THE DEVELOPMENT OF CERTAIN QUALITATIVE MEASURES OF FAMILY LIVING SPACE

Thesis for the Degree of M. A.
MICHIGAN STATE UNIVERSITY
CANDACE LYNN BABBITT
1970

ABSTRACT

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By

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Empirical evidence and inferences from authoritative experiences have resulted in a general heightened awareness of the reciprocal relations between man and his environment. The prospect of increased population density creates a sense of urgency in acquiring specific knowledge upon which to base public and private decisions regarding the human environment. Housing is one aspect of the micro-environment which requires study to interpret the needs of human beings into the qualitative dimensions of physical shelter. In such a context, traditional standards consisting of square feet of floor area, number of rooms per person or number of bedrooms per occupant are incomplete bases for determining housing adequacy.

Three factors which emerged from background readings as possible qualitative indices of housing adequacy were chosen for the focus of this study. These factors were activity density, infringement and personal space.

Activity density consists of activity time multiplied by the number of people present. The instrument entitled Activity Load was developed to measure this variable. Infringement on activities occurs when two or more conflicting activities are carried on in the same space. It was thought that identifying a high degree of infringement with activities would help delineate the nature of the shaping force of the density factor. Information from the Activity Load instrument and the Child's Personal Space instrument were combined to obtain a measure of infringement. The child's personal space is that space or area that is identified by the child as being used most often or exclusively by himself. The Child's Personal Space instrument was developed to measure this variable.

To test the viability of these measures, a pilot study was undertaken in June of 1969. The purpose of the study was to gain some knowledge which would be helpful in establishing measures of housing quality. Information was gathered from a sample of eighteen families who lived in university married student housing and had one child in nursery school. The sample was divided into two groups on the basis of family size: one group of families had an only child and the other group had two or more children. Thus, the human density of the families' living environment was different. Residents in married student housing were chosen for the study because not only the families but also

the living units had a high degree of homogeneity. This kept the basic physical parts of the environment relatively constant. Families with nursery school children were chosen because several authors have stated that environmental influence may be greatest during the early developmental years. The child's attendance in nursery school offered the possibility of administering tests which could describe trends in developmental levels.

The reliability and validity of the instruments were not statistically tested because of the small sample size. Methodology was critically reviewed immediately after the sample was taken and extensive revisions in the instruments were made. A coding procedure was developed and the data was analyzed by using a three-way repeated measures analysis of variance and a chi-square. Results showed activity density to be significant for groups and area of the home at the $<.01$ level, for time period at the $<.05$ level and for the interaction of area and time at the .05 level. Therefore, it was thought that activity density was a viable measure of space use. Infringement on the child's activities was significant at the $<.01$ level and all other variables and interactions were not significant. Although these findings may indicate that the method followed is not appropriate for measuring differences in the living environment due to infringement, the evaluation of the methodology suggested serious deficiencies in the instrument might

account for the lack of significant findings. Differences in the child's personal space between groups was significant at the .01 level (approaching .001). The high significance of this measure indicated that it was perhaps the most sensitive to differences of the density factor in the living environments of the two groups.

Conclusions were drawn from the methodological evaluation and the findings of the pilot study. On this basis, the instruments were criticized and revised. In consideration of the observable weaknesses reported in the evaluation of the instruments and the findings from the data, no firm conclusions can be stated. However, it was believed there was sufficient support for recommending further study based upon the revised forms of the instruments.

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Textiles, Clothing,
and Related Arts

1970

ACKNOWLEDGMENTS

Several people deserve my sincere thanks for their help in this study. The main source of ideas and meaningful criticism has been Dr. Gertrude Nygren. Dr. Robert Rice and Dr. Robert Boger have contributed a great deal throughout the preparation of this study as committee members. Thanks is also expressed to William Brown and Robert Wilson for directing the statistical analysis of the data.

Special appreciation is expressed to my sister, Virginia, who spent many days of her twelfth summer coding endless piles of data--just because it was mine.

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CHAPTER I

INTRODUCTION

The purpose of this study is to develop, evaluate and revise certain qualitative measures of family living space and to report the feasibility of these measures by conducting a pilot study.

A heightened sensitivity to factors contributing to the quality of the physical living environment places increased importance on recent research findings which suggest the relationship of the physical environment to human responses. The prospect of increased population density creates a sense of urgency on the need to define and explore the possible relationships between human behavior and the physical living environment. Extensive research has been done with animal populations to determine environmental conditions for optimal development. In contrast, relatively little consideration has been given to the behavioral effects of the physical living environment upon human beings. Curiously, some authoritative literature may suggest the possibility of ecological concepts but proceed to study personal and interpersonal behavior with

little consideration for possible modifying environmental effects. (see Review of Literature, p. 13).

Barker suggests that human behavior is largely determined by the spatial experiences to which man is constantly subjected.[1] Several authors have suggested that the most influential and irreversible effects of environment upon human behavior occur in the early developmental years. Environmental influence is said to be particularly significant during the ages of two to five years when the child starts to internalize those things with which he identifies. This process is the beginning of the development of the ego or self.[2] Sensorimotor skills are established by the end of the second year and provide the foundation for achievement in school.[3] The development of these skills is aided by contact and interaction with the environment. All learning and development is modified by the child's contact with his environment.[4] The importance of the early years was witnessed by the Head Start research team in the Department of Family and Child Sciences at Michigan State University. Their observations indicate that three to four year olds have been exposed to a deprived environment for too long to benefit permanently from the program.[5]

Although there would seem to be abundant information available on the physical needs and space requirements of children, the reverse is true of the information on their

social and psycho-educational spatial needs. In order to avoid making serious errors in the future, researchers should begin to develop a criterion or criteria for the amount and type of space required for an adequate living environment during the developmental years.

To date, the measures of housing space most emphasized have dealt with the amount of square footage and physical condition of the dwelling. Spatial adequacy has been described by person-room density and the extent of sharing facilities with non-family members. Space requirements for particular activities have been determined on the basis of dimensional or quantitative demands. There are numerous circumstantial factors which may have a modifying effect on the quantity and density of living space which must be examined to reach a realistic definition of housing adequacy. For this, we need more refined methods of studying spatial needs.

Even without complete affirmation of empirical research, there is evidence to indicate that high density in living spaces in United States homes does not constitute optimal living conditions. Density has been sighted by several authors as one of the most important factors affecting family life and it may be the most debilitating factor arising from the housing of low-income families. Density to the level of crowding has been said to cause stresses, strains and frustrations in family living because

it: influences attitudes toward privacy and the self, produces irritation in intra-family relations, and invites the intrusion of non-family members. For these reasons, crowding has been associated with a high level of dissatisfaction in the home.[6]

It has been hypothesized that under conditions of crowding the child's development is affected because: there is no place for private serious discussions with children, family members spend time away from home because there is not enough space for everyone to live comfortably, thus placing children out of the reach of parental control and there is no space for toys, projects and favorite possessions.[7] Density and spatial factors may well be valid primary concerns for researchers of family life due to the seriousness of the results implied.

The present crisis in housing is beginning to be acknowledged as a force which may alter American life. Although the problem touches nearly everyone, the poor are affected the most (they must pay a higher percentage of their income for housing than do other Americans). Difficulty in finding satisfactory housing at a reasonable price has contributed to a feeling of frustration in the nation, particularly in the ghetto. It has been estimated that new housing in the past four years has fallen more than 1,000,000 units shy of the amount needed. The housing industry itself is beset by conflicts and restraints which

make the housing that is produced cost more than it should. Presently, the government is involving private industry in an effort to improve the technology of low and moderate-income housing.[8] With these conditions present, it is imperative that we have knowledge available to make intelligent decisions concerning the design of new housing spaces.

Private and governmental agencies are making and will continue to make decisions regarding personal living environments with insufficient knowledge for doing so. We seem to rely on intuition, custom, fashion or just luck.[9] For intelligent future planning we need new concepts and a better understanding of human needs.[10] Our basic design difficulty is our lack of precise knowledge in understanding or predicting human response to various physical spaces.[11] We need a viable framework on which to base decisions so that we may make intelligent use of future techniques and materials that will be available for building.[12]

Frequent references in current periodicals and authoritative literature to the possibility of detrimental effects from impacted living environments (especially during early developmental years) prompted this study. (see Review of Literature). Because no appropriate instruments were located and there were numerous limitations in research methodology in the area of concern, a pilot study was undertaken. The study was limited to

developing several qualitative methods of describing space as a basis for future research in housing.

FOOTNOTES, CHAPTER I

[1]Roger Barker, Ecological Psychology, (Stanford: Stanford University Press, 1968), p. 9.

[2]James S. Plant, Personality and Cultural Patterns, (Cambridge: Harvard University Press, 1937), p. 120.

[3]Justin Pinkunas, Fundamental Child Psychology, (Milwaukee: Bruce Publishing Company), p. 119.

[4]Kenneth Francis and Eva A. Fillmore, The Influence of Environment Upon the Personality of Children, (Iowa City: University of Iowa Press, 1934), p. 7.

[5]The State Journal [Lansing, Michigan], April 14, 1969, pp. A-1 and A-16.

[6]Nathan Glazer, "Housing Policy and the Family," Journal of Marriage and the Family, XXIX, No. 1, 142.

[7]James S. Plant, "Some Psychiatric Aspects of Crowded Living Conditions," American Journal of Psychiatry, V (March, 1930), 13-18.

[8]"Why Housing Costs Are Going Through the Roof," Time, (October 31, 1969), 82-88.

[9]Edward Hall, The Hidden Dimension, (New York: Doubleday, 1966), p. 100.

[10]Humphrey Osmond, "Some Psychiatric Aspects of Design," Who Designs America, ed. Laurence B. Holland, (Garden City: Anchor Books, 1966), pp. 281-317.

[11]Ser: School Environments Research, (Ann Arbor: University of Michigan Press, 1965), p. 58.

[12]Osmond, op. cit., p. 316.

CHAPTER II

REVIEW OF RELATED LITERATURE

Environment and Behavior

Literature in human development often suggests a cause-effect relationship between man's environment and behavior. Those studies which are substantiated with empirical research data have dealt mainly with the environment as it effects physical health (Chapin, Wilner), deviant behavior (Schorr), and social interaction (Festinger). However, the basis for determining social and psychological environmental effects during the process of normal human development is still limited. The following is a brief review of the more outstanding research done to date.

In 1954, The Johns Hopkins Longitudinal Study of the Effects of Housing on Health and Social Adjustment was undertaken. Physical health and disease were most clearly linked to poor housing and crowded conditions. The better housed respondents had less illness and fewer accidents.[1] The housing variable was also associated with children's school performance but less clearly than physical health

and disease. Although the better housed did not always receive higher grades, they were more likely to be promoted at a normal pace than were the poorly housed.[2] Data also showed directional trends supporting the presence of housing influences on social-psychological adjustment. These influences were, in the order of importance:

reactions to housing and space
relations with neighbors
personal and family relations
attitudes and behavior toward neighborhood and community
social self-concept and aspirations
psychological state[3]

In addition to the influences on social-psychological adjustment, the better housed respondents expressed more positive reactions to specific aspects of the housing environment.[4] Eight percent of the sample said that no one in the family was bothered by a lack of space and that it was not an issue in family dissention.[5] Greater space and aesthetic improvement in the home were related to common family activities and the mother's reactions to and discipline of her children.[6]

In France, the team of Chombart de Lauwes studied overcrowding in the working class. To establish an index for crowding, they measured the number of square meters of living space per person. It was found that when the space per person reached a certain level (8-10 sq. meters per person) social and physical pathologies doubled. Illness, crime and crowding were distinctly linked in this study.[7]

Concepts and methods for studying "the environment of human behavior" were developed at the Midwest Psychological Field Station. Using the traditional person-centered approach, long records of children's behavior in real-life settings were made. It was found that some aspects of children's behavior could be better predicted from a knowledge of the places they inhabited than from a knowledge of the behavior tendencies of the particular children.[8] The work at the Field Station indicated that environment is itself a phenomenon worthy of investigation and not just "as an instrument for unraveling the behavior-relevant programming within persons." The environment was seen as highly structured "with an improbable arrangement of objects and events which coerce behavior in accordance with their own dynamic patterning." Barker concluded that, " . . . today environments are more varied and unstable than heretofore and their contribution to the variance of behavior is enhanced."[9]

Contributors to School Environments Research at the University of Michigan contended that, because man is always in some kind of space, he is constantly subjected to a sensing of space through his various sensory inputs and to his interpretation of these inputs, "all of which relates to his subsequent behavior."[10] The School Environments Research report states:

> . . .Man is constantly subjected to spatial experiences over which he has little or no conscious control, it becomes evident that space itself, enclosed or defined,

> is one of the most important factors in the total environment. This importance is recognized only when we consider human behavior.[11]

John Dean, author of "Housing Design and Family Values," says that:

> Evidence is beginning to accumulate suggesting that families are influenced by their living environments in all sorts of ways that neither the family nor the architect nor the social scientist were formerly aware of.[12]

In exploring the factors which contribute to home adjustments, Riemer noted that:

> . . .the process of home adjustment is dependent upon a complicated framework of socio-psychological interactions. The physical structure of the home is apt to have its bearing upon family solidarity . . .[13]

Although there is no guarantee that good housing alone will produce good behavior, bad housing does appear to contribute to family disorganization and other subsequent social ills.[14] If individual and group behavior is largely determined by the spaces man inhabits, then knowledge of the environment-behavior mix, particularly in the early years, is essential.[15] In his research with Head Start Children, Rice says:

> Numerous research studies have dealt with the influence of various aspects of the child's total environment but the role of the physical dwelling has been neglected for the most part. The research studies which have sought to identify causal relationships between housing and its effects on people have been concerned largely with the effects of housing on disease and health or on patterns of social interaction. Very few have touched upon the impact of the housing environment upon human development or more particularly, the growth and development of the younger child.[16]

Recent research in child development has indicated the importance of the early developmental years and the irreversible consequences of environmental related experiences during that time. During the first two to five years, children internalize those parts of their environment with which they can identify. This internalizing process is the beginning of the development of the ego or self.[17] Learning and development are modified by the child's contact and interaction with his environment.[18] Contact and interaction - the investigation of the environment - is aided by the development of early motor patterns.[19] As the child moves through his home spaces he begins assimilating and organizing experiences into environmental interrelations. Each of these experiences provide a basis for future development and exploration.[20] The provision of space and objects for exploration will naturally encourage the growth of coordination.[21]

The most important early environmental effects may be those which convert the child's inherited potentialities into personality traits. When environmental forces evoke a creative response, they become formative influences.[22] For the environment to be a positive influence it must provide learning stimuli from birth on. This is particularly important for the development of sensorimotor skills which are established by the end of the second year and provide a foundation for achievement in school.[23]

Head Start researchers at Michigan State have found that:

> Continued exposure to a deprived environment has deleterious effects upon a child's capacity to learn. Research of the Head Start Program has revealed that three to four year-olds who have been exposed to environmental deprivation are too old to benefit from the program.[24]

In his research on the intellectual development of lower-class, disadvantaged children, Beller states that:

> Children from crowded homes made fewer realistic demands for help from the teacher and were less effective in evoking a reaction from the teacher to their demands. These children from more crowded homes also made less constructive use of the help they received from the teacher in response to their requests. When engaged in their own activity, the same group of children were less distracted by other children. This first cluster of findings strongly suggests that the child from a lower-class, crowded home has a less intensive relationship with the teacher . . .[25]

It would seem that the preceeding information on child development coupled with the increasing implications of environmental effects would present an exciting challenge to researchers. Yet most studies continue to be done within the confines of a narrow specific discipline where possible interrelations continue to be speculated.

The Effects of Space

> Man's sense of space is closely related to his sense of self, which is in an intimate transaction with his environment. Man can be viewed as having visual, kinesthetic, tactile and thermal aspects of his self which may be either inhibited or encouraged to develop by his environment.[26] Edward Hall

The process of human development involves experiencing the social and psychological meanings of space. Spatial experiences take on personal significance in the process of acculturation and identity validation. Consciously or unconsciously, man is involved in a spatial experience every moment of his life. He is continuously influenced by the nature of structural barriers and by the people and objects within them. The spatial experience may differ with the area, volume and nature of the enclosing barriers. Man's spatial experience may be altered by activities, the number of people and things involved, cultural associations and backgrounds, and the reasons for being within a particular space.[27]

Perhaps the most noticeable spatial experience is crowding. Crowding can be so offensive and annoying that it is almost always consciously experienced. Crowding is a relative term which depends on the past experience of the individual and how his culture or sub-culture have defined it. It may refer to a lack of space or to density.

The density caused by crowding is less important than the intensity of the social conflicts which are likely to result.[28] The stresses, strains and frustrations of family living are often related to density and inadequate space in the home. To measure this, Bossard developed a "Spatial Index for Family Interaction" of x/sq. ft.; x being the number of interpersonal relationships. X is

determined by the formula $x=y^2-y/2$ where y=the number of persons. This gives a quantitative expression of the spatial setting of intra-group relationships, an index of the pressure of the physical nearness of the persons who are interacting and an indication of the degree to which home space may be presumed to place pressure upon family members in their relations with each other.[29]

Crowding has been sighted by numerous authors as one of the most important housing features effecting family life and it may be the main factor effecting low-income housing.[30] Research conducted by Wilner showed that when the dwelling was in good condition, space was the foremost housing value expressed by residents. When the dwelling was in poor condition, the condition was the foremost value and space was second.[31] To quote Wilner:

> Space is the primary perceived cause of discontent among families of four persons or less . . . overcrowding is associated with a high level of dissatisfaction . . . low density with a low level of dissatisfaction . . . as the condition of the dwelling improves, space dissatisfactions assume primary importance . . .[32]

Nathan Glazer, who is generally skeptical about the idea that housing influences behavior, admits that if there is any relationship at all, it is in the lack of space for family living. Glazer feels that crowding makes the most serious modifications on family interaction and the process of socialization because it influences attitudes toward privacy and the self, causes irritation

in intrafamily relations, and creates the intrusive presence of non-family members.[33] Crowding is one of the major stress-producing conditions. In the home, stress produced by crowding can affect child-rearing practices, housekeeping and study habits.[34] Blood, in his research on crowding and child-rearing practices, found that problems arose with two children in a two-bedroom apartment. There were more problems for the "permissive" than for the "traditional" families.[35] This difference may be accounted for by the stringent limitations of traditional discipline which places definite limitations on the right of individual family members to enter another's private areas without permission. When living space is crowded and privacy is difficult, conflicts often arise between family members. Alvin Schorr notes that:

> It is significant that the amount of space per person and the way space is arranged to promote or interfere with privacy have been related to stress.[36]

Schorr goes on to suggest that the generally high morale among suburban families may be due to the fact that they have more space and don't get in each other's way. Smaller spaces which contain a number of activities simultaneously make it difficult for family members to cope with everything at once.[37]

The effects of crowding on child development were first considered by Plant in the 1930's. He felt that crowding influenced the family in three major ways. First,

there was no place for private serious discussions with children. Secondly, family members began to spend most of their time outside away from the home because there was not enough space for everyone to live comfortably thus placing children out of the reach of parental control. Thirdly, overcrowded homes have no space for toys, projects and favorite possessions.[38] Such home conditions have potential negative effects on the development of the child. These are:

1. A perception of oneself that leads to pessimism and passivity
2. Stress to which the individual cannot adapt
3. Poor health
4. A state of dissatisfaction
5. Pleasure in company but not in solitude
6. Cynicism about people and organizations
7. A high degree of sexual stimulation without legitimate outlet [39]

In a master's thesis, Mary Winter compared the space available for play activities in apartments and single family dwellings. Winter states:

> The child's need for play space means that, in an apartment, more of the total space will be used for play activities. As more space is used for the child's activities, less space is available for parental privacy and entertaining. The child's opportunities for privacy will also be limited, because there is not a place where he can play within the dwelling that he is not near his parents.[40]

The most conclusive research done on the effects of crowding involves animal populations. Opinions differ on the validity of implying that animal behavior is indicative of human behavior but the findings are suggestive

and it may be well for us to bear in mind that the human being is not infinitely plastic. Man may, under severe and prolonged crowding, exhibit some of the same pathological behavior found in animals. James Plant, author of some of the most impressive research in human crowding, says:

> Animals brought up in situations of high density, incapable of eating, sleeping or procreating without large numbers of other individuals being present, have an increased incidence of a wide variety of pathology . . .This finding in animals confirms findings on input overload in human individuals and groups.[41]

The conditions brought on by crowding do not aid in the development of the kind of life valued by our culture. For quality in human life, we must have an environment which has spatial components to provide for quiet, privacy, independence and initiative. For proper development man needs the socializing effect of a normal human group, not one suffering from stress. These are not luxuries but real biological necessities.[42]

Territoriality

Recently, the fluid rhetoric of Robert Ardrey (The Territorial Imperative, 1966) has brought to the fore the behavioral concept known as territoriality. "A territory," writes Dubos, "is an area of space, whether of water or earth or air, which an animal or group of

animals defends as an exclusive preserve. The word is also used to describe the inward compulsion in animate beings to possess and defend a space."[43]

Territoriality has been recognized as an instinct in animals for some time but never, before Robert Ardrey, has the instinctive drive for territory been attributed to man. Ardrey explains this omission by saying that "it has been pressed aside by our political antipathies, by our sexual preoccupations, by our romantic fallacies concerning the uniqueness of man, by our contemporary dedication to the myth that man is without instinct and a creature solely of his culture."[44] He goes on to state that man is "as much a territorial animal as is a mockingbird singing in the clear California night."[45] . . ."as invested by the unknown but measurable forces of the natural world as is the planarian worm."[46] And, furthermore, that "the territorial nature of man is genetic and ineradicable."[47] Ardrey fortifies his argument by stating:

> The parallel between human marriage and animal pairing requires no lecturer with a long, pointed wand. The parallel between human desire for a place that is one's own and animal instinct to stake out such a private domain requires even less demonstration.[48]

This statement is followed by findings from empirical animal research. Man's relationship to the lower animal forms is assumed by Ardrey without the validation of empirical human research.

A number of scientists have questioned this approach to the development of a territorial theory. Ashley Montagu, (Man and Aggression, 1968), anthropologist and social biologist, has edited a number of essays refuting Ardrey's arguments on man's territorial instincts. The following are excerpts from the essays:

Crook:

> There is no doubt that Ardrey is right to emphasize the fact that human beings like animals show assertion and aggression of many kinds in relation to the ownership of objects and property and also in relation to ethnic or national territory. -- but must also consider the cultural implications -- socialization . . .[49]

Geoffrey Gorer:

> While territories are occupied and defended, the occupier can be considered the proprietor, and the territory its property. But this proprietorship differs in many ways from "private property" as understood in the modern world. It is not alienable or heritable and must be continuously defended or "earned." The data do not suggest that the territorial instinct is a natural validation of the ownership of transferable property by human beings. The demand for territory as a private breeding ground does seem to be nearly a human universal: even those societies which have "long houses" or other types of extended-family dwellings, provide a private breeding area by means of walls or partitions. A society which fails to provide adequate breeding areas for the newly mated may well evoke deep feelings.[50]

J. P. Scott:

> We have no knowledge whatever about the territorial behavior of pre-cultural man, and even if we did there has been ample opportunity for generic change to have taken place within the past several thousand years. We will have to make our judgements on territoriality in human beings on the basis of modern man himself, and here the anthropologists tell us that the importance of territory and private property varies enormously between different cultures . . .In short,

> there is no evidence that territory is or is not a biologically determined universal condition in modern man, but a great deal of evidence of important cultural differences. There may be some biological basis for territorial behavior in people, but it is equally possible that it is a human cultural invention.[51]

We need not equate man to the same natural world as the planarian worm to realize that there are implications, if not absolutes, in the concept of territoriality. Explanation and discussion is warranted as a backdrop for comparison with possession and property rights in man. The similarities between what has been observed in animal territorial behavior and human behavior may not be, as Ardrey says, derived from man's inherited instinct, but parallels do exist and they are, therefore, an important consideration in studying human spatial behavior.

To review, territoriality has been defined as "behavior by which an organism characteristically lays claim to an area and defends it against his own species."[52] Irwin Altman elaborates this definition in terms of human behavior:

> Human territory encompasses temporarily durable preventative and reactive behaviors including perceptions, use and defense of places, people, objects and ideas by means of verbal, self-marker and environmental prop behaviors in response to the actual or implied presence of others and in response to properties of the environment and is geared to satisfying certain primary and secondary motivational states of individuals and groups.[53]

All territorial behavior, whether animal or human, exhibits the following characteristics:

1. Reference to a place or geographical area within which an animal (man) behaves for some amount of time (situational contexts)

2. This functioning within a fixed geographical area is usually associated with needs or drives such as feeding, mating and child rearing. (organismic factors) (Ardrey's argument is that these needs are secondary to the need for territory.)

3. There is a characteristic territorial behavior which includes marking, defense and threats to intruders. (antecedent factors)

4. The territory is possessed by a behaving unit such as an individual, family or larger group. (organismic factors)

The functions of a territory are:

1. to insure propagation of the species by regulating density.

2. to provide a frame in which things are done.

3. to create proper spacing which insures against over exploitation of the area which a species depends on for its living. Thus, it protects the environment.

4. to provide protection from predators.

5. to define and display status.[54]

Both animal and human territorial behavior involve a specific area, marking activities, defense behavior and dominance. However, animal territory is restricted to a specific geographical area which, in humans, is more variable and abstract. Human territory varies in size from place to place and depending on the nature of situations and intruders. A man may have loyalties to community and nation which are much more abstract than the animal's loyality to a specific place. Humans also have a tendency

to lay claim to and "possess" objects as well as areas. Marking behavior is performed differently between animals and man but serves essentially the same purpose. Animals mark their territory with odors while humans use environmental props such as signs, fences, nameplates, etc. or such self-markers as body gestures, eye contact and other non-verbal behavior. Intrusion is handled by humans verbally, animals produce a physical threat display.[55]

Full-scale defense behavior is rare among humans because of man's elaborate network of barriers and subtle responses. The conditions which affect defense behavior in man are: interpersonal compatibility, role relations, social power and dominance relations. The degress of crowdedness, group size and the design and arrangement of space also cause differences in human defense behavior. A territory may be possessed by individuals, pairs or groups in both animals and man. However, man has a much broader range of possessions because of his numerous social roles and motives.[56]

In animal populations, possession of a territory makes the holder stronger. The challenger is almost always defeated and the intruder expelled. "Home ground" gives the holder more energy and at the same time inhibits the intruder. Aggression is thus limited because individual animals either avoid going where there will be disputes or engage in rituals of dominance--subordination rather

than actual combat. Human territory is associated with man's social heirarchy and satisfies certain personal and social motive states. Research indicates that there is a relationship between status and territorial behavior in man.

A form of human group territoriality is observable in the family home. Available space is assigned to different activities in such a manner as to achieve a minimum of mutual interference. This organization of family life can make even limited space functional. Families can adjust their use patterns by spatial segregation, time scheduling, functional differentiation of occasions or of objects, the use of dominence and the exercise of controls. All are measures to separate people by time and space. If these adjustments are not made and agreed upon, an inharmonious situation may develop. Family members begin to "stake out area claims and defend these territories as private domains." Family heirarchy is a defense mechanism. As the conflict becomes more intense and more threatening to the heirarchy, the areas become more delineated until special segregation is institutionalized and accepted by family members.[57]

In view of the implications and possible correlations between animal and human territorial behavior, it is surprising that more research has not been done. In searching the literature, Altman found less than a hundred studies on

territorial behavior. "Many of these were non-emperical, and many were included only by stretching the meaning of the concept." From past research, only the following is known about territorial behavior in humans:

1. Territoriality in humans is an established psychological fact. We must now know how it functions, what its origins are and what key factors affect it.

2. A frequent indication of human territory is occupation or consistent use. Only in certain instances do humans use the defense behavior common in animals. The existing research has been done mostly on the territorial behavior of individual persons, not on groups and not in normal situations. Self-marker or cognitive territoriality has not been explored. "There has been insufficient recognition of the multiple levels of territoriality including self-marker, environmental props and cognitive motivational behavior syndromes."

3. There have been a series of "demonstrations" of the factors affecting territorial behavior in humans. Affecting factors seem to be individual character such as personality traits, normal-psychotic conditions, interpersonal relationships of dominance and social need compatability. The importance of situational and environmental determinants of territorial behavior are evident in studies of isolated groups, expectations of long v s. short commitments to live with another person, and defense of own v s. public places.

4. Knowledge of territorial behavior is limited to short time periods. Little is known about the dynamics of the entire process. The emphasis has been on the current, visible characteristics of territoriality. The development of territoriality or the factors which influence its development have not been examined, nor have the long term effects, chancing patterns or losses of territoriality received attention.

5. Currently, the approaches to human territorial phenomena depend heavily upon animal research for

concepts and theory. Most authors begin with a review of animal research and end with the need for research in humans.

6. There is little theoretical basis to studies of human territoriality. Although there is agreement that in animals the territorial drive is at least partially genetic, instinctual or physiological, it is not thought to have an innate basis in humans.[58]

Privacy

Prior to the 18th century, there were no "bath" rooms, "bed" rooms, or "living" rooms. Homes had no spaces that were sacred or specialized. In the western world, privacy, as we know it today, did not exist. People came and went at will, furniture was put up, taken down and moved around according to the mood of those present at the time. Children and adults dressed alike, acted alike and were treated alike. There was no childhood, no nuclear family.

During the 18th century, rooms began to take on separate functions. The French distinguished "salle" from "chambre." The English began to name their rooms according to function -- bathroom, bedroom, living room, etc. Thus separated and defined, these new spaces provided privacy for family members. It was at this point that the family pattern we know today began to develop. Since then, the concept of the nuclear family has been further expressed and reinforced in the form of the house with private spaces being provided for family members.[59]

Privacy is the right of an individual to decide what information about himself he would like to communicate to others and under what conditions.[60] It is a result of the desire to hold back knowledge of experiences and intentions. Desire for privacy expresses the human need to be only partially known to others. It is a device for controlling other's perceptions and beliefs about the self.[61] "The right to privacy is the right to personal dignity."[62]

Privacy enables a person to assume non-public postures and thus prepares him physically for public life.[63] Psychotherapists and students of personality growth have found that people maintain their physiological and spiritual well-being better when they have a private place. In groups, privacy both reflects and helps to maintain status divisions. The ability to invade another's privacy has long been an indication of status.[64]

Because of its unique human behavioral states, Leon Pastalan has suggested that privacy is the human expression of territoriality. He has defined each of the four states and functions of privacy -- solitude, intimacy, anonymity and reserve -- in terms of Altman's definition of human territorial behavior discussed earlier. To review, these terms are:

1. Behavioral forms (use and defense)
2. Situational contexts (fixed place)
3. Antecedent factors (intrusion by another)
4. Organismic factors (sex, food, etc.)[65]

Pastalan contends that each of these characteristics is present in all four states of privacy.[66] The major difference between animal and human territorial behavior is the defense display. While animals have aggressive and ritualized displays for defending their territory such overt behavior is seldom seen in humans. It may be that the human behavioral form for protection and defense is not aggression but, instead, a drawing in and privatizing of the self from intruders or intrusions. This places new importance on the need for privacy in humans, particularly during the more vulnerable developmental years, and on the consequences of a lack of privacy.

Children are particularly susceptible to invasions of privacy, especially by adults, because of their subordination. Adults often invade the privacy barriers of the young by misunderstanding and impatience. Often adults are not aware of their intrusion, but children suffer from it.[67]

> Parental obligations concerning the care of a child override the child's rights to seclusion and place him in a position of social nakedness wherein he has no control over his appearance to others. However, to be subject to limitless intrusions is to exist in a state of dishonor, as implied in the rule against coming too close.[68]

Being subordinate, children cannot make the same demands for privacy as adults. This does not mean that privacy and separateness are not important to the child. Each state of development has it's own unique mode of privacy

which "may be defined in terms of the ego's relationship to those from whom privacy is sought and the manner in which withdrawal is accomplished."[69]

Because of the importance of privacy during the developmental years and the child's vulnerability to intrusion, emphasis will be placed on the child's needs in the following discussion of the need for privacy.

Privacy is needed for autonomy, emotional release, self-evaluation and limited and protected communication.

Personal Autonomy

Our society places a high value on the individual. The development of the individual has been linked to the need for autonomy.[70] Autonomy begins to appear at age two to three and, unless discouraged, continues to develop throughout life. For the identity of the self to become clear, the individual must be able to be alone for reverie and daydreaming. It is important that physical barriers separate the child from others during these times. "A sense of being a person is gotten from group interaction. A sense of selfhood develops apart from the group in private."[71] Reverie and daydreaming help to integrate past and present purposes and values and develop interpersonal competence which renews sociability.[72] An individual cannot develop autonomy if his intimate thoughts are constantly interrupted. Therefore, space is needed for

physical privacy. Respect by others for privacy also facilitates autonomy.[73] Speaking of the child's need for privacy, Young says:

> Without privacy there is no true individuality. There are only types. Individual personality is a process of growth, not a discovery, not a product stamped out by a machine. For that process, solitude is as necessary as companionship, quiet as important as activity.[74]

If no space is available for privacy and the child is constantly in the company of others, he may become so oversocialized that he will feel frightened and lost when left alone.[75] This destroys his sense of individuality and an incomplete personality develops. To quote Plant:

> Our work in suburban and rural districts has convinced us that periods of being alone, of playing alone, of having the privacy of one's own room, are important fostering agents in a feeling of individuality, of self-sufficiency.[76]

Emotional Release

No individual can constantly maintain a public facade. The tension would be too great. At times when one can no longer contain the emotional overload of role playing, privacy is sought for emotional release without "losing face." In situations of severe stress, a private place is crucial. When children are unable to escape stress situations due to a lack of space, they develop a hostility toward their environment. James Plant compares introverted and extroverted children by the introvert's hostility

toward his environment. Extroverts, on the other hand, are characterized by a "friendliness" toward their environment.[77] Lack of privacy and the constant presence of other individuals produces mental strain in children. If there are no times when the child can "get away from it all," relax and let down his guard against others he will become fatigued and develop a negative attitude.[78]

Self Evaluation

Time for introspective thought away from information input is needed by everyone for re-evaluating, self-evaluating, developing judgement and creative thought. As emotional involvement increases, the need for private facilities to conceal chosen habits or activities also increases. Overexposure of the parent-child relationship making <u>all</u> habits and activities known negates any mutual admiration.[79] This overexposure to others, especially to adults, has a disruptive effect on the development of the child's judgement.[80] Because the child is constantly exposed to his adult models, he sees them in all situations as they really are, not as he would idealize them to be. There is a lack of goal-images in the adults closest to the child. Hero images become unknown people outside of the family who are de-personalized.[81] Thus, the child does not have intimate goal-images whose judgement he respects and can adapt as his own at some later date.

Nelson Foote supports Plant's theory by suggesting that children who have their own space for private play and solitude develop better empathy, judgement and creativity. He argues that children who have the time and space for their own private endeavors will have more intellectual or emotional identification with others. Although exposure to others is important in developing empathy, over-exposure has the opposite effect.[82]

> There is a critical point beyond which closer contact with another person will no longer lead to an increase in empathy. . . .Up to a certain point, intimate interaction with others increases the capacity to empathize with them. But when others are too constantly present, the organism appears to develop protective resistance to responding to them. As the number of persons one must deal with increases, it is necessary to respond to them impersonally.[83]

In privacy there is also the opportunity for self-exploration and experimentation. The ability to withdraw into fantasy and make-believe enhances the development of creativity in children.[84]

> Practice in make believe and utilization of imaginary, absent or hypothetical audiences increases the probability of creativity. Respect for one's own voluntary fantasy and ability to withdraw are the principle cases in point.[85]

Limited and Protected Communication

Two aspects of communication are provided by private space. First, the opportunity for intimacy with chosen others and, secondly, a place to withdraw and limit communication by physical barriers. Withdrawal into privacy may also be accomplished by means of facial

expressions and body gestures.[86] "Withdrawal into privacy is often a means of making life with an unbearable (or sporatically unbearable) person possible." Without the opportunity for distraction and relief, intimacy can produce hostility as well as affection.[87] When intimacy is desired for family communication, it is essential that it can be shared without fear of intrusion. When there is no place for private serious discussions between parent and child, communication on important matters becomes impersonal.[88]

Measuring Space

The first challenge researchers of spatial behavior and ecology must meet is the establishment of a viable criteria for defining environmental parameters. Once developed, these parameters will serve as a valuable background for comparative behavior. To quote Barker:

> An initial practical problem of ecological research is to identify the natural units of the phenomenon studied. The essential nature of the units with which ecology deals is the same whether they are physical, social, biological or behavioral units:
>
> (a) they occur without feedback from the investigation; they are self-generated.
> (b) each unit has a time-space locus.
> (c) an unbroken boundary separates an internal pattern from a differing external pattern.
>
> The problem of identifying and describing the ecological environment of behavior is an empirical one. It is necessary to observe and describe the environment in order to develop theories that can later guide further empirical investigation.[89]

To date research in family ecology has been severely hindered by the lack of effective ways to measure and describe family living space. The implications of crowding, territorial behavior and privacy are exciting challenges for future research. But without a viable basis for defining the environmental space variable there is no stage for behavioral study. Past standards for measuring living space are grossly incomplete when coupled with social and psychological variables. These standards have been set by the American Public Health Association in an effort to define crowded living. They are:

1. the amount of square footage
   --400 sq. ft. for one person
   --750 sq. ft. for two persons
   --1000 sq. ft. for three persons
   --etc.

2. the number of people per bedroom
   --1 bedroom for two people
   --2 bedrooms for three people
   --3 bedrooms for four people
   --etc.

   Two (but no more) persons may share a bedroom if they are (1) a married couple, (2) children of the same sex or opposite sex under six years of age, (3) older children of the same sex, (4) an adult and a very young child.

3. the person per room ratio
   --one per room is uncrowded[90]

None of these measures are entirely adequate. The amount of square footage does not take into account how the space is divided or arranged.[91] It is also an unrealistic measure in actual practice. We do not speak of a

2500 square foot home but of "seven rooms" or "three bedrooms." Research on consumer space preferences indicated that consumers do not "prefer" floor area because they cannot envision the space from measures in square footage. Instead, they "prefer" rooms - a standard much more relevant to the accommodation of activities and furniture.[92] The room concept, although the most commonly used, does not take into full account the amount of usable space within the rooms. For example, the floor area of a bedroom determines how many people can comfortably use it. If, however, it is necessary for some other family members to walk through a bedroom to gain access to other living areas, its adequacy is, to a degree, limited. The person per room ratio not only ignores size and arrangement but does not consider the functions for which the rooms were designed. A six room house with only one room which will function as a bedroom may result in more crowding than a smaller house which has three separate sleeping areas.[93] The term "use crowding" is used to describe a room which has been designed for one function but is also used for other different functions to the point of overuse.[94] Use crowding may exist undetected by measures which do not take into account the number of functions that have been assigned to the spaces of a living unit. The amount of space available to accommodate family demands determines whether or not there is use crowding. Numerical measures

of crowding do not take these factors into consideration and assume that all families engage in the same activities at the same time and prefer the identical life style.[95]

Nelson Foote suggests that an ideal measure of space would take into account: (1) total floor area, (2) room count, (3) bedroom count, (4) total number of occupants and (5) age, sex and relationship of the occupants.[96] To these could be added cultural background, attitude toward the home, family activity priority and life style. These measures consider the cultural, sociological and psychological modifications of living space to develop a more valid assessment than physical and biographical data. Crowding is a relative term which precludes the establishment of absolutes of physical and biographical data. Variations on the three standard methods of measuring and evaluating living space have been developed. However, none of the variations found take into account all of the variables which must be accounted for to have a meaningful measure.

Kremer and Leaman used photography to study the home activities of children as they related to spatial requirements. An oilcloth grid was placed on the floor of the home and space use was recorded by a camera taking both single and multiple exposures of specific activities. The resulting "data" was numerous pictures of children engaged in activities on or around an oilcloth grid. The profundity of these data may account for the fact that the

methodology, not the findings, was reported. The only stated conclusion was that "the space used seemed to be determined by the space available and the placement of the furniture in the room."[97]

Woodworth made a critical evaluation of three laboratory techniques used to measure activity space needs. The techniques evaluated were: (1) observation against a grid background, (2) direct measurement by "freezing," and (3) movable wall panels. She found that the grid observation method was the least variable and also the most preferred by the subjects. "Freezing" showed the next least variability and the movable wall panel the most variable able method.[98] Although these findings may be useful in the evaluation of physical space for physical activities, they do not contribute to the development of a criteria for the evaluation of living space for human (physiological, sociological, psychological) activities.

There have been several studies done which use the three space measuring techniques evaluated by Woodworth. These studies have been concerned with physical spatial requirements and have concentrated on the economics of space - i.e., the amount of space required for convenience and efficiency for household activities and storage. These physical requirements do not contribute to the more subjective problem of determining the adequacy of living space in terms of human needs and demands. Also, they

are appropriate only when small samples are required for useful findings.

Hasler used the number of persons per bedroom ratio to study the use and adequacy of space in prefabricate houses. The houses were ranked for adequacy by yes-no answers on specific topics based on the criteria of: (1) no more than two people per bedroom, (2) a separate bedroom for children over nine of the opposite sex, (3) a separate bedroom for married couples, and (4) two brothers or two sisters were allowed in the same bedroom regardless of their age.[99] This study is subject to the same criticism as the person per room ratio - i.e., that it does not take into account the size, arrangement of space and human modifications of the rooms being considered. As such, it would seem to be an inadequate basis for the assessment of the quality of prefabricated houses.

Zimmer made recommendations for housing features which should be altered or used to provide for safety and convenience in the care of the preschool child.[100] Numerous specific physical features of the home were identified but the optimal spatial arrangement of these features was not developed. There was no attempt to explore the concept of space, i.e., the spatial experiences of the family, as a feature to be altered or used in the care of the preschooler.

An explanatory investigation to develop a hypothetical frame of reference for crowding research was done by

Reimer. Respondents were asked questions about family home activities to find what housing features were "a source of continuous annoyance." The responses were grouped under (1) space factors, (2) plan (arrangement factors), and (3) equipment. Results were compared by use of the person per room ratio. "The percentage of complaints is four-doubled (8% to 33%) as we proceed with homes with less than a half a person to homes with more than one person per room. Family size, on the other hand, does not show any clear relationship to the number of complaints about the family home." Highly crowded families offered less consideration to the problems of floor plan and room arrangement.[101]

The significance of Reimer's study is that the person per room ratio, family activities and housing factors that had "been a source of continuous annoyance" were linked to establish a more meaningful criteria for crowding. Any functional evaluation of living space must try to relate such physical features as the number of rooms, their size, arrangement and use to the more intangible factors of family activities, attitudes, needs and demands.

With these factors in mind, the following pilot study was conducted in an effort to develop a more meaningful measure of family living space. Interest in this problem was initially generated by the literature which suggests a correlation between the near environment and

human behavior. Of particular interest was the possibility that spatial factors which were previously ignored may have an impact on family life. For this reason, the degree of privacy or personal space and spatial density were explored as possible definitive measures. Having no previously tested instruments for guidance, the major effort in the study was to develop, evaluate and define viable research techniques.

FOOTNOTES, CHAPTER II

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CHAPTER III

THE PROBLEM

The specific problem of this study was to develop instruments which could be used to describe family living space. The following were seen as subunits of this problem:

A. to initiate the development of a means of measuring which determines the number and type of activities and the number of people within specified areas of the home by time period,

B. to initiate the development of an index of activity density in the home by area and by time period,

C. to initiate the development of a means of identifying the activity spaces of an individual child,

D. to initiate the development of a means of identifying the degree of infringement on the child's activity spaces,

E. to initiate the development of a means of classifying the degree of infringement on the child's activities according to the time of day and type of child's activity,

F. to initiate the development of a means of locating object space of an individual child and determine

the number of personal object spaces which are shared or individually possessed.

Definition of Terms

For the purposes of this study, the following definitions were used:

1. Activity load - is defined as the total number of activity units in an area of the home.
2. Activity units - are defined as a measure of activity by less than one half hour duration and more than half hour duration (one and two units respectively).
3. Activity density - is defined as the total number of activity units multiplied by the number of people present in the home while the activities are being carried on.
4. Activity space - is defined as that area of living space in which particular activities are carried out.
5. Child's personal space - is defined as that space or area which is identified by the child as being used most often or exclusively by himself.
6. Child's personal object space - is defined as that space or area which is identified by the child as being used for keeping his personal objects.

7. Crowding - is defined as the existence of a condition where the density of persons and/or activities and/or objects in a given space is undesirable to the inhabitants.
8. Heirarchy of space use - is defined as the family order of priority which determines which activities and family members have claim to the use of space in the home.
9. Individual creative and play space - is defined as that space or area which contains the preschool child's activities of coloring, painting, playing with toys and watching T.V.
10. Infringement - is defined as the simultaneous use of a space for two or more conflicting activities.
11. Management - is defined as the handling, direction or control of persons, activities and objects within a living space.
12. Mother's attitude - is defined as the mother's opinion of the subject in question.
13. Personal objects - are defined as articles which have special meaning for an individual. Some personal objects may be shared with certain intimate persons, other personal objects may not. Those which may not have a special meaning for identity.[1]

14. Personal care space - is defined as that space or area which contains the preschool child's activities of eating, dressing and sleeping.
15. Physical arrangements - are defined as the floor plan and furniture placement of a living space.
16. Privacy - is defined as the right of an individual to decide what information about himself he would like to others and under what conditions.[3]
17. Private space - is defined as some locus that is inviolable by others except at the person's express invitation.[2]
18. Social activity space - is defined as that space or area which contains the preschool child's activity of playing with friends.

FOOTNOTES, CHAPTER III

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CHAPTER IV

STUDY METHODOLOGY

Development of Instruments and Procedures

The major work in the development of the instruments was accomplished as an outgrowth of a two-term graduate seminar in family housing. Readings and class discussions focused upon the implications from theories of social, intellectual and psychological development found in literature pertaining chiefly to the child in the early years.[1] Readings dealing with spatial concepts were also discussed when they were relevant to developmental concepts. Major attention was devoted to identifying propositions and theories implying a relation between the social and psycho-educational levels of children and their environment. In this manner, the members of the class became aware of the absence of adequate instruments and the need for measures more fully descriptive of the qualities of the home spatial environments. It became obvious that progress in understanding man and his environment was dependent upon defining the elements of that environment.

The possibility of detrimental effects from impacted living environments focused importance on the amount and quality of private spaces in the living environment. The desirable amount and quality of private space is thought to be culturally defined. Therefore, the discussion is limited to North American living environments. For the purposes of this study, private space has been defined as some locus that is inviolable by others except at the holder's express invitation. Three factors were thought to be important in considering the amount and quality of private space: crowding, physical arrangements and management.

Crowding has been defined as the existence of a condition where the density of persons and/or activities and/or objects in a given space is undesirable to the inhabitants. It was thought that crowding may inhibit a person's private space because:

1. With a high density of persons;
    (a) there is no shield from observation by others
    (b) there is an increased possibility for interaction and, therefore, intrusion by others
    (c) there is an increased possibility of the presence of unwanted others
2. With a high density of activities;
    (a) there is less space for each other activity to be carried on

(b) there is the possibility of unwanted interruption or distraction from other activities

(c) there is the possibility of conflict from incongruous activities occuring simultaneously

3. With a high density of objects;

(a) the space available for activities may be limited

(b) there is a lack of places where personal objects can be kept without being handled or seen by unwanted others

Physical arrangements (floor plan and furniture placement) affect private space because:

1. they may or may not shield a person and his personal objects from others[2]
2. they determine certain possibilities for interaction and withdrawal and create the setting for rituals that support privacy needs[3]

Management may affect private space because the handling, direction or control of persons, activities and objects within a living space may or may not produce situations which support a person's need for private space.

Several authors suggested that the above factors were related to frustrations in family life and dissatisfaction with the living environment. In addition, there were numerous references to the importance of the living

environment during the early developmental years.[4] (see Review of Literature, p. 12)

The available methods of measuring living space are quantative in nature (i.e., person per room ratio, amount of square footage, etc.).[5] These measures appeared to be inappropriate for this study as they did not consider factors which may modify living space. Therefore, it was necessary to develop original instruments. These instruments were: The Biographical Information Instrument, the Activity Load Instrument and the Child's Personal Space Instrument. The author is responsible for the final stages of the Activity Load Instrument and wholly responsible for the Child's Personal Space Instrument.

Biographical Information

Students reviewed the biographical instruments of a number of past housing studies and made adaptations from their content and structure to fit the demands of the study. In addition to these adaptations, questions relevant to this study were composed. The resulting biographical instrument was, therefore, a combination of several past biographical studies and original questions. (See Appendix)

Activity Load Instrument

Most directly related to the development of the instrument was Bossard's "Spatial Index for Family Interaction" as it is a more qualitative expression of living space than the other measures available. The index is: x/sq.ft., x being the number of interpersonal relationships, $x=y^2-y/2$ and y=the number of persons.[6] Bossard takes into account interpersonal relationships as one of the human factors which might modify living space. This concept of relating space to interaction suggested that the density of activities and of people occupying a space could alter the way that space is perceived and used by it's inhabitants. For example, if activities were inhibited by restricted space, the participants may experience frustration that would lead to a certain type of interaction. On the other hand, if the space was adequate for the desired activities, the participants would experience a different type of interaction. Therefore, the Activity Load instrument was developed to record the number of people present in a space plus the location, type and duration of activities. From this information, activity units were derived.

Activity density was computed during coding by multiplying the activity units times the number of people present in the home. Activity units were chosen as the multiplican because they were an indication of the density of activity. The multiplier, the number of people present,

was chosen because of the suggestion from Bossard's index that human interaction modified living space. It was believed that the activity density index would give an indication of factors affecting the adequacy of living space for family activities.

The interview schedule was administered to 32 families who lived in University married housing. All of the respondents had one child in nursery school. This sample was chosen because the married housing units had approximately the same amount of floor area and similar external environments. Of the 32 families interviewed, eighteen were chosen for reporting in this study. The sample was divided into two groups; the first group of families had one child, the second group had two or more children.

A coding procedure was developed to organize information into data for computer statistical analysis. Frequency distributions were used to describe the sample population and served as a basis for the chi-square computation. The coded data was analyzed by using a three way repeated measures analysis of variance with a conservative test and, for child's personal object space, a chi-square. Differences between the two groups and/or the interaction of variables was determined by an F test for activity density and infringement and a chi-square was used for child's personal object space.

The methodology of the study was critically reviewed and suggestions for revision were made. The instruments were analyzed for their efficiency, reliability and validity and numerous revisions were made. Three new instruments, Housing Evaluation, Activity Priority and Area Crowding were designed to supplement the revised instruments.

Child's Personal Space Instrument

The objective in the development of the Child's Personal Space instrument was to explore the concept of privacy and private space for personal objects. The child was chosen as the respondent because of the frequent references in the literature to the importance of privacy and private space during the early developmental years. Age of the respondents was a seriously limiting factor in the development of this instrument because of the difficulty in communicating abstract concepts (privacy and proprietorship) to preschool children. Therefore, the instrument was limited to the location of activities and personal objects. An indication of the degree of proprietorship was obtained by noting shared or exclusive use. Eight common activities of children and six artifacts often associated with a preschool child were chosen as the indices for this information. Selection of the artifacts was dictated by the need to insure that they were objects likely to be present in the homes of the respondents and by the need to have items

with which the preschool child could identify and respond. The selection of the activities was subject to the same restrictions.

The transparency method used to record activity load was employed to record a portion of the child's responses. By using this method, transparencies could be overlaid for an indication of when and where the child's activities were occuring simultaneously with the activities of other family members. A criteria was developed to determine if the other activities were infringing on the child's activity.[7] (See Criteria for Coding Infringement, p. 69)

Selection of the Sample

The sample of families described in this investigation was obtained and selected from the cooperative nursery school at Michigan State University. Children accepted at the nursery school in September, 1969 were selected according to the following criteria:

1. Residence in university married housing (thus the space per family was nearly constant).
2. Sex (half male and half female).
3. Age (2 yrs.,10 mo. to 4 yrs.,10 mo. at the beginning of the school year).
4. Sibling status (half only children and half with siblings).

Out of 40 families who were originally considered to be eligible for the study, ten moved before the interviews could be scheduled, one mother did not understand English well enough to communicate, one was on vacation at the time of the interview and two families refused to cooperate. In the remaining group of 26 families, nine had only children and 17 had two or more children. Of the families with only children, five had another child within six weeks prior to the interview date. These families were kept in the only child group because it was felt that a six week old or younger infant would not have a significant portion of personal space for a long enough period to alter the nursery school age child's space usage. Although this situation was not ideal, the scarcity of only children families made it necessary to make allowances to maintain the cell formation.

All of the 17 families with two or more children were interviewed to have the opportunity to gain experience with the instruments. However, in the analysis of the data, one of these families was eliminated because both parents were foreign born and had markedly different living patterns. Nine families were selected randomly from the sixteen remaining families with two or more children, to create a cell equal in number to the only children families. Therefore, the final sample size was 18: nine families with an only child and nine with two or more children.

When the parents registered their child in the nursery school in the Fall of 1968, they were informed that they would be asked to participate in some type of research involving their child. In the Spring of 1969, a letter describing the project was sent to the parents by the director of the nursery school. Following the letter, each family was called by an interviewer to arrange for one hour of interview time in the home with the mother and the pre-school child.

Methods of Gathering Information

This research was initially undertaken by two graduate seminar classes in Housing which met Winter and Spring terms of 1969 at Michigan State University. Therefore, it was the responsibility of the students in the class to gather the information from the selected sample. The students also developed the interview technique to be employed and had at least some familiarity with all of the instruments before the interviews were begun. All of the eight graduate students were assigned families to interview. When scheduling permitted, two students formed a team to gain additional interview experience. Team interviews were not always possible since the interviews were done during final exams. Although varying the number of interviewers could possibly effect the results, the situation was unavoidable.

Prior to the interview, students were given a packet which contained:

A. The Instruments Used in This Study
   1. The Biographical Information instrument
   2. The Activity Load instrument
      a. A floor plan of the home (in one-fourth inch scale with a grid drawn in)
      b. Nine activity load information transparencies
      c. One extra activities information transparency
      d. A list of family activities to be used for completing (c)
   3. The Child's Personal Space instrument
      a. Two personal space information transparencies

B. Other Instruments
   1. Two copies of the Visual Impression instrument
   2. Two copies of the Personal Attitude instrument
   3. One copy of the Activity Performance instrument

C. Interview Equipment
   1. One clipboard
   2. Two felt tipped marking pens; one blue, one red

The Other Instruments contained in the interview schedule were left with the family for completion and were to be picked up at a prearranged later date. These instruments were not used in this study.

The interview procedure was a follows:

1. The interviewer introduced himself or herself and briefly explained the project as "an attempt to measure family living space." Interviewers were instructed not to state any hypothesis or volunteer more information than necessary to avoid comments which might influence the responses.
2. If two interviewers were present, one administered the Biographical Information instrument while the

other drew furniture placement on the floor plan. If one interviewer was present, the respondent was given the Biographical Information instrument to complete while the interviewer placed the floor plan on the clipboard and drew in furniture placement on the floor plan.

3. The interviewer explained the Activity Load instrument to the respondent saying:

> We would like to know what activities you perform during a typical day. As I say the time periods, tell me what your family is doing, how many of you are present, and approximately how long the activity lasts. Then point to the area that is being used on the floor plan.

The interviewer then placed a transparency over the floor plan on which the furnishings had been marked. One of the nine transparencies was used to indicate the responses for each time period, starting with 7:00 - 9:00 A.M. and ending with 11:00 - 1:00 A.M. The tenth transparency was used for additional activities which might not occur during a typical day - for example, laundry. The interviewer wrote the following information on the transparency as it was reported by the respondent; the time period, the activities being performed and the number of persons present.

As the mother pointed to the areas on the floor plan that were being used, the interviewer marked the area by the following code; diagonal lines (////) for more than

1/2 hour use and cross-hatched lines (XXXX) for more than 1/2 hour use. If the mother seemed to give very general answers, interviewers were instructed to ask for a more specific indication of the location of space use. (For example, "Do you use the table, too?")

Upon completion of the recording of a typical day of activities by two-hour time periods, the interviewer read a check list of activities and asked the mother to indicate any activities engaged in which had not been mentioned. This information was entered on the tenth transparency provided for "Extra Activities." If two interviewers were present, one administered the Activity Load instrument while the other played with the child in an attempt to establish some rapport before asking the questions contained in the Child's Personal Space instrument.

4. If two interviewers were present, the one who had been playing with the child conducted the interview with the child. The interviewer asked the child to help draw a map of his home. It was explained that he was to locate areas while the interviewer drew the map. The exact vocabulary of the explanation was left to the judgment of the interviewer. It was felt that following an exact explanation or set of directions might not be the best means of communicating with a pre-school child. Therefore, it was the responsibility of the interviewer to employ whatever devices or wording was

deemed necessary to gain the cooperation of the child. Once the explanation was satisfactory to both interviewer and child, the interviewer placed a new transparency over the floor plan. For each of the eight child's activities listed on the schedule the interviewer said, "Let's pretend you are going to (paint). Where would you go?" After the child had led the interviewer to the requested activity area, it was marked by number on the transparency using the red marking pen. This procedure was also followed for questions 9 - 11 using the exact wording stated ("Show me where you ___"). The remaining five questions were not marked on the transparency. These questions were asked by the interviewer who checked the appropriate answer blank. This ended the interview with the child.

5. Administration of the first eight questions on the Child's Personal Space instrument was repeated with the mother as the respondent. A new transparency and a blue marking pen were used for recording. The mother was asked to point to areas on the floor plan to indicate where the child performed eight specified activities.
6. The interviewer asked the mother to complete the remaining questionnaires (Visual Impression,

Personal Attitude and Activity Performance) at home at her leisure. Arrangements for collecting these were made before the interviewer left the home.

The total interview time was approximately one hour for two interviewers and slightly more for one interviewer. However, after the author had completed six interviews alone the time was reduced to about 50 minutes.

Coding Procedure

Biographical Information Instrument

Since the instruments were not pre-coded, it was necessary to assign code numbers after the information was collected, and to transfer them to code sheets for card punching.

Activity Load Instrument

The completed Activity Load instrument contained:

1. The floor plan of the home on a one inch scale grid on which furniture placement was indicated.
2. Ten marked transparencies, nine of which were for two-hour time periods during the day starting with 7:00 A.M. - 9:00 A.M. through the day to 11:00 P.M. - 1:00 A.M., the tenth marked transparency was for activities which might not occur daily such as laundry.

Line markings on the transparency indicated the length of time an area of the home was in use during a specific two-hour time period. Diagonal lines indicated less than one-half hour use while cross-hatched lines indicated more than one-half hour use. In addition, the number of people present during the time period and the activities performed were written on the transparency.

Coding procedure for activity load was as follows:

1. The coder placed the first transparency (7:00 A.M. - 9:00 A.M.) over the floor plan.
2. Starting with area 1 (living room, door side), the coder counted the number of activity units. Diagonal lines were counted as one activity unit. Cross-hatched lines were counted as two activity units. This was done for each of the seven areas which were:

   Area (1) - living room, door side

   Area (2) - living room, other side

   Area (3) - dining area

   Area (4) - food preparation area

   Area (5) - bathroom

   Area (6) - child's bedroom

   Area (7) - parent's bedroom
3. The number of people present in the home during the time period was recorded.

4. The coder removed the first transparency and placed the second (9:00 A.M. - 11:00 A.M.) over the floor plan. The number of activity units in each area and the number of people present in the home were recorded. This process was repeated for nine transparencies.*

When the coding process was completed, the code sheets contained information on the activity units of each area and the number of people present by time period. Activity density was computed for each area by multiplying activity load by the number of people. An activity density score was obtained for each area by time period. (See Development of the Activity Load Instrument, p. 56).

Child's Personal Space Instrument

The completed instrument contained:

1. The floor plan of the home on a one-fourth inch scale grid upon which the furniture placement was indicated
2. The responses to Child's Personal Space questionnaire
3. Two marked child's personal space transparencies, one completed by the child and one completed by the mother

*Since the tenth transparency, Additional Activities, was returned blank in several schedules, it was discarded.

Infringement Coding

Infringement on the child's activity space was coded by combining the activity load transparencies with the child's personal space transparency. The opportunity for infringement on the child's activities was interpreted by the coder according to a three-point scale (1 for no infringement, 2 for possible infringement and 3 for probably infringement). The child's activities included; painting, coloring, playing with toys, playing with friends, watching T.V., eating, sleeping and dressing. The following is the criteria used to interpret the opportunities for infringement on the child's activity space.

Activities

(1) Painting, (2) Coloring, (3) Playing with toys and (4) Playing with friends:

Code 1 - no infringement

If the area designated as the child's activity space was not being used for any other activity or being used for another activity which did not seem to interfere with the child's activity.

Code 2 - possible infringement

If the area designated as the child's activity space was being used for another activity which might interfere with the child's activity.

Code 3 - probable infringement

If the area designated as the child's activity space was being used for two or more conflicting activities which seemed to interfere with the child's activity.

Activity (5) Watching T.V.

Code 1 - no infringement

If the area designated as the child's activity space was not being used or was being used for one other activity with which the sound from the television would not seem to interfere or if other family members were also watching T.V.

Code 2 - possible infringement

If the area designated as the child's activity space was being used for activities with which the sound from the television might interfere.

Code 3 - probable infringement

If the area designated as the child's activity space was being used for activities which would clearly present opportunity for interference from the noise from the television.

Activity (6) Eating

Code 1 - no infringement

If the area designated as the child's activity space was not being used or was being used for a family meal or was being used for one other activity which would not seem to interfere with the child's eating.

Code 2 - possible infringement

If the area designated as the child's activity space was being used for an activity which might interfere with the child's eating.

Code 3 - probable infringement

If the area designated as the child's activity space was being used for one or more activities which would clearly present opportunity for interference with the child's eating.

Activity (7) Sleeping

Code 1 - no infringement

If the area designated as the child's activity space was not being used or was being used for another activity which would not seem to interfere with the child's sleep.

Code 2 - possible infringement

If the area designated as the child's activity space was being used for an activity which might interfere with the child's sleep or at bedtime if two children shared a bedroom.

Code 3 - probable infringement

If the area designated as the child's activity space was being used for one or more activities which would clearly present opportunity for interference with the child's sleep or at bedtime if three or more children shared a bedroom.

Activity (8) Dressing

Code 1 - no infringement

If the area designated as the child's activity space was not being used for another activity or was being used for one other activity which would not seem to interfere with dressing or was used as a dressing area by another but was not in use at the time.

Code 2 - possible infringement

If the area designated as the child's activity space was being used for an activity which might interfere with the child's dressing or might accommodate other family members dressing at the same time.

Code 3 - probable infringement

If the area designated as the child's activity space was being used for other activities which would clearly present opportunity for interference with the child's dressing or was being used for dressing by two or more family members.

Coding procedure for infringement on the child's activity space was as follows:

1. The coder placed both transparencies over the floor plan to check for inconsistencies between the mother's and the child's reports or the child's personal space. (Mother's and child's reports were

found to be consistent in all but two families. These two instruments were discarded as invalid information.)

2. The coder placed the transparency with the child's responses over the floor plan.
3. The first activity load transparency (7:00 - 9:00 A.M.) was placed over the child's transparency.
4. The coder read the notations on the activity load transparency to learn what activities were being carried on and the number of people present in the home.
5. Beginning with child's first activity space (painting), the coder identified the area used and the other activities present. Judgment was then made on the opportunity for infringement by referring to the three point scale criteria for that activity. Thus, a measure of infringement was obtained.
6. The same process was followed for each of the eight activities of the child.
7. The number of people present in the home during each time period was recorded.
8. The coder removed the first activity load transparency and placed the second activity load transparency (9:00 A.M. - 11:00 A.M.) over the child's personal space transparency.

9. The infringement coding process was repeated for each of the nine time periods.

When the infringement coding process was completed, the code sheets contained information on three categories of opportunity for infringement on the child's activities for each activity area and for each of the nine time periods of the day.

Personal Object Space Coding

Since the Child's Personal Space instrument was not pre-coded, it was necessary to assign code numbers after the information was collected and to transfer them to code sheets for card punching.

Limitations of the Study

The emphasis of this study was on the development of three instruments to measure family living space in qualitative dimensions. The variables chosen for study were activity density, infringement on activity space and personal object space. However, the independence of these variables cannot be completely tested in this design due to the number of variables which were recognized as possible modifying factors but were not controlled.

The variables which were recognized but not controlled were: managerial skills of the parents, philosophy

toward practices of child rearing, past housing experiences, elaboration of the space (i.e., the addition or embellishment of living space) and the attitude toward the space. A measure of elaboration of the space was attempted but deleted because the instrument was too crude to produce meaningful data. It was thought that the development of instrument(s) to measure elaboration of space would be a viable subject for research. However, due to the complexity of the subject, space elaboration should be the subject of a separate study and the information gained here could be useful for such an endeavor. The managerial skills of the family, past housing experiences and attitude toward the space were also considered to be additional determinants of the quality of the living space which might effect the responses to the information requested. However, due to the small sample size it was impossible to control for differences.

Since the problem of this study is, in fact, the development of certain qualitative measures to describe family living space, the major focus of the study is, by necessity, the evaluation of these measures. It was not the intent of this study to complete the development of these measures but to initiate the development. Therefore, the evaluation of these measures will involve non-statistical approaches to factors which may have influenced the reliability and validity of the instruments. (Again, the

small sample size made statistical approaches to reliability and validity unrealistic.) The logistical feasibility of the instruments was evaluated in view of the insights gained during interviewing and informal conversations with the respondents. An additional analysis of the instruments was possible by collecting empirical data in the pilot study and utilizing appropriate statistical procedures. The statistical results were used as an indication of the sensitivity of the instruments - that is, whether or not they could detect differences in the living space of families with only three members and families with four or more members.

Because of the above procedural limitations, the results of the study include both non-statistical and statistical findings which provided a basis for revision and further development of the instruments. Therefore, the results have been broken down into two sections. The first results section is concerned with the non-statistical approaches to factors which may have influenced the reliability and validity of the instruments and the logistical feasibility of the instruments. This section is titled "Methodological Results and Implications." The second results section is concerned with the statistical results of the pilot study as an indication of the sensitivity of the instruments. This section is titled "Results of the

Pilot Study" and "Implications for Revision of the Instruments from the Statistical Findings."

Since the problem of this study is the development of certain qualitative measures of family living space, the conclusions will be drawn from the evaluation of those measures. Therefore, the conclusions of the study will be concerned with the revision of the instruments.

In addition to the procedural limitations, there were several other additional limitations in the study which should be noted. The sample size made it necessary to collapse cells which were originally divided by sex, age, and family composition to two cells determined on the basis of family composition (Only Child group and Two or More Children group). Also, because of the time difficulties, two interviewers could not always be scheduled for each family. This resulted in some inconsistencies in the interview technique.

The interviewers were inexperienced and could not be trained extensively enough in the specific technique required in this study. This resulted in some inconsistencies in recording the information. However, since cost was a very real limitation, it was impossible to hire professional interviewers.

The instruments were not pre-coded and there was some difficulty in standardizing the responses into codable form. This may have eliminated some of the information

that the instruments were sensitive enough to pick up. The failure to pre-code was due to the fact that the study was originally designed as a class project and not as thesis work.

FOOTNOTES, CHAPTER IV

[1]*Robert Lance, instructor, Child Development, College of Home Economics, Michigan State University attended the first term seminars and contributed much invaluable assistance in directing the readings.

[2]Barry Schwartz. "The Social Psychology of Privacy" The American Journal of Sociology, p. 746.

[3]Leon A. Pastalan. Privacy As An Expression of Human Territory Unpublished paper. University of Michigan, Ann Arbor, Michigan, 1969.

[4]Ser: School Environments Research, p. 59.

[5]Foote, p. 216; Schorr, p. 9; Riemer, p. 643.

[6]James Bossard. "Spatial Index for Family Interaction," American Sociological Review (Vol. XVL) 2, 1961.

[7]Dr. Leon Pastalan, Professor of Architecture, University of Michigan, attended a discussion on the development of the Personal Space instrument and offered suggestions and support for it's development.

CHAPTER V

RESULTS

Methodological Results and Implications

The instruments employed were first evaluated and revised after the interviewing and coding process were completed and before the findings were known because serious weaknesses in the methodology were apparent at this point. As a consequence, this evaluation deals mainly with insights gained from the experience of acquiring and classifying the interview information.

Each of the instruments used in this pilot study were pretested individually only twice before being administered to sample families. Due to tight scheduling, there was not enough time for each interviewer to have a practice session with all of the instruments. The interviewers who tested the instruments did so with friends who lived in married housing and with one or more pre-school children. University regulations restricting the use of married housing residents for research interviewing prevented random pre-testing. However, since the reason for conducting the pilot study was to examine the methodology employed, the

development of technique was a major consideration of the study.

The techniques were analyzed in view of the factors which may have influenced the reliability and validity of the instruments.

Reliability of the Information Gathered

To obtain reliable responses from the instruments administered to the mother there were three factors which had to be considered:

A. Respondent-centered factors
   1. cooperation of the respondent
   2. positive attitude toward the interview process
B. Instrument-centered factors
   1. consistency in the recording procedure
   2. consistency in the degree of accuracy or thoroughness of the responses solicited by the Activity Load instrument
C. Coding-centered factors

Respondent-Centered Factors

Cooperation and Attitude of the Respondent

It is important to consider the composition of the sample when discussing the dependency upon the cooperation

of the respondents in this study. The main portion of the interview involves collecting information from the mother, the remainder of the interview time is spent with the preschool child. Three of the mothers were students and half of them had more than one child. The fact that they had chosen to live in married housing probably indicates a somewhat restricted budget, therefore, many of the activities and services performed outside the home in higher income families must be accomplished by the family in the space of their apartments. Since there are no private play areas where children may be easily supervised from indoors, play activities of younger children are also often centered in the apartment. In addition, there is the possibility that the mother or other family members may have been subject to other research, although there are very strictly enforced measures to restrict research in married student housing. The combination of these factors suggest that the mothers would prefer as little intrusion into their day as possible.

The above conclusion was confirmed early in the study during telephone conversations to arrange an interview time. The mothers had been informed early in the year that, if their child attended Spartan Nursery School, they could expect to be asked to participate in some type of a research study during the year. Prior to the phone call, a letter was sent to each of the homes by the director of the

nursery school explaining the project briefly and stating that they would be contacted by an interviewer. During the phone call, the interviewer stated her name and asked if the family had received a letter from the nursery school director. The person making the call then requested a convenient time for a team of two interviewers to come to the home to conduct an interview which required approximately one hour of their time. Even though the parents had agreed to the terms of the nursery school request, were given notice of the study by the director of the nursery school, and were asked to name a time most convenient for them, a substantial number of mothers only reluctantly suggested "convenient" times for an interview. There was nothing that could have been done in this study to change the respondents initial attitude toward participating in a research study. Since the possible sample was limited, any detrimental effects arising from the respondent's reluctance to participate were hopefully moderated by a tactful approach by the interviewer.

During the interview, it was observed that some of the mothers became impatient and, toward the end of the hour, their cooperation appeared to decrease. A possible explanation for this behavior could be their original hesitation to participate in combination with the tedious nature of the information requested. Since part of the schedule requires a rather precise type of answer, it is

imperative that the questionnaire be designed to be as efficient as possible. In this manner, one might presume the respondent's cooperation for the total time needed.

Instrument-Centered Factors

Consistency in the Recording Procedure

The line drawing technique used to record all of the activity load information and most of the child's personal space information varied markedly among interviewers. It is not known if line drawing variations can be corrected for they appeared to correspond to the interviewers writing style (bold or precise). If the transparency method were to be employed, variations in the recording procedure would have to be prevented by selecting only those interviewers who could develop an almost identical marking style. Such a policy could be followed if those with marking ability were also good interviewers. However, this is a rather unrealistic expectation which could severely limit the number of qualified interviewers.

Consistency of the Degree of Accuracy or Thoroughness of the Responses Solicited by the Activity Load Instrument

Variations in responses were noticeable when completed instruments were compared across families. It was thought that the open-ended nature of the instruments gave

the respondents too much freedom in the degree of accuracy or thoroughness of their answers. This problem could be corrected by a tighter design which solicits more explicit answers and provides a more efficient and reliable method of recording those answers. In this way, responsibility for the accuracy and thoroughness of the answers rests with the interviewer who, with experience, should be able to follow explicit instructions.

Coding-Centered Factors

Consistency in the Classification of Responses

It was necessary to interpret the information gathered when two transparency instruments--Activity Load and Child's Personal Space--were overlaid during coding. To determine the amount of infringement on the child's activities, it was necessary for the coder to study the information and then exercise considerable judgment as to the amount of infringement present. Although the coding method was tested with two other individuals who obtained similar results, there was no way of knowing how consistent the interpretation would have been if several individuals had participated in the actual coding. Interpretation difficulties should be eliminated in the revised instrument through the use of a more structured questionnaire and pre-coded established categories.

Classification of responses to the open-ended questions was required in almost all of the coding of the information recorded on the transparencies. It was thought that some useful information was lost in the process of classifying responses. However, due to the abundance of information collected from each family, it was necessary to do so to handle the data. It was believed that the loss of useful information has been countered by revising the instruments to elicit more structured pre-coded responses. Although a more structured instrument calls upon the respondent to place his responses in categories, it was thought that the respondents were in a favored position to make these judgmental decisions.

It was thought that two factors might influence reliability in the instruments administered to the child; intervention by the mother (respondent-centered) and a lack of communication from the choice of wording (instrument-centered).

Intervention by the Mother

Several interviewers had difficulty with the mother correcting or expounding on the child's responses. Although there is no desire to collect incorrect information, the child, not the mother, was the desired respondent to questions on his personal space. Therefore, the instructions were revised to request that the mother not interfere with the child's interview.

A Lack of Communication From the Choice of Wording

Interviewers found that some children seemed to be confused by the questioning. This was evident from facial expressions or questions from the children. When the child became confused, he seemed to lose interest in the instrument and began to play with toys or go to his mother. This lack of communication was a consideration in the revision of the instructions for the Child's Personal Space instrument. Instructions were changed to allow interviewers the freedom of rephrasing or explaining the questions to the child. Changes in the written dialogue were also made.

Statistical computations of reliability were not done for this study because:

1. It was impossible to administer the instruments twice to the same respondents. Therefore, no coefficient of reliability or standard error of measurement could be computed.
2. There was no equivalent form of the instrument with which to correlate scores for a coefficient of equivalence.
3. There was no valid criteria for arbitrarily dividing the instruments into equal halves to correlate scores. Since the data is subjective in nature, there were no "right" or "wrong" answers. This also eliminates the viability of an analysis of variance procedure to test reliability.

Due to these limitations, the discussion of reliability has been limited to influences from experiences during the collection and coding of the information.

Validity of the Information Gathered

Due to the exploratory nature of the subject, the instruments were not refined well enough to subject them to a statistical analysis of validity. However, the fact that the interviewers were involved in the development of the instruments allowed them to identify areas which they felt were not valid in terms of the intended purposes of this study. This led to several suggestions for deletion of irrelevant questions in the Biographical Information instrument. In addition, interviewers had several suggestions for improving the recording technique and refining instructions so that the exact information needed was solicited. These revisions are discussed in detail in Methodological Results and Implications, p. 80.

The Time Factor

Time per interview is an important consideration if the schedule is to be used for a larger, more significant sample because time is directly related to the cost of collecting and handling the information. There are two ways in which the time factors could be reduced; by employing

experienced or trained interviewers and by a more efficient design to facilitate recording and coding.

A More Efficient Design

An efficient design would reduce interview time and allow for more interviews to be done per interviewer. If interviewers are to be hired to collect information for a larger sample, efficient use of interview time would obviously reduce costs. In the same way, coding time could also be reduced. Contributing to the coding time in the pilot study were difficulties encountered in dealing with incorrectly placed or superfluous information, illegible or confusing recording and a lack of uniformity of style. Also, it would be impossible for someone who was not intimately involved with the study to understand and code the schedule. A more efficient coding process depends upon a well designed schedule which solicits the exact information required in a standard recording form (preferably precoded) and on an organized format.

Experienced and/or Trained Interviewers

In the pilot study, interviewing was done by class members. Although there were two training sessions, the students were inexperienced as interviewers and only two had the opportunity to actually pre-test the instruments. As a result, there were difficulties with interview

procedure and recording technique which decreased as the interviewers became more experienced. It was also noticed that the more experienced interviewers spent from 15 to 20 minutes less time with each family. It is thought, therefore, that experience and/or training would reduce the time and cost of conducting interviews.

Discussion of Other Methods of Collecting Data

Those associated with this study have suggested that perhaps the best way to collect the data would be by using the direct observation method. This method could possibly increase the reliability and validity of the data if a viable recording process for coding were devised. However, interview experience has shown that direct observation may not offer sufficient advantage to warrant changing the interview technique. Direct observation could be used to gather the needed data if the sample were kept small and there were funds available to obtain trained interviewers for fifteen continuous hours of observing per family which must be done to parallel the interview technique. If, however, the sample size is to be increased to allow for a larger number of subjects on a moderate budget, the observation method is unrealistic. There must also be a demonstrated need for this degree of accuracy in

determining the exact time and place of each family member's activity to warrant the cost of the observation method.

Information could be gathered by using cameras placed in each room of the respondent's home with the resulting film run at high speed before observers. However, this is a costly procedure and would not be an appropriate technique to use to gain information about the more personal areas of the home. Also, the camera technique would necessitate employing interviewers to record the needed data from the film. The needed bathroom and bedroom information is easily obtained by interview.

In considering both personal and camera observation there is always the possibility that the day chosen would not be representative of the normal family activity pattern and observing more than one day adds to the time and cost of handling the data. Interview data obtained from the mother was for "a typical day" and identifies the gross activity in the home. It was thought that this was sufficient for the purposes of this study as it was concerned with general activity patterns rather than a finite measure of space use or time.

The brevity and simplicity of the revised instruments is also preferred over observation in gaining the cooperation of the respondents. As mentioned previously, it is important to consider that the respondents are all mothers, some of whom are also students who care for young

children. A number of factors makes it apparent that the mothers would prefer as little intrusion as possible into their day. Although the interview took approximately only one hour to administer, there was some evidence to indicate that cooperation was waining toward the end of the interview. The direct observation method would require interview time to gather the biographical information, add the presence of a strange person to the household and confine the mother to the apartment for entire observation period. Camera observation would also require time and space for setting up and removing equipment.

In view of the factors to be considered, it was thought that the interview method was best suited for this type of research if the results indicate that the instruments are sensitive enough to detect the human and housing variables. The interview method was used because it provided economy, enhanced the chances of respondent cooperation and solicited the personal information needed for the study.

Results of the Pilot Study

The questionnaires of eighteen interview schedules provided the data used for analysis. Scores were derived from the instruments in the following manner:

1. Activity Density--From the Activity Load instrument, the Activity Density Index was determined by multiplying the activity load of an area by the number of people present (for each time period). (See Development of the Activity Load Instrument, p. 56.)
2. Infringement--By combining the child's personal space transparency with the activity load transparencies, a score for infringement on the child's activity spaces was determined. (See Infringement Coding, p. 69.)

   (For activity density and infringement, there was a score for each area and time combination.)
3. Child's Personal Object Space--From the Child's Personal Space instrument, scores were determined by the frequency of response in two categories, "exclusive" and "shared."

A predetermined coding guide was used to ready the data for the computer. All statistical computations were accomplished by computer processing with the exception of the chi-square which was computed by hand.

Sample Profile

Table 1 shows the biographical profile of the sample by Family Composition (1a), Economic-Educational Situation (1b) and Housing Experience (1c).

Table 1.--Biographical Profile of the Sample

Table 1a.--Family Composition

		G_1 (N=9)	G_2 (N=9)
Father's age	21-25	4	
	26-30	4	4
	31-35		1
	36-40	1	1
Mother's age	21-25	4	
	26-30	4	6
	31-35	1	3
Marital status	married	9	6
	divorced		1
	separated		1
	other		1
Children's age	all 1- 5 yrs	9	4
	all 1-10 yrs		3
	all 1-15 yrs		2
Children's education	all nursery or below	9	5
	all 3rd grade or below		2
	all 6th grade or below		2

Information on family composition is given in Table 1a. It can be noted that the Two or More Children group had three homes in which the father was not living with the family, whereas all of the Only Children group families were intact. As one might expect, parent's age tended to be higher in the Two or More Children group than in the Only Children group.

In Table 1b, the economic-educational frequencies indicate that the Only Child group tended to have a higher income than the Two or More Children group. Six of the fathers in the sample were employed on a full-time basis, seven were employed on a part-time basis and two were not employed (both unemployed fathers were in the Only Child group). All of the mothers in the sample were full-time homemakers but five were also students. Of the five student mothers, two in each group were full-time students and one mother in the Only Child group was a part-time student. Six of the fathers in the Only Child group and all of the fathers in the Two or More Children group had more than four years of college education. Four of the mothers in the Only Child group had four or more years of college education compared to seven of the mothers in the Two or More Children group.

In Table 1c, information designated as housing experience revealed that both groups had nearly the same average number of months at their present residence, nearly

Table 1b.--Economic-Educational Situation

		G_1 (N=9)	G_2 (N=9)
Income	2,000-2,999	1	
	3,000-3,999		5
	4,000-4,999	3	2
	5,000-5,999	5	
	over 10,000		1
	no response		1
Father employed	full-time	3	3
	part-time	4	3
	not employed	2	
Mother employed	full-time	9	9
	homemaker		
Father student	full-time	7	5
	part-time	1	
	not a student	1	1
Mother student	full-time	2	2
	part-time	1	
	not a student	6	7
Father's education	3 yrs college	2	
	4 yrs college	1	
	more than 4 yrs college	6	6
Mother's education	grade 11 or 12	1	
	1 yr college	1	1
	2 yr college	2	
	3 yr college		1
	4 yr college	2	6
	more than 4 yrs college	2	1
	beauty school	1	

Table 1c.--Housing Experience

		G_1 (N=9)	G_2 (N=9)
Average number of months at present residence		26.84	25.88
Average number of months at previous residence		16.44	28.33
Average number of months anticipated move from University housing		11.11	12.11
Average number of moves in the last five years		2.22	2.33
Last residence	single family or duplex	6	6
	apartment building	3	3
Average number of rooms in last residence		4.33	6.33
Average number of bedrooms in last residence		1.88	2.66
Last residence	owned	2	1
	rented	6	8
	lived with parents	1	

the same average number of months that they anticipated moving from University housing and nearly the same average number of moves in the last five years. However, the Two or More Children group had a higher average number of months spent at their previous residence. The groups were divided equally on the basis of the type of housing in their last place of residence which was; six of the Only Child group and six of the Two or More Children group, had previously lived in single family or duplex housing, three of the Only Child group and three of the Two or More Child group had previously lived in an apartment building of some sort. The average number of rooms and bedrooms in the previous residence was higher for the Two or More Child group. Only three families in the sample had previously owned their own home, the remainder had rented their housing with the exception of one family in the Only Child group which had previously lived with parents.

Activity Density and Infringement

A three way repeated measures analysis of variance with a conservative test (Weiner, 1962, p. 314) was used to analyze the activity density and infringement data. The three independent variables for activity density were: group (G) [Only Child (G_1) vs. Two or More Children (G_2)], area of the home (AH) (7 levels), and time period of the

day (T) (9 levels). The independent variables for infringement were the same as above except AH will be referred to as Activity Area (AA) and has 8 levels.

Table 2 is the analysis of variance summary table for activity density. It shows the degrees of freedom for the actual data. All of the conservative tests, main effects and interactions were, however, made using one numerator and sixteen denominator degrees of freedom. It can

Table 2.--Analysis of variance summary table for activity density

Source	MS	DF	F	Regular Test	Conservative Test
Groups (G)	1250.865	1	28.69	<.01	<.01
ERR (G)	43.588	16			
Area of the home (AH)	203.127	6	11.40	<.01	<.01
G x AH	26.783	6	1.50	NS	NS
ERR (AH, G x AH)	17.809	96			
Time (T)	53.336	8	4.83	<.01	<.05
G x T	12.923	8	1.17	NS	NS
ERR (T, G x T)	11.035	128			
AH x T	43.021	48	5.99	<.01	<.05
AH x T x G	10.657	48	1.48	<.05	NS
ERR (AH x T, AH x T x G)	7.176	768			

be noted that the G and AH main effects were significant at the <.01 level, T and the AH x T interaction was significant at the <.05 level and .05 level respectively.

Table 3 shows the activity density means for group, area of the home and time period of the day.

Living room (other side) and the child's room had the highest mean scores for activity density. Activity density was highest at 7:00-9:00 A.M. and from 5:00 P.M. to 11:00 P.M.

Table 4 shows the activity density means broken down for the seven by nine interaction combination.

In brief, activity density was greatest for:

Living room (door side) from 3:00 P.M. to 9:00 P.M.

Living room (other side) from 1:00 P.M. to 11:00 P.M.

Dining area at meal times

Kitchen at meal times and from 3:00 P.M. to 5:00 P.M.

Bathroom from 5:00 P.M. to 7:00 P.M.

Child's room from 7:00 A.M. to 9:00 A.M., 11:00 A.M. to 3:00 P.M. and 7:00 P.M. to 1:00 A.M.

Parent's room from 7:00 A.M. to 9:00 A.M. and 9:00 P.M. to 1:00 A.M.

Table 5 is the analysis of variance summary table for infringement on the child's activity areas. This table also shows actual degrees of freedom. The conservative test for infringement was made with the same degrees of freedom as for activity density.

Table 3.--Activity density means for group, area of the home and time period of the day

Only Child (N=9)	Two or more Children (N=9)
2.347	4.448
Area	Means
Living room (door side)	2.370
Living room (other side)	5.062
Dining area	2.914
Kitchen	3.340
Bath	2.062
Child's bedroom	4.691
Parent's bedroom	3.346
Time	Means
7:00- 9:00 A.M.	3.873
9:00-11:00 A.M.	2.556
11:00- 1:00 P.M.	3.246
1:00- 3:00 P.M.	2.476
3:00- 5:00 P.M.	3.079
5:00- 7:00 P.M.	4.278
7:00- 9:00 P.M.	4.167
9:00-11:00 P.M.	3.683
11:00- 1:00 A.M.	3.222

Table 4.--Activity density means for the seven by nine area of the home x time period of the day interaction combinations

	A.M.			P.M.					A.M.
	7:00-9:00	9:00-11:00	11:00-1:00	1:00-3:00	3:00-5:00	5:00-7:00	7:00-9:00	9:00-11:00	11:00-1:00
Living room (door side)	1.889	2.111	2.778	1.111	3.111	3.222	3.889	1.833	1.384
Living room (other side)	4.556	4.833	4.333	5.500	5.222	6.222	5.389	6.500	3.000
Dining area	3.444	1.883	4.667	.944	2.444	6.000	3.222	1.833	1.833
Kitchen	5.278	2.111	4.500	1.389	4.444	6.889	3.278	.944	1.222
Bath	2.778	1.556	.556	1.000	.556	3.167	4.889	3.056	1.000
Child's room	4.222	3.000	4.222	4.167	2.944	3.000	6.278	7.222	7.163
Parent's room	4.944	2.444	1.667	3.222	2.833	1.444	2.222	4.389	6.948

Table 5.--Analysis of variance summary table for infringement on the child's activity areas

Source	MS	DF	F	Regular Test	Conservative Test
Groups (G)	2.596	1	.57	NS	NS
ERR (G)	4.496	16			
Activity area (AA)	6.545	7	15.25	<.01	<.01
G x AA	0.121	7	.28	NS	NS
ERR (AA, G x AA)	0.429	112			
Time (T)	1.673	8	2.67	<.01	NS
G x T	0.299	8	.47	NS	NS
ERR (T, G x T)	0.626	128			
AA x T	0.487	56	3.35	<.01	NS
AA x T x G	0.136	56	.93	NS	NS
ERR (AA x T, AA x T x G)	0.145	896			

It can be noted that the AA main effect was significant at the <.01 level.

Table 6 shows the mean scores for infringement on the child's activity areas by activity area. Ranked from the most to the least amount of infringement present, the child's activity areas are: dressing, sleeping, playing with toys, playing with friends, painting and coloring, eating and watching TV.

Table 6.--Mean scores for infringement on the child's activity areas by activity area

Activity Area	Activity	Mean Score
1	painting	1.173
2	coloring	1.173
3	playing with toys	1.309
4	watching TV	1.049
5	playing with friends	1.179
6	eating	1.068
7	sleeping	1.579
8	dressing	1.593

Child's Personal Object Space

Frequencies were counted for instances of shared and instances of exclusive personal object space for Only Child and Two or More Children groups separately. Table 7

shows this two-by-two breakdown. There is significantly more exclusive personal object space for the Only Child group and more shared personal object space for the Two or More Children group ($x^2 = 10.042$; $p < .01$).

Table 7.--Chi-square for exclusive vs. shared personal object space for the Only Child group (G_1) and the Two or More Children group (G_2)

	Exclusive	Shared	
G_1 (N=9)	47	25	72
G_2 (N=9)	28	44	72
	75	69	144

$x^2 = 10.042$

Level of significance = .01

Implications for Revision of the Instruments from the Statistical Findings

Activity Density

Data from the Activity Load instrument showed activity density to be significant for groups and area of the home at the .01 level, for time period at the .05 level and for the interaction of area and time period at the .05

level. Since the Activity Load instrument was sensitive enough to distinguish differences in the living environment, it was thought that activity density was a viable measure of space use. Therefore, the activity density index was not revised. However, the methodology was revised to make the interview process more efficient. (See Revision of Instruments, p.116.)

Infringement

Infringement was defined as the situation existing when two or more conflicting activities occurred simultaneously in the same space. This was thought to be a valuable approach to the study of the adequacy of living space because identifying a high degree of infringement with activities would help deliniate the nature of the shaping force of the density factor. The child's indication of his activity space in combination with the mother's indication of the family activity space provided the researcher with information from which infringement could be inferred.

Infringement on the child's activities was significant at the .01 level for activity area. All other variables and interactions (groups, group x activity area, time, group x time, activity area x time, and activity area x time x group) were not significant. The lack of significance may indicate that infringement is not a suitable

measure of the differences in the living environments of homes with only children and homes with two or more children. However, it was thought that the theory of activity infringement was viable and, for this reason, a new instrument was designed to determine the presence of opportunity for infringement on the child's activities.

There are two possible instrument-centered reasons for the lack of significance in the infringement measure. First, the measure was highly objective in that it relied on a count of the activity load designations in the area. It is highly probable that infringement is a subjective situational condition and not sensitive to objective measure. Secondly, determination of the degree of infringement was the result of the coder's interpretation of the situation represented by the activity load marking. Thus, the coding procedure was subjective in nature and the coder may have been a significant variable.

In view of these considerations, it was thought that the validity and reliability of the instrument may account for the lack of significant findings. (See Revision of Instruments, p.123.)

Child's Personal Object Space

Differences in the Child's Personal Object Space between the Only Children group and the Two or More

Children group was significant at the .01 level (approaching the .001 level).

The high significance of this measure indicated that it was perhaps the most viable measure of the differences in the living environments of the two groups. Because of this, the instrument was revised to be more explicit and, hopefully, more sensitive to identification of personal object space. (See Revision of the Instruments, p.128.)

CHAPTER VI

CONCLUSIONS

Since the problem of this study was the development of certain qualitative measures of family living space, the conclusions will be drawn from the evaluation of those measures. Therefore, the conclusions of the study will be concerned with the revision of the instruments.

Revision of the Instruments

The Biographical Information Instrument

The Biographical Information instrument was redesigned to include only information that is pertinent to this study. The original instrument was designed by students in a graduate seminar in family housing. Students reviewed a number of past housing studies and made adaptations from their content and structure to fit the demands of this study. In addition to these adaptations, relevant questions were composed. The resulting instrument was a combination of several past biographical studies and original questions. In the revised form, questions have been deleted, reordered or replaced for three reasons; (1) they were not used in

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this study, (2) they appeared to cause negative reactions from the respondents and (3) they were arranged inefficiently for coding.

That portion of the original instrument which was concerned with past housing experience has been replaced by a Housing Evaluation Scale. This is a three point rating scale to be completed by the mother which it is thought will better accommodate the subjective nature of housing and attitudes. Originally, the housing information was in only absolute physical terms -- i.e., the number and type of rooms, type of housing, and similar questions. As a result, there was no indication of the adequacy of space other than in the gross terms of person per room or person per bedroom. These measures did not elicit reactions toward the adequacy or inadequacy of the family living space. Since there is evidence that no valid qualitative criteria has been developed for determining housing adequacy (see Review of Literature), the mother's opinion of the adequacy of the family living space was employed in the revised instrument. Ideally, the attitude of both parents should be included, but past experience in student housing indicated that responses by fathers are nearly impossible to obtain.

The Housing Evaluation instrument was designed to replace the measures of adequacy (person per room or per bedroom) used in the original instrument. It is thought

that the families opinion on the adequacy of their living space may be an important factor influencing how space is used and the effects of that use on family life. For example, families which have previously had less living space may have an entirely different reaction to and mode of space use than families accustomed to more living space. This is an important consideration in discussing the activity density in the home for, although two families may have the same activity density, one may consider the situation optimal while the other is dissatisfied. The Housing Evaluation Scale introduces attitude toward living space as a comparative factor which could make a significant difference in space use and subsequent effects on the family.

The mother was chosen to represent family opinion on housing adequacy because, since all but two of the fathers are students, the mother spends considerably more time in the home than does the father. Therefore, it was thought that the mother would have the most viable opinion of adequacy in all activity situations.

Both the revised Biographical Information instrument and the Housing Evaluation Scale have been pre-coded. The absence of pre-coding in the original instrument contributed heavily to the time factor in processing the data. The questions which were deleted or replaced and the reasons for doing so are given on the schedule of Biographical Information, p. 139 of Appendix B.

The Activity Load Instrument and The Child's Personal Space Instrument

Objective 1: To develop a economically feasible means of determining the number and type of activities and the number of people within areas of the home by time period.

Original Instrument:

1. A one-fourth inch scale floor plan of the respondent's home with a one-fourth inch scale grid drawn over it
2. Ten blank transparencies
   a. nine for two-hour time periods
   b. one for activities which did not occur daily
3. A list of suggested activities to aid in completing the tenth transparency
4. A clipboard
5. A felt tipped marking pen

Original Procedure:

1. The interviewer drew furniture placement on the floor plan.
2. Instructions were read to the mother.
3. A transparency was placed over the floor plan for each two-hour time period. The mother indicated what areas were being used at that time. Area use was recorded by the interviewer using diagonal

lines for less than one-half hour of use and cross-hatched lines for more than one-half hour of use.

4. The number of people present and the activities were written at the bottom of the transparency.

Criticism of the Original Instrument:

1. The original instrument only recorded the space used for activities. There was no indication of factors which may modify space use such as management and family heirarchy. When the original instrument was designed, the modifying potential of these factors was not fully realized. Interview experience suggested that management and family heirarchy should be accounted for. Several interviewers reported that they observed differences between families which were not evident when their instruments were compared.

   To illustrate one example, two families may have approximately the same activity density score yet one family may be subjected to controls to the extent that they ameliorate conflicts in space use. If the other family managed time, space and activities poorly, they may experience a great deal of frustration in space use. These differences were noticed by some interviewers during

informal conversations with the mother which provided additional insight into their management of living space.

From the interview experience, the activity and family member who had priority in a given area were thought to be important considerations in measuring space use. If three family members were using the same space for different activities, the most important activity or dominant individual affected how that space was used. In married student housing where space is often limited, this is a very real consideration. It is of particular importance in looking at the child's activity spaces, for children are often subject to the decisions of parents and older siblings.

2. There were variations in the recording procedure due to the amount of information offered by the respondent and line drawing differences among interviewers. Some respondents indicated area use in such detail that even five minute tasks were recorded. Others indicated use only for activities which they considered to be significant. In both cases, the interviewer recorded every response.

Line drawing by the interviewers tended to be as

varied as handwriting. Some interviewers used broad strokes while others were concise. Therefore, two interviewers recording the same information would not always have the same results.

3. Variations in the recording procedure made it difficult for the coder to correct for any superfluous information or line drawing differences. In addition, the varied recording techniques made transcription difficult.

Revised Instrument:

1. Floor plan of the home with areas numbered
2. Activity Load Instrument
3. Area Use Instrument
4. Activity Priority Instrument

Revised Procedure: Activity Load

1. The mother refers to the floor plan for area numbers.
2. The mother records the type of activity, duration of the activity, and number of people present for each area of the home by time period.

Revised Procedure: Area Use

1. The mother refers to the floor plan for area numbers.
2. For each time period listed, the mother is to rank

the areas of the home from the most used to the least used.

3. The number of people in each area is recorded.

Revised Procedure: Activity Priority

1. For each time period the mother is to check (a) the first and second activity priorities; (b) the first and second family member priorities.
2. This is done for seven areas of the home.

Rationale for Revision:

1. Essentially the same activity information is solicited from the respondent as in the original Activity Load instrument. However, to improve the chances of obtaining reliability, validity and logistical feasability of the instrument, the transparency technique previously used for recording information has been replaced by a questionnaire.
2. To include the possible modifying effects of management, the Area Use questionnaire was developed. The mother is asked to indicate which areas of the home have the highest activity load by ranking them from the most used to the least used. This is thought to be a more valid indication than the count of use units as previously employed. The mother's opinion is solicited because she is in the home more than the father and better able to

respond to subjective questions than the pre-school child.

3. A new instrument, Activity Priority, was designed to gather information on family members and activities which have priority in space use. Again the mother's opinion is solicited to represent family norms. Information from the Activity Priority instrument is useful in gaining insight into the spatial restrictions placed on the child.
4. Coding is simplified by the use of a pre-coded questionnaire. Time required for coding is reduced and it is not necessary for the coder to interpret several recording styles.

Objective 2: To develop an index of activity density in the home by area and by time period

Original Procedure:

The activity density index was computed after the information from the Activity Load transparencies was coded. The index was computed by multiplying the activity load of an area by the number of people present in the home during the time period.

Criticism of the Original Instrument:

1. The total number of people in the home during each time period was recorded. It was thought

that this measure is too gross for computing the activity density of specific areas. It is probable that not all of the people present in the home will be in the same area.

2. There was no information on the intensity or nature of the activities. These and other subjective factors may modify the actual activity units of an area. In the original instrument, units were assigned to areas by the number and type of lines drawn on the transparency (diagonal lines = one activity unit; cross-hatched lines = two activity units). Therefore, the measure of activity load was only in use units by time without regard for the circumstances of usage.
3. Theoretically, the range of activity units are unlimited. Since there was no highest or lowest number of units, there was no standardized means of comparison across families.

Revised Instrument:

1. Floor plan of the home with areas numbered
2. Area Use Instrument

Revised Procedure:

1. The instrument is to be completed by the mother using the floor plan for reference to area numbers.

2. See Revised Procedure, Objective 1.

Rationale for Revision:

1. The number of people present in each area is recorded in the revised instrument. This is a more exact measure than the previous method of recording the total number of people present in the home. Therefore, the activity density index should be more accurate.
2. To accomodate the subjective nature of space use, the mother is asked to assign activity units by ranking the areas of the home from the most used to the least used. The area ranked most used receives seven activity units. The area ranked least used receives one activity unit. This rank order provides a more realistic basis for assigning activity units than the original method of assigning units by time without regard for the circumstances of usage. Therefore, the activity load index should be more valid.
3. In the Area Use instrument activity units range from 1 to 7. By employing a standard rating scale, comparison across families is facilitated. It was thought that the combined activity density scores from the Activity Load instrument and the Area Use instrument would offer a more realistic

indication of activity density of an area.

Objective 3: To develop a means of identifying the activity spaces of an individual child

Original Instrument:

1. Child's Personal Space Instrument
2. Floor plan of the home with furniture drawn in
3. Two transparencies
4. Red marking pen
5. Blue marking pen
6. Clipboard

Original Procedure:

1. Placing a transparency over the floor plan on a clipboard, the interviewer asked the child to lead him to the area of his home where the activities named were performed.
2. As each area was located by the child, the interviewer marked the location on the transparency with a red marking pen. This was done for eight activity areas.
3. A new transparency was placed over the floor plan. The interviewer asked the mother to point to areas on the floor plan to indicate where her child performed each of the eight

activities. Each of these areas was marked with a blue marking pen.

Criticism of the Original Instrument:

1. Variations in recording technique (line drawing on transparencies) were noticed when instruments were compared across families. Line drawing variations included:
   a. recording only the number which corresponded to the child's activity
   b. recording the number and blocking out specific areas
   c. notations made by the interviewer (i.e. "Paints here sometimes")

   These variations caused difficulties during coding. It was necessary for the coder to do a great deal of interpretation and catagorizing to standardize responses across families.
2. To confirm the child's responses, the instrument was also administered to the mother. Mother and child almost always indicated the same activity areas. Since differences between their responses were very slight, it was felt that the instrument need only be administered to the child.
3. Interviewers reported that, in some cases, the child seemed to be confused by the questioning.

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This was evident from facial expressions or questions from the child. When this happened, the child usually showed a marked loss of interest in the interview.

4. Occasionally, the mother would correct or elaborate on the child's responses. It was noticed that the child was hesitant to respond after being corrected. A possible explanation for the child's subsequent hesitation could be that the mother reinforced the child's lack of confidence in a new situation by indicating that he did not respond as he should.

Revised Instrument:

1. Floor plan of the home with areas numbered
2. Child's Activity Instrument

Revised Procedure:

1. The mother was asked not to interfere with the child's interview.
2. The interviewer asked the child to go to the place where the activities named were performed. As areas were located by the child, the interviewer referred to the floor plan and recorded the corresponding area numbers.

Rationale for Revisions:

1. Variations in the recording technique were eliminated by replacing the transparencies with a questionnaire. Pre-coded boxes were provided for checking answers. The pre-coded instrument eliminated the need for the coder to interpret and categorize responses.

   Differences in transparency recording technique could have been reduced by extensive training of interviewers. However, if the instrument is to be used for a larger sample, the cost of training the number of interviewers required may be prohibitive. Even with extensive training, the transparency technique may not be reliable for it is quite difficult to standardize marking style. Therefore, it was thought that the most reliable design would be a questionnaire.

2. Administration of the instrument to the mother for conformation of the child's responses was eliminated. It was apparent from the original instrument that the child's responses were almost always correct. Similar information from the mother was superfluous.

3. To improve communication with the child, the instructions to the interviewer state that the

dialogue of the schedule may be explained or reworded until the child appears to understand exactly what is being asked of him.

4. Intervention by the mother was eliminated by including instructions which specifically request that the mother does not comment during the interview with the child.

Objective 4: To develop a means of identifying the degree of infringement within the child's activity spaces

Original Instrument:

1. Floor plan of the home with furniture drawn in
2. Child's Personal Space Instrument
3. Child's Personal Space Transparency
4. Red marking pen
5. Nine Activity Load Transparencies
6. Clipboard

Original Procedure:

The degree of infringement on the child's activity spaces was established during coding.

1. Each activity load transparency was placed over the child's personal space transparency and the floor plan. In this way, it was possible to see what other activities were carried out in the child's activity areas.

2. The coder made a judgement on the degree of infringement based on an established criteria. (See Coding Procedure, p. 69)

Criticism of the Original Instrument:

1. Infringement decisions were complicated by a lack of circumstantial information such as home management and the family heirarchy of space use. It was necessary for the coder to hypothesize the situations and make a value judgement on the degree of infringement. Therefore, the reliability of this technique was questioned.
2. Variations in recording made it difficult to standardize responses across families.

Revised Instrument:

1. Floor plan of the home with areas numbered
2. Child's Personal Space Instrument

Revised Procedure:

1. Immediately after the child has located the requested activity area, the interviewer begins questioning about the use of the area. Questioning is continued until the interviewer has enough information to categorize the space as "always," "sometimes," or "never" shared by others. Although the exact dialogue of the

initial question is given ("Does anyone else ever use this place?"), the interviewer is free to probe further if the child's first answer does not seem to be adequate.

2. The interviewer reads the child's responses to the mother. She is asked to indicate whether or not she has noticed other activities which interfere with the child's use of space. This is done for each of the child's activities.

Rationale for Revisions:

1. It is felt that those participating in or observing the child's activities could make a more valid decision on infringement than a coder. The respondents are aware of the subjective factors which may modify activity circumstances. Therefore, the coder is not responsible for infringement decisions in the revised instrument. Instead, the child is asked about space use by others and the mother is asked if this use interferes with the child's activity.
2. Line drawing on transparencies was eliminated so there would be no variations in recording technique. Therefore, responses are standardized across families.

Objective 5: To develop a means of classifying the degree of infringement on the child's activities according to the time of day and type of child's activity

Original Instrument:

1. All Activity Load transparencies
2. Child's Personal Space Instrument

Original Procedure:

1. Coding for the degree of infringement (just discussed) was done by two-hour time periods.
2. In each time period, the child's activities were identified and assigned an infringement code.

Criticism of the Original Instrument:

1. Coding time was increased by the use of transparencies. It was necessary for the coder to study each transparency to locate the numbers which corresponded to the type of child's activity. These numbers were not recorded in a consistent style; some had areas blocked out, others had arrows or notations. It appeared that several interviewers did not feel that the prescribed recording technique was sufficient for the information offered by the respondents. Additional markings made by interviewers were an attempt to include factors which may modify

space use and, therefore, infringement. However, the additional information was not standardized across families and could not be used.

Revised Instrument:

1. Floor plan of the home with areas numbered
2. Child's Activity Space Instrument

Revised Procedure:

1. The mother has been asked to indicate whether or not she has noticed other activities which interfere or conflict with the child's use of space.
2. In addition, the mother is asked to indicate the time(s) of day that interference or conflict is most likely to occur.

Rationale for Revision:

1. Coding is simplified by using a pre-coded questionnaire:
   a. it is not necessary for the coder to transcribe varying recording techniques.
   b. only the information requested is recorded.
2. The revised format is a result of changes which were necessary to accomodate the other objectives of the instrument. There were no major

difficulties in classifying infringement by type of activity and time period in the original instrument. The revised instrument is, however, a more efficient means of recording and coding the information.

Objective 6: To locate the personal object space of an individual child and determine the number of personal object spaces which are shared or individually possessed.

Original Instrument:

1. Child's Personal Space Instrument

Original Procedure:

1. The interviewer read questions to the child from the instrument. Answers were checked in the appropriate box.

Criticism of Original Instrument:

1. Interviewers reported that, in some cases, the child seemed to be confused by the questioning. This was evident from facial expressions or questions from the child. When the child became confused, he usually showed a marked loss of interest in the interview.
2. The object spaces chosen for the original in-

strument were: toy space, clothes space, favorite toy space, dining chair, towel space and own room. It is not known if all of the children regarded the space occupied by these objects as personal. Therefore, the validity of the instrument was questioned.

Revised Instrument:

1. Floor plan of the home with areas numbered
2. Child's Personal Objects and Space Instrument

Revised Procedure:

1. The interviewer asks the mother to name four objects that the child uses the most or feels the most possessive of. The names of these objects are written in the appropriate blanks.
2. The interviewer asks the child to locate each of the objects. Location is noted by referring to the floor plan.
3. As each object is located, the interviewer asks the child if anyone else keeps their things with the object. Answers are categorized as "exclusive" or "shared" space usage.

Rationale for Revision:

1. The wording of the questions to the child was changed to be more explicit. Also, interviewers were given the opportunity to explain the questions if the child seemed to be confused. It was thought that these changes would improve communication with the child.
2. The mother is asked to select four of the child's personal objects. It was thought that this would reduce the possibility that the objects selected would not be considered as personal by the child. Thus, the validity of the instrument is improved.

Implications of the Study

This study has implications for those who desire to have some empirical basis from which to make decisions regarding the adequacy of family living units. Authoritative references indicated that the quantity of space required to satisfy family living needs is subject to modification by the family's activities and personal space demands of its individual members. It therefore appeared that activity density and personal object space would be valid qualitative measures for defining housing adequacy. Currently, analyzed quantitative measures of housing adequacy adequacy (person per room, person per bedroom, and number of square feet) do not seem to be sensitive enough criteria upon

which to design future housing decisions. As our nation's housing becomes more compact and housing selections are limited, we will need new types of criteria on which to base our decisions on the nature of the single-family unit.

The present study concentrated on three measures to describe the living environment; activity density, infringement on activities and personal object space. And although no conclusion can be drawn, some promising approaches have been delineated. These are only three of several variables which may also have a modifying effect upon the physical dimensions of family living space. Other variables requiring the development of new instruments are measures of: elaboration of the space, managerial skills of families, and attitude toward the housing unit and neighborhood. In a more comprehensive study, it would be possible to relate housing variables with behavioral and developmental patterns. The results of such investigations would furnish concrete quides for designing the living environment.

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APPENDICES

APPENDIX A

COMMUNICATION WITH RESPONDENTS

MICHIGAN STATE UNIVERSITY East Lansing, Michigan 48823

College of Home Economics
Department of Family and Child Sciences

Dear

A part of our research program in the Department of Family and Child Sciences is a study currently being conducted in the Spartan Nursery School. Group I (Mrs. Newsom's class) and Group II (Mrs. Griffith's class) are being used in this particular project.

Our focus is on the relationship between certain aspects of a child's environment and his behavior and development. More specifically, we are considering the possible influence of family size in a situation in which the general physical environment is held constant.

The children in these classes were selected on the basis of age, number of siblings, and residence in university housing. Assessments of the children's reactions to situations and tasks is now being completed, and it is in this regard that we have asked for your help. Such dimensions as task initiation, verbalization, curiosity, perception of self and others, abstract ability and social competence are included in our assessment. Special child measures being used are the Cincinnati Autonomy Test Battery, the Peabody Picutre Vocabulary Test, the Goodenough Draw-a-Man Test, and the Information and Block design subtests of the Weschler Preschool and Primary Scale of Intelligence. Observation of social interaction will be carried out within the class units.

As with all our projects, extreme care is taken to protect the child and insure his enjoyment of the experience. These

tests were chosen for their suitability to the children as well as to the conceptualization of the project. All testers are qraduate research assistants who are specifically trained in this area.

The staff of our center and of the Spartan Nursery School appreciate your cooperation and interest. Later in the school year we would hope to be able to discuss the project more completely with you.

Sincerely,

Robert P. Boger

Robert P. Boger
Director of Research

MICHIGAN STATE UNIVERSITY East Lansing, Michigan 48823

College of Home Economics
Department of Family and Child Sciences

Dear Parent,

Last fall you received a letter describing a research effort at the Spartan Nursery School. As I explained in that letter, the focus of this project is on the relation of aspects of children's environment to their behavior and development. More specifically, we are considering the influence of family size and general physical environment on children's social and learning behavior.

We are now at the point in this project where we need your assistance in gaining information relative to your child's living environment. Specifically, we would like to arrange a time for an interview when we could meet with you and your children. We will also leave some material requiring the responses of both parents (if living with the family) to be picked up at a later date.

We will be contacting you by telephone early next week to determine a time when it would be most convenient to call upon you and at a time when your nursery school child will also be home.

We appreciate your continued support and cooperation.

Sincerely,

Robert P. Boger

Robert P. Boger
Director of Research

TELEPHONE INSTRUCTIONS

1. My name is_____. I am a graduate student in_____.

2. Did you receive a letter from Dr. Boger describing the research project called "The child and his housing environment?"

   If no: I was calling to establish a time when we could have an interview with you and_____ (child's name). Would you be willing to set a time now or do you prefer to wait until you have received the letter?

   If yes: I am calling to establish a time when we can have an interview with you and _____ (child's name). Let me ask you if you are planning to move at the end of the term because we would like to interview you first.

   When would be the best time to meet with you this week or next week for about an hour?

   If very open to a time: Is there any chance we could talk with you tonight? This is our regular class time and we need to get our data before the end of the term.

   If very hesitant about a time: Are you planning to move at the end of this term? (If yes,) It is very important to talk to you before you start to move things out of your apartment, or start to pack.

(If they can't give any answer as to a convenient time for an interview, ask "When may I call you back to set a time?")

Then repeat to them the following items to make sure you have the correct information.

You live at_____

The day and time of the interview is_____at_____.

Thank you very much.

APPENDIX B

ORIGINAL INSTRUMENTS

BIOGRAPHICAL INFORMATION

Present Residence:

Number of months you have lived at this address ____months

On which level is this apartment? (check one) ____upstairs ____downstairs

COMMENT: OMITTED

Previous Residence:

In what city and state (P.O. address) did you live before moving into University Housing?

_____

COMMENT: NOT USED

How many months did you live at this previous residence? ____months

What type of housing was your last residence? In what type of housing have you spent most of your life? (check one in each column)

Last housing	Most of life
Single or duplex house____	Single or duplex house____
Apartment building, 1-4 units____	Apartment, 1-4 units____
Apartment, 5 or more units____	Apartment, 5 or more units____
Mobile home____	Mobile home____
Rooming house____	Rooming house____
Other (list)_____	Other (list)_____

COMMENT: REPLACED - NOT EFFICIENT

Number of rooms in last place of residence____

Number of bedrooms in last place of residence____

Number of bathrooms in last place of residence____

COMMENT: REPLACED - NOT EFFICIENT

Did you own or rent this last place of residence? (check one)

Own_____
Rent_____
Live with parents_____
Other (list)_____

In what type of community situation did you live previous to University Housing? (check one)

Small town of less than 25,000 _____
Urban city of more than 25,000 _____
Suburban_____
Rural farm_____
Rural nonfarm_____

Number of times you have moved during the past five years_____

Planned Future:

In how many months do you anticipate moving from University Housing? ____months

---

Biographical Data:

Mother

Marital status (check one)

Married_____
Divorced_____
Separated_____
Other_____

Age (in years)

15-20_____
21-25_____
26-30_____
31-35_____
36-40_____
41-45_____
46-50_____
older_____

Education (What was the last grade you completed)

Grade 5 or less_____
Grades 6-8 _____
Grade 9 or 10 _____
Grade 11 or 12 _____
College: 1 year _____
2 years_____
3 years_____
4 years_____
more than 4 years_____
Nurses training_____
Beauty school _____

Are you a student?

Part-time student_____
Full-time student_____
Not a student _____

Are you employed outside the home?

Full-time paid worker_____
Part-time paid worker_____
full-time homemaker _____

COMMENT: REPLACED - NOT EFFICIENT

If you are a paid worker, specify the kind of work you do _____

Sales _____
Educational _____
Other professional_____
Skilled craftsman _____
Farmer _____
Managerial _____
Service worker _____
Operative _____
Clerical _____
Other (list) _____

COMMENT: OMITTED - NOT USED

If you are a student, what is your expected kind of work for pay after graduation?
Specify_____

Sales _____
Educational _____
Other professional_____
Skilled craftsman _____
Farmer _____
Managerial _____
Service worker _____
Operative _____
Clerical _____
Other (list) _____

A study of the United States shows that in this country there are three major social classes -- the UPPER, the MIDDLE, and LOWER. In which of these social classes would you say your family belongs?

Upper _____
Middle_____
Lower _____

What do you think your position is in that class?

Upper _____
Middle_____
Lower _____

What was/is your father's occupation or vocation?_____

Are you a member of a church or religious group? (check one)

Not a member _____
Member of Roman Catholic Church _____
Member of Jewish faith _____
Member of Protestant Church _____
(list)_____
Member of other religious group _____
(list)_____
Name of church or religious group
_____

How often do you attend church? (check one)

Do not attend _____
Once a week or more _____
Once a month or more, but not more than four times a month _____
Once a year or more, but not more than twelve times a year _____

Do you tend to have more sympathy with (check one)

The Democratic party _____
The Republican party _____
No preference _____
Other (specify) _____

Where have you (the mother) lived most of your life? (check one)

On a farm _____
In the open country, but my parents were not farmers _____
In a town _____
In a city _____
Other (list)_____

COMMENT: ENTIRE SECTION OMITTED - CAUSED SOME HOSTILITY IN RESPONDENTS

Father

Age (in years) _____

Education: (Check last grade completed)

Grade 5 or less_____
Grades 6 to 8 _____
Grade 9 or 10 _____
Grade 11 or 12 _____
College: 1 year _____
2 years_____
3 years_____
4 years_____
more than 4 years_____

Are you a student? (Check one)

Part-time student _____
Full-time student _____
Not a student _____

Are you employed for pay outside the home? (Check one)

Full-time paid worker _____
Part-time paid worker _____
Not employed outside the home _____
Retired, unemployed _____

If you are a paid worker, what kind of work do you do? Specify _____

COMMENT: REPLACED - NOT EFFICIENT

Is it:

Sales _____
Educational _____
Other professional _____
Skilled craftsman _____
Farmer _____
Managerial _____
Service worker _____
Operative _____
Clerical _____
Other (specify) _____

If you are a student, what is your expected kind of work for pay after graduation? Specify _____

Sales _____
Educational _____
Other professional _____
Skilled craftsman _____
Farmer _____
Managerial _____
Service worker _____
Operative _____
Clerical _____
Other _____

COMMENT: OMITTED - NOT USED

A study of the United States shows that in this country there are three major social classes -- the UPPER, the MIDDLE, and LOWER. In which of these social classes would you say your family belongs?

Upper _____
Middle_____
Lower _____

What do you think your position is in that class?

Upper _____
Middle_____
Lower _____

What was/is your father's occupation or vocation? _____

Do you do volunteer work?

Yes _____ (list)_____
No _____

Are you a member of a church or religious group? (Check one if different from mother)

Not a member _____
Member of Roman Catholic Church _____
Member of Jewish faith _____
Member of Protestant Church _____
(list) _____
Member of other religious group _____
(list) _____
Name of church or religious group
_____

How often do you attend church? (Check one)

Do not attend _____
Once a week or more _____
Once a month or more, but not more than four times a month _____
Once a year or more, but not more than twelve times a year _____

Do you have more sympathy with (check one)

The Democratic party _____
The Republican party _____
No preference _____
Other _____

Where have you (the father) lived most of your life? (Check one)

On a farm _____
In the open country, but parents were not farmers _____
In a town _____
In a city _____
Other (list) _____

COMMENT: ENTIRE SECTION OMITTED - CAUSED SOME HOSTILITY IN RESPONDENTS

Children: Number of children in the family _____

Give children's names, sex, ages and year in school. (Indicate nursery school when applicable.) List children according to age, beginning with the oldest.

NAME	SEX (male, female)	AGE	YEAR IN SCHOOL

COMMENT: OMITTED - NOT USED

List others who spend appreciable time as a guest or member of family.

COMMENT: REPLACED - NOT EFFICIENT

Income:

Please circle the range of income which most closely corresponds to your best estimate of your household's cash income during the past year. Please consider all sources:

0	1 - 499	500 - 999
1,000 - 1,999	2,000 - 2,999	3,000 - 3,999
4,000 - 4,999	5,000 - 5,999	6,000 - 6,999
7,000 - 7,999	8,000 - 8,999	9,000 - 9,999
10,000 - over		

Please rank the sources of this cash income:

None _____	Savings _____	Wages _____
Aid to Dep. Children or child support____	Contributions from others_____	Other _____

COMMENT: OMITTED - NOT USED

ACTIVITY LOAD FORM

INSTRUCTIONS TO THE INTERVIEWER:

Place a transparency over the floor plan (with the furnishings already marked). Name the first time period 7:00 a.m. to 9:00 a.m. Write on the transparency the following information:

1. The time period
2. The activity
3. The number of persons present

Ask the mother to point to the area used. If in use for less than thirty (30) minutes, mark the area with diagonal lines ////////. If in use for more than thirty (30) minutes, mark the area with cross-hatched lines XXXXX.

If the mother seems to give very general answers, you may ask for a more specific indication, i.e., "Do you use the sink, too?" Use a different transparency for each time period.

TIME PERIODS

7:00 - 9:00 a.m.
9:00 - 11:00 a.m.
11:00 a.m. - 1:00 p.m.
1:00 - 3:00 p.m.
3:00 - 5:00 p.m.
5:00 - 7:00 p.m.
7:00 - 9:00 p.m.
9:00 - 11:00 p.m.
11:00 p.m. - 1:00 a.m.

SAY:

"We would like to know what activities you perform during a typical day. As I say the time periods, tell me what your family is doing, how many of you are present, and approximately how long the activity lasts. Then point to the area that is being used on the floor plan."

Activity Areas

The interviewer is to go through this check list asking for information on activities not indicated on the daily activity load form. Fill these activities in on one separate floor plan. Please note: 1. Which activity; 2. Who participated; 3. Amount of time. If anyone spends at least 30 minutes on an activity, mark the location with diagonal lines (example //////). If anyone spends more than 30 minutes in any of the suggested activities, mark the area with crossed lines (example XXXXXX). You may mark more than one area, but please try to be specific in indicating the location.

Activity 1

Suggested activity: Food preparation

Examples: washing vegetables
mixing ingredients
cooking
serving
unloading and storing groceries

Activity 2

Suggested activity: Eating

Examples: family meals
feeding children
snacking

Activity 3

Suggested activity: Food clean-up

Examples: washing dishes
storing food
cleaning surface areas

Activity 4

Suggested activity: Housecleaning and maintenance

Examples: cleaning floors
dusting, polishing
cleaning appliances
cleaning surface areas

Activity 5

Suggested activity: Laundry and clothing care

Examples: wash clothing
soak clothing
dye and dry clean clothing
ironing
sorting

Activity 6

Suggested activity: Grooming and personal care

Examples: washing hair
shaving
bathing
dressing

Activity 7

Suggested activity: Child care

Examples: bathing
dressing
tending (of baby)

Activity 8

Suggested activity: Children's recreation

Examples: games with friends
watching TV
coloring, painting

Activity 9

Suggested activity: Adult recreation

Examples: entertaining
reading
watching TV
hobbies or craft activities
conversation

Activity 10

Suggested activity: Child's rest and sleeping

Examples: naps
night sleeping

Activity 11

Suggested activity: Adult resting and sleeping

Examples: naps
night sleeping

Activity 12

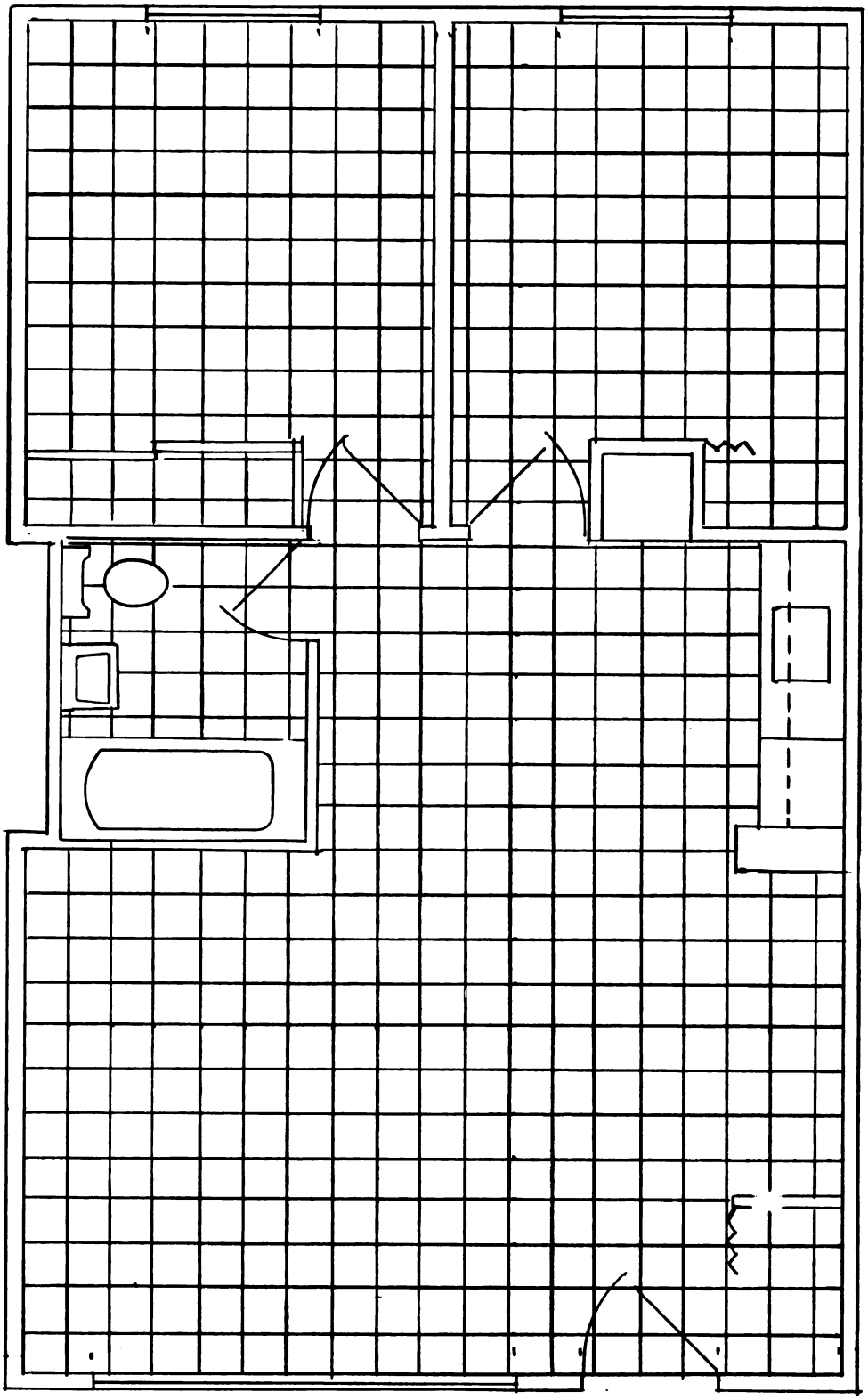
Suggested activity: Storage other than closets and drawers

Example: extra trunks
stacked or piled articles
articles on surface areas for other than decorative or functional purposes

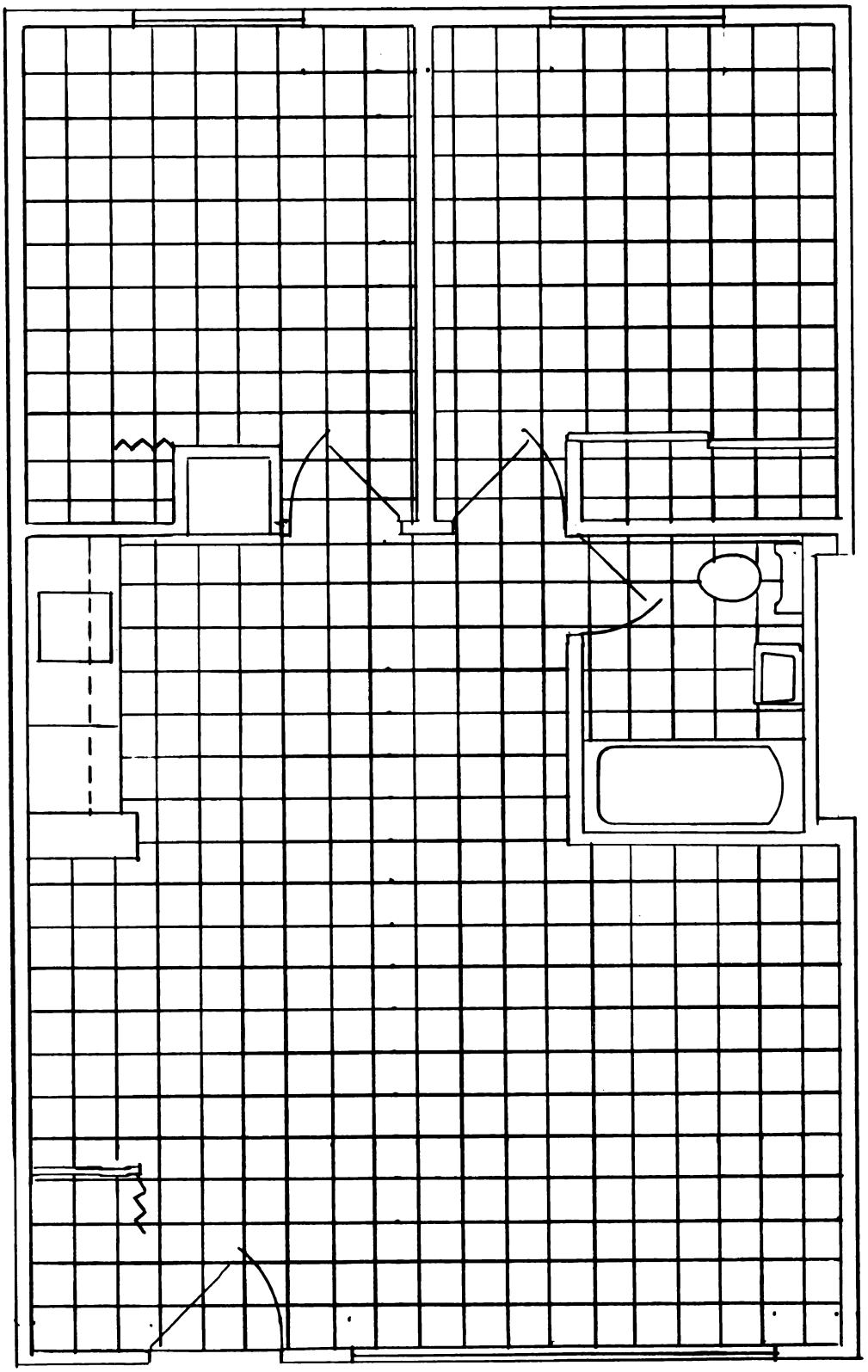
Activity 13

Other activities:

Examples:

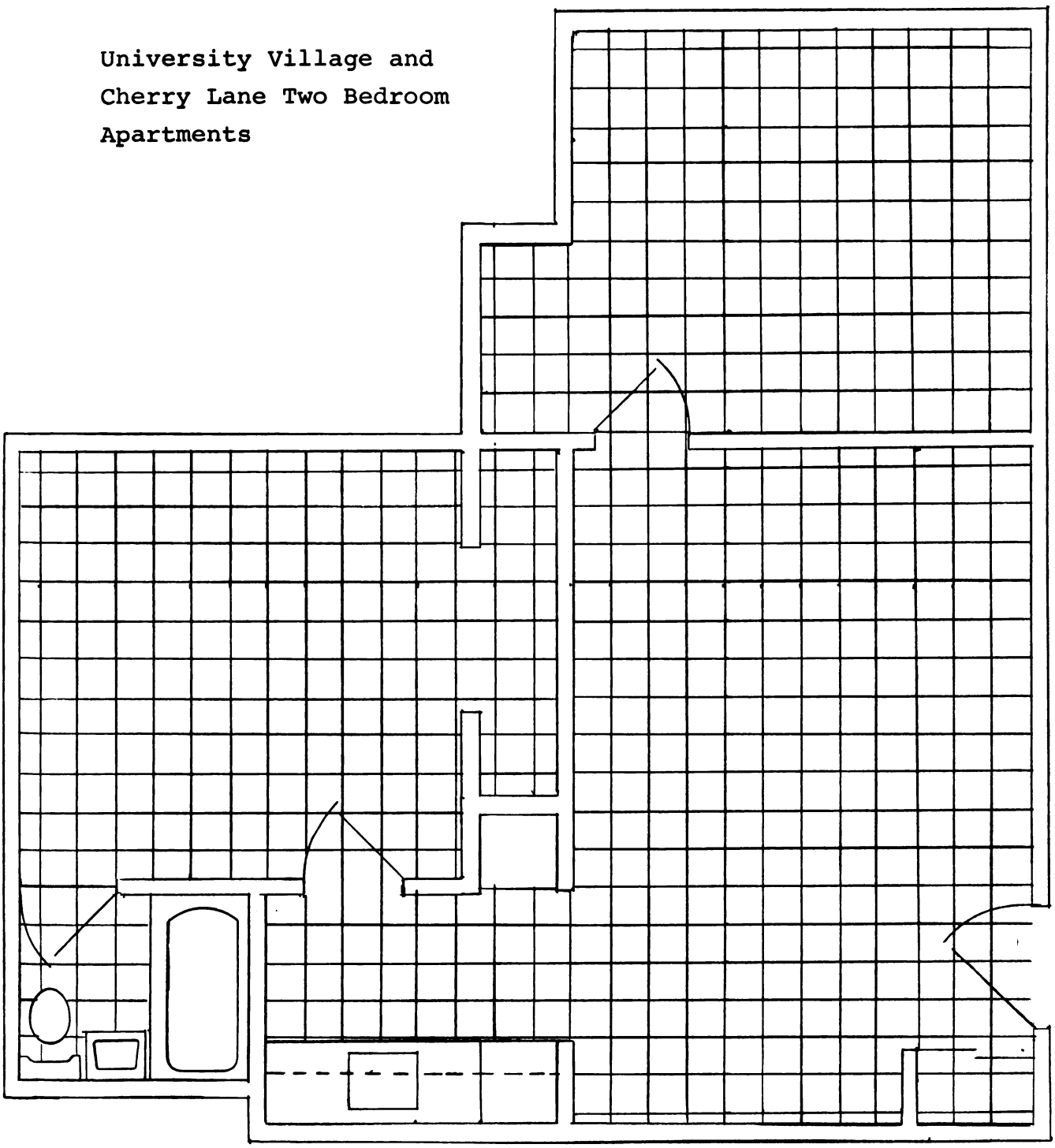


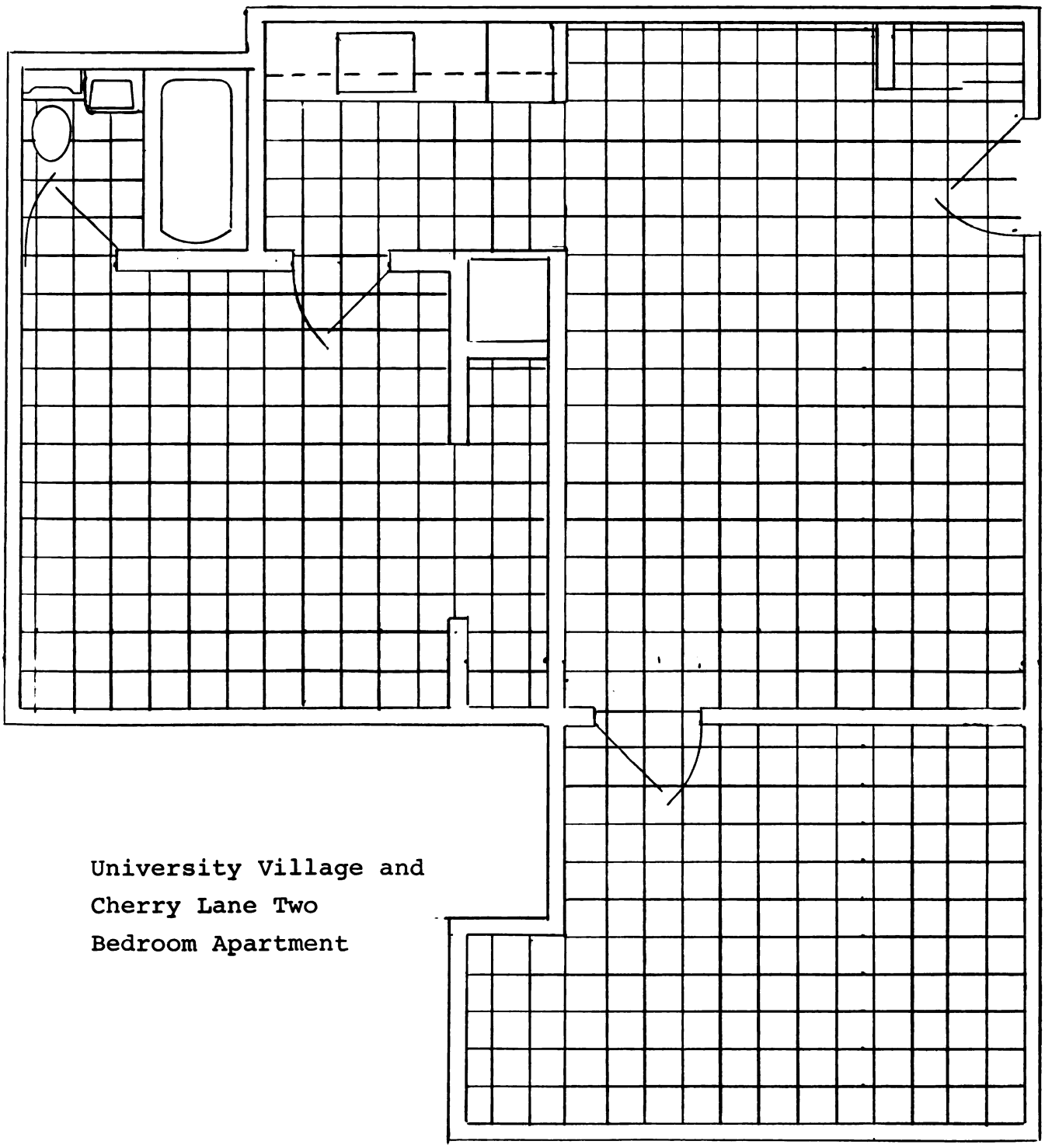
Spartan Village



Spartan Village

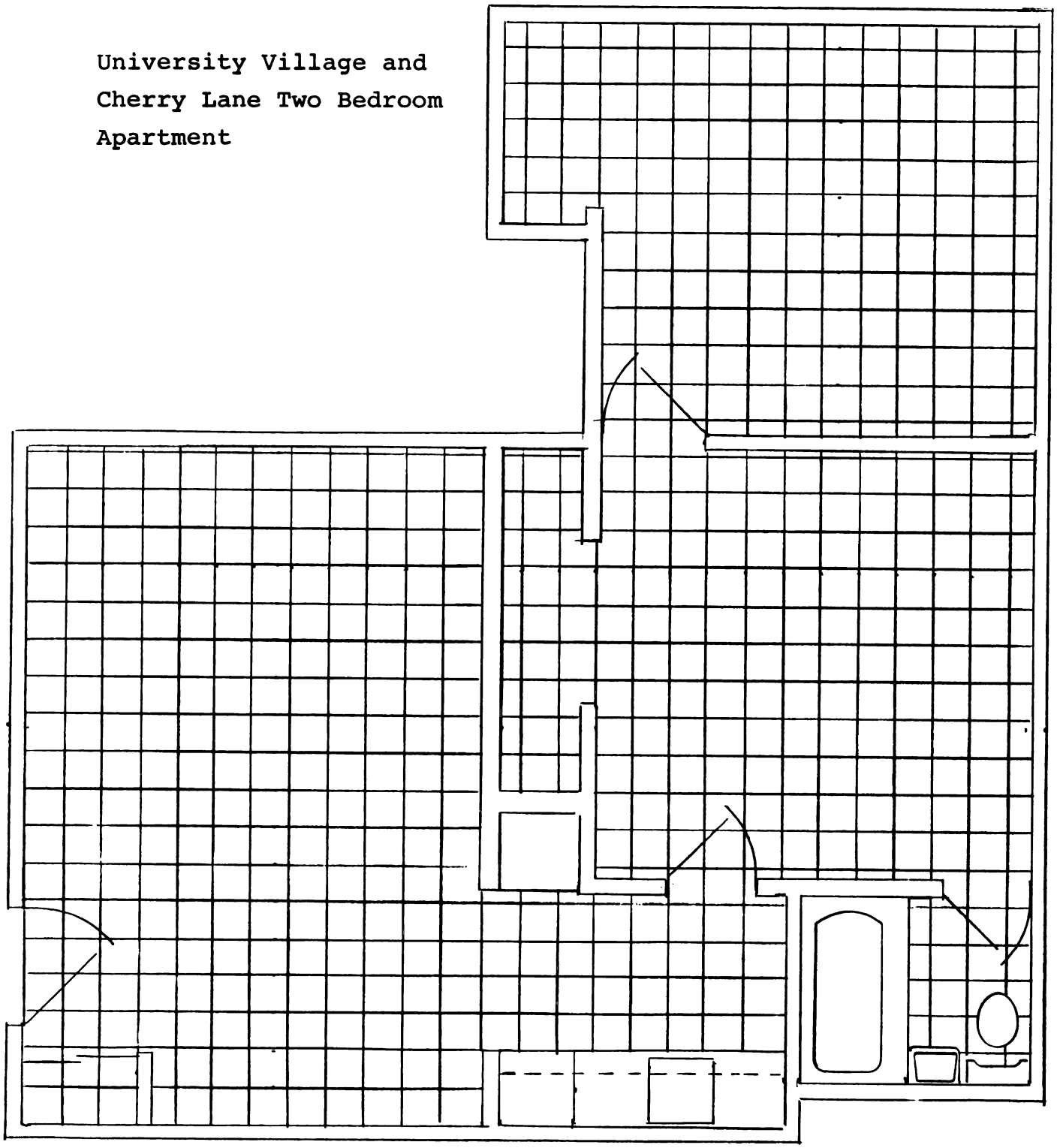
University Village and
Cherry Lane Two Bedroom
Apartments





University Village and
Cherry Lane Two
Bedroom Apartment

University Village and Cherry Lane Two Bedroom Apartment



Child's Personal Space

Instructions to the Interviewer: Place a transparency over the floor plan (with the furniture marked). Use a red pencil for marking your interview with the child. By asking the child to pretend he is going to perform certain activities you will be taken to different areas of his home. Mark these areas as specifically as possible and number them as listed below. If there is no response, place NR beside the activity. Say, "Let's pretend you are going to (paint). Where would you go?"

Activity:

1. Paint _____
2. Color _____
3. Play with toys _____
4. Watch T. V. _____
5. Play with friends _____
6. Eat _____
7. Sleep _____
8. Dress _____

Mark 9 - 11 on transparency

9. Show me where you keep your toys. Does anyone else keep toys there?
   _____ Yes
   _____ No
   _____ Sometimes
   _____ NR

10. Show me where you keep your clothes. Does anyone else keep clothes there?
    _____ Yes
    _____ No
    _____ Sometimes
    _____ NR

11. Where do you keep your favorite toy?
    _____ NR

12. Do you have your own chair when you eat?
    _____ Yes
    _____ No
    _____ NR

13. Do you always sit here?
    _____ Yes
    _____ No
    _____ NR

14. Do you have your own towel?

_____ Yes
_____ No
_____ NR

Where do you keep it?

_____ has place
_____ has no place
_____ NR

15. Do you have a room by yourself?

_____ Yes
_____ No
_____ NR

Mother's Conception of Child's Personal Space

Instructions to Interviewer: Place a new transparency over the floor plan. Use the blue pencil. Say to mother: For each of the activities below, outline the areas your child uses. Please put the corresponding numbers in the areas.

1. Painting
2. Coloring
3. Playing with toys
4. Watching T.V.
5. Playing with friends
6. Eating
7. Sleeping
8. Dressing

APPENDIX C

REVISED INSTRUMENTS

Biographical Information

To be completed by the respondent.

1. Marital status (check one)

01	Married	____
02	Divorced	____
03	Separated	____
04	Other	____

2. Age (in years) Check one column for mother, one for father.

	M	F	
15-20	___	___	01
21-25	___	___	02
26-30	___	___	03
31-35	___	___	04
36-40	___	___	05
45-50	___	___	06
46-+	___	___	07

3. Education (What was the last grade completed?)

	M	F	
Grade 9 or 10	___	___	01
Grade 11 or 12	___	___	02
College:			
1 year	___	___	03
2 years	___	___	04
3 years	___	___	05
4 years	___	___	06
over 4	___	___	07
Nurses training	___	___	08
Beauty School	___	___	09
Secretarial	___	___	10

4. Are you a student?

	M	F	
Part-time student	___	___	01
Full-time student	___	___	02
Not a student	___	___	03

5. Are you employed outside the home?

	M	F	
Full-time paid worker	___	___	01
Part-time paid worker	___	___	02
Full-time homemaker	___	___	03

Biographical Information (Continued)

CHILDREN

1. Number of children in the family. ___

2. Give children's sex, age and year in school.

Age	Sex	Year in school
___	___	_____
___	___	_____
___	___	_____
___	___	_____
___	___	_____
___	___	_____

3. List others who spend appreciable time as a guest or member of the family.

Number of others_____

INCOME

Please circle the range of income which most closely corresponds to your best estimate of your household's cash income during the past year. Consider all sources.

1,000-1,999	01	6,000-6,999	06
2,000-2,999	02	7,000-7,999	07
3,000-3,999	03	8,000-8,999	08
4,000-4,999	04	9,000-9,999	09
5,000-5,999	05	10,000-over	10

Past Housing Experience

To be completed by the respondent

1. Number of months you have lived at this address _____

2. How many months did you live at your last address? _____

3. Number of times you have moved during the past five years _____

4. In how many months do you anticipate moving from University housing? _____

5. What type of housing was your last residence? In what type of housing have you spent most of your life? (Check one in each column)

	Last Housing	Most of Life
01 Single or duplex house	_____	_____
02 Apartment building, 1-4 units	_____	_____
03 Apartment, 5 or more units	_____	_____
04 Mobile home	_____	_____
05 Rooming house	_____	_____
06 Other (list)	_____	_____

6. Did you own or rent this last residence?

01 Own	_____
02 Rent	_____
03 Live with parents	_____
04 Other	_____

7. In what type of community situation did you live previous to University Housing?

01 Small town of less than 25,000	_____
02 Urban city of more than 25,000	_____
03 Suburban	_____
04 Rural farm	_____
05 Rural nonfarm	_____

Housing Evaluation Sheet

To be completed by the mother

Compare your last home with your present home by placing a check in the appropriate box.

HOUSING FEATURE IN PRESENT HOUSE

	Better	Same	Worse
1. Total amount of space	____	____	____
2. Room arrangement	____	____	____
3. Space for family activities	____	____	____
4. Space for individual activities	____	____	____
5. Family privacy (from outsiders)	____	____	____
6. Individual privacy	____	____	____
7. Space for children's noisy play	____	____	____
8. Space for children to play with friends	____	____	____
9. Space for toy storage	____	____	____
10. Space for individual personal articles	____	____	____
11. Opportunity for quiet conversation	____	____	____
12. Opportunity for uninterrupted study	____	____	____
13. Space for hobbies and projects	____	____	____
14. Amount of noise	____	____	____
15. Space for entertaining adult friends	____	____	____
16. Space for food preparation	____	____	____
17. Space for personal care	____	____	____
18. Space for laundry	____	____	____
19. General storage space	____	____	____

Housing Evaluation (Continued)

20. Is anyone in the family bothered by a lack of space?

01	Father	_____
02	Mother	_____
03	Oldest child	_____
04	2nd child	_____
05	3rd child	_____
06	4th child	_____

21. Do you feel you need more space?

01	Yes	_____
02	No	_____

22. If yes, if you could have more space, would you be willing to pay for it?

01	Yes	_____
02	No	_____

23. How much more per month?

01	$10	_____
02	$20	_____
03	$30	_____
04	$40	_____
05	$50	_____
06	More	_____

24. If you feel you need additional space, what would you want?

01	Don't need additional space	_____
02	Bedroom	_____
03	Dining room	_____
04	Study	_____
05	Playroom	_____
06	Storage space	_____
07	Other	

Activity Load Instrument

Instructions to the Interviewer

Interviewer, say:

"We are interested in knowing the type, duration and location of the activities carried on in your home at specific two-hour time periods during the day starting with 7:00 AM to 9:00 AM."

"Look at the floor plan of your home."

"From 7:00 AM to 9:00 AM, how many people use Area 1?"

(Record response)

"What activities are carried on in Area 1 from 7:00 AM to 9:00 AM?"

As each activity is named, ask:

"Do you spend more or less than one-half hour----------.

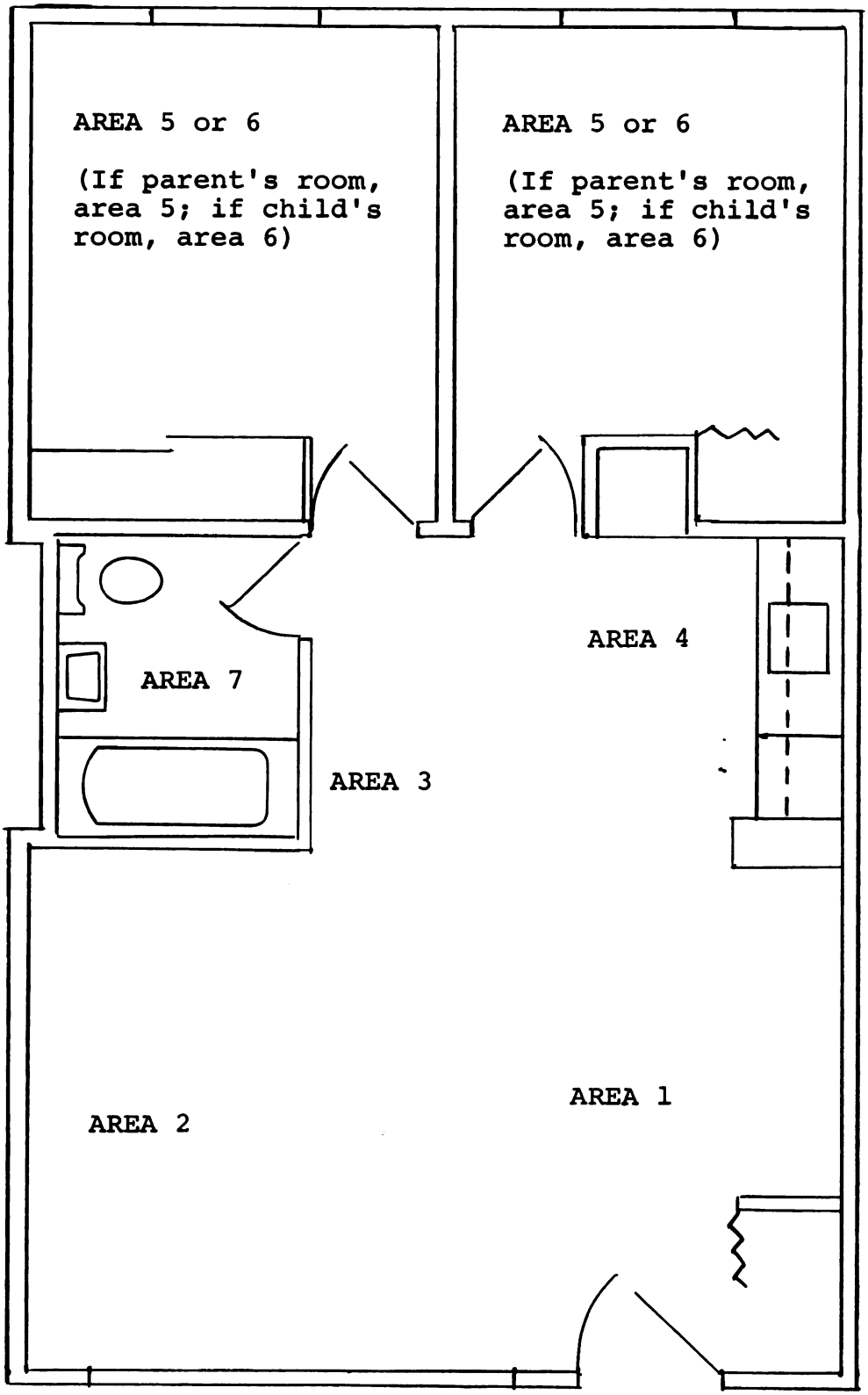
(name activity)

(Record response by checking the appropriate box.)

Repeat this questioning for all seven areas of the home for the 7:00 to 9:00 time period.

When the first time period has been completed, repeat the questioning for the following time periods in the order that they appear listed.

9:00-11:00 AM	5:00-7:00 PM
11:00-1:00 PM	7:00-9:00 PM
1:00-3:00 PM	9:00-11:00 PM
3:00-5:00 PM	11:00-1:00 AM


AREA 5 or 6
(If parent's room, area 5; if child's room, area 6)
AREA 5 or 6
(If parent's room, area 5; if child's room, area 6)
AREA 4
AREA 7
AREA 3
AREA 1
AREA 2

Activity Load

Time Period_____

Area number of child's room_____

AREA 1 No. of people using the area_____			AREA 2 No. of people using the area_____		
Less than 1/2 hour use	More than 1/2 hour use	Activities	Less than 1/2 hour use	More than 1/2 hour use	Activities
		food preparation			food preparation
		eating			eating
		dressing			dressing
		sleeping			sleeping
		parent's leisure			parent's leisure
		child's play			child's play
		studying			studying
		personal care			personal care
		laundry			laundry
		other			other

AREA 3 No. of people using the area_____			AREA 4 No. of people using the area_____		
		food preparation			food preparation
		eating			eating
		dressing			dressing
		sleeping			sleeping
		parent's leisure			parent's leisure
		child's play			child's play
		studying			studying
		personal care			personal care
		laundry			laundry
		other			other

Activity Load (Continued)

AREA 5 No. of people using the area_____			AREA 6 No. of people using the area_____		
Less than 1/2 hour use	More than 1/2 hour use	Activities	Less than 1/2 hour use	More than 1/2 hour use	Activities
		food preparation			food preparation
		eating			eating
		dressing			dressing
		sleeping			sleeping
		parent's leisure			parent's leisure
		child's play			child's play
		studying			studying
		personal care			personal care
		laundry			laundry
		other			other

AREA 7 No. of people using the area_____		
Less than 1/2 hour use	More than 1/2 hour use	Activities
		food preparation
		eating
		dressing
		sleeping
		parent's leisure
		child's play
		studying
		personal care
		laundry
		other

Area Use

To be completed by the mother

We are interested in knowing when the different areas of your home are used the most. Eight time periods of the day are listed. For each time period, you are to rank the areas of your home from the most used in the first blank to the least used in the last blank. Refer to the floor plan of your home for the number that corresponds to each area. Beside each blank provided for an area number are a set of parentheses. In the parentheses you are to write the number of people using the area during the time period stated.

For example: If the kitchen is the most used area during breakfast (7:00 AM-9:00 AM) you would place a 3 (kitchen area) in the first blank. If there are usually four people in the kitchen at the time, you would place a (4) in the following parentheses. If the bathroom is the second most used area from 7:00 AM-9:00 AM, you would place a 7 (bathroom area) in the second blank. If four people use the bathroom from 7:00 AM-9:00 AM, you would place a (4) in the following parentheses.

BREAKFAST (7:00-9:00 AM) 3 (4) 7 (4) __( )__( )__( )__( )__( )

And so on for each of the seven areas of your home.

Code Key for Areas of the Home:

1 - Living room, door side
2 - Living room, other side
3 - Dining room
4 - Food preparation area
5 - Parent's room
6 - Child's room
7 - Bathroom

BREAKFAST (7:00 AM-9:00 AM)	__( )__( )__( )__( )__( )__( )__( )
LATE MORNING (9:00 AM-11:00 AM)	__( )__( )__( )__( )__( )__( )__( )
LUNCH (11:00 AM-1:00 PM)	__( )__( )__( )__( )__( )__( )__( )
EARLY AFTERNOON (1:00 PM-3:00 PM)	__( )__( )__( )__( )__( )__( )__( )
LATE AFTERNOON (3:00 PM-5:00 PM)	__( )__( )__( )__( )__( )__( )__( )
DINNER (5:00 PM-7:00 PM	__( )__( )__( )__( )__( )__( )__( )
EARLY EVENING (7:00 PM-9:00 PM)	__( )__( )__( )__( )__( )__( )__( )
LATE EVENING (9:00 PM-1:00 AM)	__( )__( )__( )__( )__( )__( )__( )

INSTRUCTIONS FOR ACTIVITY PRIORITY

To be completed by the mother

The purpose of the Activity Priority instrument is to determine what activities and which family members have priority in using the different areas of your home. The day has been divided into morning, afternoon and evening. Areas are designated by number (see floor plan). Activities and family members are listed in separate boxes. For each time of the day, you are to check the first and second priority for activities and for use by family members in the designated area.

For example:

If in the morning the most important use of the dining area is for father's study, you would place a 1 beside studying and father. If the second most important use is cooking, you would place a 2 beside food preparation and whoever does the cooking--probably the mother.

Do this for each area during the three time periods.

Activity Priority

MORNING

Area 1 Living room (door side)	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 2 Living room (other side)	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 3 Dining	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 4 Food Prep	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___

Activity Priority (Continued)

	MORNING	
Area 5 Parent's room	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 6 Child's room	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 7 Bathroom	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___

Activity Priority (Continued)

AFTERNOON

Area 1 Living room (door side)	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 2 Living room (other side)	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 3 Dining	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 4 Food prep	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___

Activity Priority (Continued)

AFTERNOON

Area 5 Parent's room	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 6 Child's room	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 7	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___

Activity Priority (Continued)

EVENING

Area 1 Living room (door side)	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 2 Living room (other side)	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 3 Dining	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 4 Food prep	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___

Activity Priority (Continued)

EVENING

Area 5 **Parent's room**	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 6 **Child's room**	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___
Area 7 **Bathroom**	food preparation ___ eating ___ dressing ___ sleeping ___ parent's leisure ___ child's play ___ studying ___ personal care ___ housework ___ laundry ___ other ___	father ___ mother ___ oldest child ___ 2nd child ___ 3rd child ___ 4th child ___ other ___

Location of Child's Activity and Personal Care Space

Instructions to the Interviewer:

Say to the mother: "We are interested in obtaining some information from your child. It would be best if you did not participate in this interview by offering any additional information or commenting on your child's answers."

1. Say to the child: "Show me where you _____." After the child has located the area, look on the floor plan for the corresponding number and place it in the box beside the activity.
2. Immediately after the child has located the requested activity area, say: "Does anyone else ever use this place?" If the answer is vague, continue questioning the child about the use of that space until you feel you have enough information to categorize his answers as "always," "sometimes" or "never." Mark the appropriate box.
3. Repeat (1) and (2) for each of the eight activities listed.
4. Say to the mother: "We are interested in knowing if there are times when other activities conflict or interfere with your child's activities. In other words, are activities being carried on simultaneously which interfere with each other. As I read to you the activity and area of your home that your child has identified, you are to indicate the presence or absence

of conflicting activities by answering "always," "sometimes," or "never."

5. Read the activity and name the area which the child has identified (refer to floor plan). Check the appropriate box.
6. If the mother answers "always" or "sometimes" say: "At what times during the day does this occur?"
7. Record the answer by checking the appropriate box. You may record more than one time for each activity.

Location of the Child's Personal Object Space

Instructions to the Interviewer:

1. Say to the mother: "We are interested in knowing what objects your child uses the most or feels the most possessive of. Would you name four of them for me." Write the names of these objects in the blanks provided.
2. Say to the child: "Would you show me where you keep _____." As the objects are located, mark the area number by referring to the floor plan. (If the child seems to have difficulty understanding the question, you may rephrase if but DO NOT change the content.)
3. After the child has shown you the location of the object, refer to the floor plan and mark the area number in the box beside the object.
4. Say to the child: "Does anyone else keep their things here?" If the answer is vague, continue questioning the child about the use of the space containing the object until you feel you have enough information to categorize his answer as "exclusive" or "shared." Mark the appropriate box.

Child's Personal Space

Location of the Child's Activity and Personal Space

	Activity	Location	Use by Others			Conflicting Activities			Time of Conflicting Activities		
			always	some-times	never	always	some-times	never	morning	after-noon	evening
01	sleeping										
02	dressing										
03	eating										
04	watching television										
05	playing with toys										
06	playing with friends										
07	coloring										
08	painting										
			01	02	03	04	05	06	07	08	09

Location of the Child's Personal Object Space

	Name of Object	Location	Child's Use of Object Space	
			exclusive	shared
09				
10				
11				
12				
			10	11