THE IMPACT OF THE LEARNING ENVIRONMENT ON A CHILD'S BEHAVIOR

By

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A THESIS PRESENTED TO THE GRADUATE SCHOOL
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This study examined the relationship between the physical arrangement of a preschool classroom and the observed behavior of the children who use this classroom. The literature suggests that recent years have shown an increase in demand for childcare facilities that can contribute to the educational environment of young children. Some suggest, the physical environment in the preschool setting influences a child's behavior. Although there is a deficiency in environment and behavior studies regarding the impact of the classroom arrangement on behavior, two studies did show an impact of the environment on behavior in an early childhood education settings.

The researcher used an experimental research design to compare three different classroom arrangements, Pretreatment, Treatment 1 and Treatment 2. Participants in this study included 19 preschool age children, 18 set of parents and 5 teachers. Instruments such as parent questionnaires, teacher questionnaires and researcher observations were used to achieve triangulation. Questionnaires with 25 questions for parents and 30 questions for teachers were handed out to obtain a rate of the children's behavior from

both parents and teachers. Observations took place over a period of six weeks in which the researcher observed and recorded the behavior of the children through the changes and alterations made to their classroom arrangement. The instruments were analyzed using a paired sample t-test at a confidence interval of 90% or α=.10. Bar graphs, scatter diagrams, linear regression models and descriptive statistics were used to complement the analysis.

The overall results of the analysis did not show strong evidence to support the researcher's hypothesis; however, individual results were strong enough to say that the environment does have an effect on children's behavior. The individual test results demonstrated students' negative behaviors decreased and positive behaviors increased during Treatment 1.

Further research is needed to expose the relationship between the environment and its effects on behavior specifically relating to preschool age children. Further studies should focus on a larger sample along with comparison between classrooms. Architects, designers, space planners, and educators should focus on the well-being of children and always take into consideration their needs as students when designing early childhood learning environments.

CHAPTER 1
INTRODUCTION

As humans, we begin learning at the earliest stages of our lives. Our early childhood is not only one of these important stages, but it is also when we develop our future characteristics and beliefs as adults, which are based on the environments we experience during our early childhood (Olds, 2001).

Along with the women's rights movement and the increasing number of mothers entering the workforce, came an increased concern for the well-being of children and the facilities they attend while their mothers are at work (Dudek, 1996). The number of children spending anywhere from one-half to a whole day in the care of people other than their parents, and in places other than their homes has increased over the years (Olds, 2001). Sonesteain, Gates, Schmidt, and Bolshun (2002) state that in 1999, 28 out of the 73 percent of children under the age of five who were in the care of someone other than their parents, were in center-based care facilities. In addition, the percentage of children ages three to five years in center based facilities such as Head Start, preschool or nursery, increased 3.6 % from 1991 to 2001 (National Center for Education Statistics, 2002).

Due to these increases, the need for preschools or early childhood learning environments has risen steadily. This movement has transformed preschools into an important part of a child's first learning experience as well as increased emphasis on the quality of their design.

Statement of Purpose

The purpose of this study is to 1) examine how the arrangement of the preschool classroom environment affects the children's behavior during their activity times and 2) to answer the question: Does the arrangement of the environment have an effect on the children's behavior? The selected preschool classroom is one of three classrooms located in a campus-based child development and research center in central Florida.

The arrangement of a classroom, also known as spatial zoning, is the setting and independent variable based on the manipulation of movable pieces of furniture such as bookshelves, tables, cabinets, and other moveable elements. The intent of this study is to create an environment designed to support educators' control of their surroundings and ultimately, benefit the children's behavior. The hypothesis is that adequate spatial zoning and arrangement in a preschool classroom will have a positive effect on a child's behavior.

Assumptions

This research entails several assumptions. First, observation of children can happen without inducing changes in their behavior if the researcher is part of the class as a volunteer. Second, the sample is large enough to be representative of the behavioral patterns of children in the same age group within the child development center. Finally, the participant's ethnic background and race do not influence the findings.

Significance of the Study

The designers' responsibility is not only to create people's surroundings, but also to make sure these surroundings support the activities and needs of the individuals who use the space. Designers not only fill this space, but also assure that the intended use of the

space is fulfilled and this information is transmitted to the user. The same is true in preschool or nursery design.

In the past, childcare has primarily been viewed as a parental responsibility, not as an activity where the parent relies on a private facility. After the early 1990s, government agencies became concerned with premium childcare facilities (Dudek, 1996). Concerns about the adequacy of the facility design, planning and its effects on children's development has had limited study (Olds, 2001). According to Dudek (1996), changes in society, such as the number of family members, divorce rates, crime rates and increased traffic have made children's lives more limited or controlled. Due to this, children spend more time inside rather than outdoors. This has resulted in a greater emphasis on interior spaces making early-childhood education facility design more important in the future.

Early childhood learning environments are important because of their impact on the learning behavior of children. A study conducted over a period of fifteen years focused on 1539 children who attended a variety of preschools. This study showed the positive long-term benefits of attending preschool at an early age. Of the participants, 49.7% vs. 38.5% had a higher rate of completing high school, 46.7% vs. 55.0% were less likely to drop out and more likely to complete a larger number of years in education. These participants also showed a lower rate of arrests, a lower rate of grade retention and a lower rate of years spent in special education (Reynolds, Temple, Robertson, & Mann, 2001). A child's school has become the primary environment for learning and discovery, suggesting that early childhood school environments require special attention.

Research in this area is limited. Accurate correlations between the physical environment and children's development are still not known (Olds, 2001).

Environmental design should enhance the learning environment and support the intentions of the user groups. The information obtained from this research will provide a method of inquiry through the initial use of small-scale sampling to record the effectiveness of the observations, which may later lead to future studies. The results of these observations will provide useful information that may improve the learning experience of children by creating preschool settings that promote and enhance learning.

Architects and designers will benefit from research that enhances their knowledge of day care facility design and use, and will enable them to apply this information to design synthesis. Moreover, this type of study can influence other design researchers to pursue similar research using a larger sample.

Parameters of the Research

Parameters for the conclusions of this study include a preschool center, which was selected based on its location as well as its inclination to be utilized as a research site. The sample is limited to twenty students in the preschool classroom who were present at the time of observation and whose parents agreed to participate. This form of sampling excludes any child whose parents did not give their permission to partake in the current study. The period of observation is limited to the activity times of the daily routine. Four different children are observed each of the five days of the school week.

Definitions

Terms used in this research that require clarification include: 1) spatial zoning - relating to the physical space occupied by an individual and the way it is divided to form different areas; 2) behavior - the child's response to the environment he or she is in; 3) circulation - the patterns created within the classroom when children and adults move around the space; 4) physical environment - the classroom where the children play and

learn and 5) preschool - the time before kindergarten when a child is between four and five years of age.

Summary

Early childhood education research focusing on space planning and its impact on behavior is limited. Most education research focuses on secondary and higher education. The need for more research in the area of early childhood education environments is an important topic that requires more care and attention. Not only do these settings support child development, they also form the foundation for the development of future characteristics, beliefs and values gained through experiences in these settings. By creating a well-planned environment, designers can better support the educational experience. The intention of this research is to provide a starting point for discussion and future research studies focusing on the impact of the educational environment on the early development of children.

CHAPTER 2
REVIEW OF LITERATURE

A growing number of studies have documented the positive ways in which early childhood learning environments contribute to the development of children. Bredekamp and Copple (1997) state, the time a child spends in preschool is an important period of development and is not regarded as just a period before formal schooling begins. The growing interest in providing children with appropriate learning environments has initiated a concentration in the design of learning environments (Pianta, La Paro, Payne, Cox, & Bradley, 2002). A good foundation in education may lead to success in learning and, eventually, in life. Understanding the influence of the environment on a child's growth and development is an important part of building that foundation.

This research will examine how the physical environment in a preschool classroom may affect the behavior of children in that environment. It will specifically focus on the spatial zoning created by moveable pieces of furniture in the classroom and the effects of crowding within the environment. In the classroom, contributions to the social and cognitive development of children may include density, zoning, and arrangement. The literature review that follows focuses on these features. In addition to the recent literature, it is important to consider the published work of two authors, whose works are less recent, G. T. Moore and S. Teets. The lack of information on space planning for young children makes their work important and noteworthy.

General Background

According to Bredekamp and Copple (1997), recent years have shown an increase in demand for childcare facilities that can contribute to the educational environment of young children. The No Child Left Behind legislation authors recommend that all children be able to enter kindergarten ready to learn. Many of today's children can spend as many as 12,000 hours in a daycare or nursery before starting formal schooling (Isbell & Exelby, 2001). The increase in demand for more preschool facilities has researchers questioning if these environments are adequately designed to meet the needs of all children. Children learn by perception. The way they perceive their environments, whether positive or negative, has an effect on their learning experience (Read, Sugawara, and Brandt, 1999). Careful and considerate design of children spaces may lead to more interaction and involvement by the children toward their tasks and promote better learning habits (Doctoroff, 2001).

History of Preschools

Preschools, also known as nursery schools, came to the United States from Europe. They came specifically from England where nursery schools were created to provide a good environment for the child's physical, mental and social necessities. The desired age of the children in nursery school was from over two to fewer than five years of age (Lascarides & Hinitz, 2000). The first infant school in England was founded in 1816 by Robert Owen. This facility provided care and education for children ages three to ten. However, the first nursery school in England opened in 1911 (Johnson, LaMontagne, Elgas, & Bauer, 1998)

It was not until the 1920s that early childhood education began in the United States (Gordon & Williams-Browne, 1996). As nursery schools evolved in the United States,

they expanded from primarily private to for-profit, welfare, charity, laboratory, and parent-cooperated nursery schools (Lascarides & Hinitz, 2000). The first of these parent-cooperated nursery schools was created in 1915 at the University of Chicago. This facility was created by a group of wives. Still, it would not be until the 1960s that nursery schools would be affordable for poor families (Gordon & Williams- Browne, 1996).

However, the largest concern for the needs of young children came about with the start of the Depression, World War II and the post war period (Gordon & Williams-Browne, 1996). During this time, the Works Progress Administration funded the development of nursery schools, in order to provide jobs to unemployed elementary and high school teachers. Later in the 1940's the federal government provided funds to start full-day childcare facilities so women, whose husbands were at war or incapacitated, could work (Johnson et al., 1998).

Later, the development of privately owned or publicly funded facilities, as well as the education of individuals that would later teach at these facilities, would emerge. Higher education for the preparation of teaching in preschools includes programs in the departments of consumer studies, child development, human services and schools of education. (Lascarides & Hinitz, 2000).

The Preschool Child

A preschool child is defined as being between the ages of three and five, a time when children start to become verbal (Watkins & Durant, 1992). They begin to work together and interact with other children. They develop their verbal skills rapidly as they become more interested in books and writing (Isbell & Exelby, 2001). Preschoolers

become brave and are easily entertained, they are friendly to their peers; enjoy people and new experiences (Watkins & Durant, 1992).

Preschool children begin the stage Piaget labeled “preoperational”, a time when they can grasp small and simple concepts. This stage has three main characteristics. The first is centration, where the child attributes only one meaning to things. For example, a father is only a father but not the son of someone else. The second characteristic is egocentrism, which refers to the child’s belief that the world revolves around him alone. The third and final characteristic is animism, which refers to children believing all things are capable of human characteristics (Watkins & Durant, 1992).

Children at this age are able to spend a day away from home and enjoy being cooperative, especially when they receive individual attention due to their good behavior. However, they have difficulty sharing when they are tired or tense. In addition, they might cry in the middle of playing with other children because they feel frustrated (Watkins & Durant, 1992).

Preschoolers are very proud of building things out of raw materials such as clay, wood, and paint (Olds, 2001). They have a good sense of self-esteem and often feel smart and capable. These feelings, if properly nurtured, can last forever. They have a hard time grasping distance and the proper use of verbs. At this age, they use the verbs according to the way they think; this includes adding the termination -s- or –ed to a verb (Watkins & Durant, 1992).

Although most behavior problems in the preschool years are a part of typical development, teachers should avoid giving confusing or pointless rules. Sleepiness, hunger, or excessive motivation can be common explanations of why children

misbehave, cry, not share, or are not willing to interact with others (Watkins & Durant, 1992).

Impact of the Environment

The environment affects the people, or users, that interact with it; this is especially true in children who are susceptible to the influences of their surroundings (Watkins & Durant, 1992). The physical environment in the preschool setting influences a child's behavior (Read et al., 1999). According to Isbell & Exelby (2001), the environment is a good indicator of how children should respond or act. Room arrangement and materials determine where children focus their attention.

Children learn through exploration and investigation of their surroundings. A learning environment should be attractive, exciting, and a place where a child can learn and play using suitable resources (Isbell & Exelby, 2001). Most of the characteristics in the physical setting can have an effect on the way the occupants behave and on their mental health. This includes the interaction with the environment, which aids children in their development (Bailey, 2002). How children interact with their environment and its occupants should influence the arrangement of objects and activities in the space (Isbell & Exelby, 2001).

In a recent study by Read et al.(1999), children were exposed to different variations in ceiling height and color. They found that the behavior of the children was significantly changed by the alterations in ceiling heights. This study demonstrates that changes made to the physical setting may have an impact on children's behavior. In addition, a study by Teets (1985) found that modifications to the overall organization of the room had positive changes in the ambiance of the room; consequently improving the children's behavior.

These two studies support the theory that there is a relationship between the physical environment and children's behavior.

Aggression

For this current study, aggression is defined as an action performed by a child that can hurt another child either physically or emotionally. Aggression may be verbal and/or physical. Scientists are not certain if aggression is something that is part of the genetic makeup, or something that is acquired; they believe it may be a combination of both. Children at the preschool age may not understand the concept of right and wrong, usually reacting based on immediate needs and wants. Limitations of language skills can lead them to use physical force to get what they want (Kostelnik, Phipps, Whiren, Soderman, Stein, & Gregory 2002b).

McEvoy, Estrem, and Rodriguez (2003), named and compared two types of aggression. They looked at non-physical forms of aggression such as making faces, excluding children in play, or different postures, calling this type of behavior "relational aggression". Behaviors such as hitting, kicking and pushing, constituted "physical aggressions".

According to a study by Crick and Grotpeter (1995) regarding elementary school children, girls are more likely to show relational aggression and boys are more likely to show physical aggression. McEvoy et al.(2003), found parallel results to the study conducted by Crick and Grotpeter (1995) regarding the behavior of preschool children. However, they also found that overall, preschool boys show more physical and relational aggression than preschool girls in comparison to elementary school children (McEvoy et al., 2003).

Within physical and relational aggression, there are four sub-categories. These include 1) accidental aggression, 2) expressive aggression, 3) instrumental aggression, and 4) hostile aggression. Accidental aggression happens when a child hurts another by accident during playtime. Expressive aggression does not cause physical harm but it is manifested by damaging something that belongs to another child in order to see his or her reaction. Instrumental aggression is the fight over what belongs to whom where someone gets hurt in the process. Finally, there is hostile aggression, which can be described as intentionally hurting someone on a physical or emotional level (Kostelnik et al., 2002b).

Spatial Zoning

Spatial zoning for this study refers to open or closed floor plans and the creation of private spaces. Moore (1987) describes a well-defined behavior setting as an area that enables one activity while successfully combining elements such as boundaries, circulation, and visual separation. Contrastingly, he describes a poorly defined children's environment as one that lacks definition and proportion.

Kemple (2004) explains that children will better understand the activities they are expected to do based on the type of spatial arrangement. The design of the space can affect a child's self-esteem, security and comfort within that specific space (Trawick-Smith, 1992), and the environment can be arranged to encourage proper behavior by adequately zoning areas and materials in the space (Johnson et al., 1998). Some of the advantages of a well-designed environment according to Kemple (2004) are the decrease of aggression and the increase of social interaction. In most of the studies, spatial arrangements of the room are described as an open/closed plan or as modified open plan.

Open/Closed

An open plan refers to a space with an open area. Open plans have been used because they are believed to provide a structure-free and changeable environment (Trawick-Smith, 1992). An open plan child-care center includes an un-partitioned space with few or no walls. In contrast, a closed plan consists of self-contained classrooms along a hallway or a group of interconnected rooms (Moore, 1987). There are varying opinions on the value of an open plan. Kostelnik, Phipps Whiren, Soderman, Stein, & Gregory (2002a) believe an open plan encourages interest, investigation and social communication while Moore (1987) states that open plans create distractions for children, which cause them to spend less time on activities that enhance their education. The open plan also increases more traffic and provides a greater opportunity for accidents due to running and rough play (Moore, 1987). In addition, an open classroom that does not have many boundaries can lead to aggression and elevated activity (Teets, 1985). Another argument researchers make is that open plans can create more noise, aggressive behavior, and distraction from school-oriented activities. Their research showed that an open plan with no boundaries leads to a larger number of significant negative effects on children (Moore, 1987).

Modified Open Plan Facilities

Moore's (1987) research led him to recommend a space that was a combination of open and closed plan. He called this the modified open plan and concluded that a middle ground could take on the advantages of both types of plans. It removes the disadvantage of dividing activities into small or large spaces and provides an open room in which children can interact visually with the space. This in return, provides them with a separation from noise and visual distractions.

Private Spaces

Within the spatial zoning of the classroom, there has to be an area where a child can put all social activities on hold and attend to private moments. This helps the development of psychological health as well as giving force, energy and strength to a child to recuperate and take on the social environment once again (Kemple, 2004). Children enjoy having private spaces and these are often missing in children's environments (Bechtel, 1997). The privacy area for a child should be large enough to fit up to two children; this area should also have a view of the whole classroom as well as being a cozy space to get away (Kostelnik et al., 2002a; Trawick-Smith, 1992). It is recommended that the space be at least 30 inches square (Bechtel, 1997). These areas are not to be used as a time-out place or to be used as a punishment area but to give the child a place to relax, be comfortable, and have privacy from the rest of the children. Spaces like these can help relieve stress and help a child to gain self-composure (Kostelnik et al., 2002a; Trawick-Smith, 1992). It is recommended that classrooms have more than one personal space included within the spatial zoning of the classroom (Kemple, 2004).

Enhancing Spatial Organization

Teets (1985) explains four elements that, if manipulated correctly, can optimize the spatial organization of a room. The four elements are 1) organization, 2) complexity, 3) variety, and 4) activities.

Organization is a good way to improve the environment. The five suggestions given about the organization of the room include 1) making sure all paths are clear of obstructions to facilitate passage; 2) the room and the activities to be performed have to be analyzed to achieve proper placement; 3) all boundaries should be well marked between the different areas; 4) all materials should be visible to the children so they can

select them with ease; and 5) there should be sufficient room on the floor that is clear of structures to make the room seem less crowded (Teets, 1985).

A complex environment can increase children's interest in the space. There are three ways to improve complexity in a room. The teacher/designer should make sure that the materials are combinable and have more than one visible use. There should be a balance between very complex materials that have many uses and simple materials with just one use. Finally, the teacher should interact with the children to keep them interested in the space (Teets, 1985).

Variety in the environment creates options and minimizes boredom. Appropriate opportunities for variety in the classroom include 1) the ability of children to choose their own activity; 2) the availability of every day activities to be different from time to time; and 3) the ability of the space in the classroom to be reorganized occasionally (Teets, 1985).

In addition, a child should have an adequate amount of activities from which to choose, as well as enough workspace in which to work and enough room for the child to move around within that space (Teets, 1985).

Improper spatial organization of a classroom can lead to problems such as 1) the mixing of learning stations; 2) the poor condition of equipment that can lead to less use; 3) the lack of visual appeal; and 4) storing outdoor equipment where children do not have easy access to it (Teets, 1985).

Activity Areas

The ideal activity-enriched classroom is big enough to allow movement and different activities to occur at the same time. Children should work at tables rather than

desks and these tables should be divided according to each activity (Cowles & Aldridge, 1992).

Activity areas are spaces where children can learn by hands-on experiences and a well-organized activity area will help regulate behavior problems. Depending on the room size and arrangement, a room can have up to 15 to 20 activity areas. These activity areas should have five defining characteristics. First, they should be in a location that is adequate for each activity. Second, there should be visible boundaries. Third, each activity should have adequate sitting and working surface. Fourth, each area should have sufficient display and storage space. Finally, each area should be well defined visually from adjacent activities (Olds, 2001).

Typical activities in the preschool classroom include art, reading, math, science, dramatization, computer, block and multiuse stations (Cowles & Aldridge, 1992). Additionally, each classroom can be divided into zones such as the quiet zone, messy zone, and active zone. The quiet zone typically includes spaces such as reading, listening, manipulatives, writing, small blocks and math. The messy zone has water, sand, clay, painting, collage, science and a nature area. The active zone has large blocks, dramatic play, music and gross-motor skill activities (Olds, 2001). Each area has specific guidelines to follow and an ideal location within a floor plan.

Density

Density, the number of children per square feet of classroom, was a key factor when selecting the classroom to observe for this study. According to Moore (1987), the number of children included per facility should range from 60 to 75 and the number of children per group or classroom should be between 14 and 16 with two adults (Olds, 2001). However, there should be no more than 16 children per classroom.

Moore (1987) describes two types of density. One deals with the square footage per room and size of the classroom, the other deals with the number of children in one room. Density in a classroom can have both a positive and a negative connotation.

The positive connotation is directed towards keeping a low density in preschool classrooms. Batchford, Kutnick, and Martin (2001) state that smaller classes are beneficial for children at a younger age and Maxwell (2003) states that keeping the class small can lead to fewer behavior problems and more participation from students. Maxwell also states that in smaller classes, children show more academic improvement. In addition, in smaller classrooms, teachers are better able to provide children with individual help (Batchord et al., 2001). Even in a school with different preschool classrooms, Maxwell (2003) noted that children in small density classrooms performed better academically than their peers in high-density classrooms. She stated a low-density classroom should have, at most, 15 students. There is not a significant difference in improved performance by children in classrooms exceeding this number of students. Kemple (2004) explains how a ratio of 10 children per one adult is adequate to maintain the low density. In addition, children should be in groups of no more than two to four children when they work together.

Conversely, high density may lead to aggression, conflict between children, lack of concentration in activities, decreased social contact and increased isolation (Moore, 1987). Crowding has negative effects on young children (Bailey, 2002) and a lack of sufficient space can lead children to be solitary and to lack interaction (Maxwell, 2003). When the size of the group increases to more than 16 children or the classroom size become less than the minimum requirement of 25 ft square per child, the space becomes

too small for interaction and therefore inappropriate for development (Kemple, 2004). Decreasing the amount of square feet per child from 25 to 15 has significant effects on children such as aggressive behavior and fewer group relationships (Maxwell, 2003). The preferred room size is between 1000 and 1200 square feet for approximately 14 to 16 children (Olds, 2001). High-density spaces and crowding have a greater effect on boys than girls and, as density increases, so does the behavioral problems of boys (Maxwell, 2003). The feeling of crowdedness may be alleviated by providing a private space for the children (Bailey, 2002).

Summary

The literature review presented here focuses on the main points of this research. First, the increase in demand for early childhood environments since the early 1920's has resulted in more children spending most of their day in a preschool or nursery. Second, there is concern for the adequacy of the design of these facilities because preschool children are very active and eager to learn and because the physical environment influences a child's behavior (Read et al., 1999). Third, the conduct of preschool children varies between boys and girls and it is important to arrange the room to serve the needs of both. Fourth, spatial zoning in the room should support all the activities needed during activity time and allow enough room for all children to participate. Finally, in addition to a well-designed environment, adequate density in the classroom is essential to support good behavior from children in a classroom.

CHAPTER 3
METHODOLOGY

Research Design

An experimental research design was used to study the impact of the classroom environment on selected behaviors of pre-school age children. The children's response, labeled positive (engagement and compliance) or negative (aggression, disruption and non-compliance), were the dependent variables. The independent variable or treatment was the manipulation in the arrangement of furnishings to create activity zones that were more visually open, accessible and activity oriented.

The experimental research design was assembled using single-group interrupted time series design. This design included two characteristics. The participants were consistent through the six weeks of data collection and were exposed to three stages of observation: 1) Pretreatment; 2) Treatment 1; and 3) Treatment 2 in which Treatment 2 encompasses the same characteristics as Pretreatment (Groat & Wang, 2002).

According to Groat and Wang (2002), the major strengths in using experimental research design include the potential for establishing causality, generalization of the results to different settings, and the ability to control all aspects of experimental design that enables the attribution of causality. This means that the researcher will be able to prove the cause and effect of the study clearly.

Groat and Wang (2002) list three weaknesses that may influence the accuracy of the study. First, real life settings are often too complex to be reduced to cause and effect variables. In a controlled laboratory, the outcomes may lack realism and it is important

for this study to be as realistic as possible. Second, there is a tendency to generalize findings to populations that differ by gender or ethnicity. Third, over controlling the environment can place participants in a powerless position, which raises ethical concerns.

When a study uses human subjects as participants, the researcher is required to obtain consent from such participants. This study has three sets of human subjects, children, parents and teachers, who were given an informed consent to request their participation and to explain risks, if any, of participating in the study. The children in this study were under the age of 18 and required parental permission in order to participate (Appendix A, Appendix B).

Research Hypothesis

Previous studies by Read et al. (1999) and Teets (1985) have shown that changing the physical environment to create better ambiance has a positive effect on children's behavior. Based on these and previous research on the impact the environment has on children's behavior, the researcher believes there is a correlation between room arrangement and children's behavior in a preschool environment. The general research hypothesis is that room arrangement has an impact on children's behavior. More specifically, the researcher believes adequate spatial zoning and arrangement in a preschool classroom have a positive effect on a child's behavior.

Setting

For this study, a campus-based child development and research center located in central Florida, was the context and site for data collection. The selection of this facility was based on two characteristics: 1) the preschool consists of a small population with a maximum student teacher ratio of 1:10 per classroom; and 2) the preschool allowed alterations and the spatial arrangements of the classroom to be manipulated using

moveable furniture and fixtures. This facility offers childcare to children from six moths to five years of age. It is located inside a university campus therefore serving students, staff, and faculty of the university.

The preschool classroom used for this study, houses children ages four and five (Figure 3-1). This room was chosen because the children's ages were appropriate for the study and there was evidence of inappropriate social behaviors. The room, divided into two unequal areas, holds five classes. On one side, there is space for all 45 children to sit for circle and movie time and for three out of the five classes to meet during activity time (Figure 3-2). On the other side, the space is large enough to hold two classes during activity time (Figure 3-3). Although there is an outside porch where children learn during circle time, this research focused on the behaviors during activity time thus limiting the manipulation and observation to the inside spaces.

Figure 3-1. Floor plan of entire preschool classroom.

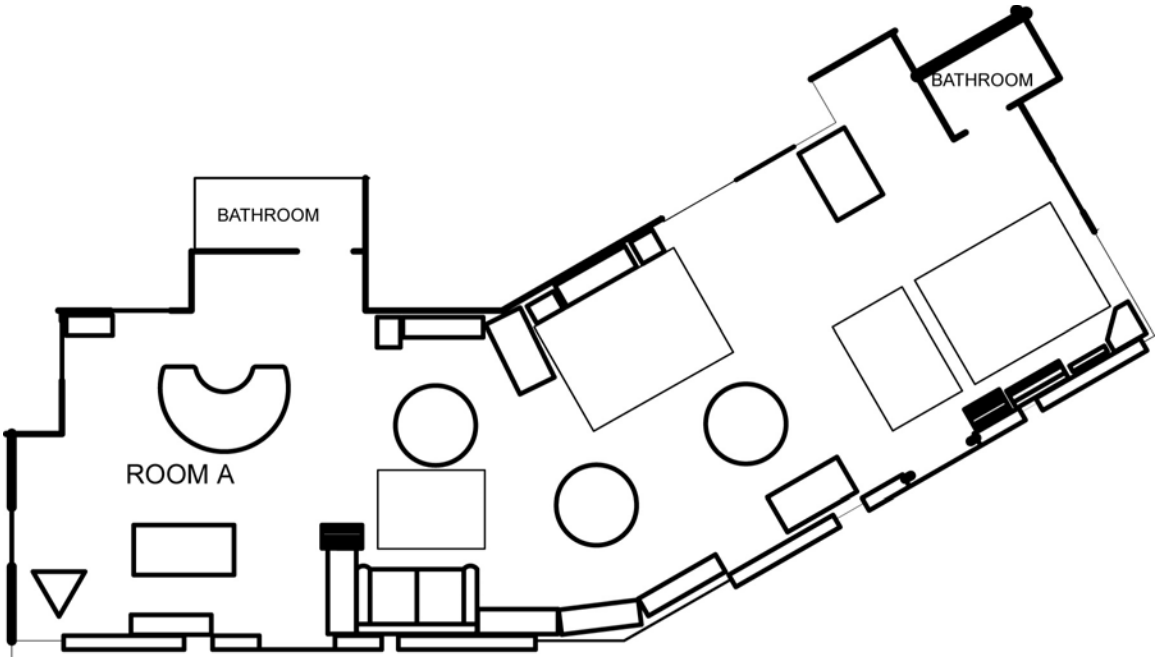


Figure 3-2. Room A accommodates all 45 children or three circle groups.

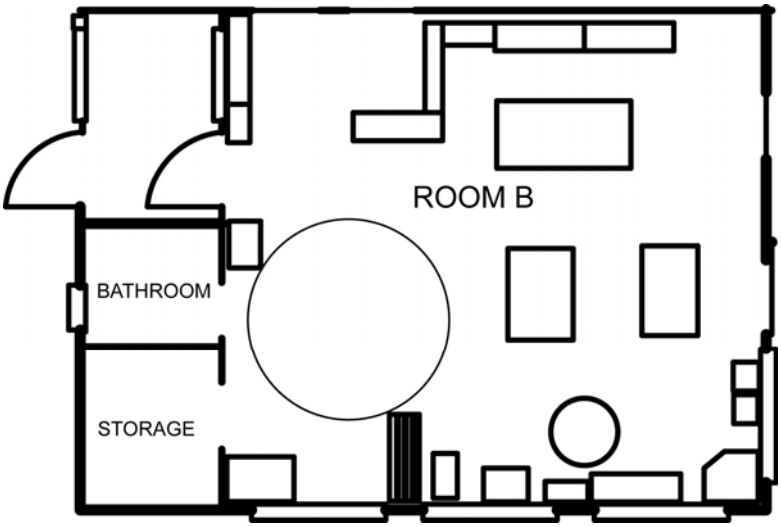


Figure 3-3. Room B accommodates two circle groups.

Participants

The participants for this study included three groups. The first group consisted of 20 students at the preschool level from the classroom at the campus-based child development and research center. There were 12 boys and 8 girls all between the ages of four and five. Of these 20 children, 16 were born in the United States and four in a

foreign country. Inclusion criteria included daily attendance from February 24, 2005 to March 4, 2005, and permission from their parents to be observed and video recorded by the researcher.

Teachers were the second group of participants. The preschool classroom had five teachers, four females, and one male. Their only role as participants was to answer four questionnaires provided by the researcher regarding the children's behavior.

The parents of the 20 students chosen for the study made up the third group of participants. Eleven of these sets of parents were employed by the university while nine were students of the university. Thirteen of the 20 sets of parents were born in the United States; seven were born in a foreign country. Their ages varied and their participation depended on whether their child was selected for the study. Their role as participants was to answer one questionnaire sent to them and to give their consent for their child's observation and permission to video record the observation sessions.

Sampling Procedures

The preschool classroom is composed of 46 students. On January 10, 2005, all 46 students and their parents received an invitation to participate in the study. Teachers of the classroom also received an invitation and consent forms (Appendix C) to participate. After only eight of the 46 parents had responded to the first invitation, a second notice was sent on January 14, 2005. Subsequently the researcher made a personal invitation to the remaining parents as they arrived to pick up their children on January 21, 2005. After the final invitation, the parents of 20 children agreed for them and their children to participate in the study. The sample was a sample of convenience. A randomizer was then used to select the order for each week in which the 20 children with parental consent would be observed.

Instruments

Three different instruments were used in this study to achieve method triangulation. The first instrument given to the parents at the beginning of the study was the Preschool Social Behavior Scale (PSBS-T) (Appendix D) which is an adaptation of a questionnaire created by Crick, Casas, and Mosher (1997) that uses a likert scale to measure social behavior in preschool age children. The measures varied from never or almost never true, not often, sometimes, often and always or almost always true. This questionnaire consists of 25 questions each worth up to five points for a maximum score of 125. It is based on the children's behavior focusing on six variables: 1) relational aggression; 2) overt/physical aggression; 3) pro-social behavior; 4) depressed affect; 5) child's acceptance with same sex peers; and 6) child's acceptance with opposite sex peers. The purpose of this questionnaire and the teacher base questionnaire was to have a pre-study score on each child from the parents and the teachers so there could later be a comparison between the base scores and the scores obtained during the study from the same questionnaire. This instrument has a range of internal consistency of 0.64 to 0.96.

The second instrument, which was a questionnaire given to the teachers at the beginning of the study and after each intervention, is a modified version of the adaptation questionnaire created by Crick, Casas, and Mosher (1997) (Appendix E). Besides the original 25 items, the researcher added five extra questions the teachers answered regarding teacher's room arrangement preferences and his or her perceptions of the children's behavior in relation to the space. Each question is also worth up to five points for a maximum score of 150. The teachers questionnaire has eight variables: 1) relational aggression; 2) overt/physical aggression; 3) pro social behavior; 4) depressed affect; 5) child's acceptance with same sex peers;6) child's acceptance with opposite sex peers; 7)

room arrangement; and 8) child's room behavior. The higher the score is for each of the questionnaires, the better the behavior displayed by each child.

The third instrument consisted of direct observation of the children by the researcher using a frequency count table (Appendix F). This table created by the researcher specifically lists the targeted behaviors, aggression, disruption, non-compliance, compliance and engagement. An observation table listed the order in which the children would be observed for the week. Since the researcher used a randomizer to make sure each child was not observed at the same time each week, the observation tables listed the children in a different order for each of the six weeks (Appendix G).

Along with the observations, the researcher used a Sony Handycam Vision video camera recorder; model number CCD-TRV318. This was used as a secondary recording device in order to increase the documentation's validity and reliability on behavioral changes that took place with each spatial change. By observing the changes, the researcher compared cause and effect between the environmental modifications and behavioral changes. The researcher was an active participant in the class by posing as a classroom volunteer.

Variable List

According to Groat and Wang (2002), experimental research design has specific coding that is commonly used by experimental researchers to diagram details. R= random assignment, X= experimental treatment and O= observation of dependent variables. This study is characterized as an R O O X O O, which is a random assignment with two observations prior and after the experimental treatment.

The independent variable for this study was the room arrangement or treatment. The room treatment was either P=present or NP=not present. The dependent variables were behaviors NG=Negative (A=aggression, D=disruption and NC=compliance) and P=positive (E=engagement and C=compliance). These codes identified the results for the likert scales as well as the frequency count tables.

Data Collection

Data collection for this study took place over a period of six weeks beginning on January 24, 2005 and ending on March 4, 2005. Child observation took place five times a week during the six-week period. Four different children were observed ten minutes each day, and all the observations took place during activity time. The observations were from 10:45 am until 11:30 am and allowed for a minute of change between children. Each child had a total of 20 minutes of observation per treatment.

Before data gathering began, parents and teachers were given questionnaire #1. This information provided a basis of what the perceived behaviors were prior to data collection. The number of questionnaires each teacher received varied from two to five. This depended on how many children participated in the study from their individual class. The researcher also spent time with the children during outdoor play and activity time to allow them to get accustomed to her presence.

Pretreatment Period

Week 1.

Teachers and parents' first questionnaire, which they received before the study began, was due at the end of the week and they were given notices in the middle of the week about their questionnaires to ensure that they were turned in on time. During this time, all aspects of the room remained unaltered. The children familiarized themselves

with the researcher in their original environment before changes to the classroom environment were implemented.

Before starting the first week's observations, the researcher read the children an assent script (Appendix H) and asked for a raise of hands to confirm agreement. The researcher observed the children in their normal environment and recorded the behavior types that were present in the setting allowing at most one count of engagement per every five minutes of observation. During this week, the researcher also documented the arrangement of the classroom and focused on the areas that were more prone to behavior problems.

The researcher reviewed and compared eye observations with the video camera for accuracy on a daily basis. Two out of the 20 students were absent during week 1 and one parent failed to return the questionnaire. Some children were curious of the video camera and wanted to ask more questions about its purpose.

Week 2.

During week two, direct observation in the unaltered environment continued. The classroom remained in its original arrangement (Figure 3-4). The teachers received their questionnaire #2 at the end of the week, recording any behavior changes since the previous questionnaire.

During week 2, two children were absent and on one of the observation days, there was a class fieldtrip. The researcher was able to collect data on two out of the six children whose data were missing during the rest of the week.

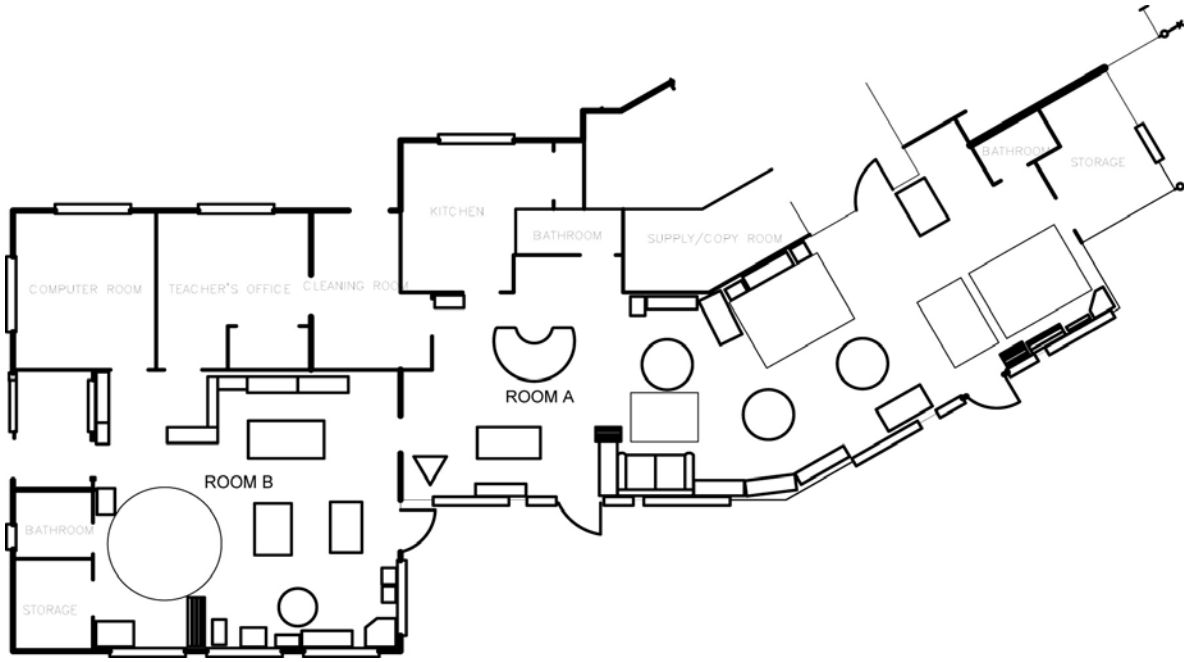


Figure 3-4. Original arrangement of preschool classroom.

Treatment Period #1

Week 3.

Week 3 marked the start of the treatment period. The activity centers were placed differently to allow a new arrangement and circulation patterns (Figure 3-5). The researcher arrived at the opening hours of the facility to ensure that everything worked properly and to answer any questions teachers may have had about the new arrangement. There was an effort to create a visual connection throughout the rooms addressing the problems observed during weeks 1 and 2. The researcher observed behaviors created by this type of change and recorded them using the frequency counts and the video recorder during activity time.

Although there was a scheduled fieldtrip for the class on the first day, the researcher was able to gather all the data needed due to previous notification by the

teachers. Additionally, during this week one participant's parent decided to withdraw from the study reducing the participant count to 19.

Questionnaire #2 was due at the end of the week. A reminder was sent to teachers in the middle of the week so the questionnaires were turned in on time. Teachers and parents gave positive feedback on the new room arrangement and the visual openness that it portrayed.

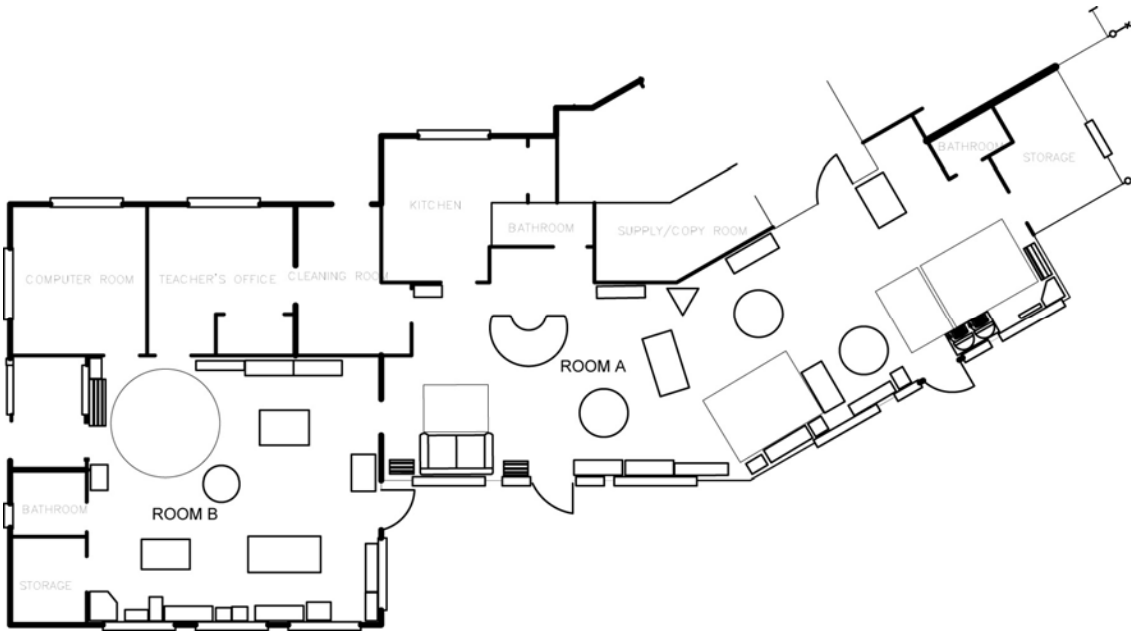


Figure 3-5. Future Gators new room arrangement (treatment).

Week 4.

Week 4 was the second week of treatment 1. The room remained unchanged from week 3 and the children continued to be observed by the researcher and the video camera. By week 4, the children may have had a better understanding of where things were located in the room and may have displayed different behaviors from the third week.

Due to the number of participants dropping from 20 to 19, the researcher obtained an extra ten minute period of observation that could be used in case a child was absent. Although there were two children absent for this week, the researcher was able to collect

data on one of the participants on a different date because of the extra ten-minute period. At the end of week 4, the teachers received questionnaire #3.

Treatment Period #2

Week 5.

The room was reverted to the pretreatment arrangement (Figure 3-4) ending the treatment period at the beginning of week 5. The researcher observed and recorded how the children reacted to their original environment and whether their behavior changed in a positive or negative way. There was also a common dislike by the teachers of having to revert to the old arrangement, raising a question of participant bias and the potential to influence the observed subjects.

The first day of this week was a holiday and the number of children in the classroom was decreased. In addition, due to school pictures taken during activity time, one child was unavailable for observation. Questionnaire #3 was due at the end of the week and teachers received a reminder to avoid late return of the questionnaires.

Week 6.

The last week of the study was different from other weeks because it took place during the University of Florida's annual spring break. Although all participants were present, the number of children in the classroom during the week was reduced by approximately ten children. Negative behaviors decreased, which may be influenced, by the decrease in density.

The researcher continued to observe the children in the same manner as the previous weeks using frequency counts and video recording. At the end of week 6, teachers received questionnaire #4 and were asked to return it to the researcher a week later.

Statistical Treatment

A Paired Sample T-Test compared the significance of the mean difference between and within methods. This test was selected because it is designed for random samples with $n < 30$ and because the t test method uses assumptions from a normal population distribution that is needed for small populations (Agresti & Barbara, 1997). Because this study is based on a small sample, the researcher used a confidence interval of 90% or α=.10 for the t-test.

The Paired Sample T-Test and bar graphs were used to compare the means of the frequency counts obtained from the researcher's observations and to compare the frequency of positive and negative behaviors that occurred during the six weeks of observation. The counts were first divided into observed positive and observed negative behaviors and listed by participants. Then the positive behaviors for Pretreatment, Treatment 1 and Treatment 2 periods were compared against each other and the same procedure took place for the negative behaviors.

Scatter diagrams visually compared data and supported triangulation of methods by providing predictions of the linear relationship between the Y and X-axis. Linear regressions were used to complement the scatter diagrams by providing the *r-value* of correlation. A bar graph was used to demonstrate changes in positive and negative behaviors within the observations as well as changes within the teachers' responses. Descriptive statistics were used in two manners, 1) to describe the demographics of the participants, their parents and their teachers and 2) to describe relevant frequency counts. Descriptive statistics were chosen because they help to state the data in a simpler form without misrepresenting it (Agresti & Finlay, 1997).

To increase the accuracy of the measures, the researcher standardized around zero all questionnaire results and observation counts. In order to standardize the questionnaire results, the researcher calculated the mean and the standard deviation of each teacher's response. Once these numbers were acquired, the researcher subtracted the mean from each individual score and divided it by the standard deviation. The observation frequency counts were separated between positive and negative behavior counts. These counts were added for each child. The square root of the measure plus one was used to standardize the counts. These final numbers were used in the paired sample t-test.

Summary

An experimental research design was used to answer the research hypotheses, which states that there is a positive correlation between a child's behavior and adequate spatial arrangement in a preschool classroom. All participants completed appropriate consent forms. It was specifically important that parents gave permission for their children because they are minors. The participants included 20 children, their parents and their teachers from the campus-based child development and research center. Data were collected for a six-week period using three instruments, parental questionnaires, teacher questionnaires, and frequency counts by researcher observations and recordings using a video camera. The observations took place every day of the week during activity time using four different children at a time. Although the results of this study may be limited by variables beyond the researcher's control (i.e. fieldtrips, teacher bias and pre-existing behavioral conditions), the researcher believes these results are an accurate reflection of the influence of environment on the behavior of pre-school age children.

CHAPTER 4
FINDINGS

The purpose of this study was to find a relationship between the physical arrangement of a preschool classroom and the observed behavior of the children who use this classroom. A review of the literature indicated a deficiency in recent or rigorous studies regarding the impact of the classroom arrangement on behavior. However, two studies (Read, et al., 1999 and Teets, 1985) did show an impact of the environment on behavior in an early childhood education setting. An experimental research design was used to collect data on the impact of the classroom environment on selected behaviors of pre-school age children.

Demographic Descriptive Statistics

This study included three sets of participants: 1) children; 2) parents; and 3) teachers. The number of children selected at random who participated in this study were 20 however during the study one child was withdrawn by the parents leaving the sample size to be $n = 19$ The average age was 4.5 years (Table 4-1). Most of the participants were male (Table 4-2), and the majority were born in the United States (Table 4-3). All participants exhibited command of the American English language, though this was not a variable tested in the study.

Table 4-1. Children's age.

		Number of Children	Percent
Age	4.0	7	36.8
	4.5	4	21.1
	5.0	8	42.1
	Total	19	100.0

Table 4-2. Children's gender.

		Number of Children	Percent
Gender	Female	8	42.1
	Male	11	57.9
	Total	19	100.0

Table 4-3. Children's location of birth.

		Number of Children	Percent
Location of Birth	Outside United States	4	21.1
	United States	15	78.9
	Total	19	100.0

There were five teachers, mainly female, who participated in this study. Twenty sets of parents initially agreed to participate in the study, however, one set of parents did not follow through with full participation and one dropped from the study. Parents were affiliated with the university as either students or employees and the majority was born in the United States (Table 4-4, Table 4-5).

Table 4-4. Parent's university status.

		Frequency	Percent
University Status	Employee	10	55.6
	Student	8	44.4
	Total	18	100.0

Table 4-5. Parent's location of birth

		Frequency	Percent
Location of Birth	Outside of United States	6	33.3
	United States	12	66.7
	Total	18	100.0

Base Parent/Teacher Questionnaires

Table 4-6 lists the original scores and percentages per child for each of the two base questionnaires and Table 4-7 lists the descriptive statistics with the maximum and minimum scores for each questionnaire as well as the average score for each. The comparison in mean percentage scores between the teacher and the parent questionnaire showed a difference of only 2.6%. This tells us the scores given by the parents and the teachers are relatively similar.

Table 4-6. Base questionnaires scores and percentages

Participant Number	Parent Base Score	Parent Base %	Teacher Base Score	Teacher Base %
1	122	98	132	88
2	113	90	94	63
3	115	92	129	86
4	86	69	90	60
5	105	84	146	97
6	114	91	149	99
7	114	91	132	88
8	113	90	120	80
9	116	93	149	99
11	116	93	137	91
12	115	92	118	79
13	N/A	N/A	140	93
14	98	78	104	69
15	108	86	141	94
16	107	86	110	73
17	115	92	138	92
18	117	94	137	91
19	117	94	144	96
20	105	84	147	98
Total n	18	18	19	19

Table 4-7. Descriptive statistics for base questionnaires.

	n	Minimum	Maximum	Mean
Parent Base Questionnaire	18	86	122	110.89
Parent Base Percent	18	69	98	88.72
Teacher Base Questionnaire	19	90	149	129.32
Teacher Base Percent	19	60	99	86.11
Valid n (listwise)	18			

The scatter diagram showed no meaningful clusters of dots to imply a correlation between the percent scores in the parent and teacher questionnaires (Figure 4-1). This could be related to the fact that some of the scores shown below are outliers, which deviate from the expected linear relationship. However, the linear regression model (Table 4-8) with $r = .536$ suggested a trend toward a positive correlation between the scores.

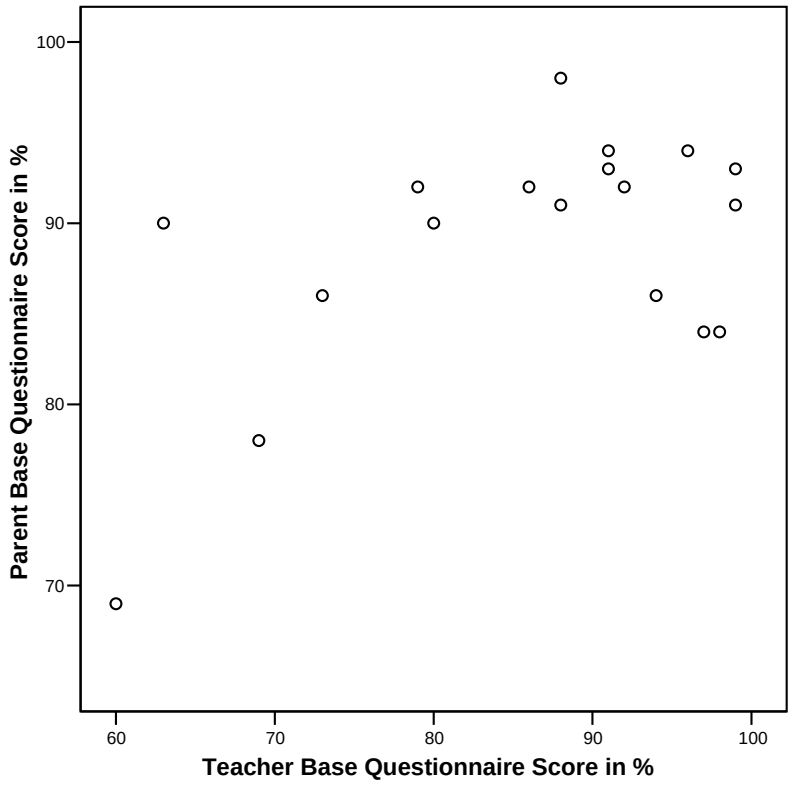


Figure 4-1. Scatter diagram for Y=Parent base questionnaire and X= Teacher base questionnaire.

Table 4-8. Linear regression of base parent and base teacher questionnaires.

Model	R	R Square
1	.536	.288

Teacher's Questionnaires

Results for the three different analyses used to interpret the questionnaires varied in concordance over the significance and correlation between the questionnaires. Table 4-9 lists the scores each child received from the teachers during the three stages of the study based on a total scoring of 150 points.

Table 4-9. Scores of questionnaires 2-4 used during study.

Participant Number		Pretreatment Questionnaire #2	Treatment 1 Questionnaire #3	Treatment 2 Questionnaire #4
1		119	129	127
2		111	105	94
3		131	127	124
4		106	109	104
5		140	100	112
6		148	149	143
7		136	129	126
8		108	98	93
9		150	150	146
11		130	129	126
12		120	123	118
13		135	123	127
14		93	109	95
15		141	140	140
16		117	125	124
17		129	133	133
18		126	137	125
19		142	134	144
20		150	147	148
Total	n	19	19	19

Significance of Means between Questionnaires

As Table 4-10 shows, the comparison between teacher questionnaire 2 (Pretreatment) and teacher questionnaire 3 (Treatment 1) for sample n=19 generated p = .804 (two-sided). The comparison between teacher questionnaire 3 (Treatment 1) and teacher questionnaire 4 (Treatment 2) produced p = .494 (two-sided). Finally, the comparison between teacher questionnaire 2 (pretreatment) and teacher questionnaire 4 (Treatment 2) produced p = .749. The *p-values* reported were not significant enough to show a change in behavior scores.

Table 4-10. Paired sample test for teacher questionnaires 2-4.

		Paired Differences							
					90% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Q# 2-Q#3	-.053	.911	.209	-.492	.387	-.252	18	.804
Pair 2	Q#3-Q#4	.105	.658	.151	-.212	.422	.697	18	.494
Pair 3	Q#2-Q#4	.053	.705	.162	-.287	.392	.325	18	.749

Comparison of Means

The bar graph below shows the mean scores for each of the questionnaires. Questionnaire #2 (M = 128), questionnaire #3 (M = 126) and questionnaire #4 (M = 124). It was expected that the mean score would rise for questionnaire #3 (Figure 4-2).

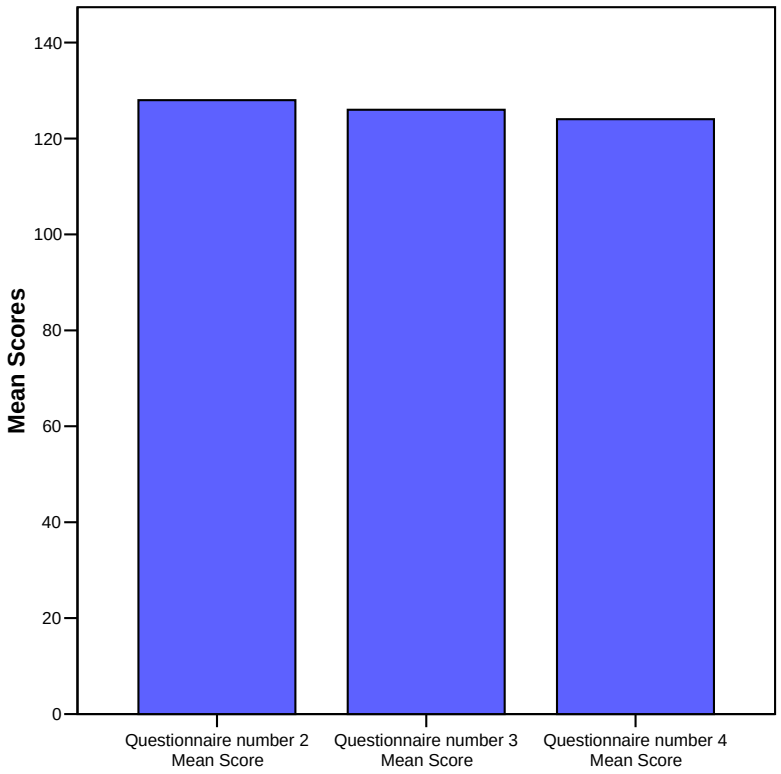
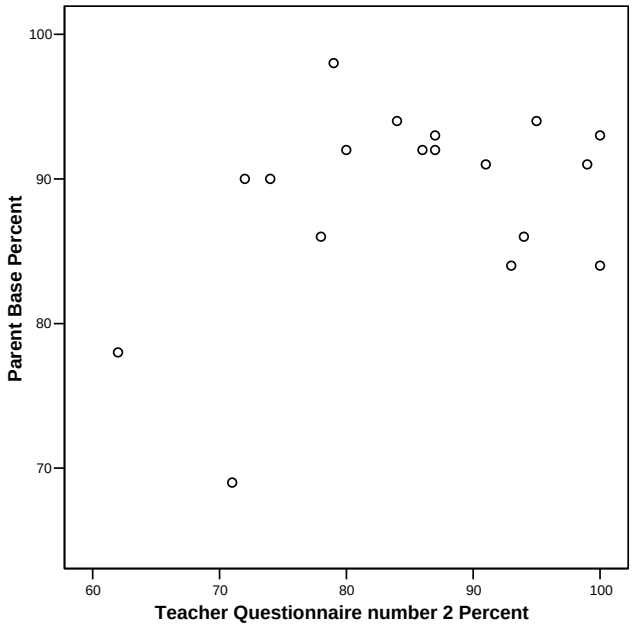


Figure 4-2. Bar graph of questionnaires means scores.

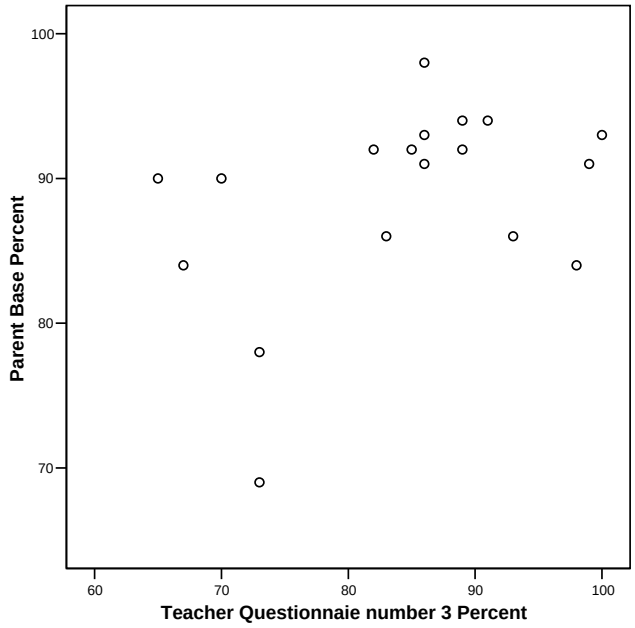
Linear Relationship between Questionnaires

The following eight scatter plot diagrams represent the linear relationships between 1) the teacher base questionnaire and teacher questionnaires 2,3, and 4 (Fig 4-3); 2) the parent base questionnaire and the teacher questionnaires 2,3, and 4 (Fig 4-4); and 3) relation across teacher questionnaires 2, 3, and 4 (Fig 4-5). The scatter plot diagrams show stronger meaningful clusters of dots among the relationships of teacher questionnaires and a weaker cluster of dots among the relationships of teacher scores compared to the parent scores. A stronger cluster is identified by an approximate linear relationship. The scatter plot diagrams can provide predictions of the approximation between the linear relationships between the X and Y-axis. The linear regression models (Tables 4-11 through 4-13), support the scatter plot diagrams' results by stating the *r*-

values of correlation based on a score of -1 to 1. The values for the teacher questionnaires are the strongest at $r = .728$, $r = .923$ *and* $r = .872$ since they are the closest values to 1.

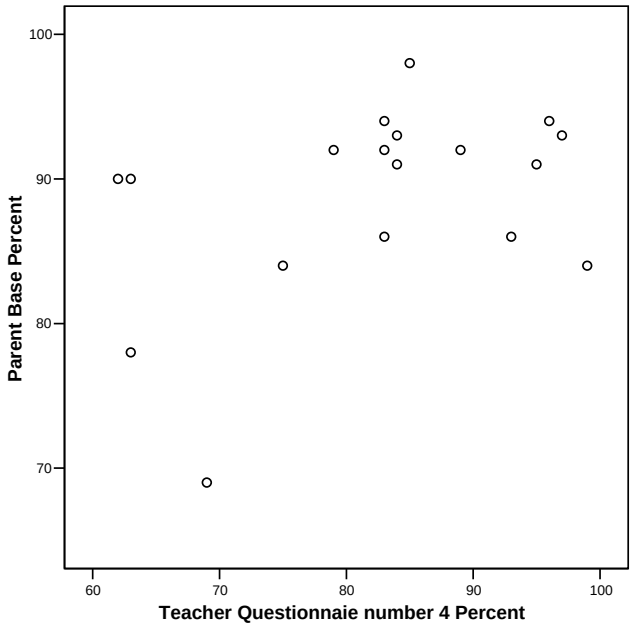


a)



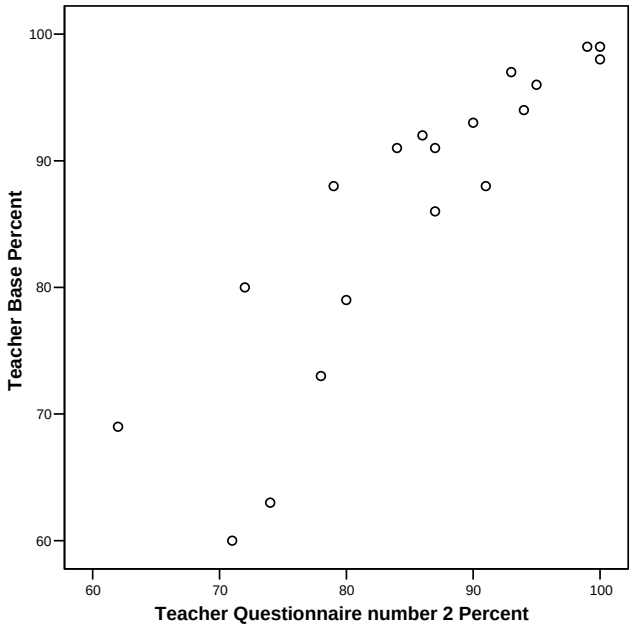
b)

Figure 4-3 a) Scatter diagram of Y=parent base questionnaire and X=teacher questionnaire 2. b) Scatter diagram of Y=parent base questionnaire and X=teacher questionnaire 3. c) Scatter diagram of Y=parent base questionnaire and X= teacher questionnaire 4.



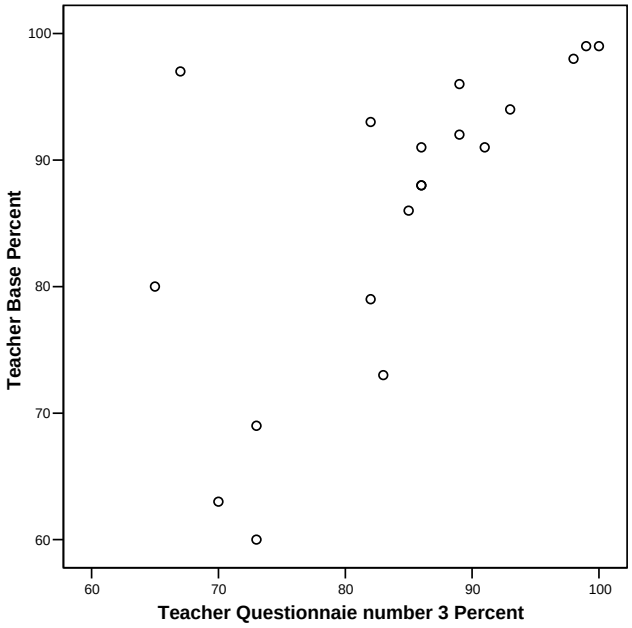
c)

Figure 4-3 Continued

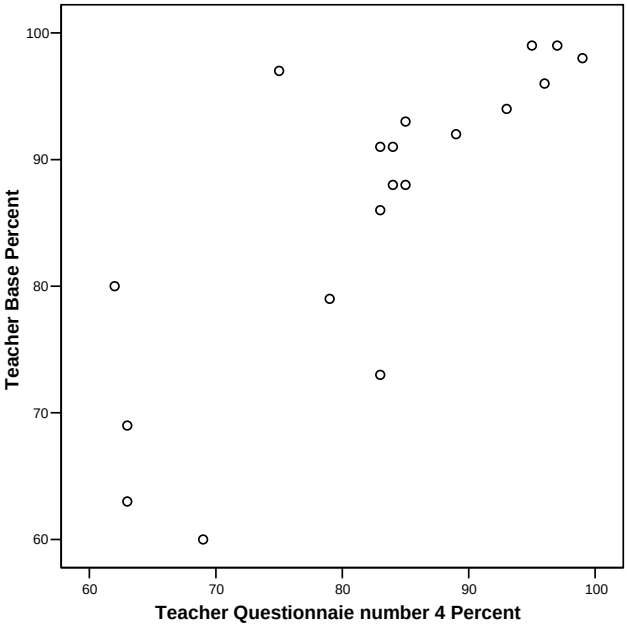


a)

Figure 4-4. a) Scatter diagram of teacher Y=base questionnaire and X=teacher questionnaire 2. b) Scatter diagram of Y=teacher base questionnaire and X=teacher questionnaire 3. c) Scatter diagram of Y=teacher base questionnaire and X=teacher questionnaire 4.

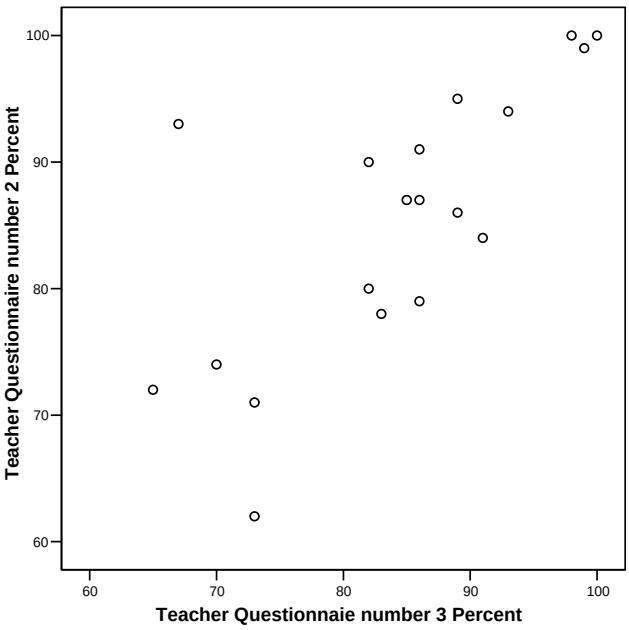


b)

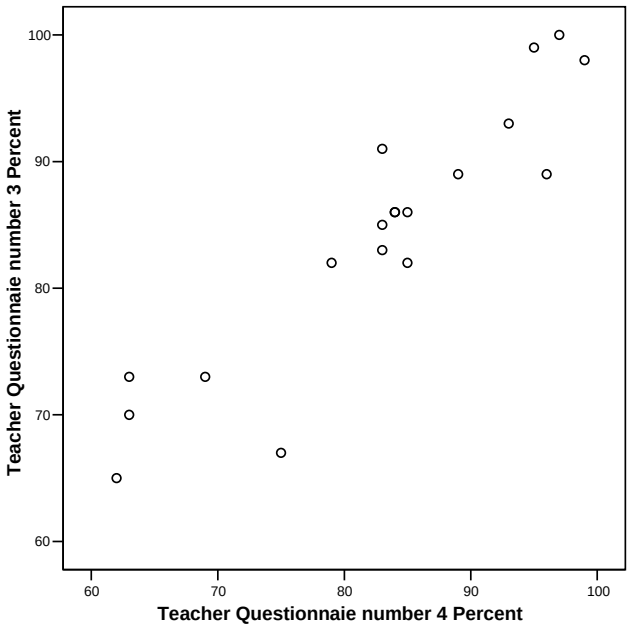


c)

Figure 4-4. Continued

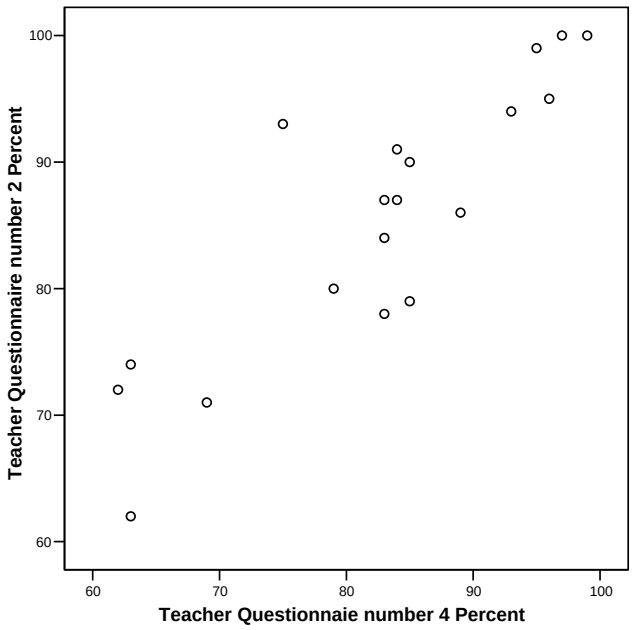


a)



b)

Figure 4-5. a) Scatter diagram of Y=teacher questionnaire 2 and X=teacher questionnaire 3. b) Scatter diagram of Y=teacher questionnaire 3 and X=teacher questionnaire 4. c) Scatter diagram of Y=teacher questionnaire 2 and X=teacher questionnaire 4



c)

Figure 4-5. Continued

Table 4-11. Linear regression of a) parent base questionnaire vs. teacher questionnaire 2. b) parent base questionnaire vs. teacher questionnaire 3. c) parent questionnaire vs. teacher questionnaire 4.

a)

Model	R	R Square
1	.378	.143

b)

Model	R	R Square
1	.399	.159

c)

Model	R	R Square
1	.406	.165

Table 4-12. Linear regression of a) teacher base questionnaire vs. teacher questionnaire 2. b) teacher base questionnaire vs. teacher questionnaire 3. c) teacher base questionnaire vs. teacher questionnaire 4.

a)

Model	R	R Square

1	.881	.777

b)

Model	R	R Square
1	.661	.437

c)

Model	R	R Square
1	.801	.641

Table 4-13. Linear regression of a) teacher questionnaire 2 vs. teacher questionnaire 3. b) teacher questionnaire 3 vs. teacher questionnaire 4. c) teacher questionnaire 2 vs. teacher questionnaire 4.

a)

Model	R	R Square
1	.728	.530

b)

Model	R	R Square
1	.923	.852

c)

Model	R	R Square
1	.872	.760

Observation Analysis

Significance of Means between Observations

There were six comparisons produced from the t-test (Table 4-14). The first three comparisons, were between the negative behaviors. The Pretreatment compared to Treatment 1 produced $p = .065$ (two-sided). Treatment 1 compared to Treatment 2 produced $p = .945$ (two-sided). Finally, the Pretreatment comparison to Treatment 2 produced $p = .095$ (two-sided).

The subsequent three comparisons were between the positive behaviors. The Pretreatment compared to Treatment 1 produced $p = .322$ (two-sided). Treatment 1 compared to Treatment 2 produced p = .00 (two sided). Finally, the Pretreatment comparison to Treatment 2 produced $p = .00$ (two-sided).

The significant *p*-values occurred between the comparison of negative behaviors in Pretreatment and Treatment 1 ($p = .065$) and between Pretreatment and Treatment 2 ($p = .095$). For the positive behaviors, the significant *p*-values were between the comparison of Treatment 1 and Treatment 2 ($p = .00$) and between Pretreatment and Treatment 2 ($p = .00$). These were the most significant because *p* was less than $\alpha = .10$.

Table 4-14. Paired sample t-test for frequency counts.

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	90% Confidence Interval of the Difference Lower	Upper			
Pair 1	NEGATIVE BEHAVIOR-Pretreatment vs. Treatment 1.	.21105	.46791	.10735	-.01447	.43658	1.966	18	.065
Pair 2	NEGATIVE BEHAVIOR-Treatment 1 vs. Treatment 2	.00737	.46060	.10567	-.21463	.22937	.070	18	.945
Pair 3	NEGATIVE BEHAVIOR-Pretreatment vs. Treatment 2	.21842	.54004	.12389	-.04187	.47871	1.763	18	.095
Pair 4	POSITIVE BEHAVIOR-Pretreatment vs. Treatment 1.	-.11789	.50478	.11581	-.36119	.12540	-1.018	18	.322
Pair 5	POSITIVE BEHAVIOR-Treatment 1vs. Treatment 2.	.71211	.40461	.09282	.51709	.90712	7.672	18	.000
Pair 6	POSITIVE BEHAVIOR-Pretreatment vs. Treatment 2.	.59421	.47629	.10927	.36465	.82377	5.438	18	.000

Behavior Counts

Tables 4-15 and 4-16 show the total number of positive and negative behaviors counts each child displayed during the observation periods.

Table 4-11. Total positive behavior counts per child.

		Pretreatment Positive Behaviors	Treatment 1 Positive Behaviors	Treatment 2 Positive Behaviors
	1	5	4	5
	2	5	3	1
	3	3	3	5
	4	3	4	4
	5	3	3	4
	6	1	4	3
	7	5	3	3
	8	4	2	4
	9	0	3	5
	11	3	4	4
	12	3	4	5
	13	3	1	2
	14	4	3	7
	15	3	5	3
	16	4	2	3
	17	3	5	2
	18	2	4	4
	19	2	6	2
	20	1	2	4
Total	n	19	19	19

Table 4-12. Total negative behavior counts per child.

		Pretreatment Negative Behaviors	Treatment 1 Negative Behaviors	Treatment 2 Negative Behaviors
	1	0	0	0
	2	1	1	5
	3	0	0	0
	4	3	0	0
	5	1	1	0
	6	0	0	0
	7	1	0	0
	8	0	1	0
	9	0	1	0
	11	0	0	2
	12	0	0	0
	13	1	3	0
	14	2	0	0
	15	3	0	0
	16	1	1	0
	17	2	0	0
	18	2	0	0
	19	1	0	2
	20	1	0	0
Total	n	19	19	19

Comparison of Total Behavior Counts

For the Pretreatment, which included observation weeks one and two, there were 19 total counts of observed negative behaviors and 57 total counts of observed positive behaviors. For Treatment 1, which included observation weeks three and four, there were 8 total counts of observed negative behaviors and 65 total counts of observed positive behaviors. Finally, for Treatment 2, which included observation weeks five and six, there were 9 total counts of observed negative behaviors and 73 total counts of observed positive behaviors (Figure 4-6, Figure 4-7).

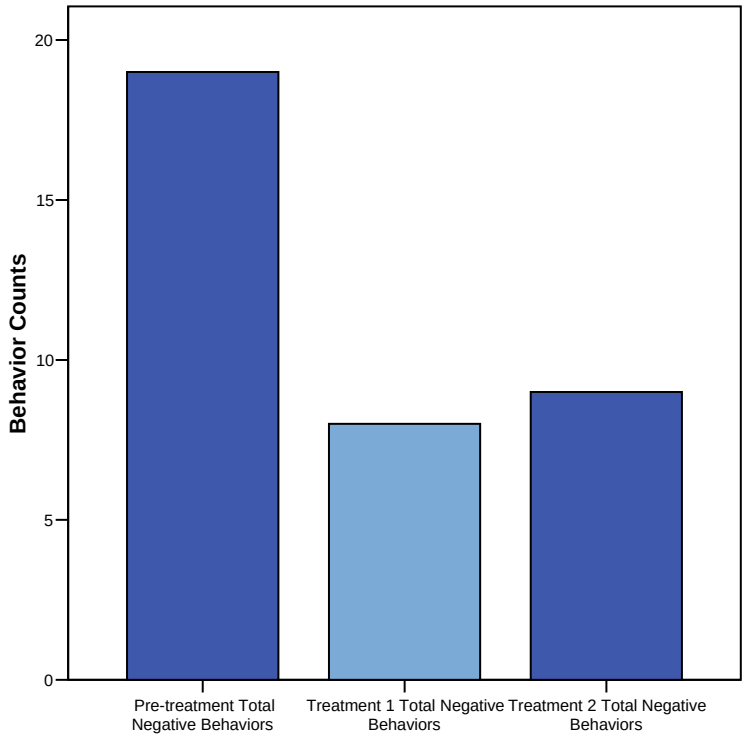


Figure 4-6. Comparison of total numbers for negative behaviors

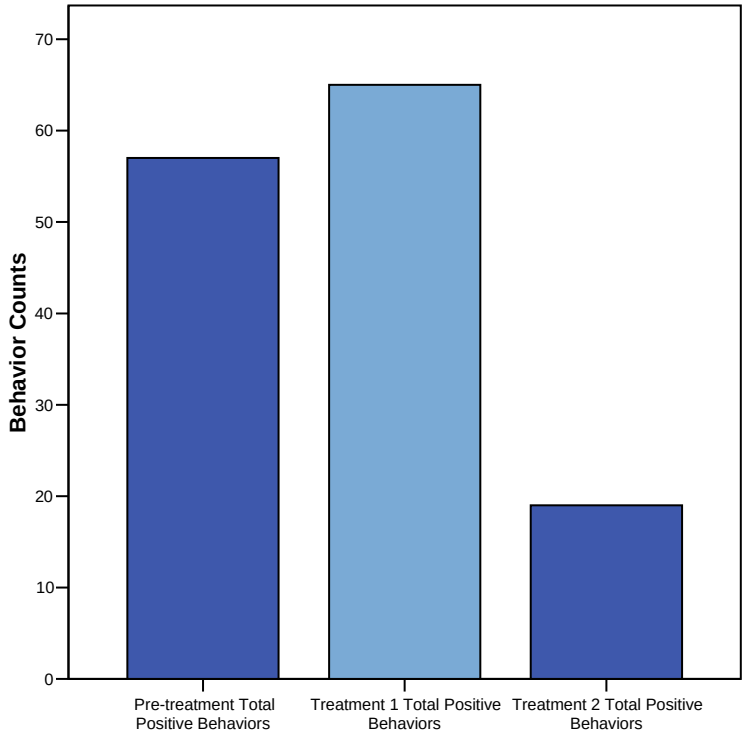


Figure 4-7. Comparison of total number for positive behaviors.

Summary

In conclusion, the use of descriptive statistics in this study aided in describing the sample used to collect the data by showing the representation in gender, age, and location of birth (i.e. United States or non-United States). The scatter plot diagrams comparing the different questionnaires showed a no correlation between the parent questionnaires and the teacher questionnaires. In contrast, the comparison among the teacher questionnaires showed a positive correlation in both scatter diagrams and linear regressions. The paired sample t-test for the questionnaire results revealed no significant difference between the behaviors displayed by children during the different observation periods. However, the t-test results for the behavior observations indicate a significant difference between the observation periods. Finally, the total number of positive and negative behaviors, represented in bar graphs, showed a strong positive correlation between the three observation periods.

CHAPTER 5
DISCUSSION AND CONCLUSIONS

Although preschool settings have been around since the 1920s, the proper design of these environments has recently become a focal point of interest. The increase in the number of children attending preschool has prompted a growing concern about the impact of the environment on individuals.

Previous research provided the foundation for the development of additional research in the area of childhood education. It is important to understand how the need for preschool environments developed and, how over the years, its physical appearance and use has become important. Key concepts previously studied by other researchers, present unanswered questions that may develop into further research topics.

The purpose of this study was to examine how the arrangement of the preschool classroom environment affects the children's behavior during their activity times. Specifically it sought to answer the question: Does the arrangement of the environment have an effect on the children's behavior?

Evaluation of the Physical Setting

Before making changes to the room arrangement, the space was evaluated by plan review and on-site verification. Problem areas and the preferred use, by the teachers and children, for the existing furnishing were documented. The on-site visit during normal classroom activities provided an understanding of how the space was used and which furnishing needed to be in close proximity to each other.

One problem identified as a potential cause for negative behaviors was the room's interference with the teachers' ability to supervise visually. The organization of the space created areas in which the children could play without direct visual contact from the teachers. An intervention was developed, redesigning the space to expose these hiding spots so teachers could focus more on helping the children during activity time and reducing the amount of negative behaviors produced by these hidden areas.

In room A, the block zone where children can engage in free play (Figure 5-1, Figure 5-2), was identified as a major problem area. As you can see from figures 5-1 & 5-2, when children sit to play, they cannot be seen from the farther end of the room. When teachers are occupied helping other children at the activity tables, their view of the children playing in the block area is obstructed since most of the activity areas are on the opposite side of the block area. The treatment applied gave the room the visual openness it needed. Room arrangement pictures of the Pretreatment, Treatment 1 and Treatment 2 may be found in Appendices I through L.

Base Parent/Teacher Questionnaires

When the two base questionnaires were compared, scores from the parent and teacher base questionnaires on each student did not agree, but the overall classroom scores were similar. This first comparison showed both parent and teachers had similar observations regarding the combined behavior of the participating children. There were 18 completed questionnaires from the parents compared to 19 from the teachers. The correlation coefficient of r=.536 revealed that there is slight positive correlation between the scores; however, the scatter diagram did not show a strong linear relationship. The differences within individual scores among the children may be a factor in the lack of a strong linear relationship. It was expected that parents and teachers would defer.

Figure 5-1. View of block area from room entrance.

Figure 5-2. Obstructed view of block area from activity tables.

Teachers report that it is common for parents to believe their children's behavior at home is the same as their behavior in school; however, this is often not accurate. Comparing the questionnaires was an important step in the process because overall, these questionnaires served as an underlining base for the rest of the study by providing average scores for teacher and parent's questionnaires.

Teacher Questionnaires

When the teacher questionnaires were compared across the three observation periods, there was no significance found, in fact, the *p*-values proved to be considerably higher than the *alpha* level of .10. A comparison of the means between the questionnaires showed that the mean score for each treatment period resulted in a lower score after each treatment was performed meaning the teachers' responses showed negative behaviors increased as each treatment period took effect. The researcher expected the mean score of Questionnaire 3 during Treatment 1 to be higher than both Questionnaires 2 and 4 (Pretreatment and Treatment 2).

Finally, a comparison of correlation between all the questionnaires was used to analyze the questionnaires. The linear regression results were supported by the results in the scatter plot diagrams; these stated that the stronger positive correlation occurred when the scores among Questionnaires 3 and 4 were compared. Overall, the tests for the questionnaires proved to have different results regarding the effect of the treatments on behavior. The differences between the teacher's scores could be due to each teacher's differing opinions and the different method each teacher used to grade the children.

Observation Analysis

The observation analysis was the strongest evidence to support the hypothesis that the arrangement of the environment has an effect on the children's behavior. Although

the analysis of the questionnaire responses failed to support the hypothesis, direct observations during activity time suggested a different trend in the data. The paired t-test results showed a significant difference ($p < .10$) for changes in negative behaviors between the Pretreatment and Treatment 1 showing that the amount of negative behaviors decreased during Treatment 1. Additionally, the number of negative behaviors decreased from 19 in the Pretreatment to 9 in Treatment 2.

The number of positive behaviors was significantly larger during Treatment 1 than during the Treatment 2; and the number of positive behaviors was larger for the Pretreatment period than for Treatment 2 ($p < .10$).

The significant difference between Pretreatment and Treatment 2 may be related to a drop of density in the classroom during the last week of the study. This last week was spring break for the university and not all 46 children were present in the classroom throughout the week. Although density was not a variable studied during the study, lower density may have had an impact on the children's behavior, therefore potentially reducing the number of negative behavior counts for Treatment 2 (Figures 4-6 and 4-7).

Although the room arrangement was the same for the Pretreatment and Treatment 2, the observation results were not duplicated for a couple of reasons. First, during the Pretreatment period density was not a factor. Most children were present and active participants within the classroom while for Treatment 2 the classroom density was lower. This change in density may have allowed teachers to have better visual connection with the remaining children. Second, children were more accustomed to being watched during Treatment 2 than during the Pretreatment. This may have been caused by the Hawthorne Effect, which suggests that a change in behavior might have occurred just from the

simple fact that children felt observed, and not necessarily due to the change in the environment (Merriam-Webster Online Dictionary, 2005). Third, using the camera as a secondary observation tool might have changed or altered the behaviors of children during Treatment 2 because, by this time, they were fully aware of its presence. Finally, the children were already familiar with the room arrangement for the Pretreatment and Treatment 2 but were unaccustomed to the room arrangement used for Treatment 1.

The number of behaviors did change between treatments, supporting the hypothesis. Negative behaviors decreased and positive behaviors increased when Treatment 1 was present in the room. These results demonstrate that the design of the physical environment may influence behavior in the classroom. Therefore, the design of the classroom environment may be an effective tool to minimize or prevent behavior problems.

Limitations

Because of its natural environment and setting, this study entailed some limitations. The data collected was from only one facility in central Florida limiting the sample size and demographics. In addition, there was neither guaranteed parental participation nor an assurance that parents would not withdraw their children after the start of the study. Due to field study conditions, there was no control over variables outside of school that may have affected a child's daily behavior. The absence of children due to sickness and holidays may have affected behaviors in the setting due to lower density. Fieldtrips, fire drills and other interruptions may have influenced children's behavior. Teachers' responses to the survey may have been because teachers interact with children all day and are likely to base their opinions not only on the behaviors during activity time, but also on the behaviors that occurred throughout the day indoors as well as outdoors. In

addition, some of the teachers returned their questionnaires after the deadline so their answers may have been influenced by the subsequent treatment periods. The study would be strengthened by a larger sample and longer duration for data collection. Finally, although observations were primarily documented by a single investigator, the supplementary use of a video camera verified the accuracy.

Suggestions for Further Research

Currently, there are a limited number of sources, which focus on the impact of the environment on children's behaviors. Therefore, it is important to recognize this study as a step toward expanding the research regarding educational settings for preschool age children. It is the opinion of this researcher that the area of early childhood education environmental research provides a wealth of information; and if researched properly, can provide useful guidelines for the future design of early childhood education and care facilities.

Future studies should focus on comparing results across classrooms located in more than one facility and include different populations and backgrounds to provide analysis that may be generalized. Furthermore, it is important to use more than one video camera when collecting data to avoid loss of information due to obstructions of the camera view.

Future studies should also perform a pre-study assessment on participants' behavior to avoid the use of children who could be considered outliers due to their extreme negative behavior. Researchers should have teachers respond to questionnaires for all participants and not only for their designated students. This can decrease bias from the teachers and standardize the results. Questionnaires should be returned according to a specific time schedule to avoid completion of questionnaires after changes have been made to the environment.

Instead of having teachers fill out questionnaires, researchers should consider having the teachers review the recorded video, and mark down behaviors they notice when they watch the videos. Researchers could also interview the children since at this age they are able to express themselves fluently.

Data collection should be over a longer period so that children will be observed for more days and for a longer time each day. The time allotted to observation should be dependent on the number of children and facilities that are observed. However, the researcher would recommend allowing a minimum of 20 minutes per child per day. When recording children, it would be best to hide the camera so children do not try to play with it or jump in front of it causing difficulties with accurate recording.

Future studies should focus on other environmental design issues such as acoustics, color and lighting. These variables are part of the whole environment and should be measured for confounds and the impact on the children's behavior.

Suggestions for Architects, Designers, Space/Facility Planners and Educators

The guidelines presented in the literature review are a foundation for the future development of preschool and educational facilities. As designers, planners and educators, we should consider children, the main users, as our fist priority and ensure we understand all aspects of the design of these facilities. It is important that educators are active participants in the design process, as they know how children are likely to use the space and are aware of environmental elements that work well for teaching and learning. Designers should take the time to interview not only teachers but also staff and parents to obtain an inclusive program for the development of these facilities.

The results of the present study indicated, although not strongly, that the proper design and arrangement of a room may have an impact on behavior. The guiding

principles specified by Olds (2001), represent a complete process for facility planning, design and use. It is the recommendation of this researcher that architects, designers, space/facility planners and educators reference Olds' (2001) manuscript when building, designing, planning and organizing educational environments for young children.

Conclusions

The results of this experimental research design did not show strong evidence to support the hypothesis. However, individual results were strong enough to conclude that the environment does have an effect on children's behavior. Direct observation of the children proved to be the most constructive and successful method of data collection. The results from the questionnaires may be influenced by the small sample size, as well as teacher biased or unpredictable events such as children's absence or withdrawal from the study. Further research might eliminate these problems with the use of a larger sample, more control over the instruments provided, and a specific period designated for data collection between treatments within the environment.

With the growing interest in preschool and early childhood environments, it is important to take into consideration the user and the user needs for these environments to avoid the presence of unnecessary negative behaviors and to optimize the learning experience of children. These spaces are not only a pastime, they are a place where children learn and acquire their first life experiences. It is our responsibility to further research the impact of environment on behavior as well as the proper design and treatment of preschool environments.

APPENDIX A
PARENTAL CONSENT

Parental Informed Consent: Students, Baby Gator Child Development and Research Center

Protocol Title: The Impact of the Learning Environment on a Child's Behavior.

Please read this consent document carefully before you decide to allow your child to participate in this study.

Purpose of the research study: The purpose of this study is to describe the impact of the learning environment on a child's behavior.

What your child will be asked to do in the study: Your child will not be asked to do anything other than attend class as normal. With your permission, your child will be videotaped during activity time.

Time required: Duration of the study is six weeks however; participation is only required three times a week and only during child's activity time.

Risks and Benefits: No more than minimal risk. There is no direct benefit to the participant in this research. However, this study may be beneficial to the future design of preschool facilities and can increase the understanding towards the impact of the learning environment on a child's behavior. These results may not directly help your child today, but may benefit future students.

Compensation: There is no compensation for participating in the study.

Confidentiality: Your child's identity will be kept confidential to the extent provided by the law. We will replace their names with code numbers. This list of names as well as

the video will be accessible only to the research team and will be kept locked in a secure location in the researcher's office during the duration of the study. Tapes will be destroyed after the completion of this project. Results will be reported in thesis format and in the form of group data.

Voluntary participation: Participation or non- participation in this study will not affect the children's grades or placement in any programs and participation is strictly voluntary.

Right to withdraw from the study: You have the right to withdraw consent for you and your child's participation at any time without consequence.

Whom to contact if you have questions about the study:

Miriam Garcia BA Department of Interior Design. 301 Diamond Village #6, Gainesville, FL 32603. Phone: 352-846-5788. Email: Dauphin03@msn.com.

Debra D. Harris, Ph.D. Department of Interior Design. PO Box 115705 Gainesville, FL 32611-5705. Phone: 352-392-0252 ext 457. Email: debraharris@dcp.ufl.edu. Fax: 352-392-7266.

Whom to contact about your rights as a research participant in the study:

UFIRB Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; ph 392-0433.

Agreement:

I have read the procedure described above. I voluntarily agree to allow my child to participate in the procedure and I have received a copy of this description.

Parent/Guardian: _____ Date: _____

2nd Parent/Witness: _____ Date: _____

APPENDIX B
INFORM CONSENT: PARENTS

Informed Consent: Parents, Baby Gator Child Development and Research Center.

Protocol Title: The Impact of the Learning Environment on a Child's Behavior.

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study: The purpose of this study is to describe the impact of the learning environment on a child's behavior.

What you will be asked to do in the study: To answer four questionnaires relating to your child's behavior.

Time required: The duration of the study is six weeks however; each questionnaire should take approximately 20 to 30 minutes.

Risks and Benefits: No more than minimal risk. There is no direct benefit to the participant in this research. However, this study may be beneficial to the future design of preschool facilities and can increase the understanding towards the impact of the learning environment on a child's behavior.

Compensation: There is no compensation for participating in the study.

Confidentiality: Your identity will be kept confidential to the extent provided by law. Each questionnaire will be given a number not a name. The list of names that will include each number will be kept under lock and key and will only be available to the research team. The results will be presented in a thesis format that will not include your name.

Voluntary participation: Your participation in this study is completely voluntary. There is no penalty for not participating.

Right to withdraw from the study: You have the right to withdraw from the study at anytime without consequence. You do not have to answer any questions you don't want to answer.

Whom to contact if you have questions about the study:

Miriam Garcia BA Department of Interior Design. 301 Diamond Village #6, Gainesville, FL 32603. Phone: 352-846-5788. Email: Dauphin03@msn.com.

Debra D. Harris, Ph.D. Department of Interior Design. PO Box 115705 Gainesville, FL 32611-5705. Phone: 352-392-0252 ext 457. Email: debraharris@dcp.ufl.edu. Fax: 352-392-7266.

Whom to contact about your rights as a research participant in the study:

UFIRB Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; ph 392-0433.

Agreement:

I have read the procedure described above. I voluntarily agree to participate in the procedure and I have received a copy of this description.

Participant: _____ Date: _____

Principal Investigator: _____ Date: _____

APPENDIX C
INFORM CONSENT: TEACHERS

Informed Consent: Teachers, Baby Gator Child Development and Research Center

Protocol Title: The Impact of the Learning Environment on a Child's Behavior.

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study: The purpose of this study is to describe the impact of the learning environment on a child's behavior.

What you will be asked to do in the study: To answer four questionnaires relating to your students behavior.

Time required: The duration of the study is six weeks however; each questionnaire should take approximately 20 to 30 minutes.

Risks and Benefits: No more than minimal risk. There is no direct benefit to the participant in this research. However, this study may be beneficial to the future design of preschool facilities and can increase the understanding towards the impact of the learning environment on a child's behavior.

Compensation: There is no compensation for participating in the study.

Confidentiality: Your identity will be kept confidential to the extent provided by law. Each questionnaire will be given a number not a name. The list of names that will include each number will be kept under lock and key and will only be available to the research team. The results will be presented in a thesis format that will not include your name.

Voluntary participation: Your participation in this study is completely voluntary. There is no penalty for not participating.

Right to withdraw from the study: You have the right to withdraw from the study at anytime without consequence. You do not have to answer any questions you don't want to answer.

Whom to contact if you have questions about the study:

Miriam Garcia BA Department of Interior Design. 301 Diamond Village #6, Gainesville, FL 32603. Phone: 352-846-5788. Email: Dauphin03@msn.com.

Debra D. Harris, Ph.D. Department of Interior Design. PO Box 115705 Gainesville, FL 32611-5705. Phone: 352-392-0252 ext 457. Email: debraharris@dcp.ufl.edu. Fax: 352-392-7266.

Whom to contact about your rights as a research participant in the study:

UFIRB Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; ph 392-0433.

Agreement:

I have read the procedure described above. I voluntarily agree to participate in the procedure and I have received a copy of this description.

Participant: _____ Date: _____

Principal Investigator: _____ Date: _____

APPENDIX D
PARENT QUESTIONNAIRE

Preschool Social Behavior Scale

Child's Name _____ Child's sex: Male or Female?

Age _____

	Never or almost never true	almost not often	some times	often	always or always
1. This child is good at sharing and taking turns	1	2	3	4	5
2. This child kicks or hits others.	1	2	3	4	5
3. This child is helpful to peers.	1	2	3	4	5
4. This child tells a peer that he/she won't play with that peer or be that peer's friend unless he/she does what this child asks.	1	2	3	4	5
5. This child verbally threatens to hit or beat up other children.	1	2	3	4	5
6. This child is kind to peers.	1	2	3	4	5
7. This child pushes or shoves other children.	1	2	3	4	5
8. This child tells others not to play with or be a peer's friend.	1	2	3	4	5
9. This child doesn't have much fun.	1	2	3	4	5
10. This child says or does nice things for other kids.	1	2	3	4	5
11. When mad at a peer, this child keeps that peer from being in the play group.	1	2	3	4	5
12. This child verbally threatens to physically harm another peer in order to get what they want.	1	2	3	4	5

	Never or almost never true	not almost true	some often	times	often	always or always
13. This child tries to embarrass peers by making fun of them in front of other children.	1	2	3	4	5	
14. This child ruins other peer's things (e.g. art projects, toys) when he/she is upset.	1	2	3	4	5	
15. This child tells a peer they won't be invited to their birthday party unless he/she does what the child wants.	1	2	3	4	5	
16. This child looks sad.	1	2	3	4	5	
17. This child throws things at others when he/she doesn't get his/her own way.	1	2	3	4	5	
18. This child smiles at other kids.	1	2	3	4	5	
19. This child walks away or turns his/her back when he/she is mad at another peer.	1	2	3	4	5	
20. This child verbally threatens to push a peer off a toy (e.g. tricycle, play horse) or ruin what the peer is working on (e.g. building blocks) unless that peer shares.	1	2	3	4	5	
21. This child tries to get others to dislike a peer (e.g. by whispering mean things about the peer behind the peer's back).	1	2	3	4	5	
22. This child verbally threatens to keep a peer out of the play group if the peer doesn't do what the child says.	1	2	3	4	5	
23. This child hurts other children by pinching them.	1	2	3	4	5	
24. This child is well liked by peers of the <u>same</u> sex.	1	2	3	4	5	
25. This child is well liked by peers of the <u>opposite</u> sex.	1	2	3	4	5	

Thank you for your time and participation, your help is greatly appreciated. Please return this to me by _____.

APPENDIX E
TEACHER QUESTIONNAIRE

Preschool Social Behavior Scale – Teacher

Child's Name _____	Child's sex: Male or Female?
Teacher's Name _____	Age _____

	Never or almost never true	almost not often	some times	often	always or always
1. This child is good at sharing and taking turns	1	2	3	4	5
2. This child kicks or hits others.	1	2	3	4	5
3. This child is helpful to peers.	1	2	3	4	5
4. This child tells a peer that he/she won't play with that peer or be that peer's friend unless he/she does what this child asks.	1	2	3	4	5
5. This child verbally threatens to hit or beat up other children.	1	2	3	4	5
6. This child is kind to peers.	1	2	3	4	5
7. This child pushes or shoves other children.	1	2	3	4	5
8. This child tells others not to play with or be a peer's friend.	1	2	3	4	5
9. This child doesn't have much fun.	1	2	3	4	5
10. This child says or does nice things for other kids.	1	2	3	4	5
11. When mad at a peer, this child keeps that peer from being in the play group.	1	2	3	4	5
12. This child verbally threatens to physically harm another peer in order to get what they want.	1	2	3	4	5

	Never or almost never true	not often	some times	often	always or always
13. This child tries to embarrass peers by making fun of them in front of other children.	1	2	3	4	5
14. This child ruins other peer's things (e.g. art projects, toys) when he/she is upset.	1	2	3	4	5
15. This child tells a peer they won't be invited to their birthday party unless he/she does what the child wants.	1	2	3	4	5
16. This child looks sad.	1	2	3	4	5
17. This child throws things at others when he/she doesn't get his/her own way.	1	2	3	4	5
18. This child smiles at other kids.	1	2	3	4	5
19. This child walks away or turns his/her back when he/she is mad at another peer.	1	2	3	4	5
20. This child verbally threatens to push a peer off a toy (e.g. tricycle, play horse) or ruin what the peer is working on (e.g. building blocks) unless that peer shares.	1	2	3	4	5
21. This child tries to get others to dislike a peer (e.g. by whispering mean things about the peer behind the peer's back).	1	2	3	4	5
22. This child verbally threatens to keep a peer out of the play group if the peer doesn't do what the child says.	1	2	3	4	5
23. This child hurts other children by pinching them.	1	2	3	4	5
24. This child is well liked by peers of the <u>same</u> sex.	1	2	3	4	5
25. This child is well liked by peers of the <u>opposite</u> sex.	1	2	3	4	5
26. As a teacher you like the current room arrangement	1	2	3	4	5
27. This child has a hard time recognizing what to do within each activity zone in the current arrangement.	1	2	3	4	5
28. This child has a hard time sharing the activities in the current setting.	1	2	3	4	5
29. This child displays behavior problems during activity time.	1	2	3	4	5

	Never or almost never true	not often	some times	often	always or almost always true
30. This child needs a space to spend time alone.	1	2	3	4	5

Thank you for your time and participation, your help is greatly appreciated. Please return this to me by_____.

APPENDIX F
FREQUENCY COUNT TABLE

Week#

		Name	A	D	NC	E	C
Mon __/__/__	19						
Mon __/__/__	8						
Mon __/__/__	9						
Mon __/__/__	11						
Tue __/__/__	2						
Tue __/__/__	13						
Tue __/__/__	12						
Tue __/__/__	4						
Wed __/__/__	3						
Wed __/__/__	1						
Wed __/__/__	16						
Wed __/__/__	6						
Thu __/__/__	7						
Thu __/__/__	17						
Thu __/__/__	10						
Thu __/__/__	15						
Fri __/__/__	5						
Fri __/__/__	14						
Fri __/__/__	20						
Fri __/__/__	18						

Agression- any negative physical behavior directed towards another person including: hitting, biing, pinching, kicking, pulling hair, pulling, pushing, throwing objects, spitting or squeezing.

Disruption- a behavior that interferes with the ongoing activity, such as verbal talk which is loud or out of context, making inappropriate noises, screaming/yelling, dropping to the ground, and remaining there, attempting to leave an area/room or leaving the area /room w/o permission.

Non Compliance- within five seconds after being given a teacher directive the child does not comply. The directive may be given directly to the child or a group of children.

Engagement- attention to or active participation in an activity in which the child is involved.

Compliance- within five seconds after being given a teacher directive the child complies. The directive may be given directly to the child or a group of children.

APPENDIX G
RANDOMIZER RESULTS

Research Randomizer Results

6 Sets of 20 Unique Numbers Per Set
Range: From 1 to 20 -- Unsorted

Job Status: **Finished**

Set #1:

p1=**19**, p2=**8**, p3=**9**, p4=**11**, p5=**2**, p6=**13**, p7=**12**, p8=**4**, p9=**3**, p10=**1**, p11=**16**, p12=**6**, p13=**7**, p14=**17**, p15=**10**, p16=**15**, p17=**5**, p18=**14**, p19=**20**, p20=**18**

Set #2:

p1=**5**, p2=**2**, p3=**14**, p4=**16**, p5=**10**, p6=**4**, p7=**15**, p8=**3**, p9=**11**, p10=**18**, p11=**19**, p12=**20**, p13=**1**, p14=**12**, p15=**6**, p16=**7**, p17=**13**, p18=**8**, p19=**17**, p20=**9**

Set #3:

p1=**11**, p2=**12**, p3=**15**, p4=**8**, p5=**18**, p6=**3**, p7=**5**, p8=**1**, p9=**9**, p10=**19**, p11=**6**, p12=**2**, p13=**10**, p14=**17**, p15=**13**, p16=**7**, p17=**16**, p18=**20**, p19=**14**, p20=**4**

Set #4:

p1=**1**, p2=**10**, p3=**15**, p4=**13**, p5=**14**, p6=**9**, p7=**2**, p8=**11**, p9=**5**, p10=**18**, p11=**3**, p12=**4**, p13=**16**, p14=**8**, p15=**6**, p16=**7**, p17=**17**, p18=**19**, p19=**12**, p20=**20**

Set #5:

p1=**16**, p2=**12**, p3=**11**, p4=**6**, p5=**2**, p6=**20**, p7=**18**, p8=**4**, p9=**1**, p10=**3**, p11=**14**, p12=**15**, p13=**10**, p14=**13**, p15=**7**, p16=**8**, p17=**9**, p18=**5**, p19=**19**, p20=**17**

Set #6:

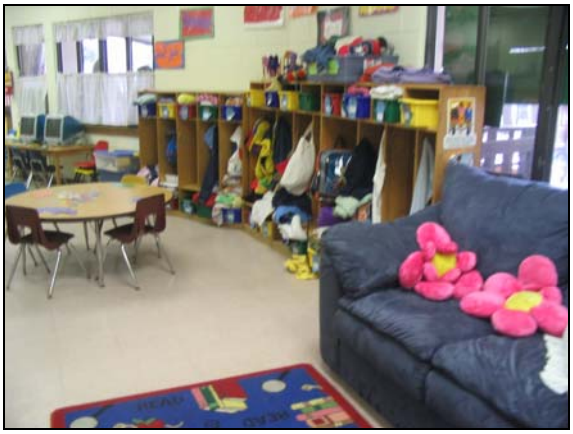
p1=**7**, p2=**12**, p3=**20**, p4=**18**, p5=**5**, p6=**11**, p7=**15**, p8=**4**, p9=**16**, p10=**8**, p11=**6**, p12=**14**, p13=**3**, p14=**17**, p15=**10**, p16=**19**, p17=**9**, p18=**1**, p19=**13**, p20=**2**

APPENDIX H
ASSENT SCRIPT

Hi, my name is Miriam and I will be volunteering at your school for the next six weeks. I am interested in observing what you learn and how your class plays together. I will also write a story about your class while I'm here. Is it ok with you if I do this?

APPENDIX I
PRETREATMENT/TREATMENT #2 PICTURES ROOM A






APPENDIX J
PRETREATMENT/TREATMENT #2 PICTURES ROOM B

APPENDIX K
TREATMENT #1 PICTURES ROOM A

APPENDIX L
TREATMENT #1 PICTURES ROOM B

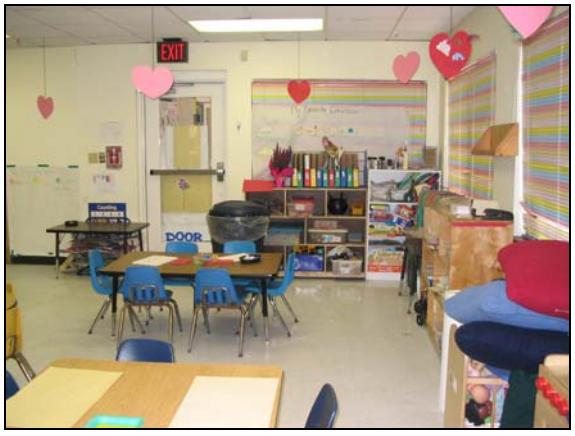


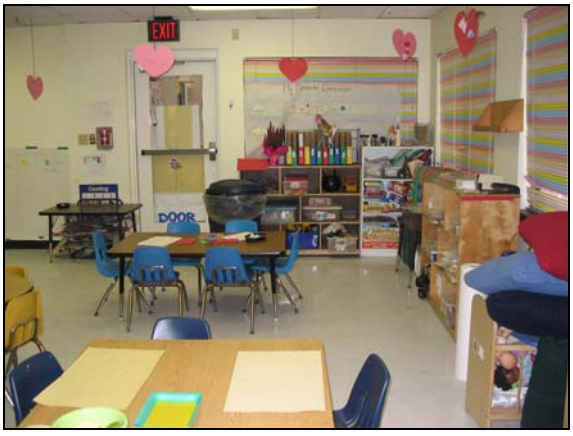



Writing


Writing


Writing


EXIT
DOOR


EXIT
DOOR

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BIOGRAPHICAL SKETCH

Miriam Margarita Garcia Ancheita, was born in July 1980 in Mexico City, Mexico. After residing there for 13 years, Miriam and her family moved to Coral Springs, FL, in October of 1993. Since childhood, Miriam has been interested in art, sketching and architecture.

Upon completion of high school in 1999, Miriam enrolled at the University of Florida where she completed her bachelor's degree in interior design in April 2004. While attending her undergraduate degree, Miriam was a member of the American Society of Interior Designers where she served as treasurer during the 2003-2004 academic years.

Eager to continue her education, Miriam enrolled in the 4+1 Interior Design program at the University of Florida and began her Master of Interior Design degree during the fall semester of her senior undergraduate year. Her main research focus was in educational design.

Upon completion of her degree in August of 2005, Miriam plans to use the knowledge she has gained at the University of Florida to work in the field of interior design and eventually teach at a university level.