. Journal of the American Institute of Planners, 36 (2): 124-129.

Lett, E. E., Clark, W. and Altman, I.

1969 A Propositional Inventory of Research on Interpersonal Distance. Bethesda, Md., Naval Medical Research Institute, Technical Report No. 1.

Little, K. B.

1965 Personal Space. Journal of Experimental Social Psychology, 1: 237-247.

Loring, William C., Jr.

1956 Housing Characteristics and Social Disorganization. Social Problems, 3: 160-168.

Lyman, Stanford M., and Marvin B. Scott

1967 Territoriality: A Neglected Sociological Dimension. Social Problems, 15: 236-249.

Mabry, John H.

1959 Toward the Concept of Housing Adequacy. Sociology and Social Research, 44: 86-92.

Madge, John

1968 Housing. I. Social Aspects. International Encyclopedia of the Social Sciences.

McBride, G.

1966 The Conflict of Crowding. Discovery, 27 (4): 16-19.

Meisels, Murray, and Francis M. Canter

1970 Personal Space and Personality Characteristics: A Non-confirmation. Psychological Reports, 27 (1): 287-291.

Merton, Robert K.

1948 The Social Psychology of Housing. In: Wayne Dennis (ed.), Current Trends in Social Psychology. Pittsburgh, University of Pittsburgh Press, 163-217.

Michelson, William

1968 Social Insights to Guide the Design of Housing for Low Income Families. Ekistics, 25 (149): 252-255.

Mykytowycz, Roman

1968 Territorial Marking by Rabbits. Scientific American (May): 116-126.

Pastalan, Leon A.

1970 Privacy as an Expression of Human Territoriality. In: Leon A. Pastalan and Daniel H. Carson (eds.), Spatial Behavior of Older People. Ann Arbor, University of Michigan Press. pp. 88-101.

Pastalan, Leon A., and Daniel H. Carson (eds.)

1970 Spatial Behavior of Older People. Ann Arbor, University of Michigan Press.

Patterson, M.

1968 Spatial Factors in Social Interactions. Human Relations, 21 (4): 351-361.

Pellegrini, Robert J., and John Empey

1970 Interpersonal Spatial Orientation in Dyads. Journal of Psychology, 76 (Sept.): 67-70.

Perin, Constance

1969 Resources for Behaviors. Paper presented at Symposium on Human Settlements and Environmental Design, AAAS Annual Meetings, Boston, Dec. 28.

Prescott, J.R.V.

1965 The Geography of Frontiers and Boundaries. Chicago, Aldine.

Rainwater, Lee

1966 Fear and the House-as-Haven in the Lower Class. Journal of the American Institute of Planners, 32 (Jan.): 23-37.

Rapoport, Amos

1969 House Form and Culture. Englewood Cliffs, Prentice-Hall.

Richards, Cora B., and Henry F. Dobyns

1957 Topography and Culture: The Case of the Changing Cage. Human Organization, 16: 16-20.

Rosenberg, Gerhard

1968 High Population Density in Relation to Social Behavior. Ekistics, 25 (151): 425-427.

Rosow, Irving

1961 The Social Effects of the Physical Environment. Journal of the American Institute of Planners, 27: 127-134.

Seeley, J. R., R. A. Sim, and E. W. Loosley

1963 Crestwood Heights: A Study of the Culture of Suburban Life. New York, John Wiley and Sons.

Sommer, Robert

1959 Studies in Personal Space. Sociometry, 22: 247-260.

1961 Leadership and Group Geography. Sociometry, 24: 99-110.

1962a The Distance for Comfortable Conversation: A Further Study. Sociometry, 25: 111-116.

1962b Personal Space. Journal of the American Institute of Architects, 38 (6): 81-83.

1965a Further Studies of Small Group Ecology. Sociometry, 28 (4): 337-348.

1965b The Significance of Space. Journal of the American Institute of Planners, 31: 63-65.

1966a Man's Proximate Environment. Journal of Social Issues, 22 (4): 59-70.

1966b The Ecology of Privacy. The Library Quarterly, 36 (3): 234-248.

1967a Classroom Ecology. Journal of Applied Behavioral Science, 3: 489-503.

1967b Small Group Ecology. Psychological Bulletin, 67: 145-152.

1967c Sociofugal Space. American Journal of Sociology, 72: 654-660.

1969 Personal Space: The Behavioral Basis of Design. Englewood Cliffs, Prentice-Hall.

Stea, David

1965 Territoriality, the Interior Aspect: Space, Territory, and Human Movements. Landscape, 15 (Autumn): 13-16.

1970 Home Range and the Use of Space. In: Leon A. Pastalan and Daniel H. Carson (eds.), Spatial Behavior of Older People. Ann Arbor, University of Michigan Press. pp. 138-147.

Steinzor, Bernard

1950 The Spatial Factor in Face to Face Discussion Groups. Journal of Abnormal and Social Psychology, 45: 552-555.

Studer, Raymond G., and David Stea

1966 Architectural Programming, Environmental Design, and Human Behavior. Journal of Social Issues, 22 (Oct.): 127-136.

Triandis, H. C., E. E. Davis, and S. Takezawa

1965 Some Determinants of Social Distance Among American, German, and Japanese Students. Journal of Personality and Social Psychology, 2: 540-551.

Triandis, H. C., and L. M. Triandis

1962 A Cross-Cultural Study of Social Distance. Psychological Monographs, 71 (540).

Watson, O. Michael

1969 Proxemics and Semiotics. Paper presented at the 68th Annual Meeting of the American Anthropological Association, New Orleans.

Watson, O. Michael, and Theodore D. Graves

1966 Quantitative Research in Proxemic Behavior. American Anthropologist, 68 (4): 971-895.

Webber, Melvin M., and Carolyn C. Webber

1967 Culture, Territoriality, and the Elastic Mile. In: H. Wentworth Eldridge (ed.) Taming Megalopolis, Vol. 1: 35 ff.

Willis, F. N., Jr.

1966 Initial Speaking Distance as a Function of the Speaker's Relationship. Psychonomic Science, 5 (6): 221-222.

Wilner, Daniel M., Rosabelle P., Walkley, And Stuart W. Cook

1952 Residential Proximity and Intergroup Relations in Public Housing Projects. Journal of Social Issues, 8 (1): 45-69.

Wynne-Edwards, V. C.

1964 Population Control in Animals. Scientific American (Aug.): 68-74.


DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS