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THE EFFECTS OF CROWDING ON THE SOCIAL AND COGNITIVE DEVELOPMENT OF YOUNG CHILDREN

by

LORRAINE E. MAXWELL

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

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Approval Page

This manuscript has been read and accepted by the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Abstract

THE EFFECTS OF CROWDING ON THE SOCIAL AND COGNITIVE DEVELOPMENT OF YOUNG CHILDREN

by

Lorraine E. Maxwell

Advisor: Professor Susan Saegert

The purpose of this study was to determine what effects the experience of high density in the home and in childcare centers has on the social and cognitive development of young children. Four-year old children were observed and tested in Daycare and Headstart centers. Children were tested for cognitive style and cognitive abilities using the Children's Embedded Figures Test and the Preschool Inventory respectively. Children also were rated by their teachers using the Behar Springfield Behavioral Disturbance Rating Scale. A questionnaire was used to obtain information about the children's home including household size, density (people per room),

and availablity of a private place for the child. A subsample consisting of four children in each center was chosen for the observations. Children attending the Daycare centers had a full-day program while those attending Headstart had a half-day program.

The findings indicated that children from low density homes engaged in more integrative behaviors in the classroom, continued the activity longer, were more likely to play with other children rather than alone or with an adult, and renewed an activity when interrupted more often than children from high density homes. Having a private place in the home was marginally related to less anxious behavior and higher scores on the Children's Embedded Figures Test. Children in high density classrooms, (in all cases these were in the full-day centers) showed less continuous behavior than those in the moderate density classrooms. Children in the high density classrooms also received higher behavioral disturbance scores than those in the moderate density classrooms. This was especially true for boys who were more likely than girls to be rated as hostile and hyperactive in these classrooms. Scores on the Preschool Inventory and the Children's Embedded Figures Test, however, also were higher in the high density, Daycare center

classrooms.

The study calls for further investigation into the function of private place for young children and larger sample sizes of different density levels in full- and half-day childcare programs to more fully evaluate the role density may play in these environments.

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Finally, I thank God.

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CHAPTER ONE--INTRODUCTION AND CROWDING LITERATURE

INTRODUCTION

The main purpose of this research is to expand our understanding of how young children are affected socially and psychologically after spending large amounts of time in crowded, high density settings. Two settings where young children spend a large amount of time, the home and childcare center, will be examined. Within this framework, the researcher also seeks to understand how home density and daycare density interacts in terms of children's cognitive and social development. In addition, this research will determine whether the negative social and psychological effects of differing levels of density can be mitigated by the physical design of the classroom, program, or teacher attitude. The amount of time (full day or half day) spent in a daycare classroom will be investigated to see how it might affect the way children adapt to different density levels and how it affects their overall development in terms of the variables

considered in this study. This research also may identify how children attempt to alter their environment or their behavior because of density levels.

Additional questions of concern are whether home or daycare density have a larger impact on children's development, how home and daycare density interact, and if there are sex differences in terms of reactions to particular density settings. Finally, further avenues for research in this field will be suggested.

Increasing our understanding of the physical and social environmental influences on children's development is important from several perspectives. First, it is important for the field of developmental psychology in terms of understanding the developmental process in different settings and under different circumstances. Second, it is important for the field of environmental psychology to contribute to the understanding of how behavior and aspects of the environment relate to each other and how people adapt to or are affected by environmental conditions. Third, it is intended to have some practical implications for daycare

and other spaces where children spend a great deal of time.

Family life styles have changed considerably in the past 20 years. Increasing numbers of mothers of young children (school and preschool age) work outside the home. This includes both married women and single women with children. The composition of families is also changing with the number of single parent households becoming the statistical norm as opposed to the once traditional nuclear family. Both single parent families (either a custodial mother or father) and nuclear families where both the mother and father are employed must find alternate means of childcare, particularly those families with preschool age children. Childcare services can be provided in a variety of forms. The children can be cared for in their own homes by relatives other than the parents or by persons employed for that purpose. Services can also be provided in a home where a woman cares for one child or a number of children. This can be done on an informal basis where the services are essentially baby sitting or it can be more formalized where the home is monitored by a city agency and the number of children is regulated. Services also can be provided in a more institutional

setting, namely daycare centers. Centers can be either publicly or privately funded; they can be found in churches, community centers, storefronts, housing projects, schools, or buildings designated for that purpose. These centers can have full day or half day programs and varying educational components. Families may pay nothing, for example in Headstart, or amounts based on a sliding scale up to $18.00 per week in public daycare or several hundred dollars a month in private daycare.

Childcare services are especially important for low- income families. For either nuclear or single parent low- income families, the mother's employment often means the only chance for the family to stay off the welfare role or to improve the family's economic status. However, since money is limited in such families, the ability to pay for childcare is also limited. Providing quality childcare is essential for children in-low income families in order not to put them at a further disadvantage once they enter the formal school system. The use of daycare centers by low-income families should positively affect the child's development and not contribute to any disadvantage for the child based on his or her economic

status. Therefore, it is crucial to understand how childcare environments can affect child development in this income group.

However, regardless of who uses centers for childcare, the centers should provide a healthy environment. What are the qualities that contribute to a healthy environment? This is an important question, not only for the low income family, but for all families. The absence of crowding in daycare classrooms may be an important aspect of this healthy environment. Most publicly funded centers must conform to certain regulations. Private centers also are required to meet minimum health and fire safety codes. As corporations begin to experiment with operating daycare centers for their employees what will be the guidelines in terms of providing a healthy environment? What part will social and physical density levels play in creating a healthy environment? This latter question will be addressed in this study.

It is anticipated that this research will provide some knowledge that could contribute to guidelines and regulations for daycare centers. This could influence both public and private daycare. Since

changes in family life styles and composition have affected the need for daycare, it is imperative for society that the daycare experience be a positive one for all children and that this experience enhance their development. This study examines some of the factors that may affect both the quality of daycare and the development of children's social and cognitive skills.

Some insight also may be gained from this study concerning children's spaces in general. By identifying particular design features in an environment that intensify or mitigate the effects of density, this research may identify issues that are important to the design of both family housing and childcare centers.

Before the details of this study are presented, the relevant crowding and daycare literature will be discussed. This discussion will be followed by a statement of the hypotheses and the methods used to investigate the questions raised by this research. Finally, the findings will be presented and discussed.

CROWDING LITERATURE

The topic of crowding has been of interest to social and behavioral scientists for a number of decades. The nature of crowding and the ways it affects living organisms has been the subject of their research. Is aloneness the opposite of being crowded? Is crowding merely the presence of other people? What level of others constitutes a condition of crowding? Is crowding always a negative condition or experience? Is crowding an urban phenomenon? Is crowding associated with specific behaviors or pathology? What is the relationship between density and crowding? These are some of the questions that have guided research on crowding and density. This chapter will review the literature on density and crowding in terms of the orientation of the research, the type of studies that have been done, and the theoretical issues associated with density and crowding.

Traditions in Crowding Research

Altman (1978) identified three traditions in crowding research: a sociological tradition centered around urban analysis, studies of

animal crowding, and psychological research looking at the individual's response to crowding. The sociological tradition was prominent during the 1920's and 1930's when urban areas were growing rapidly and the social ills that came to be associated with cities were of special concern. George Simmel, who wrote at the turn of the century, and Louis Wirth were two of the sociologists associated with this period. As early as 1903, Simmel (1950) stated that the deterioration of human relations among urban dwellers was due to the cities' size, density, and heterogenity. City dwellers conserved psychic energy by becoming familiar with a smaller proportion of people than their rural counterparts. Wirth (1938) concurred with Simmel and further identified urban human relationships as transitory, superficial, and anonymous. In the early 1970's Stanley Milgram (1970) expanded this sociological approach and gave the theory more psychological attributes by identifying mechanisms that individuals use to cope with the "social overload " (Milgram's term) associated with urban living.

The sociological approach to density research continued into the 1950's and 1960's. The studies of the earlier and later sociological

period were primarily correlational; they sought to relate high population concentrations (people per neighborhood area or people per census tract) with certain outcomes. The outcomes were usually indicators of social pathology such as crime, juvenile delinquency, physical and mental illness, mortality rates, and poor housing (Schmitt 1957, 1963, 1966). However, when income was controlled for, the correlation between high density and social pathology seemed to disappear (Galle, Gove, & McPherson, 1962) . This type of research dealt with density and crowding as a societal issue and not in terms of the individual, the family, or small groups, nor did it distinguish between physical density and subjective states of crowding. Also, since the studies were correlational and contained many variables which were uncontrolled, some predictions were possible but not those relating to individual variables.

The studies of animal crowding (conducted primarily in the 1950's and 1960's) involved both ethological naturalistic observation and controlled laboratory experimental methods. The findings indicated that there were both physiological and behavioral consequences for animals subjected to high density levels or

crowding (see Evans 1978 for a more detailed review of this literature). When crowding occurred in the wild, or natural environment, there was decreased mating and reproduction, increased mortality and infant mortality, sterility, and physiological indicators of stress. When researchers created laboratory environments as Calhoun did (1971), it was found that as density increased (increased population), the rats under study developed severe abnormal behavior patterns including: increased aggressiveness, increased infant mortality, deviant sexual behavior, cannibalism, and decreased maternal behavior including nest building. These behaviors eventually caused the breakdown of the society. Calhoun noted a phenomenon called the "behavioral sink" where the rats tended to congregate around the food source even though there was other space available seemingly indicating that when population increased the rats became more concerned about their food supply even though adequate food and water were provided.

Animal crowding research had a certain appeal to researchers because it was possible to study the effects of crowding on ongoing

social processes and dimensions of physical health over the animal's life span. Detailed autopsies were undertaken and living conditions were experimentally varied to a greater extent than would obviously be possible with human subjects. However, there were also certain limitations to this work in terms of understanding crowding and density as phenonema. It was determined that animal studies could not be generalized to humans for several reasons. First, the amount of exposure to particular density levels is usually different for animals in an experimental situation and humans in everyday life experiences. Second, the freedom to select another environment may affect coping with or behavior in a crowded environment. Human crowding is generally not as consistent as the levels experienced by the animals and humans often can opt to be in less crowded places for a period of time (how this may be different for children will be discussed later). Animal behavior is also largely biologically determined whereas humans have cultural and other inputs to behavior which may influence the relationship between density and behavior (Evans, 1978). In short, in order to understand human behavior and development and crowding, it is necessary to study humans.

The most recent tradition in crowding research over the last twenty years has involved studies organized around individual behavior and performance, development, and group processes, guided by theoretical perspectives based in psychology. The issues in this research can be categorized in terms of: 1) the type of research design, 2) concepts involved in the definition of crowding and density including stress, 3) immediate, cumulative, and aftereffects of crowding, and 4) the social, cultural, personality, or physical attributes which may interact with crowding and density, and 5) crowding in residential and childcare settings.

Research Designs

Crowding researchers have employed laboratory studies, naturalistic field studies, quasi-experimental approaches, and the statistical analysis of archival data. The laboratory studies (ie. Freedman, 1975) usually involved variations either in social or spatial density. The investigators either observed a range of behaviors in both situations or required the study participants to

perform various tasks. In this type of study several variables are often involved. Laboratory researchers are primarily in- terested in the immediate consequences of crowding. Longer- term consequences are not usually the focus of inquiry. The findings from these studies have been criticized because the density conditions are temporary and the setting is not a natural one. It is argued that the same findings might not occur if the density levels involved situations with which people have to cope on a daily basis.

The naturalistic and quasi-experimental studies attempt to address these concerns by conducting research in a natural setting, either taking advantage of naturally varying densities (e.g. Saegert, 1980a) or where the researcher varies the densities (e.g. Baum, 1978). These studies have involved a variety of data collection techniques including questionnaires, interviews, observation, and testing. Again, the behavioral consequences of crowding are usually the topic of such research. Both immediate and cumulative outcomes and the study of aftereffects have been the focus of inquiry. Most of these studies either involved different groups in different density conditions or varied the density for one group (e.g.

Loo, 1972 and Rohe & Nuffer, 1977). There have been fewer aggregate data studies compared to those using other types of designs. Aggregate studies usually involve an investigation of the cumulative effects of crowding based on data collected at the aggregate level, ie. city block, census tract (i.e. Mitchell, 1971).

Definitions of Crowding

Some crowding researchers has concentrated on the definition of crowding or the conceptual components of crowding and density. However, since the definitions have varied it often makes it difficult to compare findings. For example, some, but not all, researchers have distinquished between density and crowding. Density is an objective measurement specifying either spatial density (i.e.number of people per room, square feet per person, number of dwelling units per block) or social density (group size). Crowding, however, is considered to be a subjective interpretation associated with a particular density condition. This interpretation might be the result of feelings of loss of control over interaction and undesirable or excess contact with others (Altman, 1975; Desor,

1972; Rapoport, 1975), the perception of too little psychological or physical space (Stokols, 1972), a constriction of the amount of freedom of choice (Proshansky, Ittelson, Rivlin, 1976), feelings of excessive stimulation (Milgram, 1970) or past experiences with high density settings and one's expectations about the situation (Womble & Stuebaker, 1981).

Stress is considered to be an important component of the state of crowding. Stress may not be a direct result of high density but may be a result of social interference, behavioral constraint, or social overload (Milgram, 1970; Saegert, 1973; Stokols, 1972) which could contribute to feelings of stress. The amount of stress or negative affect associated with high density also may depend on the primacy of the space in the individual's life and the nature of the task in which the individual is involved.

Stokols (1976) differentiates between primary and secondary environments. Crowding in primary environments (home, school, office) may prove more stressful because one expects to have more control in such environments as opposed to the more transitory

crowding encountered in stores or train stations, where the crowding is brief and one does not expect to exert a great deal of control. Stokols hypothesized that behavior learned as a result of crowding in a primary environment would be nore likely to be carried over into other environments. In other words, such crowding might be cumulative and have aftereffects. This concept is especially important in looking at the effects of density and crowding on children and the developmental process. Loo and Ong (1984) also illustrated this issue in a study of perceptions of crowding in a Chinese neighborhood where crowding in a primary environment, the home, was considered more undesireable than crowding in a secondary environment, the neighborhood.

Effects on the Individual

Researchers have examined the effects that high density and crowding might have on the individual. Freedman (1975) concluded that high density did not result in feelings of stress and did not negatively affect task performance on simple tasks. Other researchers have found aftereffects of crowding on certain

cognitive tasks (Saegert, Mackintosh, West, 1975) and tolerance for frustration (Sherrod, 1974). Rodin (1978) and Baum, Aiello, and Calesnick (1978) documented a cumulative effect of crowding and identified it as a result of learned helplessness. Individuals exposed to high social density where interactions are unpredictable, may develop maladaptive avoidance strategies for dealing with others. Exposure to high density settings may have physiological effects, as well. In settings such as naval vessels, off-shore oil drilling sites, and prisons, high social density as opposed to low density was found to result in higher illness rates, higher blood pressures, and a decreased tolerance for crowding (in the high density settings the individuals expressed more dissatifaction with the housing) (D'atri & Ostfeld, 1975; Dean, Pugh, Gunderson 1975; Paulus, Cox, McCain, and Chandler, 1975). Fanning (1967) found that high residential density contributed to poor mental health in women and children. These effects seemed to be both immediate and cumulative. Mitchell (1971), however, found only superficial effects of high density on residential populations in Hong Kong although not all members of the household were equally affected. Children were more likely to feel pushed out and a place to study became a problem in the high density

households. His "superficial effects" included more hostility among family members, complaints, unhappiness, and difficulty in controlling children.

Behavioral effects also have been found in relationship to density and crowding. Withdrawal and decreased intimacy have been found for both adults and children in high density settings (Baldassare, 1977; Hutt & Vaizey, 1966; Ittelson, Proshansky, & Rivlin, 1972; Loo, 1972; Wolfe, 1975). Aggression, anti-social behavior and increased competition also have been found to be a response to high density settings as immediate effects (Epstein & Karlin, 1973; Freedman et al, 1972; Hutt & Vaizey, 1966; Loo, 1972). Some studies (in laboratory or quasi-experimental settings) have not reported aggression or increased competition. Aggression and withdrawal may be characteristics specific to the individual. For example, only autistic children in the Hutt and Vaizey study withdrew in high density conditions while normal children became more aggressive. Other behavioral effects include: increased aggression, hostility, more punitive child rearing practices (Murray, 1974), increased child abuse (Light, 1973), and reduced

cooperativeness and alturism (Bickman, Teger, Gabriele, McLaughlin, Berger & Sunaday 1973). High density and crowding more often than not seems to have a negative affect on behavior.

Mediators of Crowding Effects

Other researchers have been concerned with variables that might influence or mediate the effects of high density and the perception of crowding. One such variable is sex. Freedman (1972) found different effects of density for males and females. Competition was found to increase for males in high spatial density but decrease for females; females reported feeling more pleasant and friendly in the smaller room where the density was higher. However, Baldassare (1977) found that household crowding seemed to make women less sociable (visiting friends) than men. In this study, it was difficult to separate the effects of density and family size. There is a question as to whether the effects found were due to the amount of space available in the home or the number of people in the home. The people per room ratio could conceiveably be low in a large home but the family size could be large. The difference in

Freedman's and Baldassare's findings concerning men and women might be due to the different types of density studied (spatial vs. social), duration (short term vs. long term), and the setting where the study was done (a laboratory vs. a home), and sex differences. Stokols et al. (1973) found results similar to those of Freedman in a laboratory setting. In a crowded urban space, Saegert, Mackintosh, and West (1975) found women to have more positive affect in crowded conditions than men. However, this exposure to crowding also was short-term.

Another variable that might be a mediator of crowding is attributes of the physical environment. Wener and Kaminoff (1983) report reduced perception of crowding, discomfort, anger, and confusion on the part of visitors when signs were added to the high density lobby of a federal correctional facility. This study seemed to point to the role cognition may play in reducing the perception of crowding. The organization of a space may also contribute to perceptions of crowding, loss of control and the desire to reduce interactions with others. Baum and his colleagues (1978) found that residents living in a college dormitory with a long corridor were

less able to cope with the high social density than those who lived in suites which also had high density levels. Perception of control over the number of potential social interactions seemed to contribute to their findings as well as the existence of friendship groups that formed within the suite situation. The groups imposed a structure and a degree of predictability which seemed to reduce feelings of stress and a feeling of being crowded. Such friendship groups did not form in the long corridor situation.

Womble and Stuebaker (1981) found that the perception of crowding in a national park campground was mediated by both personal factors (preference and expectation for density level) and by environmental factors (spatial arrangement of the camping parties and the social behavior of the other campers). The researchers concluded, therefore, that the park managers could reduce the perception of crowding by means other than a reduction in the numbers of users.

The complexity of an environment may influence the affective judgment of crowding. The amount of materials available in a high

density environment may also affect behavior. For example, Kuller (1977) found that physiological arousal and the judgment of being crowded was experienced in rooms with high complexity and high density. The amount of materials available was found to mediate aggressive behavior among preschool children in a high density setting (Rohe & Patterson, 1974; Smith & Connolly, 1980). The latter two studies will be discussed in more detail in the review of the daycare literature.

A person's status in an environment also may contribute to the perception of crowding and to behavioral consequences. Davis's work with animals (1971) indicates that, among wild species, the main result of crowding is the elimination of the low ranking animals. The highest ranking animals adapted to the crowding by controlling territories while those in the middle also adapted but exhibited physiological and behavioral reactions such as withdrawal. Similiar findings have been made in studies involving humans. Rodin, Solomon, and Metcalf (1978) found that control over a setting mediates responses to density and interpretation of crowding. They have suggested that the effectiveness and need to control may vary

with age (younger people needing more control) but this has not been confirmed. Baldassare (1977) found that children seem to suffer the most in crowded households because of their lack of status and power within the home. When space became limited, parents tended to usurp the child's space. In other words, the higher status persons structured the space to reduce their own feelings of being crowded. Sebba and Churchman (1983), in their study of territoriality in Israeli family housing found that family members who did not control any area within the home stated that no place in the home served them as a primary territory. Perhaps, since high density residences are more likely to be places where some family members do not have control over areas and therefore no primary territory, that these homes are more likely to be perceived as crowded by those individuals with little or no control.

This point also is illustrated by Saegert (1980a). She reported that children living in public housing in Brooklyn were more likely to report not having enough space when they had to share a bedroom either with a sibling, a parent, or where the bedroom was located in a room serving another function (e.g. sleeping in the living room).

The children in the crowded apartments also reported feeling angry and fighting more often than children in the less crowded apartments. These children also were rated by their classroom teachers as more behaviorally disturbed, all of which suggests emotional problems. Stokols (1976) hypothesized that there is more potential threat to the emotional and physical well-being of a person who experiences high density in a primary environment such as the home than for those who have a low density experience. This may reflect the need to have control over some territory in a situation in which there is limited space because of high density as well as the need to perform certain functions some of which are enhanced by a personal space and a sense of control (ie. personal grooming).

Families, Children, and Crowding

Several types of residential settings have been studied with respect to crowding, including: dormitories, prisons, military facilities, and the family home. The literature to be reviewed here concerns the family home. People often have a special sense of

attachment to home and usually spend a good deal of time in the home. As stated previously, Stokols (1976) classified the residential environment as primary and therefore the individual expects to have a certain amount of control in this environment. Residential settings, especially the family home, are also places where people have specific relationships to others and often learn patterns of behavior that carry over outside that environment. Researchers in this area have investigated how crowding affects individuals in the home as well as their relationship to each other. Studying the family home also is important because of the effect of that environment on the developing child.

Much of the research on residential density and children concerns apartent living in urban areas. Apartment living, irrespective of internal density levels, has been criticized as a place to raise children although Van Vliet (1984) found little research to actually support this assertion. One of the issues raised in his criticism of the research is that the context of apartment living must be studied, not just the fact of living in an apartment. In other words, apartment household crowding must be considered when evaluating

apartment living for children. The following discussion focuses on the effects of residential crowding on children and families.

Family Relationships

One of the earliest pieces of research on families, children, and crowding was conducted by Plant (1930) who, in a limited study, found that children in large families living in crowded conditions seemed to be subject to emotional difficulty in developing a self-sufficient personality. Several studies in which investigators have looked at household crowding on aggregate levels found effects on children as a result of strains in family relationships. In Mitchell's 1971 examination of high density conditions in Hong Kong he found what he termed "superficial" effects. However, these effects involved indices of psychological stress on family members including hostility, complaints, unhappiness, worry, and difficulty in controlling children. For families living in high density situations on the upper floors of the high rise buildings these effects were intensified. Gove, Hughes, and Galle (1979) found that household crowding was associated with poor child care. In the crowded

homes parents tended to be less concerned with children being out of the house and they also felt less able to control them. Based on interviews with the parents, the researchers hypothesized that the children felt "pushed out" because of a lack of quiet private spaces available to them. Gove and associates (1979) also reported that the experience of crowding related to poor social relationships in the home as indicated by more arguments where there were higher person per room ratios. The lack of a private space for individual family members was the intervening variable explaining the relationship between crowding and the outcome measures-- physical and psychological withdrawal, low-esteem, and poor physical health.

In a limited (small sample size of 14 families) study of university students living in family housing Choldin, Jacobsen and Yahnke (1975) found that families in the smaller units (with family size held constant) reported more stress within the home, the husband was physically absent more often, and the children were constantly in contact with each other. Light (1973) found that household crowding interacted with unemployment of the father in contributing to a higher incidence of family conflicts and, in

particular, child abuse.

Baldassare (1977) suggests that children's lack of status in the household in relationship to the adult family members accounts for children feeling pushed out, highly controlled, or abused. When space is limited, children's spaces often are usurped by the adults or their space needs are ignored. Children's need for privacy often is overlooked in crowded homes. Wach (1979) points out that this may have consequences for cognitive development. He found a positive relationship between the lack of crowding in the home and cognitive development for the infant and young child. Home density measures for infants 12 to 14 months old were inversely related to performance on the Binet intelligence scale at 31 months. An adequate degree of personal space, which he defines as a "stimulus shelter", was found to be important for cognitive development. Such space is obviously harder to come by in a crowded home.

Parke (1978) found that higher levels of household density, not family size, increased the psychological need for privacy among children. This psychological need for privacy may be expressed by

controlling access to information as opposed to access to space by children living in high density conditions (Wolfe, 1978). Children may become "secretive" and not discuss their feelings with their parents. The adaptation to density and the need for privacy may mean several things for children: (1) a certain amount of psychological withdrawal by children, (2) spending less time in the household; (3) becoming more aggressive. The particular mode of adaptation may depend on the age, sex, or culture of the child. What all of this means in terms of social development is unclear at this point.

Saegert (1980a) also found that household crowding affects family relationships. Children living in public housing who were approximately 7 to 12 years old were interviewed about their home situation. None of them reported living in a "crowded" home, even those in the higher density situations. However, the children in the higher density homes (as measured by rooms per people) reported more people being angry and fewer people never angry as compared to the children from the low density homes. They also reported feeling angry themselves more often than the less crowded children.

Crowded children reported that when they were angry they reacted by striking out at someone while the children in the uncrowded apartments reacted to anger by physically leaving the situation. Boys in the crowded homes were most likely to strike out. Children in the crowded apartments also were disturbed more often when trying to do their homework. Children in the high density homes reported doing more things with other family members but also reported that household members were often absent and therefore did not do things with some family members as compared with children in low density homes. Since there generally were more people in the high density households, children had a greater opportunity to do things with other family members than children who may have had only one or two other people in the home. However, in the high density households family members may have withdrawn from others in the home or may physically not have been present more often than in low density households. Therefore, while children in the high density homes were more likely to be exposed to considerable social contact, they also were more likely to be lonely, especially the girls.

Health Effects

High residential density also seems to affect children's health. Gove and associates (1979) reported a positive relationship between density (persons/room) and children's poor physical health. Booth and Johnson (1975) looked at three measures of crowding -- "room deficits", the number of people in the house at different times, and neighborhood density -- and found small but adverse effects of the two household measures on the children's physical and intellectual development. The effects included: lower body weight and shorter stature than average, more illnesses, and being slightly behind in school work. The effects were strongest for first borns, only children, and males although females were most affected by room deficits in terms of poorer school performance. Neighborhood density was not found to be significantly related to any of the dependent variables. Similar effects were not found for the adults in this study. The researchers postulated that children were more adversely affected by the crowding because of their inherently limited control over the environment (as other researchers also have suggested) and that the thwarting of everyday child-type activities

by the crowding may place the child under considerable stress. Note that household crowding seemed to have had cumulative effects causing the children to do poorly in school.

Household Crowding and Behavior in Other Settings

Household crowding has also been found to affect behavior outside the home. Murray (1974) found that children, especially boys, from crowded homes were rated as being more aggressive by their peers in a school setting. These children also were assessed as being more impulsive and extroverted. The parents of such children were more punitive and cold. Thus, while density affected family relationships it also affected children's behavior in a setting other than the home. Crowding in this study was measured by a within-household density measure, persons per room. Waldrop and Bell (1964) found that in a nursery school setting two and three year old boys from large families and high density homes were more likely to seek out the female teacher in a strange situation. Children from the high density homes had less contact with the mother and therefore had not developed social independence according to the

authors. The authors point out that research has shown that children who are high achievers are less dependent on adults while low achievers are constantly seeking adult approval. Home density's effects on family dynamics, therefore, may be contributing to socially dependent personalities in children.

Rodin (1976) found that children who lived in crowded apartments were less likely to try to control their situation outside the home. Children's task performance was affected even when they were not in the crowded situation. According to Rodin, adapting to crowded conditions, as these children seemed to have done, may produce maladaptive personality traits. For example, even when situations were controllable, the children from the crowded homes made no attempt to excercise control over the situation. Rodin describes this as "learned helplessness." Rodin (1978) also suggests that her research indicates that the inability to exercise control over the environment reduces the cognitive skills necessary to promote self-control and self-regulation in children. Instead, they tried to control others thus explaining the increased competitiveness and aggression often found in individuals, children

included, exposed to high density. Rodin notes that these effects will carry over to settings outside the home environment.

Saegert (1980a) also reported effects of residential density on behavior outside the home. When classroom teachers rated children's behavior in school those from the high density homes received overall higher behavioral disturbance scores, especially on the anxiety and hyperactive-distractibility scales. Boys received higher scores than girls. There also seemed to be a relationship between apartment density and children's academic performance. Children in the higher density homes did more poorly in school (boys more so than girls). High apartment density also was related to lower vocabulary and reading comprehension scores. Apartment density was a better predictor of reading scores than building density or building size. Density at the building-wide level, however, was related to children's cognitive clarity. Those in the high rise buildings could not give an accurate count of how many apartments there were in the building. They also were more likely to report the building as being crowded than children in the low rise building. Children on the upper floors of the high rise building in

high density apartments experienced the highest densities and were most negatively affected in terms of academic performance and behavioral adjustment.

Michelson (1968) found in a study of 710 third graders in the Toronto Public schools that functional privacy as opposed to personal privacy in the home was a better predictor of the Metropolitan Achievement Tests scores and teacher ratings of adjustment, performance, and creativity. Children who spent their homework time in their own bedroom or a bedroom set aside for that purpose received the highest scores on all measures. Sharing the homework room did not greatly affect the child's performance in school although children who had personal privacy did better than those who shared. What mattered more was whether or not the homework room was shared with other activities at the time homework was being done. Children who spent their homework time in the kitchen received the lowest scores. This study did not find residential crowding per se (persons per room) to be a factor in explaining children's school performance. The number of people in the household was apparently not as important as the ability to

arrange the space available for compatible activities, i.e. to arrange for functional privacy if personal privacy was not possible.

Michelson also found noise in the home to affect school achievement. Children subjected to the most amount of noise inside and outside the home received low scores with respect to creativity, spelling, and language. These two findings taken together suggest that characteristics which are likely to appear in high density housing, such as more noise and less functional or personal privacy, can affect children's performance in another setting, namely the school.

Density and Cognitive Performance

What is the relationship between density and the cognitive processes that affect school performance and other cognitive skills? Why does the presence of other people seem to be related to cognitive skills? Freedman (1975) found that density did not affect task performance in adults However, other researchers (Baum, 1978; Rodin, 1978; Saegert, Mackintosh, and West, 1975) found that

density does affect other than simple tasks in adults. Research on the effects of noise on task performance may shed some light in this area.

Cohen, Glass, and Singer (1973) found that children living on the lower floors of a 32-story building over a heavily travelled expressway had poorer auditory discrimination ability and poorer reading scores. These children had lived in the building for four years or more. These findings held even when parental socio-economic status was controlled. The authors' explanation of these findings suggests that living under prolonged exposure to unwanted and uncontrollable noise caused the children to "tune out" auditory cues, even the important ones. They did this in order to cope with all of the unwanted noise. This adaptation to noise seems to interfere with the development of certain cognitive skills. In high density homes other people (as well as noise) may be the unwanted and uncontrollable stimuli and the adaptation is to "tune out" here, as well. This tuning out may, in turn, affect school performance. Milgram's concept of "social overload" (1970) may operate under a similar principle. Too much social stimuli may mean

tuning out socially.

Welch's (1970) psychophysiological view of adaptation states that different levels of functioning are established and maintained according to the prevailing level of environmental stimulation. In other words, humans adapt to a certain amount of stimuli (ie.noise, other people, crowding), but their level of functioning is determined by the amount and type of stimulation. Hambrick-Dixon (1986) found that certain visual and memory tasks in young children attending daycare were not affected by experimentally induced short term noise. She also found that children in noisy centers did better on the tasks under noisy conditions and children from quiet centers better under quiet conditions (noise was defined as near or far from an elevated subway train). These findings seem to support Welch's psychophysiological theory.

Hambrick-Dixon points out that long-term exposure to noise may be detrimental to cognitive perceptual skills that require vigilance, focused attention, and high levels of functioning such as reading. She further states that the formation of developmental functions

cannot be viewed in isolation from characterisitics of the physical environment. Based on the density research, density, as part of the physical environment, also may be interacting with factors affecting the development of certain cognitive skills. Density may be negatively affecting the ability of children to pay attention to important cues in the environment when there are many things to pay attention to. Children may be learning to "tune out" in crowded as well as noisy situations whether at home or in a daycare center and this may affect the development of cognitive skills. Heft (1979) supports this view by his research which indicates that high levels of residential density are negatively correlated with performance on a visual search task. Children from high density homes could not easily find an object in a picture suggesting that they were distracted by other things in the picture.

Summary

Density and crowding have been topics of research for most of this century. A variety of environments have been studied in terms of density levels including the city as a whole, the laboratory, and

residential settings. Effects of high densities on animals as well as on human beings have been examined. Researchers have made a distinction between physical density levels and the perception of crowding. This difference has been related to behavior. Likewise, the relationship of spatial density and social density to crowding effects also has been examined as well as various factors which can either mediate the affects of high density or the perception of crowding. Immediate, later, and cumulative effects of exposure to high density have been identified as well as carry-over effects from one environment to another. Finally, the effects on adults, children, and family relationships have been studied although the consequences of crowding for the developing child have not been completely identified. Although many questions about density and crowding effects have been dealt with in the literature, one question that has not been studied concerns the effects on the individual of exposure to high density in two primary environments, both the home and the daycare center. This is the guiding question of this study. The review of the relevant crowding literature discussed crowding in the home. The next chapter addresses the relevant literature on the effects of daycare itself and the effects on children of high

density and crowding in the daycare environment.

CHAPTER TWO - DAYCARE LITERATURE

This section involves a review of the daycare literature in order to gain a broader understanding of the role of that environment on child development. The purpose and value of preschool programs have been debated for some time now. The most traditional of these programs is nursery school. The nursery school program used educational institutions as their model and was primarily used by middle income families who wanted their children to have a school/group experience before the traditional school years. Many of these programs were half-day since they were not necessarily designed to serve working mothers.

The day nursery program, or what has become daycare, grew out of the child welfare movement and provided a response to the need to offer childcare for working mothers and to generally improve the conditions for low income children. Preschool-aged children attended these programs for the entire day (programs provided for older, school-aged children covered a few hours after school). The

needs of families have changed over the past three to four decades. Today, many middle class families have two parents working outside of the home. Therefore, these families also need whole day programs. Full day daycare can take several forms as indicated earlier: in home care, a caretaker's home, or institution. However, the findings in this section will deal only with services being provided in centers. Research that relates to nursery school will be identified separately from daycare.

Infant Daycare

Typically, daycare centers provide services to children of nursery school age, 3, 4, and 5 years of age although some will take a child of 2 years providing the child is toilet trained. However, as family needs have changed, daycare has also changed. Infant care typically has been provided by a parent or grandparent in the home. When the child's family is not available, infants often are cared for by a sitter or nanny either in the child's home or another home. A number of daycare centers, however, now provide infant care, sometimes for infants as young as one month old. Some of these centers have older

children, as well, while others are solely devoted to children under the age of 2 years.

In order to evaluate the effects of infant daycare, children in such programs have been compared to home-reared children and to children who do not attend daycare until after their second birthday. Blanchard and Main (1979) found that for middle class, white infants in daycare, socio- emotional adjustment was better the longer the infants had been in substitute care and that they were less likely to avoid their parents upon reunion. The average age of these infants was 19 months. Another study compared middle and working class white and Chinese daycare infants to home reared infants (Kagan, Kearsley, and Zelazo 1977). The study was longitudinal and looked at infants 3.5 months old to 29 months old. The infants were assessed at 20 and 29 months and little difference was found between the daycare infants and the home reared infants with respect to cognitive functioning, language acquisition, attachment, separation protest, and play tempo. The daycare experience for the working class Chinese seemed to reduce apprehension in unfamiliar situations but this finding did not occur for whites.

In two other longitudinal studies the researchers looked at cognitive development and behavioral effects. Robinson and Robinson (1971) followed black and white children in a comprehensive daycare program for a period of two years. The daycare group either entered as infants and was tested at 2.5 years or entered at age 2 and was tested at 4.5 years. The control group involved children on the waiting list or at another less comprehensive center. The findings indicated that high quality care enhances cognitive development, especially verbal skills. The high quality comprehensive program seemed to have the most effects on the "culturally disadvantaged" children. Schwarz, Stickland, and Krolick (1974) found that lower middle class children who had been in daycare as young as 9 months were more aggressive, motorically active, less cooperative with adults, and less tolerant of frustration than those who were reared at home until age 3 or 4 and then entered daycare. The amount of time spent in daycare did not seem to affect the findings but rather the age at which the children began attending. There was no difference in adjustment to peers for either group. These findings may have been due to the self-selection of the

children and parents into each group since the research design was ex post facto. Infant care does not seem to have detrimental effects nor does it, in itself, have positive effects. The quality of the program may be a factor. However, evidence on this issue is not available.

Preschoolers in Daycare

What are the effects of daycare on children entering after infancy in terms of cognitive skills and cognitive development? Cahoon (1975) argues that more specifically planned cognitive elements should be included in daycare programs in conjunction with loosely structured play activities. He states that daycare is an ideal place for these activities since children can learn through group effort and cooperation can be learned, as well. If such elements are included in a program, what are the short- and long-term effects? Baker (1973) found that the positive academic effects of nursery school attendance on white Title I children identified in the first grade did not continue into the second grade. Non-Title I children attending nursery school also showed positive gains by first grade

but their loss by second grade was not as great as for the Title one children. Taylor (1978) looked at low socio-economic children attending whole day daycare, half day programs, and no daycare and found that there was no difference between the groups in terms of language develpment and intellectual functioning. The children attending half day programs (the other part of the day was spent at home) scored higher on maturity than the other groups (the children in each group were not necessarily equivalent in all aspects). Winett (1977) found similar results in a study done with white middle class families. The children in the mixed care situations (daycare center and home care) tended to score higher on an intellectual ability test than the children in the whole day daycare center, all day sitter, or exclusively at home. In both studies the results might be accounted for on the basis of children in the mixed group situation being from higher socio-economic status families. Another explanation for the higher maturity scores among the children who attended half-day programs might be that parents of less mature children send them to whole-day programs so that they can enhance their social skills.

Cochran (1977) studied the cognitive and behavioral effects of daycare and home rearing patterns among Swedish families. The investigator controlled for family size, socio-economic status, child's gender, and location of the home. The home families were selected from center waiting lists to control for attitudes toward daycare. The children were observed and tested at 12, 15, and 18 months. On a caregiver-child interaction scale, home-reared children were more likely to be engaged in cognitive verbal, exploring, and play activities when involved in interactions with adults. On the mental development scale, the home-reared children scored higher on the speech and hearing scales. In the home settings there was more exploring while in the daycare center there was more play activity. This was probably due to the fact that daycare centers are set up for play while the home offers more opportunities for exploring. The researchers found that there were many similiarities between the daycare and home-reared children suggesting that daycare has neither positive nor negative effects. These findings may be due to the homogeniety of Swedish society. It seems that on the basis of these cognitive and behavioral outcome measures, neither home-reared nor daycare-reared children will

have any social or intellectual advantages over the other.

Belsky and Steinberg (1978) have reviewed much of the research on the effects of daycare and offered some criticism. The major problem with such research, as they see it, is that it often is done in high quality, university- based centers which are not the type of centers available to most parents. They also criticize the lack of comparability of the family backgrounds in many studies since attendance at daycare may be confounded with social class. Additional studies focusing on longer-term effects need to be conducted. Based on the research they reviewed, Belsky and Steinberg concluded that: daycare has neither a positive nor negative effect on middle class children's cognitive development but that the positive effect that it has on low income children is not lasting; cognitive development should be tested by observation as well as standardized tests in order to assess functional as well as outcome skills; daycare-reared children seem to interact more with peers both positively and negatively; and attachment to the mother does not seem to be negatively affected. They caution that these findings are based on research conducted mainly at high quality centers.

Classroom Physical and Social Structure

Other researchers have looked at specific aspects of the daycare classroom instead of the overall affects of daycare. Huston-Stein, Friedrich-Cofer and Susman (1977) found a clear relationship between classroom social structure and social behavior, imaginative play, and self-regulatory behavior in Head Start centers in an urban area. Classroom social structure was defined in terms of high, medium, or low teacher-directedness. Children in highly structured classrooms (high teacher directedness) were less cooperative, helpful, and empathic toward their peers and less aggressive as well. These children were less imaginative in their play but more attentive in circle time and at clean-up time and showed more self-regulatory behavior except in task persistence. They also exhibited more patient waiting and less independent task performance than children in the low structured classrooms (low teacher directedness). In this study the more highly structured classes were generally the larger classes.

Prescott (1981) also found that center size was positively correlated with high social structure. Huston- Stein and colleagues point out that the highly-structured classes seem to facilitate attention to tasks and rules, conformity, and certain types of learning; however, it does not encourage self-directedness and independent efforts toward the mastery of motor and cognitive skills or lead to generalization of learned skills. So, while high structure is positively related to certain types of learning, it must be remembered that other researchers have shown that the gains made in cognitive skills in daycare do not necessarily predict future academic performance, nor do these gains persist. Inventiveness, curiosity, and verbal-social participation skills do persist over time but these behaviors and skills are not facilitated by highly structured classrooms or high social structure in the classroom.

Other elements of structure in the classroom have been shown to affect behavior in the daycare classroom. Doke (1975) found higher levels of participation for children in informal activities than in formal times. Misbehavior was also more frequent during formal times when children had not chosen their activites. Sheehan and

Abbott (1979) found the highest level of child involvement in child-initiated activities. Johnson, Ershler, and Bell (1980) found more goal-directed, constructive play in a formal program and more functional play in a discovery-based program at a university- based preschool center. The functional play was considered more age-appropriate.

The physical structure of a classroom also affects behavior. Moore (1986) found an interaction between the spatial definition of activity areas and teacher behavior on children's behavior. Better defined space was associated with teachers being more involved with the children. The children also subsequently engaged in more exploratory, cooperative and interaction behaviors. While highly teacher- structured classrooms do not seem to encourage these behaviors, physical structure may facilitate such positive and desirable behaviors, ie. exploratory behavior and teachers actively involved on levels other than discipline. Another important aspect of the physical environment of daycare classrooms that has been studied is density and group size.

Social vs. Spatial Density

Hutt and Vaizey (1966) observed normal, brain-damaged, and autistic children during free play in a preschool setting. They found that the brain-damaged children became more aggressive in the high density condition while the autistic children withdrew to the periphery of the room. The normal children interacted less with others in the high density condition. Loo (1972) experimentally manipulated spatial density (square feet per child) in a play setting with 4- and 5-year old children. Children were assigned to groups of ten (five boys and five girls) and each group was exposed to both high and low density conditions. She found fewer acts of aggression in the high density situation. The children also interacted less and spent less time in group involvement and more time in solitary play in the high density condition. This behavior probably accounts for the decreased acts of aggression. She also found that children, especially the girls, were interrupted more in the high density condition.

Loo suggests that the type of density condition and the amount of

exposure to density may have influenced the findings. Spatial density was used here while social density might have yielded different results. Also, increased exposure to high density may increase aggressive behavior as well. When social density (Loo, 1978) was manipulated in a play setting for 5-year olds, there was more activity- aggression-anger (the study used factor analysis and these characteristics clustered on the same factor) in the crowded condition and boys exhibited these characteristics significantly more than girls. Social density was related to physical aggression (as opposed to playful aggression) and negative affect (defined as the desire to leave the room).

In another study by Loo (1977) of preschool 5 year-old children she found that social density affected children differently depending on the child's personality. The children rated by their teachers as high hyperactive- distractible were affected by density to a greater extent than those rated as low on this trait. The high-anxiety children showed more negative affect toward the situation and toward others in the high density situation. Their anger and distress increased in the high density situation while the low-anxiety

children coped with the high density setting by avoiding other children and moving around less. The same results were found for the impulsive children who were more emotional in the high density setting. In general, those children who showed some indices of behavioral disturbance, according to their teachers, were more negatively affected by high density than those rated as normal. Loo concluded from her work that social density was more powerful than spatial density in its effects on preschool children and certain groups of children are more at risk than others to negative effects of crowding. She also found that older children, 10- year olds, responded to crowding by avoiding one another and playing less actively while 5-year olds became more negatively aggressive in a crowded situation (1978). This suggests that coping strategies are at least partially developmentally based.

Hutt and Vaizey's work and Loo's work were conducted under experimental conditions. What type of effects are found in real life settings? Rohe and Nuffer (1977) found that when spatial density was increased in a daycare center, cooperative behavior decreased and aggressive behavior increased. Activities that required high

concentration were also found to be discouraged by high density. However, when partitions were introduced by the researchers, cooperative and constructive behavior increased. It should be noted that the partitions had the effect of reducing social density although the spatial density remained the same. Loo's findings in the experimental settings were confirmed in a real life setting. Other effects have been found for spatial density. Krantz and Risley (1977) found that high spatial density was related to low attention levels of preschoolers when spatial density was high. Smith and Connolly (1980) found that with spatial densities of 15 square feet per child, physical activity was greatly inhibited, parallel play increased, and more aggressive behavior was observed. These effects were not found at 25 square feet per child.

Group Size Effects

A major study concerned with group size and social density is the National Daycare Study conducted in functioning centers by Abt Associates (Ruopp et al, 1979). This study involved 67 daycare centers nationally and the investigators attempted to determine

what variables contributed to quality care. The findings indicate that both children and teachers are affected by classroom social density. For children, group size was a better predictor of specific cognitive and social measures than the classroom adult/child ratio or teacher training. In the smaller groups (less than 15 children), the daycare children exhibited greater cooperation and compliance, more reflection and innovation, more verbal initiative, and less aimless wandering, lack of involvement, and hostility and squabbles. The children in the smaller groups also showed a larger gain in their scores on the Preschool Inventory and the Peabody Picture Vocabulary test over a nine-month period than those in the larger groups. These findings were independent of the child's level of education. The teachers were more active, social and less managerial in the smaller groups as compared to the larger ones.

The effects of group size are illustrated in numerous other studies. As early as 1934, Dawe found that as class size increased, the amount of discussion and the percentage of kindergarten children participating in the discussion decreased. In a study of play behaviors, Tizard, Philps, and Plewis (1976) found less symbolic

play (dramatic play) among preschoolers in open classrooms where there were twice as many children than in the traditional classroom. Symbolic play requires cooperation and getting to know other children. Although this type of play is most typical for this age group, it is more difficult in a large group to get to know other children. Smith and Connolly (1980) also found that large groups in daycare yielded less imaginative play and more same-sex play companions than smaller groups. The researchers hypothesized that smaller groups permit a more comfortable feeling among the children and therefore they are willing to engage in fantasy and play groups of either sex. The literature on school size (Barker & Gump, 1964) suggests that smaller groups permit the individual to feel more involved and to participate more. There is also more prosocial behavior (cooperativeness, helping, empathy) and less apathy in the smaller groups. Although this research was conducted with older children and adults, it seems likely that group size affects behaviors in similar ways with preschool children.

Density and Program Structure

Bronfenbrenner (1977) states that ecological research must take into account second-order effects (an outcome variable may be affected by an independent variable only through another independent variable). For example, social density may affect behavior through classroom structure and/or teacher behavior. Moore's research (1986) described earlier points to the relationship between social and physical variables in daycare centers. The Abt study (1979) suggests that group size affects teacher behavior. In the larger groups, teachers were less active and it was hypothesized by the researchers that the children's lack of cognitive gains was due to the teachers being less likely to present educational activities in such groups. In other words, group size was affecting the outcome measure, cognitive gain, through teacher behavior.

Huston-Stein, Friedrich-Cofer and Susman (1977) found an interaction between highly structured (teacher-directedness) classrooms and large group size which was highly related to less prosocial behavior as well as less imaginative play, less self-regulatory behavior and less task persistence. Here the outcome measure, social and play behavior, was not affected directly by

group size but by the way teachers behaved in large group size classrooms. Fagot (1977) found no behavioral or social interaction effects (play, physical aggression, verbal aggression, and nontask behavior) for 4- year olds in crowded Dutch day nurseries. These nurseries, however, were highly planned and directed, children were assigned to specific areas of the room, they were not permitted free play, and they had no opportunity for gross motor activities. Again, the outcome measures were not directly affected by the density conditions but were dependent on other aspects of the situation, in this case, the structure of the activities.^

Researchers have found that high program structure inhibits certain behaviors even when density is not an issue. Sheehan and Abbott (1979) found that in a highly structured daycare center, the involvement of children in activities was lowest. Doke (1975) found that children 4- to 6-years old participated in activities more during informal periods than during formal ones. When crowding or density is an issue it seems that one of the results of high density or large group size in daycare classrooms is that teachers try to structure the activities so as to alleviate direct negative effects of

crowding (ie. aggressive behavior). But in these more structured situations children seem to become less involved with activities. Prescott and Jones's research (1967) suggests that the size of the center also may affect the likelihood of teachers highly structuring the classroom.

Prescott and Jones grouped a sample of 50 daycare centers into two categories, closed or open. The closed centers all had more than 60 children and the programs emphasized rules and teacher control. The open centers had 30-60 children and emphasized less restraint. In a subsequent study (1978) Prescott found that in the closed centers more time was spent in structured transitions (ie. lining up to use the toilet) and children were less free to choose their own activities. Therefore, while increased structure may alleviate some of the negative consequences of crowding for both adults and children, what this type of structure means in terms of development has not been documented. Gump (1978) states that more research is needed not on direct crowding effects on children in preschool settings, but instead on how group size/density helps to shape program design.

Relationship of Physical Setting to Play Behaviors

The importance of the physical setting (other than density levels) in centers has also been addressed by researchers. Swift (1964), in an early study of preschool settings, states that whole-day programs should be careful to provide for solitary play because of the tiresome effect on children of being with a group all day. Anselmo (1976) suggests that the physical setting of a daycare center can help to encourage or discourage appropriate behaviors. If the center's goal is to encourage children to make their own choices, the room should be set up so that choices are clear and traffic patterns do not favor one activity over another. Montes and Risley (1975) found that the arrangement of toys may affect how children play with materials.

Moore (1986) found that significantly more exploratory behavior, social interaction, and cooperation of children was found in spatially well-defined behavior settings than in moderately or poorly-defined ones. He conducted the research in operating daycare

centers with varying types of spatial arrangements. Teachers also were more involved with the children in active, encouraging ways in the well-defined settings. Well-defined settings are defined by Moore as those having a high degree of spatial differentiation from other settings and therefore from other activities (ie. the block area is not spatially confused with the house or dramatic play area). These settings also might be described as limiting social density since the settings were designed to accommodate a particular number of children. In addition, there were strong interaction effects of teacher styles, spatial definition, and children's behavior. The latter finding points to ecological concerns mentioned earlier. Children's behavior, indeed, seems to be a product of the total environment, both social and physical. Moore also found that certain behaviors are potentially influenced by spatial concerns. These behaviors include concentration on activities, exploration, reciprocal social interaction, mutual cooperation and co-action between staff and children. They will be considered in this research with repect to a specific aspect of the physical environment, density.

A relationship between amount of resources, density, and behavior also has been documented. Rohe and Patterson (1974) found that an interaction between spatial density and the amount of toys available in a daycare setting had specific behavioral affects. Aggression and destruction were highest under the high density and low availablity of toys condition. Smith and Connelly (1980), however, found that if play resources per child are maintained, densities varying between 50 and 25 square feet per child do not increase aggression and conflict. This was not the case for densities as high as 15 square feet per child even with the maintenance of play resources.

Summary

The research on daycare indicates that childcare outside of the family home is not in itself either harmful or beneficial. The effects depend on many factors including the child's age, the family's socio-economic status, the type of center, the type of

program, and whether long-term or short- term effects on development are being studied. The type of effects also depend on variables such as: teacher/child ratio, teacher attitudes, teacher training, amount and type of resources and materials available, group size, physical attributes of the setting and the relationships between and among these factors. The research reviewed here also indicates that crowding in the daycare center or the home can have specific effects for children. Crowding in the home affects children's behavior in the home and outside the home. Residential crowding also was found to affect children's cognitive development. Crowding in the daycare center has been found to influence children's play behaviors, social behavior, and cognitive performance. Often this influence has had indirect influence through program structure or teacher behavior which was affected by crowding. In short, children are affected by crowding either directly or indirectly and this effect is often negative.

Although children are apparently affected by crowding in the home and in daycare, there has been no research to date that has looked at crowding in both environments in the same study.

Hambrick-Dixon (1986) found that children accustomed to a noisy daycare center performed certain tasks better under noisy conditions. Do children from crowded homes perform better in crowded daycare than children from uncrowded homes? Do the coping skills that they learn in one environment help them to deal with another environment that has similar characteristics, namely noise in Hambrick-Dixon's study or high density as described in this study? Are these coping skills useful or maladaptative in terms of development? These questions all will be addressed in this study.

CHAPTER THREE -- HYPOTHESES

In this study the effects of home and daycare center density on children's cognitive development and style, social behavior and development, and ratings of behavioral adjustment will be examined. Although other researchers have examined the relationship of density to each of these variables in either the home or daycare setting, none have systematically examined both settings in one study. This study will expand what has been documented in other studies. This includes not only the effects of density on young children regarding the measures identified above but also the interaction between home and daycare density and their combined effects on these measures as well as any other intervening or mediating variables.

There are a number of theoretical issues that have been suggested by other research which will be addressed in this study. First, Stokols postulates that crowding in primary environments such as the home, office, school, or daycare center will affect long

term behavior patterns and coping strategies more so than crowding in secondary environments. He suggests that this is so because the ability to control interactions is a key component in the subjective state of crowding. Since one expects to have more control in primary environments, crowding in these environments which interferes with this sense of control is more likely to have longlasting and detrimental effects on behavior and personality. Baum and Valins (1977), Hambrick-Dixon (1986), Saegert (1980a), and Welch (1970) all have suggested that an individual's behavior and task performance in one environment is affected by other environments to which the individual has become accustomed. This would seem to indicate that if a child has developed a certain style of functioning in a high density or crowded situation, that he or she would carry over this style to other high density situations. Stokols emphasizes that if the crowding occurs in a primary environment the individual is even more likely to generalize his or her behavior and functioning style to other settings. If these statements are accurate, children from high density homes would then function differently in high density daycare than children from low density homes and vice versa.

Saegert (1980a) and other researchers have demonstrated that high residential density negatively affects children's behavior in school and daycare and seems also to negatively affect academic performance. Since both the home and daycare center are primary environments according to Stokols's classification, it might be expected that children from two high density situations would be the most negatively affected. In this study, however, not only will children operating in two high density situations be investigated but also children from low density homes attending high density daycare and those from high density homes attending low density daycare. While the results of this study will not be able to tell us whether high or low density in the home or the daycare center "causes" specific behaviors such as hostile aggressiveness, cooperativeness, ability to concentrate on tasks, and passive observation, it has been designed to allow the researcher to examine the relationship between home density, daycare center density, and these behaviors and styles of functioning as well as the interaction between home and daycare density levels.

Development does not happen in a vacuum but rather within particular contexts that are both physical and social. It is therefore important to include various aspects of the environment when studying behavior and development. In this study physical and social aspects of two environments that are important to young children will be examined. The primary variable of concern in this study, density, will be studied in terms of direct effects as well as how it influences or interacts with other aspects of the physical and social setting to affect development or elicit certain behavior(s).

A second theoretical issue concerns "social" versus "spatial" density. The literature on crowding has identified spatial and social density as two separate components of density. According to the literature on preschool environments, social density or group size is the more potent in terms of certain behaviors, namely onlooker activity, concentration on tasks, and aggressiveness (Loo, 1977, 1978; Rohe & Nuffer, 1977; Ruopp et al, 1979). In this study the researcher will examine the effects of group size as well as spatial density (although spatial density cannot be held constant). Half of the centers have only one class; these centers are also half-day

programs (Head Start). The remaining classes are in daycare centers that have more than one class and are full-day programs. The size of the center as well as the class/group size will be examined for any contributions to density effects. Additionally, the researcher will assess whether the amount of time (full-day or half-day) spent in a childcare setting interacts with density in affecting program structure or any of the outcome variables.

Third, I will examine the strategies children and/or their teachers adopt to ameliorate high density situations. Children are a vulnerable population; they have little control over what happens in their lives. The younger the child is, the more this is so. Evans (1978) points out that one of the reasons studies of animal crowding cannot be generalized to humans is that animals usually do not have control over leaving a crowded situation and humans usually have some options. For young children, the options available to leave an unpleasantly crowded situation are few, if any. The availablity of such options in both the home and the daycare setting and how the availablity or lack of these options relates to certain density effects will be examined. In the home, the availablity of a private

place and access to the outside will be considered while in the centers, the availability of quiet places in the classroom and accessibility to the outside or another space will be considered. Program structure in the classroom may also affect children's options and the relationship between structure and density will be examined. Other researchers (Baldassare, 1977; Davis, 1971; Sebba & Churchman, 1983) have suggested that individuals with the most authority in a crowded situation attempt to structure that situation to alleviate some of the negative aspects for themselves. In general, when some structure is imposed on a crowded situation people feel less crowded. Teacher structuring of the classroom or individual children's activities will be examined as to how it relates to density, group size, and the outcome variables. In this study I will try to determine if young children attempt to impose any structure on high density situations or whether they only respond by withdrawing or acting out.

The above discussion concerns issues that have been dealt with at one level or another in the literature to date. This researcher has indicated how these issues have affected the direction of this study.

Specific hypotheses are listed below. In addition, insight will be provided into certain research questions for which there are no specific hypotheses.

Hypotheses

1) Four year old children from higher density homes will test lower on measures of cognitive development and be rated by their teachers as more behaviorally disturbed. 2) Children from higher density homes but in low or moderate density daycare will be expected to display patterns of behavior similar to the children in the large groups as found in other research (The Abt National Daycare study, Ruopp et al, 1979). The behaviors include lack of cooperativeness and concentration in large groups as well as greater amounts of onlooker behavior and lower cognitive test scores. 3) Children from higher density homes will be expected to show more field dependence on an embedded figures test. Field dependence/independence in adults has been found to be related to density experiences as a child (Saegert, 1980b). Those adults who had high density experiences in childhood were more field dependent than those with low density experiences. Field dependence is related to individuals having a sense of themselves as having a

separate identity from their surrondings. This hypothesis assumes that differences on field dependence and independence related to density will be apparent in childhood. 4) Children in higher density centers/classrooms will show more behavioral disturbance and density related maladaptive behaviors in teacher ratings and by researcher's observations. 5) Based on earlier research (Saegert, 1980a) this researcher expects that sex differences are likely on the measures in this study. Specifically, it is suggested that boys will be likely to generate conflictual interactions in high density situations and be more likely to withdraw from the high density situation when they experience anger or frustration. It is also suggested that girls' cognitive development may be associated with either supportiveness, indifference, or rejection which they experience in the daycare setting and that these experiences may be density dependent. Specifically, girls may score higher on cognitive tests when they are in supportive environments and teachers are more supportive in low density classrooms. Additionally, it is anticipated that there will be sex differences on the behavioral and cognitive measures and that these differences will be density related.

Additional Questions

In addition to the hypotheses stated above there are other issues that this study is concerned with. At this point, however, there is not enough information available to be able to state them as specific hypotheses, but these questions/issues also guide the study. The questions are :1) To what extent will the density of the daycare center interact with the child's home density in terms of cognitive and behavior adjustment? 2) If one can view the behavioral and cognitive measures as both indicating something about how the child is coping with and learning from his or her experiences, will we find either correlations among these different measures for the total sample or for density stratified subsamples? Will there be behaviors and cognitive styles that reduce information flow and/or interaction that would ameliorate behavioral disturbance in higher density conditions, either at home, in the center, or both? 3) How will having a private place in the home relate to home density? If a child has a private place to go to how will this relate to the behavioral and cognitive measures? Will Wach's (1979) "stimulus

shelter" findings be confirmed? 4) Will certain room configurations/ arrangements and/or design features serve to ameliorate otherwise high density situations? 5) Will the larger group size centers/classes fall under Prescott and Jones' (1967) classification of "closed" centers more so than the smaller group size? Will center structure (teacher structure) mediate children's adaptation to group size and/or will center structure differentially affect children from more and less crowded homes? 6) How will the length of program (full- or half-day) interact with center/class density in terms of effects on class structure or on the children's behavior, cognitive scores, and ratings of behavioral adjustment?

The following chapter will describe the research design and the instruments used to test the hypotheses and answer the research questions.

CHAPTER FOUR -- METHODS

A combination of observations and standardized tests were used to obtain data to test the hypotheses. In the preceeding chapter, hypotheses were stated concerning both home and daycare center density. For the purposes of this study children were observed and tested only in the daycare setting although information was obtained about each child's home situation. Only children in the four year old group of each center were part of the study. This age group was chosen because it was more likely that the children would have been in daycare previously and therefore be accustomed to the routine. Public daycare was chosen because it represents the type of childcare typically available to many people requiring such services.

Sites

A total of eight classrooms in seven centers were chosen. Four of the classrooms were in full-day (8 am to 6pm) programs and four were in half-day (1pm to 4pm) programs. The half-day programs were Headstart centers under an umbrella agency that is responsible for six Headstart centers. Theoretical considerations did not lead to

the inclusion of the half-day programs. Rather they were included because of their willingness to participate in the project. However, the analysis will investigate any differences that can be accounted for on the basis of whether the program is full-day or half-day. All of the centers served low to moderate income families and received public funding. Parents paid for the daycare services on a sliding scale basis with some parents paying nothing and others paying up to a maximum of $18 a week. All Headstart families pay no fees given that the families eligible for this program must be either beneath the poverty level or have working parents whose income is below the poverty level and are not receiving any entitlements. Public daycare eligibility requirements dictate that the parents must either be working or in a job training program. The majority of the children were either Black or Hispanic with a few Portuguese and Orientals in two of the centers.

Two of the centers were located in Newark, New Jersey and the remaining six in New York City (Manhattan). The centers were chosen on the basis of: having the appropriate age breakdown (a separate class of 4-year olds), serving low or moderate income

families, the willingness of the director and teachers to cooperate, the willingness of the parents to cooperate, and some variability in home density levels. A center in Newark, New Jersey was used to pretest all of the instruments used in this study but it was not included in the final sample.

Selection of sites and population sample

When the name of a center was suggested to the researcher an appointment was made with the director to explain the project and obtain preliminary information about the center. If the director was willing to cooperate, a set of questionnaires for the parents to complete was left with the center. The questionnaires were used primarily to establish home density levels by asking for the number of adults and children living in the home and the number of rooms (including bathrooms) in the home. The questionnaire also provided information about the type of housing the child lived in (multifamily, single family), the number of floors in the building and what floor the child lived on, whether the child had a private place to go to in the home, and when the child used this place. Parents

also signed this questionnaire to indicate whether or not they would permit their child to participate in the project. No child was tested unless the parents gave permission. Parental socio- economic data was not collected because it was felt that asking such private information as income would inhibit parents giving their permission for their child to participate in the study. (See the Appendices for the complete questionnaire.)

Once the questionnaires were returned and a reasonable number of parents gave permission for their child to participate (75% of the parents in all centers gave permission), the home density level for each child was determined by calculating the number of people per room in the home. The mean and median home density level for the class was then calculated and the children were divided into high and low home density groups based on the group mean. Four children were chosen at random to be part of the observational sample; a boy and a girl from a high density home and a boy and a girl from a low density home. Whenever possible, children were chosen from the extreme density conditions. The four children were observed in the classroom setting and tested along with all of the other children

whose parents gave permission.

Preliminary Data Gathering

Before any formal testing or observations were begun, the researcher visited the classroom at least twice in order to become familiar with the physical surroundings and the class routine as well as to allow the children to become adjusted to seeing her in the class. In some centers the researcher was formally introduced to the class by the classroom teacher while in others she introduced herself when individual children approached her. During one of these initial visits, a sketch of the room was made indicating the shape of the room and where various activities were located. A questionnaire about the center (see Appendices) was completed by the researcher during one of these initial visits, as well. The information obtained from the questionnaire included: name of center, address and phone number, director's name, number of stories in the building, whether an outside play area was available, total number of children in the

center, total number of children in the class participating in the project, square footage of the classroom, and a general description of the classroom and/or program.

Description of Sites

Center 1 was a daycare center located in a 2-story building designed as a daycare facility. The center had a total of 63 children broken down into a large group of 3-year olds and two smaller groups of 4-year olds. The class participating in this study had 20 children, 9 boys and 11 girls. The classroom was located on the second floor. The children ate all of their meals (breakfast, lunch and snacks) in the classroom. Two teachers were assigned to the class, one head teacher and an assistant. A play area with climbing equipment and a water play area was located to the rear of the building. The classroom density level was 27.3 square feet per child.

Center 2 also was a daycare center. It was in a building

originally designed as a church but not used by any congregation at the time. A total of 60 children occupied the center with one large group of 3-year olds and two small groups of 4-year olds. The class participating in this study had 16 children, 5 boys and 11 girls with a head teacher and an assistant teacher. This classroom was at ground level and an outdoors play was immediately accessible although children were permitted outside only at scheduled times. The density level was 52.3 square feet per child.

Center 3 was a daycare center operating in a building designed as a nursery school. It was a 5-story building with a basement and a roof playground. There were 77 children in the center in four groups: one group of 3-years olds, two groups of 4-year olds (one group older than the other), and one of 5-year olds. The older group of 4-year olds participated in this study. There were 18 children in the class with 11 boys and 7 girls as well as two teachers including a head teacher and an assistant. This group occupied a classroom on the third floor where an indoor play area gym-type space also was located. The classroom was accessible by an elevator or stairs. The indoor play area was utilized by all groups. The center also had

separate rooms for testing unlike any of the other centers. The classroom density level was 27.7 square feet per child.

Center 4 was a Headstart center located in renovated space on the ground floor of a public housing project. There was no outdoor play area immediately adjacent to the classroom but there was a playground on the site which was used by the Headstart class. The center consisted of one classroom with a total of 19 children, 11 boys and 8 girls. In this center, as in all of the Headstart classes in this study, the 4-year old group arrived in the afternoon and had lunch and a snack at the center. As with the daycare classrooms, two teachers were assigned to the class, a head teacher and an assistant. The Headstart area also had a small kitchen where meals were prepared and an administrative and parents' area. The classroom density level was 47.2 square feet per child.

Center 5 was a Headstart center located in the community house of a church. The classroom was on the ground floor and the kitchen, where meals were prepared, and a gym were located in the basement. For outdoor excercise, the group used a playground located across

the street from the church. This was the only center where the toilet was not located on the same floor as the classroom. The group had a head teacher and an assistant. There also was a social worker assigned to the center who occupied an administrative area opposite the classroom. This room also was used as a parents' area. There were a total of eighteen children in this class, 10 boys and 8 girls. The classroom density level was 37.5 square feet per child.

Center 6 was a Headstart center in the same space described above. This center was used twice but a year apart (Fall 1985 and Fall 1986) so different children were involved and hence given a different center number. This group consisted of nineteen children with 6 boys and 13 girls. The same staffing pattern as described above applied to this group as well. The classroom density level was 35.5 square feet per child.

Center 7 also was a Headstart center. It was located in a church building on the second floor. An outdoor fenced-in play area was located adjacent to the church but the pavement in the yard was not smooth and there was no equipment in the yard. A kitchen was

located in the church basement. There were two classrooms adjacent to each other separated by folding doors. Often these doors were left open so the effect was of one large room. Each classroom, however, was operated as an independent class with two teachers for each group. The groups did not do things together either so the children did not have contact with each other. The noise level, of course, was higher than if the classrooms had been physically separated from each other. The group that participated in this study had 19 children, 12 boys and 7 girls. The classroom density level was 35.5 square feet per child.

Center 8 was a daycare center located on the third floor of a community center. The daycare center was accessible by an elevator or stairs. The center had an enrollment of 64 children with eighteen 3-year olds, twenty-three 4-year olds, and twenty-four 5-year olds. There was an administrative office, a parents' lounge, adult toilets, and a storage area on the same floor. There was no outdoor play area immediately available to this center. The 4-year old group participating in this study had three assigned teachers (one head teacher and two assisitants) although only two were in the classroom at the same time. This classroom compared to all of the

other classrooms in this study had the least amount of materials immediately available to the children, ie. on open shelves. There were considerable materials, however, in the classroom storage closets to which only the teachers had access. There were a total of twenty-three children in this class, 15 boys and 8 girls. The classroom density level for this group was 28.5 square feet per child.

All of the classrooms in both the daycare centers and the Headstart centers were equipped in a similar manner and arranged in the typical groupings; ie. a reading/library area, a dramatic/playhouse area, a math/manipulative area, an art area, and a science area. All of the classrooms had approximately equal amounts of materials available to the children except for Center 8 as described above. None of the classrooms had any real variation in surfaces, except for an occasional throw rug in the reading areas which was usually kept rolled up until the teacher put it down during story time. There also was no place in any of the classrooms for a child to retreat to when he or she wanted to be alone.

Data gathering techniques

Three data gathering techniques were used in this study; observations, testing, and the use of a rating scale. The testing instruments measured cognitive style and school readiness skills. The observational instrument was primarily concerned with social skills and cognitive style. The rating scale was used to identify problem behaviors. The observations and testing were done by the researcher (with the exception of one center where the teachers did the testing). All of the children were rated by their classroom teachers. A detailed description of each data gathering technique follows.

Observations

All of the children in the observation sample were observed by the researcher. All children were observed prior to being tested. The procedure for choosing children to be included in the observational sample was described earlier. Although the researcher was responsible for putting the children in the high and low home

density categories, she was not aware of the target child's home density level on the day of the observation. Observations were done to determine if and how behavior and social interactions are affected by the density level in a daycare setting or the density level of a child's home. Elizabeth Prescott's Day Care Environmental Inventory was used to conduct the observations (see Appendices). This observational schedule was designed for use in a study conducted by Prescott and her colleagues assessing various child-rearing environments. The instrument was designed to provide a detailed, coherent description of the child's experienced environment and how the child constructed a personal activity system within the given larger setting. The types of behavior to be coded using this instrument were especially relevant to this study. Also, because of the detail required in this coding, it appeared that the researcher could get a good picture of the child's social interactions which is important for understanding the questions posed in this research.

In Prescott's study each child was observed for two hours in the morning and one hour in the afternoon. Observers rotated every 40

minutes. Since all observations in this study were conducted by the same researcher, each child was observed for only one 40-minute segment. Reliablity among observers for this instrument in Prescott's study was tested with Cohen's Coefficient of Agreement on 56 paired observations. The percentage for agreement was k=80.7%. Chance agreement is taken into account by using the coefficient which is lower than the actual percentage of agreement. The percent disagreement ranged from 0.1% to 9.9% with a mean of 2.0%. The reliability of the observer for this study also was tested. A video tape of a daycare center not included in this study was viewed by the researcher and two independent observers. The behavior of the child being observed was coded by each observer. During the first observation period there was 50% agreement and 70% on the second.

The observations were conducted in the following manner. Each child was observed for 40 minutes as indicated above. Sometimes the actual session lasted 45 to 50 minutes because the child was taken away from where the observer could see the child for a period of time. (One child was observed for less than 40 minutes because

she was picked up early. This happened on two occasions and no further attempts were made to try and observe this child for the full 40 minutes. She was observed for 30 minutes.) The total number of observation segments ranged from 80 to 110. The researcher coded the first 80 segments for each child for the analysis. Therefore, the child observed for only 30 minutes was equal to the others in terms of observational segments. Each child was observed during some type of activity segment. Either the activity was for the whole group (i.e. circle time) or an individual or small group activity. Sometimes the individual or small group activity was in a free play situation and at other times it was an organized activity. At no time was the entire 40 minute observational period during transition or nonplay activities. Some of the observations were outdoors or partially outdoors although most were indoors.

The researcher moved about the room while being careful not to become involved in the children's activities. The coding instrument called for a recording of behavior every 15 seconds. At each time segment three items were coded. First was the child's mode of behavior which was divided into four major categories: rejection,

thrusting, responsive or receptive, and integrative. The child's behavior also could be coded as indeterminate, child attends to self, or unable to code. Second, the direction of the child's attention or behavior was coded: to an adult, to a child, to the environment, to the group, or to more than one of the above. Third, the continuity of the behavior was coded; either the behavior was a new one, a continued behavior, or a return to a previously noted behavior. If an integrative behavior continued for four or more minutes, another level of coding was used to describe this activity in more detail. At the time of the observation, the researcher made note of the adult/child ratio and any changes in this ratio during the time of the observation as well as the general activities in the room at the time.

Testing

Once the observations were completed, testing was begun. Two standardized tests were used: the PreSchool Inventory developed by Bettye Caldwell and the Children's Embedded Figures Test. The center had the option of permitting the researcher to do all of the

testing or having one of its staff trained to do the testing. Only one center chose to do its own testing (Center 2).

The Preschool Inventory (PSI)

The Preschool Inventory (PSI) is a test of school readiness skills and not a test of general cognitive or intellectual skills. Although the test is not culturally unbiased(low income black children tend to score lower than white middle class children) it does tend to predict academic success in school since school systems are based on middle class achievement values. The PSI was also used in the ABT National Daycare Study (1979) and it was found to be sensitive to social density levels in daycare centers. The following areas of competence are included in the PSI: basic information and vocabulary, number concepts and ordination, concepts of size, shape, motion, and color, concepts of time, object class, and social functions, visual-motor performance, following instructions, independence and self help. The test is timed and the child's bith date is recorded as well as how long the child has been attending the

center, the child's major language, and the language in which the test was given.

Children's Embedded Figures Test (CEFT)

The Children's Embedded Figures Test (CEFT) developed by Stephen Karp and Norma Konstadt is an adaptation of the Embedded Figures Test for use with adults. This is not a test of skill but rather of perceptual style and problem solving approach. The CEFT tests field-dependence and independence. The theoretical framework of this test indicates that in a field-dependent mode of perceiving the overall organization of the field is dominant and the parts are only experienced as "blurs" while in the field- independent mode of perceiving specific parts of the field are experienced as discrete parts of the whole. This perceptual style is not an either-or designation but rather a tendency toward one approach more than the other. This perceptual style has been shown to be sensitive to age and sex. People tend to become more field-independent as they get older and boys and men tend to be more field-independent than girls and women.

In addition, residential density levels seem to affect this style in adults. Saegert (1980b) found that adults who grew up in high density situations were more field-dependent than those growing up in low density homes. The test was used in this study to see if it discriminated among residential density levels for young children. The CEFT is designed for children ages 5 to 10; however, the test was used for this sample of four year olds to test style and therefore the total scores on this test are not as important as the pattern of the scores in relationship to the children's residential density and the center classroom density.^

The CEFT consists of recognizing two shapes, a triangle and a house. There is a cardboard cutout of each shape with a number of cards of different pictures with the particular shape embedded in it. The pictures increasely become more complex and the shape more cleverly hidden. The triangle is used first. The child is allowed to hold the shape during the pretest period and is asked merely to find the identical triangle on a card that has four triangles of different sizes. The child then is introduced to the idea of the test by having

to find the triangle shape on a picture of a truck. In this case the triangle is clearly defined and it is explained to the child that he or she will then have to find the triangle on all of the other pictures. If the child successfully finds all of the triangle shapes, the test proceeds with the house shape. If, however, the child cannot complete the last four items on the triangle test, the test is not continued. The child is allowed to hold the shape initially but is required to identify the shape in the picture without holding the cardboard shape sfter the first few pictures. However, since this test was intended for 5 to 10 year olds and the children in this study were younger, the researcher modified the proceedure and permitted the children to hold the shape throughout all of the testing.

All of the children were tested individually and each of the tests were given at different times. If a child seemed uncomfortable initially, the researcher talked to the child for a few minutes and tried to assure the child that nothing or no one was going to harm the child. It was explained to all children that they were going to play a type of game with the researcher and answer some questions. Some children were shy at first but none of the children refused to

take the tests although all were given that option if they felt uncomfortable. Testing took place at the child's center. Testing usually was done in a separate room or in a hallway that was used infrequentally. In only one center was testing done in the classroom because of the unavailablity of any other space. A screen was set up to give visual and some auditory privacy in that instance.

Ratings of Behavioral Disturbance

In addition to the testing and the observations for each child participating in the study the classroom teacher rated his or her behavior. In each center, except Center 8, the ratings were done by the head teacher. In Center 8, an assistant teacher completed the ratings because the head teacher was absent for several days and the substitute did not know the children as well as the assistant teacher. Although the teacher was more likely to be subjective about the child than the researcher, the classroom teacher had the advantage of knowing the child better than the researcher. The Behar-Springfield Behavioral Rating instrument was used for this purpose (see Appendicesfor a copy of the instrument). The

instrument is a questionnaire containing 30 statements of descriptions of behavior often shown by pre-school aged children. The teacher indicates whether the behavior described in each statement "certainly applies" "applies sometimes" or "does not apply" to the child being rated. The ratings are scored and a total behavioral disturbance score is obtained. There also are three subscales and corresponding scores: hostile-aggressive, anxious, and hyperactive-distractible. The three subscores are independent of the total score and were used separately in the analysis. The test has been shown to have high criterion validity and high interrater and test-retest reliability (Behar & Springfield, 1974).

In summary, a total of eight classrooms in seven centers were part of this study with a total 151 children (77 boys and 74 girls) in the respective centers' group of 4-year olds. The total number of questionnaires returned was 114 (52 boys and 62 girls). Of this group, 32 children (16 boys and 16 girls) were in the observational sample. A questionnaire about the home environment was completed for all 114 children. The majority of the children were tested on two standardized tests, the PSI (n=110), and the CEFT (n=112), and

all 114 were rated on a behavioral disturbance rating scale by their teacher. The subsample of children was observed and their behavior systematically recorded. Information about the center and the classroom also was recorded. Four types of data will, therefore, be available for analysis: 1) information about the center and classroom's physical and social environment, 2) information about the home environment and demographic information about the children, 3) information about activities, behavior, and social interactions in the classroom, and 4) information about the children's cognitive and problem-solving abilities.

Data analysis

The primary data analysis method was a multivariate analysis of variance (SPSSX-MANOVA) model. This model was used because it allowed for interaction effects to be tested as well as direct effects. This was important since the hypotheses deal with direct effects of home and daycare density and the interaction of these two densities. The hypotheses also raised questions about the interaction of sex of the child, having a private place and the density

of home and daycare situations. These interactions also could be tested with this model. Both two- and three-way interactions were used in the model depending on the hypothsis.

The order of entry of the variables and interactions were controlled by the researcher depending on the hypothesis. When the sequential MANOVA model was used, the order of entry was the more conservative test of the hypothesis. The sequential model allows the researcher to designate the order of entry of the dependent variables. The variables were entered based on the hypotheses being tested with the variables anticipated to affect the hypotheis most entered last. When there was no specific hypothesis concerning the variables, the unique model was used which was the most conservative because the variables using the most variance are entered first.

The preliminary analysis of all data included establishment of frequency distributions and means and medians for all descriptive data. One-way analysis of variance (ANOVA) was used for selected relationships where signifigant differences were suggested by the

frequency distributions.

CHAPTER FIVE -- FINDINGS

In presenting the findings general results will be described first followed by a more detailed description of findings related to the hypotheses and research questions.

Center Characteristics

A total of 8 classes from 7 centers participated in the study. (One center was used twice but two different classes were used.) The centers ranged in size from a low of 18 children to a high of 77 children with a median of 42. All of the daycare centers (full-day program) had more than 50 children while the Headstart centers (half-day) all had fewer than 25 children. The class size ranged from 16 to 23 children with a median of 19 (the New York City Health Code, Article 47 states that children 4-5 years of age can be in groups of up to 20; the Child Welfare League of America recommends a group size of 15-16 children for 4 to 5 year olds). Class size did not vary much by type of center; two of the daycare centers had the largest class sizes but the others were in the same range as the Headstart centers.

The New York City Health Code, Article 47 also requires two adults/teachers for this age group (the standard applies to daycare and Headstart centers). Each class participating in this study was assigned two teachers, a head teacher and an assistant teacher. However, actual teacher/child ratios were recorded during each of the four observational periods in each center. The average teacher/child ratio was 2:16 with a range of 1:13 to 3:21. Center #4, a Headstart center, had the widest variation in teacher/child ratio during the various observation periods with a range of 1:16 to 3:21. Center #8, a whole-day daycare center, had the highest ratios during the observation periods with only one teacher for 15 to 27 children. The other centers had more consistent ratios during each of the observational periods all within the 2:16 range.

The mean classroom density in the centers was 36.0 square feet/child (the New York City Health Code, Article 47 requires a minimum of 30 square feet/child of indoor play space while the Child Welfare League recommends 50 square feet/child with a minimum of 35 square feet/child where climate permits an interrelated use of indoor and outdoor space during most of the

year). The range in density was 25.9 to 47.2 square feet/child. The higher densities were generally found in the daycare centers except for one which was in the lower range. The Headstart centers tended to have the lower and medium densities except for one which was in the high density range (see Table 1).

Characteristics of children

Of the 114 children participating in the study, 54% (62) were girls and 46% (52) were boys. The age of the child was documented at the time of the testing and observation. The median age of the children was 4 years, 9 months with a range of 3 years 10 months to 5 years 6 months. The children attending the daycare centers had been in daycare longer (an average of two years) than the children attending Headstart (an average of one year).

Home Characteristics

The questionnaire on the child's home revealed the following information. The majority of the children lived in multifamily buildings (81%) with only 12% and 6% living in two family and

Table 1

Center and classroom characteristics

Ctr.	a Type	b Bldg.	c Yard	Total Class	No. Boys	No. Girls	Density	d T/C
1	Full	DC	Yes	63	9	11	27.3	2:16
2	Full	Church	Yes	60	5	11	52.3	2:14
3	Full	DC	Yes	77	11	7	29.3	2:13
4	Half	HP	No	19	11	8	47.2	2:18
5	Half	Church	No	18	10	8	37.5	2:15
6	Half	Church	No	19	6	13	35.5	1:15
7	Half	Church	Yes	19	12	7	35.5	2:15
8	Full	CC	No	64	15	8	28.5	1:22

a. Full-day programs are Daycare programs, 8am - 6pm. Half-day programs are Headstart, 1pm - 4pm.

b. DC = Daycare center; HP = Housing project; CC = Community center

c. Yes = Outdoor play area immediately adjacent to building
No = No outdoor play area immediately adjacent

d. Average teacher per child ratio during times of observation

single family homes respectively. The median number of floors in these buildings was 5 although the upper range was 35. Eighty-five percent of the children lived in buildings with 12 floors or less. There was a significant difference between centers for total number of floors of a building. Center #3, 4, 6, and 7 had children who lived in buildings with 13 or more floors (chi-square=184.8, p=0.000). For the children participating in this study, the median for the floor that these children actually lived on was 4 with a range of 1 to 22. The children who lived on floor 13 or above were also in centers #3, 4, 6, and 7.

The median number of rooms in the dwellings was 5 with a range of 1 to 10. The mean and median number of adults and children living in the dwellings was 2 adults and 2 children. There was a range of 1 to 7 adults and children in each household (the smallest family size was 2 people). The median family size was 4 with a range of 2 to 10 people in a household. Approximately 62% of the children came from households with 4 or less people. Centers 3 and 5 had children who lived in larger households. Centers 1, 2, and 7 had children who lived in the smaller households with only one child in each of these centers living in a household with more than 5

people.

The mean residential density (people per room) was .839 (median=.8) with a range of .25 to 3.0. Typically a density ratio above one person per room is defined as crowded. If this ratio is used as a standard 85% of the children (88% of the girls and 80% of the boys) in this sample lived in low density households. The larger households were also the most crowded. Household size was positively correlated with household density (.494, p=0.000) (see Table 2).

Socio-Economic Characteristics

Income data were not collected for this study. However, family income levels can be inferred based on the ability to pay for child care. Parents do not pay any fees for Headstart. In order for a family to qualify for Headstart parents must meet income guidelines. Families receiving no or little income and/or are on welfare and medicaid are given first priority. Families making $10,000 to $15,0000 annually are second in line (see Methods

Table 2

Children's Characteristics

Ctr.	a Age mean, median		b Years in daycare	c Have PP	Household size, mean	d Home density
1	4,3	4,10	2	35%	4.2	.78
2	4,5	4,11	1.1	57%	4.1	.80
3	4,5	4,11	1.7	55%	4.6	.71
4	4,5	4,11	1	55%	4.9	.85
5	4,6	5,00	1	71%	5.1	.86
6	4,1	4,06	1	61%	4.1	.79
7	3,9	4,05	1	50%	4.1	1.44
8	4,1	4,08	1.6	50%	4.1	.76

a. Years, months
b. Mean reported
c. Percent with a private place to go to in the home
d. Number of people per room

chapter for complete description of Headstart guidelines). All of the day care centers were public day care so fees were based on a sliding scale guided by ability to pay (income) with an upper income limit of $18,000.00 annually. Therefore, based on this information, it is assumed that all of the children came from families of low to moderate income.

Income is usually considered to be one of the major indicators of social class. Inferences are often made about life style, home characterisitics, educational level, and occupational status based on income. However, low income families are not a monolith. All low income families do not have the same life style. While the financial resources of a family may limit some type of activities, income levels do not tell us everything about life style and advantages or disadvantages of children. For example, when compared to the general population it would be expected that low income households are more crowded. In this study, the majority of the children came from low density households. A potential criticism of this study may be that findings seemingly attributable to high density (crowding) may, in fact, be a result of the child's socio-economic status. Since this study does not compare income groups on the

outcome measures this cannot be ruled out except that there are high and low density homes all of which are low income. However, since there may be considerable variation within an income group, SES as a background variable might have been misleading. When using income or SES as a background variable it would perhaps make more sense to describe the specific aspects of a home situation or life style that are important to that study. What I have done here is to describe characteristics of the child's home (and day care center) which seemed to be relevant to the hypotheses guiding this research. One such characteristic is having a private place.

Having a Private Place

In order to determine if children participating in this study had a private place or "stimulus shelter" (Wachs, 1979) in their home to which they could go when they chose, parents were asked to indicate this on the parental questionnaire. Fifty-five percent of the children had such a place while 45% did not. More girls were reported as having a private place (55%) as compared to boys (45%). The distribution among the centers of those with a private place was not equal. In centers #2, 3, 4, 5 and 6 the majority of the children had a

private place while in center #1 the majority did not. In centers #7 and #8 50% of the children had a private place and 50% did not. Children living in a high density household were more likely not to have a private place (.144, p=.068).

Children went to their private places for various reasons. The most frequent reason was to play, the second reason was because the child was tired, the third was because the child was angry, and lastly because the child was upset. It should be remembered, however, that the parents provided this information; the children were not interviewed in this study.

In the classrooms there were no real private places to which children could retreat. Each classroom had a reading/library corner and usually there was a rug nearby for children to sit on. However, these areas were in full view of everyone and did not afford a child any real privacy. During observation periods the researcher occasionally would notice a child go to such a place seemingly to be alone (the child would usually pick out a book and "read"), but the child would always be interrupted.

Accessibility to outdoors

The results reported here refer to the home experience. Nearly every child had the opportunity to go outside every day: 94% of the children went out with an adult, 18% went with other children but without an adult and only 8% (9 children) went outside alone. This pattern of use of the outdoors could be expected since this was an inner city population. This pattern also suggests that children in crowded households could not easily go outside to play to get away from other people in the home. Since only nine children could go outdoors alone accessibility to the outdoors in relationship to home density and the cognitive and behavioral measures was not included in the statistical analysis.

Cognitive Tests

Embedded Figures Test

The Children's Embedded Figures Test measures many of the factors of concern in the adult version of the test. The authors of the test do not recommend using the CEFT for prediction purposes,

only for research. The CEFT has been found to be related to measures of psychological differentiation including: a sense of separate identity, articulated body concept, and certain articulated perceptual or problem solving functions as measured by the WISC. In addition, the test is sensitive to income and age but not race.

One hundred and twelve of the 114 children in the study took the Embedded Figures Test (2 children were not present during any of the testing sessions). The highest possible score on this two-part test is 25; the mean score for this sample was 6.8 and the median score 5.0 with a range of 0 to 23. The standardized mean for children 5 to 6 years old is 7.1. The test was not designed for children under 5 years of age. As discussed in the Methods chapter the test was used here as a measure of style. Thus, although the children in this sample were somewhat younger than the standardized group, they scored very close to the standarized norm. A one-way analysis of variance revealed a significant difference between full-day programs, (daycare centers) and half-day programs (Headstart centers) ($t=4.986$, $p=.000$) for this test. In general, children in the full-day programs did better on this test than those in the half-day ones.

On the "tent" (or triangle) subtest the highest possible score is 11. The median for this sample was 4.0 with a range of 0 to 11. If children were not able to answer the last four questions on the "tent" subtest, the second subtest, "house", was not administered. Consequently, 72% (82 children) of the sample did not take the second part of the test. The highest possible score on this subtest is 14 and for the 28% who took this part, the median score was 7.3 with a range of 2 to 14. The mean on this more difficult subtest, "house" was higher than the mean on the "tent" subtest, but only those children who did well on the first part were allowed to take this part of the test. In addition, the number of children taking the second part of the test may not truly be representative of the sample because one center's scores may be statistically unreliable. The teachers conducted the test in this center and all the children scored higher than children from other centers. The center, children's characteristics, or testing method could account for this difference. A one-way analysis of variance test revealed that the scores on this test for Center #2 were significantly different from the rest of the sample ($f=28.8$, $p=.000$). Subsequent analyses will therefore be done both with this center and without it to see what

differences occur (see Table 3).

The Preschool Inventory

The other test administered was the Preschool Inventory. This test measures performance in the following areas: basic information and vocabulary; number concepts and ordination; concepts of size, shape, motion, and color; concepts of time, object-class, and social functions; visual-motor tasks; following instructions; and independence and self-help.

One hundred and ten children took this test (4 children were not present during testing sessions). Of this group, 7.3% had attended their center less than a year, 57% had attended one year, 33% two years, and 2.7% had attended three years; the median for years attending daycare was 1. English was the major language for 83% of the children, Spanish was the major language for 16% and Portugese was the major language of only one child. The test was given in English to 92.7% of the children and in Spanish to the remaining 7.3%. The Portugese-speaking child took the test in English.

Table 3

Mean scores on the cognitive and behavioral measures

	a PSI	b CEFT	Behavioral Disturbance Scale			
			Total	Hyper	Anxious	Hostile
Ctr.						
1	48.7	8.4	14.1	3.4	3.0	5.4
2	46.4	19.1	16.4	3.3	4.9	5.3
3	50.7	3.8	11.7	2.5	3.1	3.8
4	44.6	3.4	8.4	2.0	1.7	3.3
5	43.0	3.8	8.8	3.4	2.6	1.7
6	40.0	5.8	5.4	1.7	2.3	0.8
7	36.5	3.9	5.3	1.5	1.8	1.8
8	44.0	4.6	14.9	3.5	2.6	5.9

a. Preschool Inventory Test
b. Children's Embedded Figures Test

The test consists of 64 items. The median number answered correctly was 46 (mean=45) with a range of 15 to 61. Based on the national standardization sample, the mean number of questions answered correctly for children ages 4 years to 4 years and 5 months was 30 and 33.9 for children 4 years, 6 months to 4 years, 11 months. This is the age range in which the majority of the children in this study fall. Based on these means, the mean for this sample, 45, is well above the national norm. The scores in center #2 were not in any way significantly different from the other centers as was the case with the Embedded Figures test (ANOVA f=1.56, p=.154).

The median number answered incorrectly was 15 (mean=15.5) with a range of 2 to 46. A child also could respond " I don't know"; 80% of the children used this response. Of this group, the mean number of questions to which this response was given was 4 with a range of 1 to 19. Only the number answered correctly was used in subsequent analyses.

Full-day vs. Half-day programs

A one-way analysis of variance revealed no statistically significant differences among the individual centers for mean number of questions answered correctly. However, there was a difference based on type of center. Children in the daycare centers (full-day programs) tended to answer more questions correctly than the children in the Headstart centers (half-day programs). This difference was significant ($t= 2.616$, $p=.010$).

The author of the test states that the scores are to be interpreted as a measure of performance and not potential since it was not intended to be an intelligence test. It also was designed to be sensitive to change and intervention so it is not "culture-free." It was designed to measure any "deficits" in children entering kindergarten and to be sensitive to any educational intervention associated with Headstart. Perhaps the relatively high median for this sample as compared to the median for the standardization sample is due to the fact that these children had some educational intervention (a median of 1 year) prior to taking the test (see Table 3).

Behavioral Disturbance Rating Scale

All of the children were rated by their teachers on the Behavioral Disturbance Rating scale. This scale is used to detect emotional problems in preschool children. Based on the standarization sample, it discriminates between normal children and those with emotional problems. A child could receive a score of zero as a total score or on any of the subscales if the teacher felt that the child did not display any of the behaviors listed. Such a score would indicate that there was no behavioral disturbance (in terms of the behaviors measured). In this sample, there were 5 children (4.5%) who received a score of zero. The highest score was 40. The median total score, was 8.0 and the mean was 10.7. The mean for normal children in the standardization sample was 9.1 with a standard deviation of 7.6 and 23.4 for emotionally disturbed children. In this sample, 13.4% of the children had scores above 23.4. A one-way analysis of variance test, (t=4.986, p=.000) indicated significant differences for type of center. Children in the half-day programs (Headstart) tended to receive lower behavioral disturbance scores. Boys were generally given higher disturbance scores than girls (ANOVA t=3.13, p=.002).

Subscales: The test is composed of three factors and separate

scores are reported for each subscale as well as for the total. The median for the Hostile-Aggressive subscale was 2.0 with a range of 0 to 20; 31 children (27%) received a score of zero. Boys were rated higher than girls on this subscale (ANOVA t=4.55 p=.000). On the Anxious-Fearful subscale, the median was 2.0 with a range of 0 to 13; 29 children (25%) had a score of zero. There was no difference based on sex for this subscale. The median for the Hyperactive-Distractible subscale also was 2.0 with a range of 0 to 8; 23 children (20%) received a score of zero on this subscale. Boys also were rated higher than girls on this subscale (ANOVA t=3.24, p=.002). There was a significant difference between the centers based on type of program (full- or half-day) for all of the subscales (Hyperactive t=3.95, p=.000, Anxious t=2.41, p=.018, Hostile t=3.74, p=.000). Scores on each of these scales were higher in the full-day centers (see Table 3).

Observation of Selected Children

A subsample of the children was chosen for observation. Based on the Home questionnaire, a boy and a girl each from a high density home and a low density home were chosen; four children in all from

each center were randomly chosen for a total subsample of 32. The children were chosen based on having an individual home density either below or above the mean. Whenever possible, children at either extreme of the home density spectrum were included for observation. The Day Care Environmental Inventory developed by Elizabeth Prescott et al (1975) was used. As described in the Methods chapter, the observational instrument required two levels of coding. The first level defined the type of activity (rejection, thrusting, responsive/receptive, and integrative), the direction of the activity (to adult, child, the group, dual, or the environment), and the continunity of the activity (new, continous, and renewed). The second level coding was done for children who continued with a particular integrative activity which required the child's concentration for 4 minutes or more.

The two major categories of activity engaged in by the children was Responsive/Receptive and Integrative which accounted for 79% of the coded activities. The two individual activities most engaged in by the children were: 1) concentrating on a particular activity, and 2) listening/ watching activity. These two activities accounted for 65% of the total activities (39% and 26% respectively). Two

other categories of activities each accounted for the next highest percentage in frequencies of behavior. Attending to one's self (ie thumb sucking, tying shoes) and simple physical activity (ie walking or running to get some place not as part of another activity) each accounted for 5% of the behaviors. The thrusting/initiating/ selecting activities accounted for 14% and rejection activities accounted for 2% of the total behaviors. For fewer than 1% of the behaviors the researcher was unable to code the activities observed. (See Appendix E for complete listing and frequency of individual behaviors.)

Girls engaged in more concentrating behavior than boys ($\bar{x}$=32.8, girls and $\bar{x}$=27.9, boys). On an average, low home density boys and girls engaged in more concentrating behaviors than their peers who lived in high density homes. The mean score for watching behavior also was higher for girls (22.1) than for boys (18.3). Center #5, a Headstart center, had the highest frequency of children engaging in concentrating activity and the lowest frequency of watching/ listening activity.

Direction and continuity of behavior

As indicated previously, the direction and the continuity of the child's behavior also was coded. The majority of the behaviors was directed either to the environment (37%) or to another child (20%). Behavior directed to an adult, the group, or to a combination of any two of the categories mentioned was evenly divided (12%, 13%, and 11% respectively). New behaviors accounted for 42% and continuous behaviors 55% of the total. Only 3% of the behaviors were categorized as being renewed. This pattern suggests that either children continued a particular activity for an extended period of time or began a series of new activities. Children also interacted with their surroundings (40%) or another child (22%) more frequently than with an adult (teacher) (12%) or a group of children (14%).

Relationship of Behavioral Disturbance Rating scores to observational measures

Although the Behavioral Disturbance Rating scale was administered by the classroom teacher and the observations were done by the researcher, both measures seemed to be tapping some of

the same characteristics of children. Pearson Correlations were found to be significant for the following major categories of behavior: 1) thrusting behavior (observational instrument) and the Hyperactive-Distractible subscale (.294, p=.052), the Hostile-Aggressive subscale (.342, p=.065) and the total score of the Behavioral Disturbance Rating scale (.291, p=.053); 2) integrative behavior (observational instrument) and the total score of the Behavioral Disturbance Rating scale (-.342, p=.035); 3) attending to self (observational instrument) with the total score of the Rating scale (.432, p=.007), the Anxious- Fearful subscale (.240, p=.093) and the Hyperactive- Distractible subscale (.351, p=.025); 4) starting new activity (observational instrument) with the total score on the Rating scale (.476, p=.003) and the Hyperactive-Distractible subscale (.438, p=.006); 5)continue an activity (observational instrument) with the total score on the Rating scale (-.500, p=.002) and the Hyperactive-Distractible subscale (-.455, p=.004); 6) renew an activity (observational instrument) with the Hostile-Aggressive subscale (.467, p=.016) (see Appendices C and D for Pearson Correlation tables and other correlations).

Second Level Coding

Of the 32 children, 24 (75%) required second level coding of their observational data. The eight children who did not require second level coding did not concentrate on a particular activity for four minutes or more. This coding further described the concentrating/integrative behavior in which the child was engaged. The activities in which these children engaged fall into four categories: 1) Group Activities: circle time, singing, listening to music or stories, watching television. 2) Gross Motor Activities: riding tricycles, climbing on apparatus, riding on a seesaw. 3) Fine Motor Activities: puzzles, pegboard, waterplay. 4) Creative Play: playhouse, painting, drawing, playdough, building blocks. Gross motor activities occurred less frequently than the others. The other activities occurred equally.

Choice of activity: The majority of the activities (63%) took place in the room or play yard as a whole. Sixty-seven percent of the activities had been selected or directed by the teacher for the child who was observed or the group as a whole. The remaining 38% of the activities were free choice. Teacher influence on activity choice also is evident by the fact that the source of both initiation and

termination was either teacher pressure or teacher instigation 63% of the time. Child initiation of an activity (either the child being observed or another child) occurred only 29% of the time. However, while the teachers seem to play a major role in choosing the activities, it appears that they did not attempt to exert much influence over the activity; 54% of the time the teacher did not interfere with the structure of the activity and 63% of the time the teacher's approach to the situation was neutral as opposed to friendly or unfriendly. When the teachers did attempt to direct the activity or were involved with the child(ren) in the activity, their primary emphasis was on rules of social living, that is, restraint and control.

Interference with activities: The majority of the children (63%) were highly involved with their activity and interference was not a major problem. Interference refers to a child not being able to continue his or her chosen activity for any number of reasons. When there was interference, teacher behavior was responsible 30% of the time and the child's own inability 20% of the time (inability refers to the task exceeding the child's ability). Physical environmental conditions did not seem to interfere with children's activiities. In

one center, however, the lack of equipment available to the children did interfere with the planned activities. Interference was a problem for 10 of the 24 children in this observation sample.

Most of the children were observed to be effective in the activity in which they were involved and seemed to derive pleasure from their activity. Fourty-seven percent showed a high degree of involvement in their activities although most of the children did show some awareness of what was going on around them. This, however, did not overall seem to interfere with the chosen activity.

Social interaction with peers: The majority of the children who engaged in an integrative activity for more than 4 minutes did so with a group of other children or children and an adult (77%). The two children who chose to play alone were boys and neither had a private place at home. One-way analysis of variance for social interactions indicated that children in the higher density, larger classes tended to play with fewer children in these situations ($t= 2.6$, $p=.01$ and $t= -2.6$, $p=.01$ respectively). Other social groupings were: playing with one's best friend, with an adult, or variable.

There was only one child in each of these categories.

In summary, children who played alone or with only one child were either from high density homes or in the larger, high density classrooms. The children who concentrated on a particular activity for a certain period of time enjoyed what they were doing and were highly involved with it. For the most part, the teacher influenced the choice of activity but otherwise there was not much teacher intervention in terms of doing the activity. Teachers did intervene to discipline or terminate an activity. Children were most often engaged in the activity with other children or with an adult and children rather than alone.

Relationships between the outcome variables from the second level coding and the other outcome variables, scores on the Preschool Inventory, the Embedded Figures test, and the Behavioral Rating scale, were investigated with chi- square tests. Tests also were run for these measures against several input variables, including home and daycare density, sex, and age of child. However, due to the small sample size, none of the chi-square tests were reliable.

Hypothesis Testing

In order to see how the various input measures contributed to the outcome measures, a multivariate analysis of variance (MANOVA) design was used. This design also permitted interaction effects to be tested and variables to be entered on a hierarchial basis (sequential model) depending on the hypothesis being tested. If there was no specific hypothesis about the variables, the unique model was used whereby the variables with the least amount of variance contributing to the model were entered first.

First Hypothesis

The first hypothesis states that children from high density homes will test lower on the measures of cognitive development and will be rated more behaviorally disturbed by their teachers than children fom low density homes. In this analysis, home density, either as a main effect or interacting with other variables, was not

significant for the Behavioral Disturbance Rating scale total score (see Table 9). However, as described above, there are three subscales of the Behavioral Disturbance Rating scale. There were no significant home density effects for the Hostile-Aggressive subscale (see Table 4). A sequential analysis was used here with sex as a main effect and in second and triple-order interactions since the literature (Saegert, 1980a) suggests that there will be sex differences on this measure.

Having a private place was marginally significant (p=.106) for the Anxious-Fearful subscale with higher anxious scores given to children who did not have a private place at home (see Table 5). A sequential model was used based on the researcher's hypothesis. Having or not having a private place in the home is often an indication of the home density level, so while there were no effects for home density found for this subscale findings for private place may indicate that one particular aspect of a high density home (private place) is a critical factor in developing an anxious style.

A significant main effect was found for the interaction of home density and classroom density for the Hyperactive subscale (p=.091).

Table 4

MANOVA results for Hostile-Aggressive subscale of Behavioral Disturbance Rating scale with independent variables

Independent Variables	SS	DF	MS	F	Sig.F
Sex	186.07	1	186.07	15.06	.000 *
Sex by home density by classrm. density	38.02	2	19.01	1.54	.220
Sex by classrm. dens.	157.29	2	78.64	6.36	.002 *
Sex by home density	4.20	1	4.20	.34	.561
Home density by classrm. density	16.24	2	8.12	.66	.520
Classroom density	108.43	2	54.22	4.39	.015 *
Home density	.20	1	.20	.02	.900

* Means Tables

SEX	Girls	2.323	CLASSROOM DENSITY	Low	4.156
	Boys	5.721		Moderate	2.154
				High	5.221

SEX BY CLASSROOM DENSITY	Girls	Boys
Low	3.722	4.714
Moderate	1.545	2.941
High	1.952	8.643

Table 5

MANOVA results for Anxious-Fearful subscale of Behavioral Disturbance Rating scale with independent variables

Independent variables	SS	DF	MS	F	Sig.F
Private place	22.52	1	22.52	2.65	.106 *
Private place by classrm. density	27.97	2	13.99	1.65	.198
Private place by home density	.79	1	.79	.09	.761
Private place by home dens.by classrm. dens.	6.57	2	3.28	.39	.680
Home density	15.00	1	15.00	1.77	.187
Classroom density	14.63	2	7.31	.86	.425

* Means Tables

PRIVATE PLACE	Yes	2.317
	No	3.265

A sequential model was used here for similar reasons as with the Hostile-Aggressive subscale. Hyperactive scores were higher for children in high density homes and in high density classrooms than for those in low or moderate density classrooms (see Table 6).

Cognitive measures - Embedded Figures Test

Effects were found for this measure with the classroom density and private place interaction (p=.038). A unique analysis was used here since there was no specific hypothesis posed by the researcher. Scores on the Embedded Figures test were generally higher for children who had a private place in the home. The exception was for those in the moderate density classrooms and without a private place. These results, however, must be viewed with caution because there were no daycare centers in the moderate density category, only Headstart centers, so a complete analysis could not be done.

Scores also were higher in the high density classrooms than in the low density classrooms especially for those with a private place. This finding is not surprising since children in the full-day

Table 6

MANOVA results for Hyperactive-Distractible subscale of Behavioral Disturbance Rating scale with independent variables

Independent variables	SS	DF	MS	F	Sig.F
Sex	44.45	1	44.45	11.77	.001 *
Sex by home density by classroom density	3.10	2	1.55	.41	.664
Sex by classrm.density	30.69	2	15.34	4.06	.020 *
Sex by home density	6.35	1	6.35	1.68	.197
Home density by classrm. density	18.51	2	9.26	2.45	.091 *
Classroom density	30.25	2	15.12	4.01	.021 *
Home density	.02	1	.02	.00	.945

* Means Tables

SEX Girls 1.919
Boys 3.173

CLASSROOM DENSITY Low 2.500
Mod. 1.667
High 3.233

SEX BY CLASSROOM DENSITY

	Girls	Boys
Low	2.333	2.714
Mod.	1.500	1.882
High	2.000	4.524

HOME DENSITY BY CLASSROOM DENSITY

	Low	Mod.	High
Low	2.632	1.577	3.053
High	2.308	1.846	4.600

programs did better on the cognitive tests than those in the half-day programs and high density classrooms were more representative of the full-day programs. If there were a more equal density distribution of classrooms in the full-and half-day programs then perhaps the role private place is playing for this measure could be better understood. At this time the results seem to indicate that private place, type of program and cognitive style as measured by the Embedded Figures test are related (see Table 7). There were no main effects for home density for the Embedded Figures test; therefore, the results of this MANOVA are not reported. There also were no differences on this measure for sex of the child. In addition, because of empty cells in the triple order interactions no effects were found for home density with other variables. Center #2 (a Daycare center) was excluded from this analysis because of testing problems. A means test indicated that there was a significant difference between that center and the others ($f=28.8$, $p=.000$).

Preschool Inventory Test

Home density by classroom density was marginally significant (p=.106) for the Preschool Inventory test. A sequential model was used with type of center entered first and classroom and home density entered last since it was hypothesized that density would have the most effect on the scores for this measure. Scores were higher in the low home density and high classroom density interaction than in the low home density and low classroom density interaction. Scores were lowest in the moderate density classrooms although they were higher for the high home density condition than for the low density condition. This analysis would seem to indicate that children from low density homes did best in the high density classrooms which were more likely to be in the Daycare centers. Any conclusions, however, are conditional because of the missing data (see Table 8).

In summary, this hypothesis was not totally supported by the data. Although home density and classroom density together were found to affect hyperactive behavior, there was no direct effect on either the behavioral disturbance scores or either of the cognitive measures. Private place was marginally significant for anxious behavior and interacted with classroom density to explain scores on

Table 7

MANOVA results for Embedded Figures Test scores with independent variables

Independent variables	SS	DF	MS	F	Sig.F
Sex	11.63	1	11.63	.84	.363
Classroom density	33.08	2	16.54	1.19	.310
Private place	6.30	1	6.30	.45	.503
Sex by classroom density	11.31	2	5.66	.41	.668
Sex by private place	3.23	1	3.23	.23	.632
Classroom density by private place	94.46	2	47.23	3.39	.038 *
Sex by classroom density by private place	18.54	2	9.27	.67	.517

* Means Table

PRIVATE PLACE BY CLASSROOM DENSITY	Yes	No
Low	5.800	2.889
Mod.	3.800	6.071
High	6.412	5.330

Table 8

MANOVA results for Preschool Inventory Test scores with independent variables

Independent variables	SS	DF	MS	F	Sig.F
Type of center	562.20	1	562.20	6.77	.011 *
Type by home density	1.53	1	1.53	.02	.892
Home density by class-room density	381.46	2	190.73	2.30	.106 *
Home density	33.56	1	33.56	.40	.526
Classroom density	67.64	2	33.82	.41	.666
Model		7		1.80	.095

R = .107
Adjusted R = .048

* Means Tables

TYPE OF CENTER	Headstart	42.879
	Daycare	47.321

HOME DENSITY BY CLASSROOM DENSITY	Low	High
Low	44.474	46.769
Mod.	41.000	43.615
High	48.026	45.200

Note: Type of center refers to whether it was a Headstart or Daycare center. Differences on this measure were found for type of center.

the Embedded Figures test. Home density did interact with classroom density on the Preschool Inventory measure but any conclusions are inconclusive.

Second Hypothesis

The second hypothesis states that children from higher density homes but low and moderate density classrooms will display behavioral patterns similar to the children in the large groups in the Abt National Daycare study: namely, lack of cooperativeness and concentration, more onlooker behavior and lower cognitive test scores. This hypothesis was designed to see how home density and center classroom density might interact to affect the outcome variables.

This hypothesis could not be tested for the home density and center classroom density interaction for the Embedded Figures test since all interactions with home density were insignificant. The hypothesis was only to be partially tested in terms of classroom

density for the number right on the Preschool Inventory because there were no moderate density classrooms in the daycare centers. Preliminary analysis showed differences by center type for the number right on the Preschool Inventory therefore the MANOVA model used for this hypothesis was a sequential one and included type of center. Type of center was entered first and was found to be significant in terms of explaining scores on this test (p=.011). Scores were higher in the Daycare centers than in the Headstart centers. Type of center with home density was entered second which was not significant (see Table 8).

The results discussed above suggests that this hypothesis cannot be supported. Although there was a significant interaction for home density and classroom density (p=.027) when type of center was not included, higher scores not lower scores were associated with high density homes, for children in low and moderate density classrooms. Although children from high density homes and high density classrooms scored lower than children in high density classrooms and low density homes they scored higher than those from low density homes and low density classrooms. It also must be pointed out that the centers in the Abt study were all full-day programs. In

this study both half-and full- day programs were included and there were no moderate density conditions in any of the full-day programs.

Third Hypothesis

The third hypothesis states that children from high density homes will show more field dependence on the Embedded Figures test than those from lower density homes. As indicated above, Center #2 was not included in this analysis because of the testing problem in that center with this measure. When home density as a main effect and as part of interactions was entered in the MANOVA analysis, neither home density or any of the other variables and interactions were significant. When home density, however, was removed from the analysis and another home variable, private place, was entered into the analysis, the interaction of center classroom density and private place was found to be significant. These results are reported above under the first hypothesis. This hypothesis was, therefore, not supported (see Table 7).

Fourth Hypothesis

The final hypothesis states that children in high density classrooms and/or in a large class will show more behavioral disturbance as indicated by the teacher ratings and by observation. The MANOVA design was a sequential model with classroom and home density entered last in order to provide the most conservative test of the effects of density. The results indicated that center classroom density predicts Behavioral Disturbance scores (p=.002). Higher scores were found in the high density classrooms (see Table 9). As anticipated, sex of the child also predicted scores on this variable (p=.001) with boys receiving higher scores than girls. Girls scores, however, were higher in the low density classrooms than in the high density classrooms. The opposite case was found for the boys. In this analysis, scores were higher in the low density classrooms than in the moderate density classrooms. This isprobably accounted for by the fact that there were only Headstart centers in the moderate density category and as indicated previously, an ANOVA indicated that children were less likely to receive high Behavioral Disturbance scores in the Headstart centers (see Table 4).

Effects were found for classroom density on two of the subscales

Table 9

MANOVA results for Behavioral Disturbance Rating scale, total scores with independent variables

Independent variables	SS	DF	MS	F	Sig.F
Sex	674.76	1	674.76	11.91	.001 *
Sex by home density by classroom density	3.72	2	1.86	.03	.968
Sex by classroom density	851.70	2	425.85	7.52	.001 *
Sex by home density	148.52	1	148.52	2.62	.108
Home density by classroom density	163.24	2	81.62	1.44	.241
Classroom density	742.44	2	371.22	6.55	.002 *
Home density	17.50	1	17.50	.31	.580
Model		11			.000

R = .311
Adjusted R = .236

* Means Tables

SEX	Girls 8.500	CLASSROOM DENSITY	Low 11.813
	Boys 13.385		Mod. 6.667
			High 13.605

SEX BY CLASSROOM DENSITY	Girls	Boys
Low	11.944	11.643
Mod.	5.545	8.118
High	8.636	18.810

of the Behavioral Disturbance Rating scale. Sequential models also were used here for the reasons described above. There were main effects for classroom density (p=.015) on the Hostile-Aggressive subscale with higher ratings in the high density classrooms than in the low density classrooms. Ratings, however, were lowest in the moderate density classrooms. As indicated above, there were no daycare center classrooms in the moderate density condition and Behavioral Disturbance Rating scores tended to be higher in the daycare center classrooms. Main effects also were found for sex on this measure (p=.000) with boys being rated as more hostile than girls. Also, effects were found for the interaction of sex and classroom density (p=.002).

Similar results were found for the Hyperactive-Distractible subscale. A sequential model was used here. There were main effects for classroom density (p=.021) with higher scores in the high density classrooms than in the low density classrooms. Once again, scores were lowest in the moderate density classrooms for the same reasons as stated above. There also were main effects (p=.001) for sex on this measure with boys being rated more hyperactive than girls. There were effects for the interaction of sex

and classroom density for this measure (p=.020). This interaction revealed that boys were twice as likely as girls to be rated as hyperactive and distractible in high density classrooms. The difference between girls and boys nearly disappeared in the low density classrooms. Ratings on this measure were lowest for both boys and girls in the moderate density classrooms for the reasons stated above. There also was little difference between boys' and girls' ratings in this density condition. There was moderate effects for this measure for the interaction of home density and classroom density (p=.091). Hyperactivity scores were higher in the high density classrooms and more so for those from high density homes (see Table 6).

Observational sample analysis

A separate analysis was done for the observational subsample. There were 32 children in the observational sample; 8 boys and 8 girls each from high density homes and low density homes. The MANOVA analyses for the primary outcome variables, the Preschool Inventory and the Embedded Figures tests, and the Behavioral Disturbance Rating scale were all insignifcant due to the small

number of children involved. A more useful analysis was determined to be one of the specific behaviors and their relationship to the independent variables, home and classroom density, a private place in the home, and sex of the child.

As described earlier, all of the behaviors fall into four major categories: thrusting (initiating), rejection, integrative, and responsive. MANOVA analyses were conducted for each of these categories. The unique model was used at all times since there were no specific hypotheses for these models. Although the majority of behaviors which occurred were either integrative or responsive, significant interactions with the independent variables were found only for the thrusting and integrative behaviors. The thrusting behaviors included: simple physical activity not related to an integrative activity (i.e. walking or running to get to the other side of the room not as part of an activity), selects an activity to do, asks for assistance in a task or comfort from others, makes social contact, gives orders, playful aggression, and expresses a feeling or opinion. Significant findings occurred for sex ($p=.090$) and the sex by classroom density interaction ($p=.085$) (see Table 10). Overall, boys engaged in more thrusting behavior than girls and this behavior

TABLE 10

MANOVA results for Thrusting/Initiating behavior with independent variables

Independent variables	SS	DF	MS	F	Sig.F
Classroom density	60.02	2	30.01	.76	.482
Home density by classroom density	41.07	2	20.53	.52	.604
Sex	126.12	1	126.12	3.18	.090 *
Sex by classrm.density	121.36	2	110.68	2.79	.085 *
Sex by home density	15.04	1	15.04	.38	.545
Home density	.26	1	.26	.01	.936
Sex by home density by classroom density	107.02	2	53.51	1.35	.282

* Means tables

SEX Girls 7.688
Boys 11.625

SEX BY CLASSROOM DENSITY	Girls	Boys
Low	10.250	7.000
Mod.	6.667	10.833
High	7.000	15.500

increased as classroom density increased. Girls, however, initiated more thrusting behavior in the low density classrooms among themselves and more than boys in low density classrooms. Thrusting behavior for girls in the moderate and high density classrooms was about equal but less than in the low density classrooms.

Integrative behaviors included: examining or tinkering with an object, hostile reciprocity, simple reciprocity, offers sympathy or help, and attends with concentration to a particular activity. The only significant finding was for home density (p=.006) (see Table 11). Children from low density homes engaged in more integrative behavior than children from high density homes.

The rejection/refuses input category (ignores intrusion and continues activity, avoids an intrusion, and actively tries to eliminate an intrusion) and the responsive/receptive category (obeys, cooperates, responds to questions, imitates another person, superficial or automatic response, receives positive input on a task, receives positive affect, receives rejection or frustration, being perceptive or reflective, and watching/listening/ scanning) were

Table 11

MANOVA results for Integrative Behavior with independent variables

Independent variables	SS	DF	MS	F	Sig.F
Classroom density	336.70	2	168.35	.93	.410
Home density by classroom density	85.02	2	42.51	.24	.792
Sex	34.97	1	34.97	.19	.664
Sex by classrm.density	175.55	2	87.78	.49	.622
Sex by home density	122.76	1	122.76	2.90	.104
Home density	1122.04	1	1122.04	9.55	.006 *
Sex by home density by classroom density	58.52	2	29.26	.16	.851

* Means Tables

HOME DENSITY	Low	38.950
	High	23.417

found not to be significantly affected by the independent variables. Individual behaviors within these categories were found to be significantly affected, however, and they will be discussed later.

The direction of behaviors also was analyzed. Most frequently, activity was directed toward another child or children, an adult, or to the environment (which meant the child was playing alone). An activity directed to a group of children and adults or any two of the above occurred less frequently (see Appendix K for frequencies). Only the first three categories (child, adult, environment) were analyzed. There were two significant findings for activities directed toward a child: sex ($p=.024$) and sex by private place by classroom density ($p=.045$). (The results of the latter finding is tentative since there were missing data in this model.) In general, boys directed more activities to another child(ren) than did girls. This was true for boys with or without a private place within the home. Girls with a private place in the home and in low or moderate density classrooms directed more activity to another child than girls in the high density classrooms. Girls without a private place in the home (there were no girls in low density classrooms without a private place in the home) directed their activity to another child

increasingly as the classroom density increased. These girls were more likely to direct their behavior to another child than girls with a private place in the home. Boys with a private place in the home were more likely to direct their behavior to another child as the classroom density increased. For boys without a private place in the home, this pattern was reversed (see Table 12).

For activities directed to an adult there were two significant findings, home density (p=.011) and sex by private place by classroom density (p=.090). Children from high density homes were twice as likely to direct their behavior to an adult than children from a low density home (see Table 13). The triple order interaction was only marginally significant at p=.090 and there was an empty cell for girls without a private place in low density classrooms (see Table 14).

There was only one significant finding for behavior directed to the environment, an interaction of sex by classroom density (p=.068). In low and moderate density classrooms, girls directed more of their behavior to the environment than did boys. The pattern reversed itself in the high density classrooms. Girls in low density

Table 12

MANOVA results for Direction of Behavior toward a Child with independent variables

Independent variables	SS	DF	MS	F	Sig.F	
Private place by classroom density	31.07	2	15.54	.26	.773	
Private place	76.15	1	76.15	1.28	.271	
Classroom density	48.08	2	24.04	.40	.673	
Sex	156.70	1	156.70	6.00	.024	*
Sex by private place	58.17	1	58.17	.98	.334	
Sex by classrm.density	67.97	2	33.99	.57	.573	
Sex by private place by classroom density	272.30	1	272.30	4.58	.045	*

* Means Tables

SEX	Girls	11.533
	Boys	18.933

SEX BY PRIVATE PLACE BY CLASSROOM DENSITY	With PP		Without PP	
	Girls	Boys	Girls	Boys
Low	11.000	13.000	-	40.000
Mod.	10.750	16.600	13.500	30.000
High	4.000	22.000	17.000	15.000

Table 13

MANOVA results for Direction of Behavior toward an Adult with independent variables (home density)

Independent variables	SS	DF	MS	F	Sig.F	
Home density by class-room density	111.80	2	55.90	1.75	.199	
Home density	253.72	1	253.72	7.95	.011	*
Classroom density	18.39	2	9.19	.19	.753	
Sex	76.28	1	76.28	2.39	.138	
Sex by home density	91.01	1	91.01	2.85	.107	
Sex by classrm.density	11.84	2	5.92	.19	.832	
Sex by home density by classroom density	3.43	2	1.72	.05	.948	

* Means Tables

HOME DENSITY Low 5.950
High 12.583

Table 14

MANOVA results for Direction of Behavior to an Adult with independent variables (private place)

Independent variables	SS	DF	MS	F	Sig.F
Private place by class-room density	72.15	2	36.08	.76	.481
Private place	90.53	1	90.53	1.90	.183
Classroom density	114.68	2	57.34	1.21	.320
Sex	21.08	1	21.08	.44	.513
Sex by private place	100.51	1	100.51	2.11	.162
Sex by classrm.density	113.65	2	56.83	1.19	.323
Sex by private place by classrm. density	151.12	1	151.12	3.18	.090 *

* Means Tables

SEX BY PRIVATE PLACE BY CLASSROOM DENSITY	With PP		Without PP	
	Girls	Boys	Girls	Boys
Low	8.000	11.667	-	10.000
Mod.	4.000	12.000	10.000	4.000
High	6.500	5.667	5.333	13.333

classrooms directed their behavior toward the environment more often than they did in either the moderate or high density classrooms. Boys displayed the opposite tendency and were more likely to *direct* their behavior to the environment in the high density classrooms than they were in either the moderate or low density classrooms (see Table 15). Continuity of activity also was analyzed. Each behavior was either a continuation of an existing activity, a new activity, or a renewed activity which had been interrupted. There was a relationship found among the three levels of continuity. New activity was negatively correlated with continuous activity (-.317, p=.039) and there was a moderate positive correlation between renewed activity and continuous activity (.229, p=.104) (see Appendix D for Pearson Correlation table).

There were five significant findings for renewed activities. One, home density (p=.055), children from low density homes renewed a previous activity more than those from high density homes. Two, classroom density (p=.022), renewed activity increased as classroom density increased. Three, sex by classroom density (p=.065), boys in high density classrooms renewed more activities

Table 15

MANOVA results for Direction of Behavior toward the Environment with independent variables

Independent variables	SS	DF	MS	F	Sig.F	
Home density by class-room density	111.61	2	55.80	.35	.702	
Home density	373.98	1	373.98	2.41	.136	
Classroom density	539.08	2	269.54	1.74	.201	
Sex	34.63	1	34.63	.22	.883	
Sex by classrm.density	953.79	2	476.89	3.08	.068	*
Sex by home density by classroom density	16.69	2	8.34	.05	.948	

* Means Tables

	Girls	Boys
Low	41.000	24.500
Mod.	24.833	20.333
High	25.000	37.167

than other boys in the low and moderate density classrooms and more than girls in general. There was little difference among the girls across the classrooms density levels. Four, private place by classroom density (p=.090), in the low density classrooms children with a private place in the home were more likely to renew activities than those without a private place ($\bar{x}$=0.00). In the moderate and high density classrooms, having or not having a private place in the home made less of a difference in the incidence of renewed activities than it did in the low density classrooms. Generally, those with a private place renewed activities more than those without a private place. Five, sex by private place by classroom density (p=.028), again in general, children with a private place renewed more activities than those without a private place. In low density classrooms, both boys and girls from homes with a private place were equal in terms of renewed activity. However, in the moderate density classrooms girls were more likely to renew activities than boys and in the high density classrooms boys were more likely to do so than girls. Among children from homes without a private place, boys in low density classrooms did not renew any activities but did so in moderate and high density classrooms equally for both density levels. Girls without a private place in high

density classrooms were more likely to renew activities than girls from moderate density classrooms (there were no girls in low density classrooms without a private place) and more likely to do so than boys. Girls without a private place in high density classrooms seemed to behave similar to those with a private place in the moderate density classrooms in terms of renewed activity (see Tables 16 and 17).

Starting a new activity meant that the child did not continue with a previous activity or return to renew an activity if interrupted. Therefore, the more new activities a child started, the less that child concentrated on any one activity for an extended period of time. For new activity there were three significant findings; sex (p=.056), sex by classroom density (p=.049), and sex by home density by classroom density (p=.023). In general, boys started more new activities than girls did in all classroom density conditions. Among the girls, those in the low density classrooms started more new activities than those in the moderate or high density classrooms. Boys in the moderate density classrooms (half-day program) were less likely to start new activities than those in the low and high density classrooms. Children from low

Table 16

MANOVA results for Renewed activity with independent variables (home density)

Independent variables	SS	DF	MS	F	Sig.F	
Home density by classroom density	2.57	2	1.29	.19	.825	
Home density	27.43	1	27.43	4.15	.055	*
Classroom density	13.88	2	6.94	1.05	.368	
Sex	.27	1	.27	.04	.842	
Sex by home density	.44	1	.44	.07	.799	
Sex by classrm.density	8.85	2	4.43	.67	.523	
Sex by home density by classroom density	16.42	2	8.21	1.24	.310	

* Means Tables

HOME DENSITY	Low	4.450
	High	2.250

Table 17

MANOVA results for Renewed activity with independent variables (private place)

Independent variables	SS	DF	MS	F	Sig.F
Private place by class-room density	34.74	2	17.37	2.72	.090 *
Private place	37.53	1	37.53	5.88	.025 *
Classroom density	59.65	2	29.82	4.67	.022 *
Sex	20.66	1	20.66	3.24	.087
Sex by private place	17.25	1	17.25	2.70	.116
Sex by classrm.density	40.10	2	20.05	3.14	.065 *
Sex by private place by classroom density	35.93	1	35.93	5.63	.028 *

* Means Tables

CLASSROOM DENSITY	
Low	2.625
Mod.	3.333
High	4.727

SEX BY CLASSROOM DENSITY	Girls	Boys
Low	3.000	2.250
Mod.	4.167	2.500
High	3.800	5.500

PRIVATE PLACE BY CLASSROOM DENSITY	With PP	Without PP
Low	3.000	.000
Mod.	3.667	2.333
High	4.800	4.667

SEX BY PRIVATE PLACE BY CLASSROOM DENSITY	With PP		Without PP	
	Girls	Boys	Girls	Boys
Low	3.000	3.000	-	.000
Mod.	5.500	2.200	1.500	4.000
High	2.000	6.667	5.000	4.333

density homes generally started fewer new activities than those from high density homes except for girls from high density homes and high density classrooms who started the fewest new activities among the entire observational sample. Among the children from low density homes, boys started more new activities than girls across all classroom density levels. However, among those from high density homes boys in moderate density classrooms started fewer new activities than girls did but in the high density classrooms boys started the most new activities across the whole observational sample (see Table 18).

There were two significant findings for continuous activity, home density (p=.071) and classroom density (p=.063). Children from low density homes had more continuous activities than those from high density homes and those in the moderate density classrooms had more continuous activity than those in the low or high density classrooms. Children in the high density classrooms had the least amount of continuous activities (see Table 19). All of the moderate density classrooms were in the Headstart centers (half-day programs). An ANOVA indicated that, in fact, type of center (half or full-day program) was an important determining factor in the

Table 18

MANOVA results for New Activity with independent variables

Independent variables	SS	DF	MS	F	Sig.F
Home density by class-room density	234.47	2	117.23	1.25	.307
Home density	97.57	1	97.57	1.04	.319
Classroom density	184.04	2	92.02	.98	.391
Sex	383.79	1	383.79	4.10	.056 *
Sex by home density	.97	1	.97	.01	.920
Sex by classrm.density	657.24	2	328.62	3.51	.049 *
Sex by home density by classroom density	854.92	2	427.46	4.57	.023 *

*Means Tables

SEX	Girls	27.938
	Boys	35.313

SEX BY CLASSROOM DENSITY	Girls	Boys
Low	35.250	37.500
Mod.	27.667	30.167
High	23.333	39.000

SEX BY HOME DENSITY BY CLASSROOM DENSITY	Low		High	
	Girls	Boys	Girls	Boys
Low	26.000	34.500	44.500	40.000
Mod.	26.200	34.000	35.000	26.333
High	29.000	34.250	12.000	48.500

amount of continuous behavior. There was more continuous behavior in the Headstart classrooms (half-day program); t=.032 (half-day $\bar{x}$=46.250, full-day $\bar{x}$=37.250). Several analyses were done for individual behaviors that were part of the four categories of behavior (thrusting, integrative, responsive, rejection). The individual behaviors were chosen on the basis of frequency of occurence among the observational sample, therefore not all individual behaviors were analyzed. Behaviors were grouped together on the basis of potentially tapping similar phenonoma.

MANOVA models were developed consisting of individual behaviors, direction or continuity of behavior, and categories of behavior from the second level coding (all children who engaged in an integrative activity for more than four minutes received additional coding of that behavior). Each of these models was analyzed with sex of the child, private place in the home, home density, and classroom density as independent variables. The unique MANOVA model was used in each case since there was no specific hypotheses guiding the order of entry of the independent variables. The results of these analyses follows.

Table 19

MANOVA results for Continuous Activity with independent variables

Independent variables	SS	DF	MS	F	Sig.F	
Home density by class-room density	356.53	2	178.27	1.45	.257	
Home density	444.35	1	444.35	3.63	.071	*
Classroom density	780.63	2	390.32	3.19	.063	*
Sex	13.46	1	13.46	.11	.744	
Sex by home density	300.63	1	300.63	2.45	.133	
Sex by classrm.density	19.32	2	9.66	.08	.924	
Sex by home density by classroom density	21.03	2	10.51	.09	.918	

* Means Tables

HOME DENSITY	Low	44.550
	High	37.083

CLASSROOM DENSITY	Low	40.875
	Mod.	47.583
	High	36.500

Two responsive behaviors which seemed to be related were "obeys a command" and "gives an automatic or polite response." This model was significant at p=.066 for home density by classroom density although only the second behavior, "gives an automatic or polite response" was significant (p=.030). Children from high density homes and in moderate density classrooms gave the most automatic responses while those from low density homes and in moderate density classrooms gave the least such responses. (See Table 20).

Social contact and playful aggression were looked at together. This model was significant for the following variables: sex (p=.004), sex by private place (p=.006), and private place by classroom density (p=.012), all for social contact. Generally, boys made more social contacts than girls and boys without a private place in the home made more social contacts than boys with a private place. All children who had private places in the home were more likely to make social contacts in the classroom than those without a private place except for those children in the moderate density classrooms (Headstart centers) who did not have a private place

Table 20

MANOVA results for Obey and Automatic Response for independent variables home density and classroom density

Multivariate test of Signifigance

Test name	Value	Approx.F	Hypoth.DF	Error DF	Sig.F
Wilks	.63676	2.40516	4.00	38.00	.066

Univariate F-tests with 2,20 DF

Variable	Hypoth.SS	Error SS	Hypoth.MS	Error Ms	F	SigF
Obey	34.470	204.217	17.235	10.211	1.688	.210
Automatic Response	82.855	197.200	41.430	9.860	4.202	.030

* Means Table

HOME DENSITY BY CLASSROOM DENSITY for AUTOMATIC RESPONSE	Low	High
Low	3.250	.750
Mod.	.250	7.250
High	.750	1.500

in the home. These children made more social contacts than those in the other categories. When social contact was examined with direction of contact (either an adult or another child), there was a significant finding for sex with social contact (p=.012). Boys were more likely than girls to make social contact with another child. (See Table 21). It should be remembered that boys also were found more often than girls to direct their behavior to another child so this finding relating to social contact confirms the earlier finding.

Concentrating on a particular activity was one of the integrative activities. An example of such behavior would be playing with blocks, working on a puzzle, painting a picture, or riding a tricycle as an activity and not as a means of getting from one place to another. Children could engage in this type of behavior as a new behavior, on a continuous basis, or renew the activity after being interrupted for one reason or another. When concentrating behavior was examined with continuity of behavior, the model was found to be moderately significant at p=.073 for home density and classroom density at p=.068. Children from low density homes were found to engage in more concentrating behavior (p=.009), continue the behavior (p=.071), or renew the behavior after an interruption

Table 21

MANOVA results for Social Contact and Playful Aggression for independent variables sex, private place, and classroom density

Multivariate test

Ind.Var.	Test	Value	Exact F	Hypoth.DF	Error DF	Sig.F
Sex	Wilks	.516	7.579	2.00	19.00	.004
Sex by PP	Wilks	.586	6.702	2.00	19.00	.006
Classrm. density	Wilks	.514	3.750	4.00	38.00	.011
PP by classrm. density	Wilks	.517	3.716	4.00	38.00	.012

Univariate F-tests with 2,20 DF

Dep.Var.	Ind.Var.	Hypoth. SS	Error MS	Hypoth. MS	Error MS	F	Sig.F
Sex	Playful agg.	.619	22.033	.619	1.102	.561	.462
	Social contact	89.852	116.783	89.852	5.839	15.388	.001
Sex by PP	Playful agg.	.063	22.033	.063	1.102	.057	.814
	Social contact	82.063	116.783	82.063	5.840	14.054	.001
PP by classrm. density	Playful agg.	.733	22.033	.366	1.102	.333	.721
	Social contact	104.724	116.783	52.362	5.840	8.967	.002

Means Tables for Social Contact

SEX		
	Girls	1.667
	Boys	3.125

SEX BY PRIVATE PLACE	With PP	Without PP
Girls	2.300	.400
Boys	2.727	4.000

PRIVATE PLACE BY CLASSROOM DENSITY	With PP	Without PP
Low	2.286	.000
Mod.	2.222	5.000
High	3.400	1.167

(p=.055) more so than children from high density homes. Children in low or moderate density classrooms continued their activities more than those in high density classrooms (p=.063). Those in the moderate density, Headstart centers, had the most continuous behavior (see Table 22). As indicated previously, children who continued with a concentrating, integrative activity for four (4) minutes or more received additional coding for that behavior. The only variable found to have any signifigance was "source of initiation and termination" when it was included in a model with "selects an activity". The model was significant for private place at p=.043 and sex by classroom density at p=.080 for source of initiation and termination (initiation and termination could be teacher instigated, teacher pressure, spontaneous, child instigated, or a combination of the above). The model indicated that more spontaneous initiation or termination of an activity was found among children with a private place in the home, while more teacher pressure or instigation was found for children without a private place, p=.045. Girls had more spontaneous behavior in the high density classrooms which were generally the Daycare centers. Boys had more spontaneous behavior in the moderate density centers which were in all cases the Headstart centers (see Table 23).

Table 22

MANOVA results for Concentrating, Continuous, and renewed behaviors for independent variables home density and classroom density

Multivariate test of significance

Variable	Test	Value	Approx.F	Hypoth.DF	Error DF	Sig.F
Classrm. density	Wilks	.539	2.175	6.00	36.00	.068
Home density	Wilks	.686	2.749	3.00	18.00	.073

Univariate F-Tests with 2,20 DF

Ind. Vari.	Dep. Vari.	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig.F
Class. Dens.	Cont.	780.634	2450.833	390.317	122.542	3.185	.063
Home Dens.	Conc.	1471.544	3561.467	1471.544	178.073	8.264	.009
	Cont.	444.353	2450.833	444.353	122.542	3.626	.071
	Renew	27.432	132.133	27.432	6.607	4.152	.055

Means Tables for Continuous behavior

CLASSROOM DENSITY	Low	40.875
	Mod.	47.583
	High	36.500

Means Tables for Concentrating, continuous, and renewed behavior

HOME DENSITY	(concentrating)	Low	34.850
		High	20.583
	(continuous)	Low	44.550
		High	37.083
	(renewed)	Low	4.450
		High	2.250

Table 23

MANOVA results for Source of initiation and termination for selects an activity with independent variables private place and sex by classroom density

Multivariate tests of significance

Variable	Test	Value	Exact F	Hypoth.DF	Error DF	Sig.F
Sex by classrm. density	Wilks	.607	3.886	2.00	12.00	.050
Private place	Wilks	.593	4.122	2.00	12.00	.043

Univariate F-Tests with 1,13 DF

Ind. var.	Dep. var.	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig.F
Sex by classrm. density	Source	1146.706	3027.117	1146.706	232.855	4.925	.045
Private place	Source	1139.851	3027.117	1139.891	232.855	4.895	.045

Means Tables for Source of Initiation and Termination of activity

PRIVATE PLACE	Yes	29.143
	No	24.500

SEX BY CLASSROOM DENSITY	Girls	Boys
Low	25.333	22.000
Mod.	25.167	33.667
High	28.000	23.000

Summary of observational findings

Home density, classroom density, and having a private place in the home were all found to affect certain classroom behaviors. Sometimes these variables interacted with each other and with the sex of the child in relationship to certain behaviors. In general, children from high density homes as opposed to those from low density homes tended to have fewer integrative activities on which they concentrated for a continuous period of time. The children from the high density homes were more likely to start a new activity than those from low density homes and, when interrupted, were less likely to renew their original activity. Children from low density homes also gave fewer automatic responses to questions or comments from teachers (especially those in the moderate density classrooms) than those from high density homes. Children from high density homes tended to direct their behavior to the adults in the room as opposed to other children. Basically, children from high density homes seemed to have more trouble concentrating on an

activity than their classmates from low density homes.

Children who had a private place to go to in their home were more likely to spontaneously start and stop an activity while those without a private place were more likely to do so at the teacher's instigation or pressure. In general, children who had a private place at home to go to were more likely to make social contacts with others in the classroom than those without a private place except for those in the moderate density (Headstart) classrooms. These children made more social contacts than those in high or low density classrooms regardless of their private place condition at home. Boys without a private place made more social contacts than boys with a private place. For this subsample, having a private place at home clearly seems to affect whether or not children are likely to start and end a particular activity. The effect on making social contacts is less clear since other variables such as sex of the child and classroom density also seem to be playing a role.

Classroom density and type of center had the most direct effect

on continuity of activity for all children. The most amount of continuous activity was found in the moderate density, Headstart classrooms (half-day programs). The least amount of this type of activity was found in the high density classrooms. Children in the moderate density classrooms also made more social contacts in the classroom than children in either the high or low density classrooms.

Classroom density affected thrusting behavior and direction of behavior differently for girls and boys. In low density classrooms thrusting behavior was higher for girls and decreased as classroom density increased. For boys, the opposite was the case. Boys thrusting behavior increased as classroom density increased. In other words, boys initiated more activity in the higher density classrooms. Boys also were more likely to play alone in the high density classrooms than they were in the low or moderate density classrooms (they directed their behavior to the environmnent). Girls, however, were more likely to direct their behavior to the environment (play alone) in the low and moderate density classrooms. There were apparently fewer interruptions for children in the low and moderate density classrooms since there was less

renewed activity in these classroom settings; however, in the high density classrooms there was more renewed activity, especially for boys (amount of renewed activity for girls did not differ across classroom density levels). This would suggest that boys were interrupted more in high density classrooms since they had more renewed activity (p=.065, see Table 17).

Classroom density and sex of the child affected the amount of new activity. In moderate density classrooms, boys started fewer new activities than boys in the low or high density classrooms. However, girls in the high density classrooms from high density homes started the fewest new activities in the whole sample. Girls in the high density classrooms started more new activities than those in the low or moderate density classrooms. Starting new activities generally meant that a child did not continue with a particular activity for any length of time and went from one activity to another. This measure tapped some of the same aspects of behavior as the Hyperactive-Distractible subscale of the Behavioral Disturbance Rating scale.

Following this interpretation, boys were able to continue with

one activity for a longer time period in the half-day centers than they were in the full-day ones. It also would follow that girls were less able to continue with one particular activity in the low and moderate density classrooms than they were in high density classrooms. However, another explanation might be that classroom density was affecting girls and boys differently. Perhaps being in a moderate density classroom as part of a half-day program is an environment in which boys find it easier to continue with one activity for an extended period of time while for girls, classroom density affected their ability to participate in any activity. Girls might have found it easier to start an activity when the classroom conditions were less crowded while girls in high density classrooms, especially those from high density homes, were least able to initiate any new activity. Perhaps, for girls starting a new activity represents the ability to be creative while for boys continuously starting new activities represents distractibility.

Sex of the child and classroom density also affected spontaniety of initiating activities. Girls exhibited more initiation of their own activities (as opposed to teacher initiation) in the high density classrooms which were generally the Daycare centers. Boys,

however, had more spontaneous behavior in the moderate density classrooms which were all in Headstart centers. Perhaps the increased social stimulation in the high density classrooms encouraged girls to spontaneously initiate the activities they were involved in. Boys in high density classrooms may require more adult supervision. In moderate density, half-day programs, boys may find it easier to initiate activity and the teacher may feel that boys do not require as much supervision in these situations.

Classroom density affected continuity of activity, initiating activity, direction of behavior, spontaniety of activity, and amount of social contacts. Some of the effects also were related to the sex of the child and the child's home density situation. Analysis of the observational sample provided additional insight into how home and classroom density and having a private place may be affecting young children's social and cognitive development. These findings, along with the findings for the entire sample, will be discussed in the following chapter.

CHAPTER SIX--DISCUSSION

This chapter is a discussion of the findings as they relate to the hypotheses and questions posed for this study. The primary hypothesis of this study is that home density and daycare classroom density will have specific effects on preschool-aged children in terms of their social behavior and cognitive development. The findings indicate that classroom density, type of center, sex of the child, and having a private place in the home were most explanatory in terms of social behavior and performance on the cognitive tests. Home density also was found to be related to these measures, most often interacting with another variable. The data relating to cognitive development will be discussed first.

Cognitive Development

Preschool Inventory: The most significant finding for this measure was that type of daycare program is related to higher scores on this achievement-type test. Children in the full- day programs tended to score higher on this measure than those in the half-day programs.

Although the half-day programs (Headstart programs) are designed specifically to provide low-income children with early educational experiences, the children in the full-day programs scored higher than those in the half-day programs. Perhaps more exposure (translated as a longer day) to certain concepts and more opportunity to practice using these concepts enabled the children to do better on this test. In addition, the full-day programs provided more formal educational-type settings which also could account for these findings. In this sample, the Daycare centers (full- day programs) had more formal instructional times than the Headstart programs (half-day). In each of the Daycare classrooms included in this study a portion of the day was set aside when all children were involved in the same instructional-type activity, i.e. drawing shapes, coloring certain pictures. In the Headstart classrooms children were always given several options during different activity times. In the Headstart centers there were times when activities were done in a group (i.e. circle time) but the Daycare centers had circle time as well as the more formal activity times when children were seated at work tables.

What is interesting about this finding is that large centers, large class sizes, and high classroom density were all characteristics more closely associated with the full- day programs than the half-day ones and yet the scores were higher in the full-day program centers. Work done by Ruopp and his colleagues (1979) would suggest that higher scores on the Preschool Inventory would be found in the lower density classrooms. However, this study seems to suggest that formal instructional opportunities are more important than classroom density for certain academic-type skills as measured by the Preschool Inventory.

Another possible reason for this finding is the time of day when each group of children was tested. All children in the full-day (Daycare) centers were observed and tested in the morning. However, since all 4-year olds in the half-day (Headstart) centers came to the afternoon session, they were all observed and tested in the afternoon. Although not specifically investigated, intuitively it may be that 4-year old children may be more likely to be at their best in the morning than at 2 or 3 o'clock in the afternoon.

Children who did best on the Preschool Inventory test were from high density classrooms but low density homes. This finding supports the earlier finding that classroom density may have less to do with high scores on this measure than other classroom factors such as the type of program. It also seems to indicate that children from low density homes were better able to adjust to the high density classrooms than those who lived in high density homes. The findings from the observational sample indicated that children from low density homes were better able to concentrate in the classroom. This may be why children from low density homes did better on the Preschool Inventory even when they were in high density classrooms. Perhaps children in low density homes learned to concentrate on a particular activity in the classroom because they have more opportunity to concentrate in the home especially if it is persumed that there is less activity and, hence, less of a chance for interference in the low density home as compared to a high density home.

These findings do not support Hambrick-Dixon's findings (1986) that children accustomed to one type of environmental condition

(noisey, crowded) will perform certain tasks better under conditions that are similar to the situation to which they are accustomed. Other explanations of the difference in findings is that the types of tasks in the two studies were not comparable or that in this study the type of program (Daycare as opposed to Headstart) is more related to scores on the Preschool Inventory than similarity of density level. The findings from the observational sample of more concentrating behavior among children from low density homes, however, would seem to indicate that home density and the general home environment, or tempo, may have some influence on children's cognitive abilities, at least as measured by the Preschool Inventory. There were no sex differences on this measure.

Embedded Figures test: The findings for the Children's Embedded Figures test follow a pattern similar to the Preschool Inventory. Scores were highest in the high density classrooms which were primarily in the whole-day program centers. Having a private place in the home also was important for this measure. In both the low and high density classrooms children who had a private place at home scored higher than those who did not. This finding would seem

to indicate that having a private place at home contributes to a problem solving style that is useful in distinguishing figure/ground relationships. The earlier finding concerning children who had a private place in the home having better concentrating skills also may be related to better scores on the Embedded Figures test. In addition, it seems that having a private place at home is more important than the classroom density level. This finding taken together with the reported relationship between not having a private place and anxious-fearful behavior would seem to indicate that having a private place in the home is important for children to be able to develop a positive sense of themselves as being separate from the rest of the environment. There were no sex differences on this measure. The behavioral findings will be discussed next. These findings are based on the teachers' rating of behavior and the researcher's observations.

Behavioral Measures

In this study, type of center, classroom density, and sex of the child affected problem behavior. Children in the full-day programs

generally received higher behavioral disturbance scores than those in the half-day programs. This was true for boys and girls but more dramatically so for boys. Several explanations of this finding seem plausible. First, children who attended full-day programs (8am to 5 or 6pm) were exposed to a large amount of stimulation without being able to take some time out from the group (i.e. taking a nap alone) so acting out became a way of coping with what might have been too much social stimulation for them. Second, children might have learned maladaptive social interaction patterns in daycare from other children and being in it longer (a longer day) intensified these patterns. Third, since teachers are with the children longer in the full-day programs they may be more likely to see certain behavior patterns or be more likely to negatively interpret some behaviors because they are with the children for a longer period of time.

Classroom density affected behavioral disturbance scores, especially for boys. Boys in high density classrooms had higher total behavioral disturbance scores than those in low density classrooms. Scores were lowest in the medium density centers;

however, this reflects the fact that there were no full-day programs with medium density classrooms, so essentially this category represented the half-day programs where scores were generally lower than in full-day programs. Boys in the high density classrooms also had higher scores on the hyperactive-distractible subscale than those in the low density classrooms, and boys overall had higher scores than girls on this subscale. Supporting the teachers' evaluations is the finding for the observational sample indicating that, in general, boys engaged in more thrusting (initiating) behavior than girls and their thrusting behavior increased as classroom density increased. Perhaps because boys were generally more active than girls, and this activity increased in the higher density classrooms, they were more likely to be viewed by the teacher (a female in all cases) as more disturbing and hence received higher scores on this measure. During the observation periods boys seemed to be more noticeable, primarily because the type of activities in which they were involved (i.e. playing with trucks, pulling a wagon) were more likely to attract attention than the kind of activities in which girls were involved (i.e. playing with dolls, doing a puzzle).

The findings also indicated that children in high density classrooms were rated higher on two of the Behavioral Disturbance Rating scale subscales, hostile-aggressive and hyperactive-distractible. Home density and classroom density were found to interact in terms of effects on hyperactive- distractible behavior. Children from high density homes and in high density classrooms scored higher on this subscale than children from high density homes and low density classrooms.

Among the observational sample, howvever, there were direct effects for home density for behaviors which are related to hyperactivity and distractibility. Children from low density homes engaged in more integrative behaviors (the major one being concentrating on one activity) and continued their activities longer than those from high density homes. Based on the findings from the observational sample it would seem that children from low density homes were less likely to be hyperactive and less easily distractible in the classroom than children from high density homes. Children in high density classrooms in the observational sample also had less continuous activity than children in the low density classrooms.

This pattern, along with the findings for the sample as a whole, would seem to indicate that home and classroom densities independently affect children's ability to concentrate on an activity in the classroom for an extended period of time.

Classroom and home density also have combined effects on concentrating on an activity ,indicating that higher density levels in both environments increase the likelihood that children will not engage in concentrating activities for any length of time. Children from high density homes generally may receive more environmental stimulation (i.e. noise, other people) than those who live in low density homes. Simply put, there is likely to be a lot of activity in a high density home and the young child who has not yet mastered concentration skills may find him or herself constantly interrupted. The child also may have the option of doing a number of things (listening to the radio or television, playing with younger or older siblings, being with adults, playing alone) and therefore not do any one thing for very long. White (1980) and Nobles (1980) have indicated that African/ American households (particularly low-income ones) may not value isolated independent activities as

much as white, middle- income households. In high density households where, by definition, there are more people than rooms it becomes very difficult to isolate individual activities and, according to White and Nobles, in African-American households this may not be valued anyway. The majority of the children in this study were African-American and all were low-income. Perhaps not only density was contributing to lack of concentration skills in the classroom but a difference in what skills are valued. School-type (white, middle-class) environments value independence, individuality, and ability to concentrate. The children's homes may value collective activity and interdependence. When a high density classroom has some of the same attributes as the home, i.e. a lot of people or a lot of activity, the child from the high density home may behave as he or she does at home, going from one thing to another. Teachers may need to develop methods to enable such children to use their own enthusiasm in productive ways in the classroom. For example, help a child to choose an activity from which he or she can have a finished product so that the child also can begin to value the ability to concentrate and rewards of completing a task.

The interaction of sex and classroom density for the hyperactive-distractible subscale revealed that boys in high density classrooms were twice as likely as girls to be rated as hyperactive and distractible. Findings from the observational sample indicate that boys in the high density classrooms exhibited more thrusting (initiating) behavior which included making social contact, selecting something to do, and playful aggression. These behaviors increased among boys as classroom density increased. These two findings support each other. If boys were generally more active than girls, this may account for why they were judged by their teachers to be more hyperactive and distractible. Since both the hyperactivity-distractibility and thrusting/initiating behavior increased among boys as the classroom density increased, these findings may mean that high density classrooms encourage boys to be more active. Boys also were more likely to play alone (direct their activity to the environment) in the high density classrooms.

Loo (1972) found that 4- and 5-year old children interacted less and played alone more in high spatial density conditions. In this study, 4- and 5-year old children reacted differently to high spatial

classroom density depending on the gender of the child. Boys interacted with others more in the high density classrooms than they did in the low density ones but girls interacted less in the high density classrooms. It should be remembered that Loo used experimental settings for her study and that this study took place in the classroom the child regularly attended. When Loo (1978) looked at real classroom settings, she found that boys were more active in more crowded situations. This time, however, Loo measured crowdedness in terms of social density. This study supports Loo's findings in her 1978 study although this study measured spatial density, not social density. Perhaps the similarity of setting (both studies used real daycare settings) accounts for the similarity in findings even though density was measured differently.

Based on these findings it appears that children, especially boys, in a high density classroom environment are more susceptible to behavioral problems, especially hostile and aggressive activity, and that when these children also come from high density homes they are even more likely to be hyperactive, distractible, and concentrate less in the classroom. In addition, when they do choose an activity,

they are likely to play alone. This might be a result of feeling overwhelmed by being with other children all the time, or, since these children were likely to be aggressive and hostile, other children might not want to play with them.

Another home variable, private place, was found to affect anxious behavior. Children who did not have a private place to go to in their home tended to be rated by their teachers as exhibiting more anxious and fearful behavior than those children who had a private place. Since anxious behavior in this study was not affected by either home or classroom density specifically, it would seem that not having a private place to retreat to in a primary environment such as the home is most critical when it comes to anxious-type behaviors such as staring into space, easily giving up, quickly changeable moods, and being afraid of new situations. Based on the observation sample, children, and boys especially, who did not have a private place at home were more likely to sulk or play alone than those who had a private place. Perhaps these children were anxious about themselves and about extending themselves into situations that involved others. Wolfe (1978) also found that children living in

homes without sufficient privacy may create psychological privacy by controlling communication between themselves and others. Since children who did not have a private place in the home also were from the higher density homes, it is likely that an important feature of high density homes is not having a private place to go to. It may be this feature, not just the density level, that is crucial in terms of certain behavioral problems.

Summary of findings

Behavioral problems were found to be highly related to the daycare environment, both the length of the program day and the classroom density. Boys tended to have more problems in these environments than girls. Girls are socialized to be dependent and nonaggressive and therefore may have appeared to have fewer behavioral problems. Girls are generally judged to mature faster than boys (especially by female teachers), so the "lack of maturity" of the boys may have been interpreted as behavioral problems. In addition, because boys are usually socialized to be independent and often are more physically active than girls, they may engage in more

activities that can be judged as problematic. The home environment, density level, and presence of a private place for the child also played a role in contributing to certain behavioral problems.

Children who attend a full-day daycare program seem to be more at risk of exhibiting behavior judged to be problematic but such programs may enable children to score higher on certain cognitive tests. This finding supports other research (Baker, 1973; Belsky & Steinberg, 1978) that daycare may improve a child's cognitive skills but may have a negative effect on his or her social skills. Since the cognitive gains do not necessarily persist during the primary school grades but behavioral patterns do, perhaps full-day programs need to re-evaluate their program. More emphasis should be placed on learning positive behavioral patterns and cognitive and thinking styles/patterns which will help children to maintain their cognitive skills throughout elementary school. Perhaps lower density classrooms in the whole-day programs would contribute to such a learning situation.

Boys may be at particular risk for behavioral problems related to

social skills. The problems are intensified in high density classrooms in full-day programs, especially if the boys also came from high density homes. Although the findings are somewhat tentative, it seems that having a private place in the home contributes to fewer feelings of anxiousness and, perhaps, a clearer concept of one's self.

Signifigance of density

Although home density was presented in this study as potentially a major factor in the social and cognitive development of preschool-aged children, the findings suggest that having a private place, or Wach's "stimulus shelter" (1979) or Michelson's "functional privacy" (1968) is more important than density for certain types of development and skills. It shoud be pointed out, however, that this research does not necessarily indicate that home density does not play a role in children's behavior and development. Several explanations may be offered as to why this research did not identify high home density as a major explanatory variable. First, the distribution for residential density in this sample was skewed in

favor of low density. The mean density in this study was 0.8 while in Saegert's (1980a) study of school-age children and crowding the mean residential density was 1.12. If high and low density are measured as deviations above or below one person per room, most of the children in this study lived in low density households. This was not the case in Saegert's study where she found differences based on residential density.

Second, confounding the residential density distribution problem is the relatively small overall sample size of 114 children (Saegert's sample consisted of 257 children and Michelson's, 710). Due to the small sample size, it was difficult to do certain analyses. For example, it was important for the study's hypotheses that the sample be subdivided by low and high home density boys and girls. Because of the unequal density distribution and the small sample size, there were either very few or no individuals in certain cells. Future research in this field should not only attempt to have a larger overall sample but a more even residential density and private place distribution as well.

Third, the center classroom density distribution presented a similar problem. Although there was a range in classroom density in this study, this distribution was not equal across both types of programs. There were more high density classrooms in the full-day programs, more low density classrooms in the half-day programs, and there were no medium density classrooms in the full-day programs. Obviously, this distribution made it difficult to separate the effects of type of program and classroom density. Although it does appear that type of program is an important contributor to certain behavioral and cognitive development, future research should include an equal number of each type of center for each density level (high, medium, low) in order to be able to test this more conclusively.

In spite of the density distribution problems in the classrooms, effects were found for classroom density, some of which confirm other researchers' findings. Children in this study who were in high density classrooms were found to be less likely to continue an activity than those in low or moderate density classrooms. Ruopp and his associates (1979), in the National Daycare Study, had a

similar finding; children in smaller class groupings exhibited less aimless wandering and lack of involvement in an activity in the classroom. Children in this study who were in high density classrooms were found to be rated more hostile-aggressive and hyperactive-distractible, especially boys. Loo's (1977, 1978), research had similar findings for children, boys in particular, in socially crowded situations. In this study, the children who came from high density homes were even more likely to exhibit hostile and hyperactive behavior in high density classrooms. Since Ruopp and Loo did not look at home density it is not known how children in their studies would have been affected by crowded classrooms and high or low home density; however, some of the behaviors found in crowded classrooms in their studies also were found in this study and in this case high home density intensified behaviors judged to be problematic.

This study confirmed Saegert's (1980a) research of sex differences on the measures under scrutiny here, especially social behavior. As noted previously, boys were rated higher on the hostile-aggressive and hyperactive-distractible subscales of the

Behavioral Disturbance Rating scale. As indicated by the observational sample, boys were more likely to direct their behavior to the environment (play alone) in the high density classroom whereas girls were more likely to play alone in the low and moderate density classrooms. Although boys in the high density classrooms were more likely to direct their behavior to the environment (play alone), they also were more likely to initiate activity which included making social contact in these crowded classrooms. An explanation for these seemingly contradictory findings may be that although boys made many social contacts with other children they also were more likely to be aggressive or hostile and hyperactive and may have alienated others and hence played alone. Although boys initiated less activity and social contact in the low density classroons, they were more likely to play with other children in these situations. They also were less hyperactive. Perhaps the boys felt more comfortable or had fewer collisions and competitive experiences in the less crowded situations and therefore could more easily play with others. The lower scores for boys for social contact and initiating activity in the low density classrooms also may mean that boys were playing with other

children for an extended period of time instead of going from one activity to another.

There were opposite findings for girls. Girls initiated more behavior in low density classrooms than they did in high density classrooms and more than boys in the low density classrooms. However, they were more likely to play alone in the low density classrooms than they were in the high density classrooms. Perhaps the increased classroom density stimulated the girls to play with others and although the girls initiated activity in the low density classrooms, they may not have initiated activity that would involve other children. Ehrlich and Freedman (1971) found increased cooperativeness among women in high density laboratory conditions; perhaps it is possible that something similar was happening with the girls in this study. It is possible that girls felt more like playing with other children in the high density classrooms. It should be noted that this playing together was not associated with increased hyperactive or aggressive activity in girls. High density classrooms were associated with increased hyperactive and aggressive behavior for boys, however.

Additional issues

Size of center

There were several research questions posed in the hypothesis chapter which have not been dealt with as part of the earlier discussion of the major hypotheses. One such question dealt with center size and teacher structuring of the classroom activities. Prescott and Jones (1967) classified centers on the basis of how many children were in the center. A center with more than 60 children was considered "closed" and one with 30-60 children was "open". They found that teachers structured the classroom activities more in the "closed", large centers than in the "open", smaller centers. Prescott and Jones and other researchers (Huston-Stein et al, 1977; Sheehan & Abbott, 1979) found certain consequences for children in the more structured situations including lower levels of involvement with activities, less imaginative play, less task persistance, less self-directedness and independent efforts but more attention to rules and academic tasks.

In this study, teacher structuring of some classroom activities did seem to differ by size of center. All of the full-day classrooms were in large centers while the half-day programs were all in small centers. Children's scores on the Preschool Inventory and the Children's Embedded Figures test were higher in the full-day program classrooms while high behavioral disturbance scores and less task persistance (concentrating continuously on an activity) was also common in these classrooms. It was indicated previously that perhaps children scored higher on the cognitive tests in these classrooms because there were more structured academic activities. Based on observing the classrooms, lining up to go the toilet or to outdoor activities was not affected by size of the center, the type of program, or classroom density. Although in this study, size of center was confounded by type of center (Daycare or Headstart), Prescott and Jones' classification of centers does seem to be useful in terms of differentiating certain types of teacher behavior. It also suggests that some form of program assessment would be useful to include in future research of this type.

Arrangement of classrooms

Another question dealt with how the architectural or spatial arrangement features of the classroom may have affected the outcome variables. Moore (1986) found that well-defined play areas that were spatially differentiated from other activities encouraged more exploratory behavior, positive social interaction, cooperation among children and higher levels of involvement of teachers with the children. The well-defined areas may have had the effect of reducing social density and therefore encouraging these behaviors just as small group size in the Abt study (Ruopp et al., 1979) encouraged similar behaviors. Anselmo (1976) suggested that the playroom in preschool program be set up so that choices between activities are clear and traffic patterns do not favor one activity over another if children are being encouraged to make their own choices.

In this study, effects of physical design were not measured because of the homogenity of the classroom arrangements across the different classroom types. All of the classrooms had the typical

activity areas found in a preschool classroom; namely, a pretend or dress-up area, a block area (floor play), an art area for painting, a library or reading area, an area with manipulative materials (i.e. play dough, puzzles, cuisnaire rods), and a toy/game area. Other types of areas found in some of the classrooms included a "science area" with plants, fish, or an animal, a music area with instruments and a record player (only the teacher could use the record player), or a sand/water table. In all of the classrooms, however, there was little (one Daycare classroom had a separate structure for house play but the other activity areas ran together), if any, differentiation between the areas (see Appendix P for an example of a layout of a classroom). Therefore, the type of spatial definition described by Moore (1986) was not found in these classrooms. The Headstart classrooms were not any better defined than the Daycare classrooms.

The amount or variety of materials available in the classroom was not identified as a potential independent variable in this study. Through observation, however, it was noted that although all classrooms had the basic preschool materials, some classrooms

seemed to have more variety of materials. The difference was especially noticeable between several of the Headstart classrooms. It was determined that individual teachers could request any materials they wished from a central Headstart office and apparently some teachers requested a larger variety than others. The teachers with more variety of materials generally had a more cheerful- looking classroom but there was no systematic measurement of this aspect to see what relationship it might have had to any of the outcome measures. Since other researchers (Rohe & Patterson, 1974; Montes & Risley, 1975; Smith & Connolley, 1980) have found relationships between amount of toys or arrangement of toys, density, and how children play or the amount of aggression, future research should not overlook this aspect of the physical environment. Future research also might look at the relationship of the quality of the physical environment (things such as variety and type of materials, attractiveness of the classroom, display of children's work and other decorations), the program, and aspects of children's development. Perhaps teachers who pay more attention to the physical environment will have different ways of handling various density levels and this in turn will affect the classroom

program and subsequently children's development.

One observation can be made about the arrangement of classrooms. Three of the classrooms (two were Daycare, full-day programs and one a Headstart, half-day program) had a gym-type space available to class that was used for large muscle-type activity (ie. riding a tricycle, indoor running games). The space was a room with very little if any furniture where mats could be spread out for certain activities. The activity level in these classrooms seemed to be calmer perhaps because this other type of space was so readily available. Although children could not use the space on their own, teachers could more easily use this type of space on an unplanned basis and this ability to go from one space to another may have allieviated some tensions that could otherwise have built up in the classroom. No specific measurements were made concerning aggression or other types of behavior; the "calmer" quality was only an observation by the researcher.

Future research

It has already been indicated that future research investigating similiar hypotheses and questions posed here should utilize a larger sample in order to have more children in every category, make use of a sample with a more even distribution of home density levels, and have a more even distribution of classroom density levels in both types of daycare programs. In order to have a more complete understanding of the young child's physical and social environment it is also suggested that future research collect more information about the home environment, including perhaps observing in the home. Each of these aspects might help researchers to see precisely how the home and classroom density levels may be affecting children.

One aspect of the home environment that seems to be potentially interesting and worthy of further investigation is the concept of private place. Wolfe (1978) found that children living in high density homes without sufficient privacy tend to create psychological privacy by controlling communication between themselves and others in the household. In this study, generally children with a private place in the home made more social contacts

in the classroom than those without a private place. Those with a private place also were more likely to spontaneously initiate or terminate an activity in the classroom whereas those without a private place engaged in activities initiated by the teacher. It also seems that children without a private place were rated by their teachers as exhibiting more anxious behavior. It seems that private place is potentially an important variable in research on young children and their behavior patterns.

Wachs (1979) and Michelson (1968) found a relationship between aspects of cognitive development and access to a private place. The qualities of Wachs' "stimulus shelter" seem to be similar to Michelson's "functional privacy"; in other words, a place where a child can go to do what he or she wants to without competing activities or interference. This research also suggests a relationship between having a private place and cognitive development; those with a private place in the home scored higher on the Embedded Figures test. Future research should explore this variable more fully. Perhaps children could be asked such questions as: when do they go to their private place, what they do there, etc.

Michelson suggests that having functional privacy may contribute to children's creative abilities. In other words, one needs a certain amount of quiet or solitude to think creatively. How functional privacy works, especially in high density, low-income African-American homes where there is likely to be alot of environmental stimulation (i.e. noise, other people), with respect to the development of cognitive skills also is something that should be investigated in future research. One of the keys to successful research in this area would be appropriate definitions of creativity and how cognitive skills are measured so as not to bias the outcome (many instruments that measure creativity, cognitive skills, and intelligence use a white, middle-class frame of reference).

In addition, perhaps classrooms with private-type places could be included in the study to see what difference such places may make in how children behave or use the classroom. Swift (1964) stated that in full-day programs solitary time (excluding naps) should be available for all children because of the tiresome effect of being with a group all day. As stated previously, in this study none of the classrooms provided such an opportunity so the effects of a

private place in the classroom on the outcome variables could not be measured. Future research might either introduce a private place in a classroom or find centers that provide them. Another way to approach this would be to ask children where they go in the classroom when they want to be alone and to observe the way children use the corners of the room, under tables, the coat cubbies, and other spaces that might provide a "stimulus shelter" for a young child.

The observational portion of this study proved to be very useful in understanding behavioral issues and as a balance to the behavioral ratings given by the teachers. In this study all observations were conducted at the beginning of the session (for the full-day programs observations were done in the morning and in the afternoon for the half-day programs). None of the observational periods sampled the child's entire time at the center. Future research might utilize several observational periods to cover various times of the day. Perhaps patterns or choices of activities differ depending on the time of the day and the classroom density level. It was noted earlier that children were tested at different times of the day due

to the type of program the child attended. Future studies might test all children at the same time of day in order to ensure that any differences found between scores in full-day and half-day programs are not due to the time of day the testing took place.

In conducting future research in this area one very important issue should be kept in mind. Much of the research on daycare and preschool-aged children is conducted in university-sponsored childcare centers or in highly controlled research environments. Belsky and Steinberg (1978) cite this as a problem in terms of making an assessment of the affects of daycare on children since most children in this country are not in these type of centers. This study used centers more representative of what is available to many working-class families, namely, publically supported daycare and Headstart. The Abt National Daycare Study (Ruopp et al, 1979) used a similar population. The findings from this study confirm some of the behavioral findings of the Abt study; namely, children in smaller groups and lower density classrooms are more likely to be involved in their activities and engage in less aimless wandering.

Other findings from the Abt study were not confirmed. In this study higher scores on the Preschool Inventory were not found in the low density classrooms as in the Abt study. Perhaps this study did not have enough variation in group size and classroom density in the full-day programs (where the higher scores were found) so differences could not be detected. In the Abt study differences were found for group sizes of fifteen or fewer children. The class size range in this study was sixteen to twenty-three. The higher cognitive scores in the high density classrooms may have been in spite of the density level and had more to do with the more formal educational periods found in these classrooms. In this study, high density was confounded with program type. If the findings from this study and the Abt study are taken together it does seem that children would benefit from attending low density, small group size classes. Whether half-day programs would be better cannot be determined from this study because while lower behavioral disturbance scores were found in the half-day Headstart programs, the half-day and whole-day programs were not comparable on all levels especially density and group size.

This study has confirmed that high density home and daycare environments can have negative consequences for young children. This study also has documented that high density maybe more detrimental in the development of certain cognitive styles and social behavior than in the development of certain academic skills. It appears to confirm Wach's and Michelson's findings that having a private place in the home is important for children's development. It also appears to confirm Wolfe's theory that children without physical privacy attempt to create it psychologically (in this study those without a private place at home generally made fewer social contacts in daycare). A further implication of the private place findings of this study is that private places should be provided in the classroom as well. Certainly it seems that aspects of one environment, the home, are affecting behavior in another environment, the daycare classroom.

This study also has identified areas of, and direction for, future research in this field. Most importantly, this study has been conducted with the type of childcare centers available to most low and moderate income families and therefore the findings and

implications are potentially more applicable to a broad base of children and their families.

APPENDIX A - PEARSON CORRELATIONS TABLE

	DENSITY	HHTOTAL	Daycare DENSE	TOTAL	CLASS	PP	AGE
DENSITY	1.0000 (0) P= .	.4949 (114) P= .000	.1209 (114) P= .100	-.2024 (114) P= .015	-.0208 (114) P= .413	.1439 (109) P= .068	-.0508 (114) P= .296
HHTOTAL	.4949 (114) P= .000	1.0000 (0) P= .	.1509 (114) P= .055	-.0987 (114) P= .148	-.0957 (114) P= .156	-.0279 (109) P= .386	.2098 (114) P= .013
Daycare DENSE	.1209 (114) P= .100	.1509 (114) P= .055	1.0000 (0) P= .	-.5946 (114) P= .000	-.5759 (114) P= .000	-.0621 (109) P= .261	.1035 (114) P= .137
TOTAL	-.2024 (114) P= .015	-.0987 (114) P= .148	-.5946 (114) P= .000	1.0000 (0) P= .	.2521 (114) P= .003	.0971 (109) P= .157	.0636 (114) P= .251
CLASS	-.0208 (114) P= .413	-.0957 (114) P= .156	-.5759 (114) P= .000	.2521 (114) P= .003	1.0000 (0) P= .	.0953 (109) P= .162	-.1625 (114) P= .042
PP	.1439 (109) P= .068	-.0279 (109) P= .386	-.0621 (109) P= .261	.0971 (109) P= .157	.0953 (109) P= .162	1.0000 (0) P= .	.0030 (109) P= .488
AGE	-.0508 (114) P= .296	.2098 (114) P= .013	.1035 (114) P= .137	.0636 (114) P= .251	-.1625 (114) P= .042	.0030 (109) P= .488	1.0000 (0) P= .
SEX	.1610 (114) P= .043	.0612 (114) P= .259	-.0377 (114) P= .345	-.0206 (114) P= .414	.1919 (114) P= .020	.0194 (109) P= .421	-.0198 (114) P= .417
YEARS	-.1714 (114) P= .034	-.0576 (114) P= .271	-.2577 (114) P= .003	.6959 (114) P= .000	-.1113 (114) P= .119	-.0947 (109) P= .164	.1310 (114) P= .082
DWELL	-.1028 (100) P= .154	.0455 (100) P= .327	.0403 (100) P= .345	-.1590 (100) P= .057	.0564 (100) P= .289	.1159 (99) P= .127	.0756 (100) P= .227
PSI FIGHT	.0505 (114) P= .297	.1836 (114) P= .025	-.1337 (114) P= .078	.2633 (114) P= .002	.0172 (114) P= .428	.0481 (109) P= .310	.2360 (114) P= .006
Beh. TOTAL1	-.0887 (114) P= .174	.0677 (114) P= .237	-.1245 (114) P= .093	.3871 (114) P= .000	.0831 (114) P= .190	.1281 (109) P= .092	.0957 (114) P= .156
CEFT TOTAL2	.0426 (114) P= .326	-.0259 (114) P= .392	.2116 (114) P= .012	.3469 (114) P= .000	-.4186 (114) P= .000	.0371 (109) P= .351	.1806 (114) P= .027
ANXIOUS	-.1253 (114) P= .092	-.0182 (114) P= .424	.0267 (114) P= .389	.1776 (114) P= .029	-.1519 (114) P= .053	.1629 (109) P= .045	.1441 (114) P= .063
HYPER	-.0909 (114) P= .168	-.0062 (114) P= .474	-.1694 (114) P= .036	.3160 (114) P= .000	.1496 (114) P= .056	.1724 (109) P= .037	-.0420 (114) P= .329
ANGRY	-.0596 (60) P= .326	-.1437 (60) P= .137	-.2402 (60) P= .032	.1988 (60) P= .064	.2671 (60) P= .020	. (60) P= .	-.1745 (60) P= .091
TYPE	-.1952 (114) P= .019	-.1074 (114) P= .128	-.5232 (114) P= .000	.9567 (114) P= .000	.2586 (114) P= .003	.1136 (109) P= .120	.0953 (114) P= .157

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	YEARS	DWELL	PSI RIGHT	Beh. TOTAL1	CEFT TOTAL2	ANXIOUS	HYPER	ANGRY	TYPE
	-.1714	-.1026	.0505	-.0887	.0426	-.1253	-.0909	-.0596	-.1952
	(114)	(100)	(114)	(114)	(114)	(114)	(114)	(60)	(114)
	P= .034	P= .154	P= .297	P= .174	P= .326	P= .092	P= .168	P= .326	P= .019
	-.0576	.0455	.1936	.0677	-.0259	-.0182	-.0062	-.1437	-.1074
	(114)	(100)	(114)	(114)	(114)	(114)	(114)	(60)	(114)
	P= .271	P= .327	P= .025	P= .237	P= .392	P= .424	P= .474	P= .137	P= .129
	-.2577	.0403	-.1337	-.1245	.2116	.0267	-.1694	-.2402	-.5232
	(114)	(100)	(114)	(114)	(114)	(114)	(114)	(60)	(114)
	P= .003	P= .345	P= .078	P= .093	P= .012	P= .389	P= .036	P= .032	P= .000
	.6959	-.1590	.2633	.3871	.3469	.1776	.3160	.1988	.9567
	(114)	(100)	(114)	(114)	(114)	(114)	(114)	(60)	(114)
	P= .000	P= .057	P= .002	P= .000	P= .000	P= .029	P= .000	P= .064	P= .000
	-.1113	.0564	.0172	.0831	-.4186	-.1519	.1496	.2671	.2586
	(114)	(100)	(114)	(114)	(114)	(114)	(114)	(60)	(114)
	P= .119	P= .289	P= .428	P= .190	P= .000	P= .053	P= .056	P= .020	P= .003
	-.0947	.1159	.0481	.1281	.0371	.1629	.1724	.	.1136
	(109)	(99)	(109)	(109)	(109)	(109)	(109)	(60)	(109)
	P= .164	P= .127	P= .310	P= .092	P= .351	P= .045	P= .037	P= .	P= .120
	.1310	.0756	.2360	.0957	.1806	.1441	-.0420	-.1745	.0953
	(114)	(100)	(114)	(114)	(114)	(114)	(114)	(60)	(114)
	P= .082	P= .227	P= .006	P= .156	P= .027	P= .063	P= .329	P= .091	P= .157
	-.0438	-.0105	.0586	.2838	-.1192	-.0293	.2928	-.0268	-.0192
	(114)	(100)	(114)	(114)	(114)	(114)	(114)	(60)	(114)
	P= .322	P= .459	P= .268	P= .001	P= .103	P= .378	P= .001	P= .419	P= .420
	1.0000	-.1306	.2025	.2041	.3942	.0896	.1922	.1216	.6335
	(0)	(100)	(114)	(114)	(114)	(114)	(114)	(60)	(114)
	P= .	P= .098	P= .015	P= .015	P= .000	P= .172	P= .020	P= .177	P= .000
	-.1306	1.0000	.0553	-.0746	-.1456	-.0416	-.1299	-.2551	-.1825
	(100)	(0)	(100)	(100)	(100)	(100)	(100)	(56)	(100)
	P= .098	P= .	P= .292	P= .230	P= .074	P= .341	P= .099	P= .029	P= .035
	.2025	.0553	1.0000	-.1539	.2937	-.1473	-.2549	-.0872	.2399
	(114)	(100)	(0)	(114)	(114)	(114)	(114)	(60)	(114)
	P= .015	P= .292	P= .	P= .051	P= .001	P= .059	P= .003	P= .254	P= .005
	.2041	-.0746	-.1539	1.0000	.1598	.5983	.7783	.0397	.4262
	(114)	(100)	(114)	(0)	(114)	(114)	(114)	(60)	(114)
	P= .015	P= .230	P= .051	P= .	P= .045	P= .000	P= .000	P= .382	P= .000
	.3942	-.1456	.2937	.1598	1.0000	.2269	.0646	-.1457	.4546
	(114)	(100)	(114)	(114)	(0)	(114)	(114)	(60)	(114)
	P= .000	P= .074	P= .001	P= .045	P= .	P= .008	P= .247	P= .133	P= .000
	.0896	-.0416	-.1473	.5983	.2269	1.0000	.3133	.0519	.2220
	(114)	(100)	(114)	(114)	(114)	(0)	(114)	(60)	(114)
	P= .172	P= .341	P= .059	P= .000	P= .008	P= .	P= .000	P= .347	P= .009
	.1922	-.1299	-.2549	.7783	.0646	.3133	1.0000	.0503	.3496
	(114)	(100)	(114)	(114)	(114)	(114)	(0)	(60)	(114)
	P= .020	P= .099	P= .003	P= .000	P= .247	P= .000	P= .	P= .351	P= .000
	.1216	-.2551	-.0872	.0397	-.1457	.0519	.0503	1.0000	.1753
	(60)	(56)	(60)	(60)	(60)	(60)	(60)	(0)	(60)
	P= .177	P= .029	P= .254	P= .382	P= .133	P= .347	P= .351	P= .	P= .090
	.6335	-.1905	.2399	.4262	.4546	.2220	.3496	.1753	1.0000
	(114)	(100)	(114)	(114)	(114)	(114)	(114)	(60)	(0)
	P= .000	P= .055	P= .005	P= .000	P= .000	P= .009	P= .000	P= .090	P= .

APPENDIX B - PEARSON CORRELATIONS TABLE

	DENSITY	HHTOTAL	PP	DENSE	CLASS	TOTAL	DWELL
DENSITY	1.0000 (114) P= .	.4949 (114) P= .000	.1439 (109) P= .068	.1209 (114) P= .100	-.0208 (114) P= .413	-.2024 (114) P= .015	-.1028 (100) P= .154
HHTOTAL	.4949 (114) P= .000	1.0000 (114) P= .	-.0279 (109) P= .386	.1509 (114) P= .055	-.0957 (114) P= .156	-.0987 (114) P= .148	.0455 (100) P= .327
PP	.1439 (109) P= .068	-.0279 (109) P= .386	1.0000 (109) P= .	-.0621 (109) P= .261	.0953 (109) P= .162	.0971 (109) P= .157	.1159 (99) P= .127
Daycare DENSE	.1209 (114) P= .100	.1509 (114) P= .055	-.0621 (109) P= .261	1.0000 (114) P= .	-.5759 (114) P= .000	-.5946 (114) P= .000	.0403 (100) P= .345
CLASS	-.0208 (114) P= .413	-.0957 (114) P= .156	.0953 (109) P= .162	-.5759 (114) P= .000	1.0000 (114) P= .	.2521 (114) P= .003	.0564 (100) P= .289
TOTAL	-.2024 (114) P= .015	-.0987 (114) P= .148	.0971 (109) P= .157	-.5946 (114) P= .000	.2521 (114) P= .003	1.0000 (114) P= .	-.1590 (100) P= .057
DWELL	-.1028 (100) P= .154	.0455 (100) P= .327	.1159 (99) P= .127	.0403 (100) P= .345	.0564 (100) P= .289	-.1590 (100) P= .057	1.0000 (100) P= .
SEX	.1610 (114) P= .043	.0612 (114) P= .259	.0194 (109) P= .421	-.0377 (114) P= .345	.1919 (114) P= .020	-.0206 (114) P= .414	-.0105 (100) P= .459
AGE	-.0508 (114) P= .296	.2098 (114) P= .013	.0030 (109) P= .488	.1035 (114) P= .137	-.1625 (114) P= .042	.0636 (114) P= .251	.0756 (100) P= .227
PSI RIGHT	.0505 (114) P= .297	.1836 (114) P= .025	.0481 (109) P= .310	-.1337 (114) P= .078	.0172 (114) P= .428	.2633 (114) P= .002	.0553 (100) P= .292
Beh. TOTAL1	-.0887 (114) P= .174	.0677 (114) P= .237	.1281 (109) P= .092	-.1245 (114) P= .093	.0831 (114) P= .190	.3871 (114) P= .000	-.0746 (100) P= .230
LEFT TOTAL2	.3426 (114) P= .326	-.0259 (114) P= .392	.0371 (109) P= .351	.2116 (114) P= .012	-.4186 (114) P= .000	.3469 (114) P= .000	-.1456 (100) P= .074
ANXIOUS	-.1253 (114) P= .092	-.0182 (114) P= .424	.1629 (109) P= .045	.0267 (114) P= .389	-.1519 (114) P= .053	.1776 (114) P= .029	-.0416 (100) P= .341
HOSTILE	-.0117 (114) P= .451	.1280 (114) P= .087	.0567 (109) P= .272	-.1287 (114) P= .086	.1454 (114) P= .061	.3121 (114) P= .000	-.0275 (100) P= .393
HYPER	-.0909 (114) P= .168	-.0062 (114) P= .474	.1724 (109) P= .037	-.1694 (114) P= .036	.1496 (114) P= .056	.3160 (114) P= .000	-.1299 (100) P= .099
TYPE	-.1952 (114) P= .019	-.1074 (114) P= .128	.1136 (109) P= .120	-.5232 (114) P= .000	.2586 (114) P= .003	.9567 (114) P= .000	-.1825 (100) P= .035
TCRATIO	-.1330 (114) P= .079	-.1434 (114) P= .064	.0289 (109) P= .383	-.2052 (114) P= .014	.5931 (114) P= .000	-.1026 (114) P= .139	.1007 (100) P= .159

(COEFFICIENT / (CASES) / 1-TAILED SIG) " . " IS PRINTED IF A COEFFICIENT CANNOT

AGE	RIGHT(PST)	TOTAL1	TOTAL2(LEFT)	ANXIOUS	HOSTILE	HYPER	TYPE	TCRATIO
-.0508 (114) P= .296	.0505 (114) P= .297	-.0887 (114) P= .174	.0426 (114) P= .326	-.1253 (114) P= .092	-.0117 (114) P= .451	-.0909 (114) P= .168	-.1952 (114) P= .019	-.1330 (114) P= .079
.2098 (114) P= .013	.1836 (114) P= .025	.0677 (114) P= .237	-.0259 (114) P= .392	-.0182 (114) P= .424	.1280 (114) P= .087	-.0062 (114) P= .474	-.1074 (114) P= .128	-.1434 (114) P= .064
.0030 (109) P= .488	.0481 (109) P= .310	.1281 (109) P= .092	.0371 (109) P= .351	.1629 (109) P= .045	.0587 (109) P= .272	.1724 (109) P= .037	.1136 (109) P= .120	.0289 (109) P= .383
.1035 (114) P= .137	-.1337 (114) P= .078	-.1245 (114) P= .093	.2116 (114) P= .012	.0267 (114) P= .389	-.1287 (114) P= .086	-.1694 (114) P= .036	-.5232 (114) P= .000	-.2052 (114) P= .014
-.1625 (114) P= .042	.0172 (114) P= .428	.0831 (114) P= .190	-.4186 (114) P= .000	-.1519 (114) P= .053	.1454 (114) P= .061	.1496 (114) P= .056	.2586 (114) P= .003	.5931 (114) P= .000
.0636 (114) P= .251	.2633 (114) P= .002	.3871 (114) P= .000	.3469 (114) P= .000	.1776 (114) P= .029	.3121 (114) P= .000	.3160 (114) P= .000	.9567 (114) P= .000	-.1026 (114) P= .139
.0756 (100) P= .227	.0553 (100) P= .292	-.0746 (100) P= .230	-.1456 (100) P= .074	-.0416 (100) P= .341	-.0275 (100) P= .393	-.1299 (100) P= .099	-.1825 (100) P= .035	.1007 (100) P= .159
-.0198 (114) P= .417	.0586 (114) P= .268	.2838 (114) P= .001	-.1192 (114) P= .103	-.0293 (114) P= .378	.3947 (114) P= .000	.2928 (114) P= .001	-.0192 (114) P= .420	-.0251 (114) P= .395
1.0000 (114) P= .	.2360 (114) P= .005	.0957 (114) P= .156	.1806 (114) P= .027	.1441 (114) P= .063	-.0686 (114) P= .234	-.0420 (114) P= .329	.0953 (114) P= .157	-.2857 (114) P= .001
.2360 (114) P= .006	1.0000 (114) P= .	-.1539 (114) P= .051	.2937 (114) P= .001	-.1473 (114) P= .059	-.0590 (114) P= .267	-.2549 (114) P= .003	.2399 (114) P= .005	-.1204 (114) P= .101
.0957 (114) P= .156	-.1539 (114) P= .051	1.0000 (114) P= .	.1598 (114) P= .045	.5983 (114) P= .000	.8678 (114) P= .000	.7783 (114) P= .000	.4262 (114) P= .000	-.0543 (114) P= .283
.1806 (114) P= .027	.2937 (114) P= .001	.1598 (114) P= .045	1.0000 (114) P= .	.2269 (114) P= .008	.0627 (114) P= .254	.0646 (114) P= .247	.4546 (114) P= .000	-.2421 (114) P= .005
.1441 (114) P= .063	-.1473 (114) P= .059	.5983 (114) P= .000	.2269 (114) P= .008	1.0000 (114) P= .	.2173 (114) P= .010	.3133 (114) P= .000	.2220 (114) P= .009	-.1163 (114) P= .109
.0686 (114) P= .234	-.0590 (114) P= .267	.8678 (114) P= .000	.0627 (114) P= .254	.2173 (114) P= .010	1.0000 (114) P= .	.6074 (114) P= .000	.3330 (114) P= .000	-.0520 (114) P= .291
-.0420 (114) P= .329	-.2549 (114) P= .003	.7783 (114) P= .000	.0646 (114) P= .247	.3133 (114) P= .000	.6074 (114) P= .000	1.0000 (114) P= .	.3496 (114) P= .000	.0576 (114) P= .271
.0953 (114) P= .157	.2399 (114) P= .005	.4262 (114) P= .000	.4546 (114) P= .000	.2220 (114) P= .009	.3330 (114) P= .000	.3496 (114) P= .000	1.0000 (114) P= .	-.0353 (114) P= .355
-.2857 (114) P= .001	-.1204 (114) P= .101	-.0543 (114) P= .283	-.2421 (114) P= .005	-.1163 (114) P= .109	-.0520 (114) P= .291	.0576 (114) P= .271	-.0353 (114) P= .355	1.0000 (114) P= .

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APPENDIX C

PEARSON CORRELATION COEFFICIENTS

	TOTAL1	ANXIOUS	HYPER	ANGRY	REJECT	RESPONS	INTEGRA	THRUST
TOTAL1	1.0000 (32) P= .	.7247 (32) P= .000	.8746 (32) P= .000	.0637 (21) P= .392	-.0184 (32) P= .460	-.3242 (32) P= .035	-.0605 (32) P= .371	.2913 (32) P= .053
ANXIOUS	.7247 (32) P= .000	1.0000 (32) P= .	.4960 (32) P= .002	-.0923 (21) P= .345	.0333 (32) P= .428	-.2327 (32) P= .100	.1031 (32) P= .287	-.0426 (32) P= .409
HYPER	.8746 (32) P= .000	.4960 (32) P= .002	1.0000 (32) P= .	.2165 (21) P= .173	-.0649 (32) P= .362	-.2331 (32) P= .100	-.0430 (32) P= .408	.2935 (32) P= .052
ANGRY	.0637 (21) P= .392	-.0923 (21) P= .345	.2165 (21) P= .173	1.0000 (21) P= .	.0559 (21) P= .405	.0610 (21) P= .396	.1895 (21) P= .205	.3417 (21) P= .065
REJECT	-.0184 (32) P= .460	.0333 (32) P= .428	-.0649 (32) P= .362	.0559 (21) P= .405	1.0000 (32) P= .	-.2419 (32) P= .091	.0633 (32) P= .365	.1078 (32) P= .278
RESPONS	-.3242 (32) P= .035	-.2327 (32) P= .100	-.2331 (32) P= .100	.0610 (21) P= .396	-.2419 (32) P= .091	1.0000 (32) P= .	-.4125 (32) P= .009	-.0941 (32) P= .304
INTEGRA	-.0605 (32) P= .371	.1031 (32) P= .287	-.0430 (32) P= .408	.1895 (21) P= .205	.0633 (32) P= .365	-.4125 (32) P= .009	1.0000 (32) P= .	-.2116 (32) P= .123
THRUST	.2913 (32) P= .053	-.0426 (32) P= .409	.2935 (32) P= .052	.3417 (21) P= .065	.1078 (32) P= .278	-.0941 (32) P= .304	-.2116 (32) P= .123	1.0000 (32) P= .

APPENDIX D

PEARSON CORRELATION COEFFICIENTS

	RENEW	NEW	CONTU	ADULT	ENVIRON	CHILD
RENEW	1.0000 (32) P= .	-.1818 (32) P= .160	.2292 (32) P= .104	-.1867 (32) P= .153	.4332 (32) P= .007	-.1629 (32) P= .187
NEW	-.1818 (32) P= .160	1.0000 (32) P= .	-.3169 (32) P= .039	.2804 (32) P= .060	.1696 (32) P= .177	.4466 (32) P= .005
CONTU	.2292 (32) P= .104	-.3169 (32) P= .039	1.0000 (32) P= .	.0494 (32) P= .394	.1733 (32) P= .171	-.0199 (32) P= .457
ADULT	-.1867 (32) P= .153	.2804 (32) P= .060	.0494 (32) P= .394	1.0000 (32) P= .	.0182 (32) P= .461	-.1374 (32) P= .227
ENVIRON	.4332 (32) P= .007	.1696 (32) P= .177	.1733 (32) P= .171	.0182 (32) P= .461	1.0000 (32) P= .	-.1041 (32) P= .285
CHILD	-.1629 (32) P= .187	.4466 (32) P= .005	-.0199 (32) P= .457	-.1374 (32) P= .227	-.1041 (32) P= .285	1.0000 (32) P= .

Appendix E

Frequency of all coded behaviors
Among observational sample, n=32

Behavior Category	Frequency	Percent
Responsive/Receptive		
Obeys	97	4
Responds to question	26	1
Imitates another person	17	1
Automatic response	62	2
Receives positive affect	9	>1
Receives rejection	1	>1
Receives positive input (task)	8	>1
Reflective/perceptive	10	>1
Watching, listening	645	26
	875	34
Rejection		
Ignores intrusion	10	>1
Avoids intrusion	12	>1
Eliminates intrusion	17	1
	39	1
Thrusting		
Initiates an activity	49	2
Simple physical activity	126	5
Ask-information or help	16	1
Asks for comfort	22	1

Initiates social contact	75	3
Gives orders	6	>1
Selects an activity	17	1
Playful aggression	39	2
Expresses feeling, opinions	10	>1
	360	16
Integrative		
Testing, shows curiosity	1	>1
Hostiie reciprocity	8	>1
Reciprocity	95	4
Offers sympathy	12	>1
Concentrates on specific activity	971	39
	1087	43
Other		
Indeterminate activity	17	1
Self involvement, ie. fixing clothes, sucking thumb	122	5
	139	6
Totals	2500	100

Appendix F

Frequency of Watching Behavior Among Observational Sample, n=32

Center	Boys		Girls	
	Low home density	High home density	Low home density	High home density
1	23	11	19	17
2	19	19	10	23
3	15	9	22	18
4	25	6	17	29
5	24	13	6	8
6	14	28	44	39
7	21	35	6	18
8	12	18	34	43
	$\bar{x}$ = 19.1	$\bar{x}$ = 17.4	$\bar{x}$ = 19.8	$\bar{x}$ = 24.4

Appendix G

Frequency of Concentrating Behavior Among Observational Sample, n=32

Center	Boys		Girls	
	Low home density	High home density	Low home density	High home density
1	23	28	44	40
2	28	22	60	26
3	50	41	21	27
4	38	36	25	13
5	32	44	50	48
6	19	21	20	14
7	20	7	48	45
8	22	15	23	21
	$\bar{x}$ = 29	$\bar{x}$ = 26.8	$\bar{x}$ = 36.4	$\bar{x}$ = 29.3

Appendix H

Frequency by center of private place in the home

Center	# Yes	# No
1	5	9
2	8	6
3	5	4
4	10	8
5	10	4
6	11	7
7	4	4
8	7	7

Frequency by sex

	# Yes	# No
Boys	27(45%)	23(47%)
Girls	33(55%)	26(53%)
	100%	100%

Appendix I

Frequency of total scores on Behavioral Disturbance Rating Scale by sex (62 Girls, 52 Boys)

Scores	Girls	Boys
0	4	1
1	1	2
2	3	2
3	7	-
4	4	1
5	1	5
6	5	3
7	6	3
8	4	8
9	6	2
10	3	1
11	6	1
12	2	1
13	2	3
14	-	2
15	1	-
16	2	2
18	-	1
20	-	3
21	-	1
22	1	-
23	-	1
24	1	2
25	2	-
26	-	1
27	-	1
29	-	1
30	-	1
31	1	1
32	-	1
38	-	1
40	-	1

Appendix J

Frequency of continuity of activity for observational sample

Continuity	Frequency	Percentage
New activity	1,054	42
Continuous activity	1,372	55
Renew previous activity	118	3
N. A.	2	>1

Appendix K

Frequency of direction of behavior for observational sample

Behavior toward	Frequency	Percentage
Environment	929	40
Another child	514	22
Adult	290	12
Dual	262	12
Group	335	14
		100%

APPENDIX L

DAY CARE CENTER STUDY

CENTER DESCRIPTION

Name of Center:

Address:

Phone number:

Director:

Originally built as:
Number stories:
Yard available:

Total # children in Center:

Breakdown:

Average Attendance:

CLASSROOM

Total # children registered: Boys Girls

Average attendance since Sept.

Square footage:

Density:

General descritpion:

APPENDIX M

Questionnaire

Newark Childcare Network Project

Name _____

Child's Name _____ Age _____

Center Name _____

I agree to have my child participate in the project _____.

I do not wish for my child to participate in the project _____.

Parent's (or Guardian's) Signature _____

Date _____

PLEASE ANSWER THE FOLLOWING QUESTIONS:

1. How do you and your child normally travel to and from the day care center?

   Car _____ Bus _____ Walk _____

2. Do you live in a: multi-family building _____

   two-family house _____

   single-family house _____

3. If you live in an apartment, a. how many floors does the building have _____

   b. what floor do you live on _____

4. Indicate how many of each type of room is in your home

   bedroom _____ (for example: 2 bedrooms, 1 kitchen, etc.)

   living room _____

   dining room _____

   kitchen _____

   bathroom _____

   den (study) _____

5. How many people live in your home?

   adults _____

   children _____

/2 Questionnaire

6. a. Does you child go outside alone without adult supervision?

Yes _____ No _____

b. Does your child go outside with other children without adult supervision?

Yes _____ No _____

7. If child goes out without an adult, where does child go?

Yard _____

Porch _____

Balcony/terrace _____

Street _____

Playground _____

8. Does child spend time outside with an adult?

everyday _____

a few times a week _____

once a week _____

almost never _____

9. a. Does your child have a private place to go to in your home?

Yes _____ No _____

b. If yes, where? _____

10. When does he/she go to this private place.

When angry _____

When upset _____

Wants to play _____

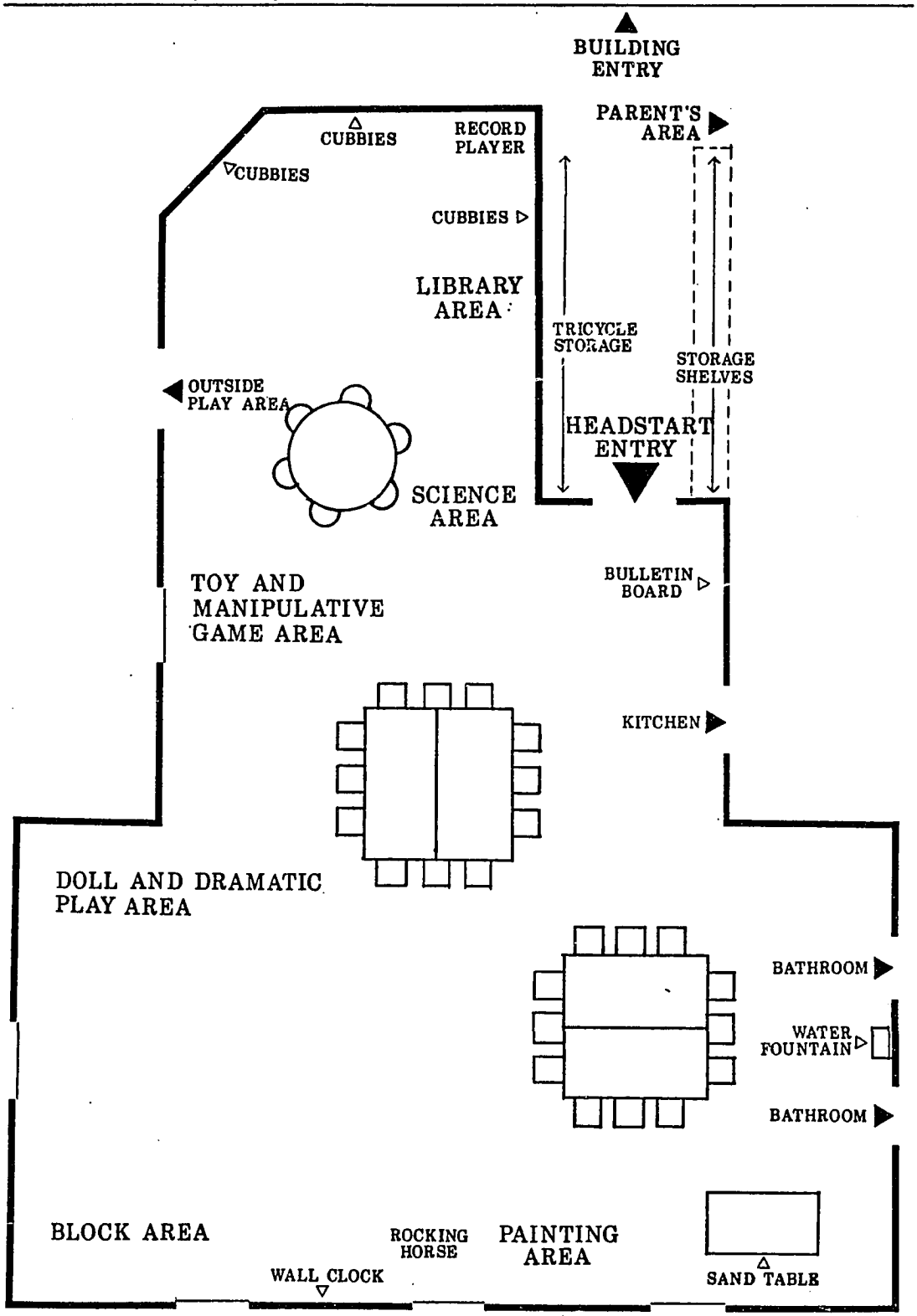
When tired _____

Other (specify mood) _____

Feel free to make an additional comments.

ST. NICHOLAS HEADSTART

APPENDIX P



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