

Transitional Space and Preschool Children's Play & Learning Behavior in Childcare Environment

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ABSTRACT: Research shows that the built environment influences children's behavior. A number of previous studies indicate that the indoor environment, as well as the outdoors, motivates children's activities. However, very few, if not any, empirical studies exist on the relationship between *in between* transitional space and children's behavior. Transitional space is defined by the interrelation between the indoors and the outdoors and is often described as an important space for children by researchers, educators and designers. This paper describes the methodology of a research design which aims at examining the claim of the importance of transitional space in children's lives with empirical evidence.

Case study research will be conducted in childcare settings on preschool age (3-5 years) children. The study will employ Behavioral Mapping as its primary data collection method and compare behavioral variances between indoor, outdoor and the transitional environment. Behavioral mapping provides the unique opportunity of measuring actual use of a site and capable of providing data for understanding the usage pattern of a space. It is, in fact, the only instrument which can make behavior *visible* in the context of a physical environment. *Play* and *learning* are the two observable behaviors of children in this study which are taken into account as dependent/measured variables. Visual analysis and statistical analysis of data gathered by behavioral mapping will be corroborated by qualitative questionnaire data analysis.

It is expected that findings of this research will demonstrate the value of transitional space for influencing certain play and learning behavior among children, which are restricted to or limited in indoor or outdoor environments. It is also assumed that the methodology described in this research will depict the ways of defining and measuring transitional space variables which are crucial from the perspectives of children's usage. Aim of this research is to influence design awareness and design policy for childcare environment.

KEYWORDS: transitional space, behavioral mapping, preschool age children, play and learning behavior.

1. INTRODUCTION

Throughout history, architecture has both accommodated and constrained behavior, and it is not surprising that there has been a considerable amount of discussion on behavioral research for architectural design (Lang, 1974). Schools, including care environments are among the four most influential environmental settings in the lives of the children alongside natural environment, home environments and neighborhood landscapes (Irwin & Joachim, 1978). How the architectural design of a school may influence the play and learning behavior of children is an emerging issue; both in the fields of design and environmental behavior studies. However, very few studies have provided empirical evidences on the relationship between architectural variables and children's behavior in childcare/preschool settings. Children have a decidedly different perception of architecture. Where adults perceive space more on form, function and aesthetic, children see the space more on its functions rather than aesthetic (Christensen, 2008). Research addressing the relationship between architecture and children's behavior, therefore, demands a different methodological approach. Early childhood institutes are much more than just institutes for education and care. Children spend most of their waking hours in such environments, and that should in itself prompt investigation into the impact the physical environment has on them (Martin, 2006). Educational research has focused on what is taught, and how it is taught, however, what has received too little attention is the physical environment in which education occurs (Sanoff, 2009). There seems to be a lack of research in educational settings that look into the school environment and children's behavior (Martin, 2006). Very few research studies have examined the role of transitional space on play and learning behavior of preschool children.

1.1. Why Transitional Space?

In this study, transitional space refers to any space which cannot be defined as an indoor or outdoor. An indoor space is formally defined by architectural enclosure like walls and roof and contains controlled

environment. The outdoor on the other hand refers to the surrounding site area of the building which defines and contains the indoor environment. Transitional space lies between the indoor and the outdoor. There are few fragmented clues in thoughts and writings of researchers, reformists, designers and philosophers which impose importance of research on the relationship between transitional space and children's behavior. Revisiting those clues is of prior significance for this research. Perhaps the boldest statement on the importance of the transitional space in an early childhood institution is given by Olds in her famous book 'Child Care Design Guide' (2001). She has given specific instruction for providing a strong relationship between indoor/outdoor space in a childcare center and emphasized on making the most of a transitional outdoor space. She described transitional space as the suitable area for *messy* activities encouraging experimentation. Her ideas are incorporated in *Child Care Center Design Guide* by the U. S. General Service Administration (GSA) and they also provided guidelines for creating a stronger bond between indoor-outdoor space in a childcare center by providing well designed transitional space (GSA, 2003). Moore and Cosco emphasized on the importance of good transitional space in the school environment in their design approach (Moore & Cosco, 2007) undertaken for naturalizing the Montessori school grounds. They mentioned about the visionary interest in transitional space of Maria Montessori, the legendary physician and educator, best known for the philosophy of education which bears her name (Montessori system). Design of early examples of Montessori schools bears signs of her vision for using transition spaces for specific activities connecting classrooms to the outdoors. This is perhaps the earliest attempt to incorporate transitional space as an important aspect of design for motivating play and learning among young children. Moore and Cosco (Moore & Cosco, 2007) has further elaborated on the value of indoor – outdoor transitions of space and mentioned that where classrooms meet the outdoors are crucial areas, which demand designers intervention. Frost and colleagues in their work (Frost, Wortham, & Reifel, 2001) has also given importance to transition space for play behavior and mentioned that the best play and learning places for children flow between the indoor and the outdoor settings. The authors also emphasized on the need for more studies that would explore the relationship between transitional space and children's activities.

1.2. Why Play and Learning?

Play and learning are perhaps the two most influential observable behavioral outcomes of children that can be heavily attributed to the physical/environmental variables. In early childhood and preschool age, play and learning are often inseparable and closely knit to each other. Play is central to the process of socialization, and during these years children assimilate environmental experience and information through play which enhances their cognitive abilities. Play, is the central essence of childhood; one of the most essential criteria for healthy physical, social, emotional, and intellectual development of the child. Literature emphasizing the importance of play in lives of children seems to be an infinitive source over time. Beginning from the time of eminent psychologist Parten and Piaget, to the present day era of behavioral studies; researchers were univocal about the numerous developmental roles of play. Play contains all developmental tendencies and is itself a significant source of development. Children are at the highest level of development when they are at play (Vyogotski, 1978). Play contributes not only to the health and wellbeing of a child, but it is equally beneficial for his/her cognitive development, brain development, social communication skills, creativity and imagination. Many organizations have advocated for the important role of play in children's development. For example, the NAEYC, the leading organization of early childhood educators developed a position statement on principles of child development and learning that inform developmentally appropriate practice. The statement includes the item play as a powerful vehicle for children's social, emotional, and cognitive development (NAEYC, 2009).

1.3. Why Preschool Children and Childcare Environment?

Preschool age is defined as the age range from 3 years to 5 years (GSA, 2003). Between the ages of 3 and 5, children are still in their *play years*. Play is central to the process of socialization, and during these years children assimilate environmental experience and information through play (Narayan, 2010). In the perspective of child development, McDevitt and Ormrod (2002) posited that early childhood is a period of incredible fantasy, wonder, and play. They perceive the world as a forum for imagination and drama. That is they reinvent the world, try on new roles, and struggle to play their parts in harmony. Through sensorial and motor activities with peers and adults the children rapidly develop their language and communication skills. During these years, children assimilate environmental experience and information which enhances their cognitive abilities. Childcare has become an accepted aspect of childhood. Early care environments should be subjected to research, particularly as the child may spend the majority of his/her waking hours in a childcare setting (Goelman & Jacobs, 1994). Also, childcare environment is suitable from the observational methodology stance of the study because It is not as regularized as formal schools, therefore, provides researchers the opportunity of observing untaught and spontaneous responses of children to their surrounding environment. Childcare and preschools predominantly house children of 3-5 years of age.

2.

2. BACKGROUND LITERATURE

2.1. Defining Transitional Space

This study is particularly interested in transitional space in architecture which demarks the relationship between the indoor space and the outdoor space. Surprisingly, an elaborated search was unsuccessful in finding studies that have actually discusses the architectural aspects of such a relationship. Harle has emphasized on the uniqueness of transitional spaces which demarked the relationship between indoor/outdoor (1993). He has also said that these (transitional) spaces are more necessary for children and old people than for working adults.

More clearly stated definition of transitional space and indoor outdoor relationship has come from a design guideline for childcare center (GSA, 2003). They described transitions as to be the link between interior and exterior spaces such as a deck or open vestibule. From a childcare design point of view, transitional areas allow for a blend of interior and exterior environments and can function as a point of departure or staging area for play yard excursions. This definition is given prior importance because it directly addresses the need of such transitional spaces from children's point of view. This study tries to generate its own definition of transitional space consistent with the research perspective. Figure 2 shows how transitional spaces can be formed by removing defining elements (wall/s, roofing) of an interior and illustrates few of the possibilities of transitional spaces that may occur between the complete indoor and outdoor. The definition that will be used for *transitional space* is as followed

If one or more wall elements and/or the roof are entirely or partially removed to expose an enclosed environment to the outdoors, then such partially enclosed space becomes a transitional space. Examples of such transitional space are verandah, open vestibule, covered walkway, garden pergola etc.

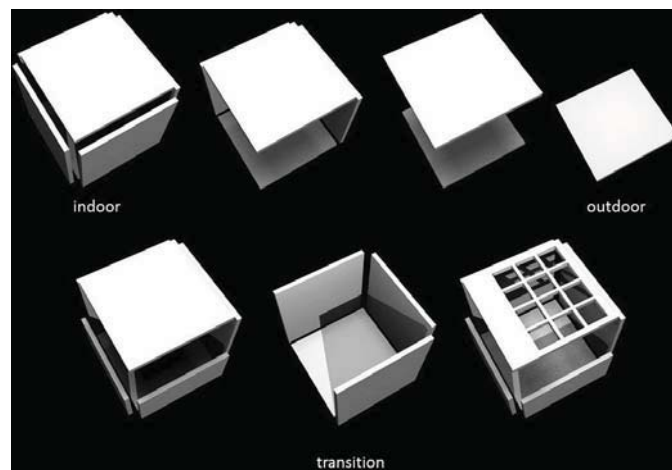


Figure 1: Transitional space can be any combination that lies between complete indoors to complete outdoors (author)

2.2. Extent Research and Their Findings

No research study was found which tried to establish the relationship between transitional space and children's behavior. This subsection tries to summarize similar research findings which have examined the role of certain built-environment variables on specific behavior of children (see Table 1). There are few studies which have examined the role of indoor or outdoor space on children's behavior. Sandra Home Martins review literature titled *The Classroom Environment and Children's Performance – Is There a Relationship* (Martin, 2006) was a good starting point which summarized findings of many previous studies exploring the relationship between various classroom (indoor) variables and the performance of children. The author in her discussion provided a classification of such variables based on the empirical findings and discussed them under four broad categories namely function, room organization, the ambient environment and other environmental factors. Indoor – outdoor relationship of space was absent from the list of the author. There is a good amount of studies which have established the importance of outdoor environment in lives of young children. The outdoor is the place where the diversity of the natural world is presented in all its sensory glory, and if the outdoor environment is sufficiently diverse, children and teachers can together ride the wave of motivation (Moore, 1996). In a study of 41 programs, it was found that in lower quality outdoor environments children engaged themselves in more functional and repetitive play while in higher quality outdoor environments, children showed a tendency to display more constructive play. As the quality of the

outdoor environment decreased, the frequency of negative behavior increased (Debord, Moore, Cosco, Hestenes, & McGinnis, 2005). One research showed that preschool children were more likely to engage in more complex forms of peer play (i.e., interactive and dramatic play) outdoors than indoors (Shim, Herwig, & Shelley, 2001).

Table 1: Literature list indicates a lack of previous research on transitional space for children

Indoor(classroom) environment & children's behavior	Outdoor environment & children's behavior
The Classroom Environment and Children's Performance – Is There a Relationship' (Martin, 2006)	The Preschool Outdoor Environment Measurement Scale Debord, K., Moore, R., Cosco, N., Hestenes, L., & McGinnis, J. (2005)
Preschool Science Environment: What Is Available in a Preschool Classroom? (Tu 2006)	Childhood's Domain: Play and Place in Child Development Moore, R. (1986)
The Classroom Environment and Its Effects on the Practice of Teachers (Martin, 2002)	Preschoolers' Play Behaviors with Peers in Classroom and Playground Settings (Shim, Herwig, & Shelley, 2001)

2.3. Variables of Play and Learning

The research heavily referred the introduction of the book titled *Children's Play in Child Care Settings* by Goelman and Jacobs (1994) for understanding the complex range of variables of play and learning of children. A list of possible play variables in childcare settings is generated based on the discussion provided by this book (see Table 2). Some of these variables were considered for coding as other relevant variables of the study.

Table 2: List of other independent variables of play and learning

CATEGORY	VARIABLES	MEASUREMENT
Child Data	Gender, age, socioeconomic, familiarity with child care setting, average hours in child care	Observation + mapping/coding questionnaire
Environmental Data	Amount, novelty, types and realism of available play material	Systematic observation
	Crowding/density	Systematic observation
	Amount of open space	Systematic observation
	Space organization	Systematic observation
	Climate condition	Recorded data
Miscellaneous Data	Daily/weekly schedule	Questionnaire
	Caregivers' education	Questionnaire

(Based on *Children's Play in Child Care Settings* by Goelman and Jacobs)

3. THEORETICAL PERSPECTIVES AND RESEARCH QUESTION

At its conceptual level, the study will examine a relationship between the child's behavior and its environment. This relationship is mentioned as to be a reciprocal one in many studies (Björklid 1982, Moore 1986). For its conceptual base, this study revisits a fundamental concept in the field of Environment and Behavior of Children commonly termed as Ecological Psychology. Behavioral Setting by the eminent social psychologist Roger G. Barker emphasizes the reciprocity of the environment-behavior relationship and is considered to be a good fit for the study in hand. Behavior setting has been applied for decades as a useful construct in environment-behavior research. Behavior settings are ecological units where the physical

environment and behavior are indissolubly connected. These eco-behavioral units were first described by Barker (1976). Behavior settings have a clear structure: they are located in time and space, they are composed of entities and events (people, objects, and behavior) and other processes (sound, shade, etc.), their spatial and temporal boundaries are identifiable.

3.1. Research Questions

The background literature leads the study towards its primary research questions. The study asks -*Why is transitional space in preschool/childcare architecture crucial for children's play and learning behavior?*

The study would try to investigate whether the transitional space accommodates certain level or type of play and learning activities among children which is not afforded in the other environmental settings (indoor or outdoor). The second research question would try to investigate the mechanism of the relationship between transitional space and children's behavior. The question is stated as - *How does a transitional space impact preschool age children's play and learning behavior?*

The study is also interested in learning about the qualitative values of transitional space and asks - *What is the value of a transitional space in the school/childcare environment of preschool age children?* It is expected that finding the answers of these three research questions would identify empirical evidence of the importance of well-designed transitional space.

4. METHODOLOGY

4.1. Research Design

The research will be conducted in two distinct phases. The first phase of the study adopts a single case study research design (Yin, 2003; Groat & Wang, 2002). The main theme of the study is to compare play and learning activities of preschool children between transitional space and other environments (indoor and outdoor). The research intends to learn from the differences of level and diversity of play/learning between transitional, indoor and outdoor environment in a child care setting. The case should be carefully selected so that the variation between outdoor, indoor and transitional environment is prominent and well defined. The second phase will be a multiple case study design. Behavior and activity data will be collected from different schools/childcare with varying degree of transitional spaces. Besides observational data from behavior mapping, this phase will also incorporate questionnaire analysis of teachers to understand how transitional space can become a crucial determinant for play and learning activities in early learning environment of children. Conclusions drawn from the 1st and 2nd phase of the research will be used to answer the 3rd question.

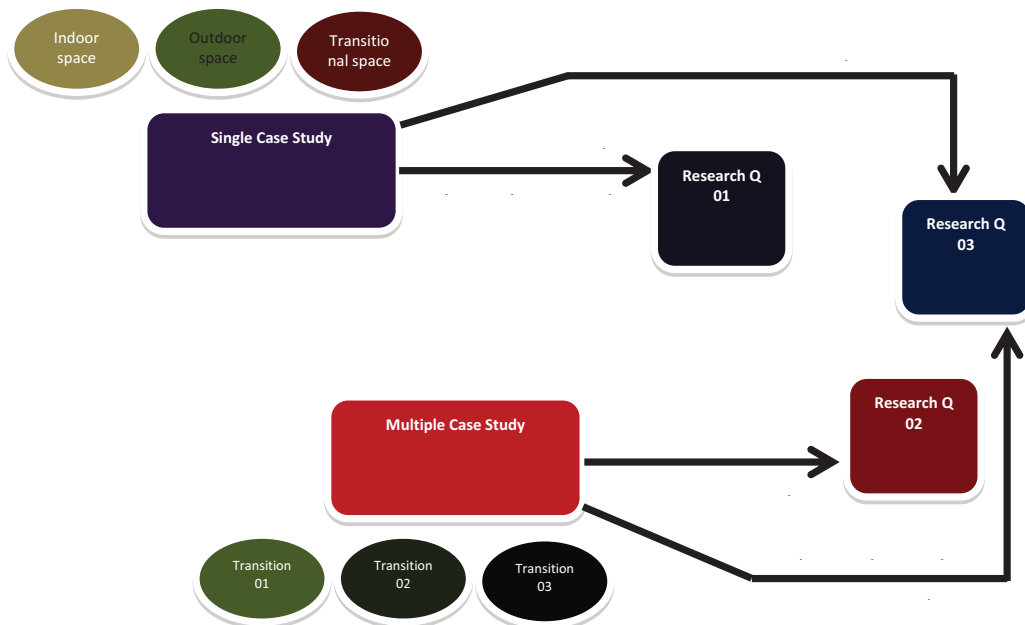


Figure 2: Methodology flow diagram

4.2. Dependent and Independent Variables

The two main dependent variables of the study are *Play* and *Learning*. Play will be measured in two sub categories – Play Activity Level of the child and Play Variance. Play activity will be measured by a modified CARS (Children's Activity Rating Scale) scale (Durant et al. 1993). The scale allows trained observers to record children's activity on a scale of 1 to 5 representing different levels of energy expenditure. Play variation will be measured by POS (Play Observation Scale) scale (Rubin 2001) which uses Parten (1932) and Piaget's (1968) classification of play. The POS proposes a comprehensive tool for observing play behavior of children. The tool provides a matrix of total 28 observable behaviors. Learning of a child will be coded as 4 distinct science learning activities – reading-writing, observing, exploring, and cause-effects. The key independent variable of the study is space type. It is a categorical variable with three possible values: indoor space, outdoor space and transitional space. The idea is to compare the measurements of the dependent variables among these three kinds of spaces in a childcare setting. For the second phase, the research will incorporate *transitional space* variables elaborated later in 4.3.2. This study will also incorporate the other important variables of play and learning as discussed in 2.3.

4.3. Data Collection

4.3.1. Behavioral Mapping

The method that is most comprehensively aligned with the concept of behavioral setting is known as Behavioral Mapping (BM). BM can be used to compare the use across sites (Cosco, Moore and Islam 2010) or within sites (Moore and Cosco 2007). It allows a researcher to measure or evaluate a physical environment in terms of activities and behavior. The philosophy highly matches with the purpose of the intended research. This research is interested in knowing the behavioral dimensions of a transitional space, not only the architectural ones. This is why behavioral setting as a conceptual ground carries immense importance for this particular study because it offers methods for defining an environment in terms of activity of children. Typical question being asked - *What dimensions are imposed to the environment by the behavior of its inhabitants? or what is the measurement of an environment in terms of behavior?* This question reflects a lot of similarities with the research questions of the intended study.



Figure 3: BM provides a researcher data about distribution of use by type of setting/site zone (author's own work)

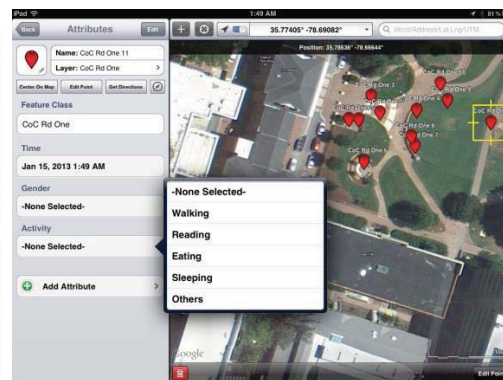


Figure 4: Latest advent of behavioral mapping by GIS Pro (by Garafa Inc.) allows simultaneous coding and mapping

Traditionally, behavioral mapping has two distinct parts – *mapping* allows a researcher to map the point location of the subject on a base map and *coding* records all the attributes of the subject. The *coding* part is flexible and designed as per the direction of the research question.

4.3.2. Transitional Space Measurement

Due to lack previous similar study, it was difficult to establish the measurement variables of a transitional space. Olds' (2001) famous book *Child Care Design Guide* gives a faint clue when it claims that a maximally effective transitional space should not be less than 6 feet deep and ideally should be around 15 feet deep. This research would use this clue, and a list of all possible architectural dimensions is listed in Table 3.

Table 3: List of transitional space variables

Indicators	Measurement
Total area of the transitional space	Direct measurement
Length-width proportion of the transitional space	Direct measurement
Amount of interlocking between indoor and outdoor space in the transition	Direct measurement
Height of the transitional space	Direct measurement
Enclosure type	Systematic observation
Roofing type (open/pergola/enclosed)	Systematic observation
Shading condition of transitional space	Systematic observation
Lighting condition of transitional space	Systematic observation
Color of enclosure/roof	Systematic observation
Materiality of the transitional space	Systematic observation
Vegetation	Systematic observation
Seating provision	Systematic observation
Availability of play equipment (novelty, type, amount)	Systematic observation

4.4. Data Analysis

Three types of unique quantitative data analyses are possible from data gathered by the overarching frame work of BM. They are Map Analysis, Map Overlay and Spatial Statistics. Qualitative Analysis will be conducted on data gathered by questionnaire survey.

CONCLUSION

Promoting play and learning by developing a childcare environment for preschool children requires empirical understanding on the relationship between childcare environment and children's behavior. The purpose of this research is to examine particular elements of architecture that are responsible for motivating play/learning behavior among children in a child care/preschool setting. It is expected that BM data will demonstrate behavioral variation of children in indoor, outdoor and transitional space of a childcare environment. BM data will also identify which design aspects of transitional space are most influential for behavioral outcomes. The researcher is aware of the constraints like tight schedule of a childcare institute which may hinder observation of spontaneous behavior in environmental variation; which is the key to the methodological innovation of the research. However, an early childhood institution provides more flexibility than formal schools and possibility of observing/coding spontaneous behavior is higher. It is assumed that this research will demonstrate empirical evidences for the importance of transitional space in motivating certain play and learning behavior among children which is not possible in indoor classrooms or outdoor playgrounds. It will corroborate the speculation of educators, designers and reformists (discussed in 1.1) with research evidences from the real world observation.

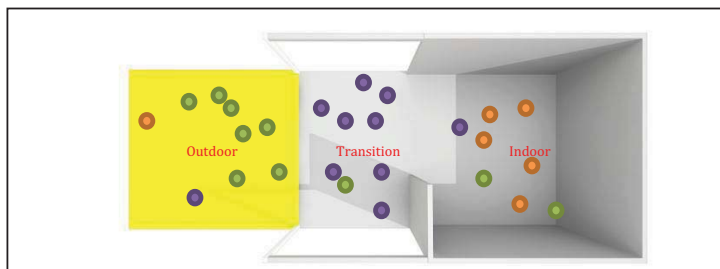


Figure 5: Hypothesis of the research expects behavioral variation in BM data among indoor, outdoor and transitional space (author)

Findings of this research may become a useful guide for designers, educators and policy makers because it has the potential of explaining the importance of certain architectural characteristics of early childhood institutions. The findings of this research should be able to contributing in design directives for childcare centers and preschools. The innovative methodology itself may become immensely useful for future research intended to unfold relationship between architecture and behavior because it applies direct observational techniques (BM) for delineating relationship between environment and behavior.

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