A STUDY OF OUTDOOR ENVIRONMENTS FOR YOUNG CHILDREN: RE-ENVISIONING THE CHILD DEVELOPMENT LABORATORIES AT UIUC

BY

XUCAN ZHOU

THESIS

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Master’s Committee:

Professor Laura Lawson, Chair
Professor William Sullivan
Professor Carol Emmerling-DiNovo
Abstract

Although the significance of the outdoor environments in young children’s physical, cognitive, social and emotional development has been affirmed for a long time, there is an obvious decline in contemporary children’s daily outdoor experiences. In respond to this trend, traditional research focuses on the playground redesign and safety issues with play equipment. While learning through nature has been proposed, it mainly emphasizes the positive effect of play with natural elements. With the belief that the high-quality outdoor experiences – including both environmental education and social education – are necessary for young children and should exist everywhere, this study moves outside the proverbial box of playground design and explores quality outdoor environments with daily accessibility for young children.

Taking the child care center (including a child development laboratory – CDL, and an early child development laboratory – ECDL) at University of Illinois at Urbana-Champaign as the site of research, through on-site observation and interviews with parents and teachers, the major barriers to young children’s daily outdoor experiences, including time, space, safety concern and faculties, are summarized. Meanwhile, it is concluded that, enhanced accessibility, extended play space, suitable micro-climate, effective supervision and enriched learning opportunities, are basic elements of ideal outdoor environments. On the basis of precedent study, three design strategies, including grey space, mixed-use development, and movable play facility are proposed. Three design options illustrate them correspondingly.
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Chapter 1  Introduction

1.1 Background Information

Learning outside through direct interaction with natural materials and life situations is a congenital need of children. Over time, a growing number of professionals from different disciplines have justified the multidimensional benefits -- intellectual, emotional, social, spiritual and physical -- of daily outdoor experiences, and specifically in natural environments, throughout childhood.

Luckily, when I was a little girl, outdoor experiences was my daily routine. I grew up in a city in southern China. Although I don’t remember any playgrounds near our friendly neighborhood, we had a nice garden within walkable distance, which was the destination for all my daily adventures. Hide-and-seek in the bush and running in the rain with my playmates were my favorite activities; collecting seasonal plants also gave us countless pleasure and the first lesson about the respect for natural resources; even a pile of gravel or soil after some construction projects could be the fantastic setting of my dreamy kingdom. The textures, sights, sounds, smells, and even tastes within outdoor environments in all kinds of weather composed an attractive three-dimensional world for us to explore, and still remain in my memory today.

However, the world is changing rapidly. No matter in China or in the United States, in urban areas or suburban communities, it is more and more difficult for me to find young children in outdoor public spaces such as sidewalks, streets, playgrounds, and backyards, which makes me very upset. Undoubtedly, free contact with outdoor natural worlds and relatively free from adult interference has gradually been vanishing from childhood experience for the vast majority of today’s young children (Rivkin 1995). In fact, a Hofstra University survey conducted in 2004 even revealed that, 70 percent of mothers in the United States had daily outdoor play when they were children, while only 31 percent of their children had the similar experiences (White 2004). Besides the
time in child care center, usually young children stay in their home with the company of the television set.

A number of factors are related with this embarrassing phenomenon, such as the popularization of television, culture of fear based on perceived rather than actual risk, parental tight schedules, the lure of sedentary experiences, and the increase of urbanized environments (Elliott 2008).

Although we may not be able to completely allow young children the same sort of "free-range" lifestyle that many adults experienced in previous eras, I believe something should and could be done to optimize children’s positive contact with outdoor environments. Effectively dealing with the safety and accessibility issues is a meaningful research direction, but they are just the minimum requirements -- our expectation should go beyond them to ensure all children reap the benefits of the outdoor experience.

To reverse this phenomenon, the first thing that should be kept in mind is contemporary child’s daily environments and routine, which are significantly influenced by the changing trends of family structure and gender roles. Compared with 47.4 percent in 1975, the number of women employed in the United States increased to 71.4 percent in 2008 (U.S. Department of Labor 2009). Correspondingly, according to the National Survey of America’s Families (2002), about 42 percent of the nation’s children under age 5 spend 36 hours or more in some type of child care every week, 19.9 percent spend about 15-to-35 hours, and 16.5 percent spend 1-to-14 hours (Hestenes 2009). Therefore, instead of the backyards and the neighborhood which were the primary outdoor environments known to the previous generation, outdoor environments within or adjacent to those childcare centers are often the primary outdoor space that most contemporary young children experience in their daily life. The challenge is to creatively design these spaces where children spend a long time per day and find vital opportunities to reconnect children with the natural world and create a future generation who values and preserves nature (Malone and Tranter 2003).
1.2 Research Purpose

The purpose of this study is to explore quality outdoor environments with daily accessibility for young children. Taking the child care center (including a child development laboratory – CDL, and an early child development laboratory – ECDL) at University of Illinois at Urbana-Champaign as the site of research, through literature review, on-site observation and interviews with parents and teachers, some specific issues have been studied, including the historical development of outdoor play space design, the present supports and barriers to young children’s daily outdoor experience, and the potentials for optimization through specific landscape approaches.

1.3 Definition of Terms

Some terms used in this study need to be explained at the outset. Throughout this study, “young children” is defined as those under age 6. Typically, a further category includes: infant (under 12 months), toddler (1-3 years old), and preschool aged (4-6 years old). Considering that the outdoor setting for infants has many special requirements because of their physical and developmental limitation, for more generalized outcomes, this study concentrate mainly on the age group 2–5 years old.

Another term used throughout is “young children’s outdoor environments”, which refers to all of the outdoor spaces where young children can contact with nature or at least gain outdoor experiences -- such as the backyards of their home, the path from home to CDL/ECDL, the bus stops, the parking lots of supermarkets, not only limited in realm of the playgrounds attached to child care facilities or public parks.

1.4 Conceptual Framework

This study takes the outdoor environments of Child Development Laboratories at UIUC as the physical center of research, while also involving consideration of context in different scales – University of Illinois at Urbana-Champaign campus, and nearby communities where children live.

According to the initial proposal, it was planned to be a feedback-based study. Besides the inspirations from literature review and on-site observation, the first-hand
information from interviewing teachers and parents, whose philosophy and perspectives significantly affect young children’s daily outdoor experiences, was expected to effectively lead to the further landscape design interventions. Focus group discussion was also planned, as an assessment tool for design responses. However, because of some restraining factors in practice, positive support from the child development laboratories was insufficient and the final number of interviewees was limited. Therefore, corresponding changes about research methods has been made during the process. Finally, the findings from literature review, precedent study, interview, and on-site observation comprehensively laid a foundation for a series of design suggestions for physical modification.

To fulfill the requirements of human subject research, before conducting the observation in public settings as well as individual interviews, the research proposal was required to be submitted to Institutional Review Board (IRB) at UIUC for review. The determination of exemption was given by IRB on June 24, 2009.

![Visual model of conceptual framework](image)
1.5 Methods

1.5.1 On-site Observation

On-site observation (with no interaction between researcher and children/adults being observed) mainly included: the parental pattern of behavior when dropping off and picking up their children, the complex integration of activities and functions which take place within the play yards of CDL/ECDL, and children’s patterns of behavior in the nearby area of CDL/ECDL. Observation was documented through mapping, sketches, and text record. Considering the impact of climate on children’s outdoor schedule, this observation work spanned approximately half a year -- 2009 summer and fall—in order to record maximum outdoor play during the school hours. Photos with children or parents have not been taken without their permissions, based on the requirements from IRB and CDL.

1.5.2 Interview

According to the literature review, a great amount of resources indicating young children’s preferences of outdoor environments are available. However, research focusing on the parental and teacher’s viewpoints are comparably limited. Considering the adult’s controlling effect on young children’s outdoor experiences, there is a need to fill this gap. Therefore, the focused interviewees in this study mainly include three groups of people: the parents whose children currently study in CDL or ECDL, the teachers working in CDL or ECDL, and the administrator of CDL and ECDL. An information letter that explains the research and requests participation on a voluntary basis as well as a consent form was sent to potential interviewees through CDL's research solicitation process. Those people willing to participate were contacted by a phone call or email to arrange the detail time and place for an interview.

All interviews were conducted at CDL/ECDL offices or other settings chosen by the participants, from July to November, 2009. Each of them lasted thirty to forty-five minutes, according to the interviewee’s availability. All interviews were recorded and transcribed for analysis purposes, with the permission of the participants.
Interview questions focus on participants’ perception of current status, typical supports and barriers, and their ideal outdoor play space for young children. Corresponding adjustments of questions were given for different groups of interviewee. The full version of interview questions is listed in the appendix.

1.5.3 Precedents Study

A great number of successful contemporary precedents designed within last ten years – not only limited to landscape architectural approaches, but also involving architectural remedies – have been studied. Grounded in a child-centered perspective, most precedents blend excellent design principles, innovative planning strategies, and affordability concerns together.

1.6 Research Significance

In respond to the obvious decline in contemporary children’s daily outdoor experiences, traditional research focuses on the playground redesign. Considering the significance of outdoor play as well as its relationship with environmental and social education, there is a need to think outside of playground and explore more outdoor environments with daily accessibility for young children through landscape approaches.

Also, while a core of literature exists concerning safety issues – the major barrier to children’s outdoor experiences, most of the emphasis has been paid on developing safer equipment and formulating safety standards (Henle 2003). Comparably little is available that addresses the parental perceived risk. Therefore, it is important to explore more innovative solutions from a psychological viewpoint.

In addition, considering the prevalence of university-based child care center, the findings of this study are expected to reflect generalized problems and potentials within this context, and inspire relevant future exploration as well.
Chapter 2 Literature Review

The following review of research related with young children’s outdoor environments includes four categories: 1) related theories; 2) typical form; 3) a limiting factor; and 4) design expectations.

2.1 Related Theories

2.1.1 Theories of play

Play has long been acknowledged as a significant aspect of children’s lives, and therefore is the core of many philosophies of early childhood education (Hestenes 2009).

For historical accounts of the evolution of play, following the publication of Charles Darwin’s Origin of Species in 1859, biological explanations for play were proposed and provided useful information. The early classic theories mainly include:

1) Surplus energy theory – put forwarded by Friedrich Schiller (1759-1805) in 1855, and major focus was the need to release excess energy. Those traditional playgrounds emphasizing motor activities were the typical products guided by this theory (Brehony 2004).

2) Instinct practice theory – put forwarded by Karl Groos (1861-1946) in 1898, and explained play as an instinct necessary for survival, a practice of capacities to be used in life (Brehony 2004).

3) Race recapitulation theory – put forwarded by James Mark Baldwin (1861-1934) in 1906, and emphasized play as the recapitulation of an earlier evolutionary state (Brehony 2004).

4) Recreation theory – put forwarded by Maurice Lazarus in 1900, and explained play as a way to restore energy expended in work (Brehony 2004).

Later, play was studied from a broader perspective. Different from those explanatory theories stressing biological functions of play, twentieth-century
psychological theories tried to illustrated play as a significant tool to fulfill children’s emotional, cognitive, social, and perceptual-motor needs (Minor 1991).

1) Psychoanalytic theory – put forwarded by Sigmund Freud (1856-1939) in 1908, and conceptualized play as a tool for children to pursue pleasant or painful feelings, and develop control emotions (Minor 1991).


2.1.2 Importance of the Outdoors

The early years in a child’s life are an important time for exploration, discovery, and play. As one setting “that can complement and extend what is offered indoors”, the outdoor environment is “very well suited to meeting children’s needs for all types of play, building upon real experiences” (Richardson 2007, 93).

In retrospect, the diverse values of regular outdoor experiences have been emphasized by a great amount of long-standing theories from disciplines including biology, psychology, pedagogy and others. The importance of the outdoors for young children mainly includes: 1) improving the cognitive development through whole body, multi-sensory experience (Hart and Sheehan 1986); 2) inspiring imagination and creativity in a boundless way (Fjørtoft and Sageie 2001); 3) enriching children’s relationships with adults and other children (Richardson 2007); 4) providing environmental education that fosters the love of nature (Moore 1997); 5) enhancing motor fitness and addressing obesity; and 6) helping children feel in a good mood and feel positive about their surrounding environment (Moore 1997).

To maximize the functions of outdoor experiences, the quality of the environment itself is a critical factor. Relevant research indicates that, a rich, open environment could provide abundant play choices to inspire creative engagement, while more antisocial or unhealthy behaviors happen in boring environments (DeBord et al. 2005). Furthermore, according to landscape architect C.T. Sorensen’s theory, “in any environment, both the degree of inventiveness and creativity, and the possibility of
discovery, are directly proportional to the number and kind of variables in it” (Dannenmaier 1994).

2.2 Typical Form: Playgrounds

The playground is a relatively new outdoor building type with a distinctly urban character. Since its beginning, the playground has been among the most important space for children outside their home. Primarily based on the findings from Susan G. Solomon -- the author of American Playgrounds: Revitalizing Community Space, as well as other relevant researches, the historic development of playgrounds in the United States could be generally divided into four phases:

1) Emerging Phase (about 1820s – 1940s): While the first formal playgrounds were introduced in 1821 in the United States, they were typically limited to provide “indoor gymnasium equipment modified for outdoor use”, and mainly worked for older children (Hestenes 2009). It was until the 1880s that the first freestanding purpose-built playgrounds were built in the United States, to retain the control of children's social play. Thanks to the Mothers' and Children's Reform Movement, several policies were designed to protect children in the labor force and to support schools, playgrounds, and kindergartens during this period. In 1900s, major American cities had playgrounds with sand pits and the "gymnasium" (an early climbing apparatus); however, “gymnasiums” were removed from all of parks in New York City for safety concerns in 1912 (Solomon 2005).

2) Developmental Phase (about 1950s – 1960s): At the background of the Post World War II and devastation, there was a pioneer trend in Europe, marked by the birth of the first adventure playground in Denmark in 1943. Following this burgeoning trend, an optimistic enthusiasm for playgrounds had lasted between 1950s and 1960s in the United States. A number of innovative projects – either pursuing aesthetic values, or focusing on Children’s developmental needs – had been accomplished during this period. (Solomon 2005).
3) Decline Phase (about 1970s – about 2000s): While “the first formal effort to develop standards for playground apparatus was made by the National Recreation Association in 1929”, it was not until 1970s that risk aversion and standardized commercialization started to be the key words in this field. Overemphasis on safety issues and related safety guidelines restricted designers’ abilities to “craft imaginative areas in which kids can play”, and resulted in a decrease in the number of designers who preferred to undertake this type of project. Only large equipment manufacturers can sustain the possibility of legal defense, and therefore their standardized commercial products gradually became the primary choice of customers. Since 1980s, the prevalence of "post-and-platform" paradigm (such as McDonald Model) gradually dominates the field, which was also the product of mass commercialization (Solomon 2005).

4) Revitalizing Phase (currently): With children’s access to the outdoors becoming increasingly limited, more and more people have recognized that playgrounds -- especially those in child care, kindergarten, and schools, where children spend 40 to 50 hours per week -- are important opportunities to reconnect children with nature. Plenty of innovative design projects, such as the imagination playground, reveal the latest perspectives on unconstructed child-direct play (Solomon 2005).

2.3 A Limiting Factor

2.3.1 Safety and Play

Among a series of factors that lead to the current decline in the opportunities provided for outdoor play, the “culture of fear” is an overriding and complicated one. A study reveals that crime and safety concerns have been regarded by 82% of mothers with children from 3 to 12 years old as one of the primary reasons they keep children indoors (White 2004). Because of the fear of strangers, a great amount of children are no longer free to roam their neighborhoods or even their own yards unless accompanied by adults (Moore and Wong 1997). In addition, traffic hazards, fears of ultraviolet rays, insect-born diseases and various forms of pollution are also resulting in adults’ choice of refusing children’s outdoor activities (White 2004).
It is verified that currently some common outside areas are definitely not safe enough for young children, partly due to inappropriate design or adult’s incaution. One ubiquitous example is the parking lot. It has been reported that, from 2001-2003, about 2500 children (ages 1-14 years) per year were sent to Emergency Rooms because of being struck or run over by vehicles in parking areas or driveways, and an average of 229 children died. Close to half of these injured children were ages 1-4 years (Texas State Child Fatality Review Team 2008).

However, how to measure whether it is safe or not is a complex issue, since risk always includes real ones and perceived ones. It is justified that parental perception of safety has a profound impact on children’s outdoor experiences, and to some extent, leads to the parental overprotection.

Moreover, “a recurrent theme in the literature is that children benefit developmentally from risk in play, and that over-protection from risk can inhibit development” (Gleave 2008, 3). Appropriate challenges within a framework of safety provided by adults and the environment are beneficial to young children.

2.3.2 Solutions to increase real safety

*Proposed Safety Standards for playground Equipment* was the first report prepared by the Consumer Product Safety Commission (CPSC) in 1976, with the revisions, set by the National Bureau of Standards, published as *Handbook for playground Safety* in 1981 (Minor 1991). In the form of guidelines, this document presents playground equipment safety information for parks and designers, equipment purchasers, installers, and others interested in playground safety.

However, there is a verified relationship between the increased safety restrictions and a decline in the play value of site (Solomon 2005). Moreover, it has been proved that children are inclined to engage in adventurous play or use equipments in unintentional ways when they are bored with the banality, and thereby accidents are more likely to occur (Striniste & Moore 1989). Therefore, enhancing the degree of playability, defined as “the sum of opportunities for challenge, excitement, learning and
development offered by a particular environment”, could decrease the risk in children’s play spaces (Striniste & Moore 1989, 28).

2.3.3 Key features to increase perceived safety

Research is limited regarding the key features that can offer adults the peace of mind to let their children freely roam and explore in outdoor environments. Below is a brief summary of some identifiable features:

1) Convenient and secure access: indirect access to the outdoors increases uncertainty about children’s safety as well as their ability to find the route independently (Richardson 2007);

2) Defined boundaries: undefined boundaries around a unit give rise to the concern about strangers passing through the play spaces (Richardson 2007);

3) Careful zoning: typical application is separating very young children from action-packed areas (Striniste & Moore 1989);

4) Effective supervision: according to the theory of Crime Prevention through Environmental Design, surveillance strategies could be generally classified as organized (such as caregivers’ accompanying), mechanical (such as lighting and monitors), and natural (such as windows) (Crowe, 2000).

2.4 Design Expectations

While fulfilling the minimum safety standards in the outdoor environment design is necessary, it is not enough to sufficiently stimulate and support children’s positive outdoor experiences. Four key features of creative play spaces include:

1) Healthy risk taking – appropriate opportunities of taking risk through new skill learning process should be supported on safe, well supervised playgrounds (Wellhousen, 2002).

2) Graduated challenges – changing needs and abilities of children should be accommodated by providing equipment with varying degrees of difficulty or by adapting multiuse play materials (Wellhousen, 2002).
3) Promoting various play types -- variety of available materials and spaces could inspire a broad spectrum of quality outdoor play (Wellhousen, 2002).

4) Children-manipulating the environment – providing movable parts or accessory materials has been proved to be a simple but effective solution (Wellhousen, 2002).

2.5 Conclusion

In conclusion, several key points, which were learnt from literature review and inspired my following research, have been summarized below.

1) The evolution of how we perceive play in children’s development is not a one-way process and children's outdoor play areas have changed over time to reflect evolving ideas.

2) Safety issues in children’s outdoor experiences include real ones and perceived ones. There are a series of safety standards dealing with real safety issues, but research on how to assess and manage perceived safety is comparably limited.

3) Appropriate risk and graduated challenge responding to the changing needs of children, are essential elements in children's outdoor play spaces and beneficial to their all-around development.
Chapter 3  Description of Research Site

3.1 Site Selection

Since the majority of young children spend significant parts of their day at the child care centers, whether their outdoor experiences at these centers are positive and supportive enough has strong influences on the development of young children.

As one special type of child care centers, first conceived in early 1920s, now arising at many universities, the university-based child development laboratory (CDL) has played a vital role in early childhood education field. Compared with conventional child care centers, CDL effectively shares educational and recreational resources with the university, which stimulates their own development. In turn, CDL not only offers parents (faculty, staff, or students) high quality education with convenient situation for their children, but also serves as a laboratory site where students – typically those majoring in early childhood education and child development – can get invaluable hands-on interactions with young children, and other related researches or teaching projects can be conducted as well (McBride 1996).

Therefore, the Child Development Laboratory (CDL) and Early Child Development Laboratory (ECDL) at UIUC were chosen to be the key site in this study. Additionally, in order to get comparably comprehensive understanding of young children’s daily outdoor environments and try to break the common boundary of playgrounds, University of Illinois at Urbana-Champaign campus as well as nearby communities, were also included into this study.

3.2 General Information

3.2.1 About the CDL and the ECDL at UIUC

The CDL on the University of Illinois campus was established in 1941 as a half-day program for preschool children. Ms. Frances Perkins was its first director. It was initially
located in the Women’s Building (known today as the English Building on the Main Quad) until the Child Development Laboratory Building was built on Nevada Street in 1955. It was accredited by the National Association for the Education of Young Children (NAEYC) since 1990. After that, to expand the age range and the number of children served by the CDL, an additional Early Child Development Building was built in the east of CDL in 2003 (CDL web site 2009).

Community service, teaching training, and academic research are the major missions of the CDL and ECDL. The selection of enrollment tries to reflect the community demographics, in terms of sex, race, and socioeconomic background. In 2003, “about 75 percent of children in CDL belonging to faculty, staff and students, and the remaining 25 percent belong to families not affiliated with the university. About one-third of the children came from low-income families” (Foreest 2003, 1). Currently, the CDL offers a half-day program for two- to five-year old children and full-day program for three- to five-year old children, and the ECDL is more focus on the children between the ages of six weeks and five years of age. A total of 180 children (90 in CDL, and 90 in ECDL) aged six weeks to four years of age are served in these two buildings (CDL web site 2009).
3.2.2 About University of Illinois at Urbana-Champaign Campus

Located at the twin cities with total population of 180,000 in east-central Illinois, the University of Illinois at Urbana-Champaign (UIUC), which the child care center serves, currently has approximately 40,000 undergraduate and graduate students combined (UIUC web site 2010).

3.2.3 About Nearby Communities

Because the utilitarian forms of physical activities are easiest to get on a daily basis, the study in this scale would focus on the daily routes and traffic mode from children’s home to CDL / ECDL, and explore the opportunities to expand the outdoor experience.
3.3 Site Inventory

3.3.1 Transportation

1) The site is defined by Lincoln Ave. in the east and Nevada St. Lincoln Ave in the north, and faces to the campus in the south and west. Lincoln Ave. is the east boundary of the University of Illinois at Urbana-Champaign, and an important north-southern four-lane traffic artery with heavy traffic volume during week days in the twin cities. Comparably, Nevada St. is an east-western two-lane campus road with lighter traffic condition. Both Lincoln Ave. and Nevada St. have two-way sidewalks. The existing bicycle routes within this site include on-road bike routes and off-road trails. A difficult intersection is also identified on the map.

Figure 4. Roadway, bike route, and sidewalk around the CDL and the ECDL
2) Parking Lots: The size of existing parks lots of CDL and ECDL are too small to fulfill the needs of the parents and staff. Curb parking on Nevada St is popular during the busy time.
3) MTD Bus Routes: Champaign-Urbana Mass Transit District (MTD) service currently covers the site by the regular fixed routes 2 Red Weekday, 22 Illini Weekday, 12 Teal Weekday, 20 Red Saturday, 220 Illini Saturday, 120 Teal Saturday and 220 Illini Sunday. Several designated bus stops are located in the nearby areas -- some of them are shelters, while others are only identified with a bus stop sign.

Figure 6. MTD service map of the site
3.3.2 Surrounding Land Use

Currently, the surrounding area of CDL and ECDL is mix-used. It provides various potential educational resources for CDL and ECDL, and complicated groups of visitors as well. For example, the dance studio adjacent to ECDL regularly provides dance class for children.

Figure 7. Surrounding land use
3.3.3 CDL & ECDL Building

Figure 8. Plan and perspective of the CDL and ECDL buildings
Both CDL and ECDL building comprise two floors with a series of age segregated playrooms and offices for faculty members. In ECDL building, there are several “observation booths with one-way glass allow visitors to monitor staff members and children in their classroom” (Forrest 2003, 1).

Based on the 3-D model created in Sketch-Up, the sunshine duration variation was analyzed as follows. It shows that, in the CDL, the east play yard used for the half-day class in the morning is always full of sunshine and lacks of enough shade area, but the west one used for the full-day class in the afternoon often lacks of sunshine.

Figure 9. Sunshine duration variation analysis of the CDL and the ECDL
3.3.4 Children’s Play Space

Confined by fences, existing play yards of the CDL and the ECDL offer very limited accommodations for active play beyond basic sand play areas and isolated climbing structures placed in grass. With the exception of water and tricycles, opportunities for children to manipulate the outdoor environment are limited.

Figure 10. Plan and perspective of play yards
Chapter 4  Barriers and Expectations: Findings from Observation and Interview

4.1 Findings of Observation

This study involves a direct on-site observation of CDL and ECDL outdoor environment. From August 2 to August 5, 2009, on-site observation had been conducted every morning approximately from 8:30 a.m. to 9:00 a.m., focusing on parental and children’s behavior patterns in the parking lots. From September to November, 2009, observation focusing on children’s behavior in the play yards of CDL and ECDL had been conducted almost one time per week, and the time was usually in Wednesday morning (approximately from 9:30 a.m. to 10:00 a.m.) or Friday afternoon (approximately from 4:30 p.m. to 5:30 p.m.). In addition, casual observation has also been conducted when I passed through the site.

4.1.1 Traffic-related behavior patterns and problems

Based on the on-site observation, the common means of transportation for parents to visit CDL and ECDL is by car, and very limited parents choose to walk or ride a bike. Comparably, I observed that there seemed to be more parents from Asian background like walking. However, a potential explanation for it is due to the lack of cars. Distance between home and CDL/ECDL may be another consideration.

The typical routes parents choose when picking up and dropping off their children are identified in the Figure 11. It is obvious that, because of the Government & Public Affairs Building between the buildings, the current physical separation between CDL and ECDL not only leads to the annoying inconvenience for parents to drop off and pick up their children studying in each building, but also limits the sharing of educational resources between them. Some form of the spatial connection or shared space between these two laboratories is needed urgently.
The parking lot problem is also identified in the Figure 11. The parking lot in front of ECDL is mixed-used by several groups of people: parents, faculty and staff working nearby, and customers to the surrounding stores. It is a busy place especially in the morning when children arrive and UIUC students are passing through. Lack of sidewalk in the parking lot leads to the increased risk for children to walk freely when they leave cars and inappropriate planting design nearby makes the situation even worse. Since it’s difficult for drivers of large vehicles to see young children around their vehicle and young children rarely pay attention to their surroundings, there is a hidden potential for injury to young children, especially when their parents are distracted by other things, chatting with people, or have hands full during the rush hour. Ensuring the safety of young children here is a primary concern and requires every user’s participation.
Another difficult intersection identified in Figure 11 is near the north entrance to the CDL building. For young children, it is a relatively risky space where pedestrian, cyclists and cars join up.

In addition, gender differences in the parental behaviors when picking up or dropping off their children were observed. Generally, compared with male parents, female parents are inclined to spend more time when picking up and dropping off their children. They always consciously or unconsciously slow down their steps and communicate with the staff, children, and other parents. Male parents, however, tend to focus on the task at hand.

Figure 12. Behavior mapping
4.1.2 Behavior Patterns of Children in the Outdoors

Children have their preference of space when they play and observe the surrounding world, including: (a) Interfaces that connect the exterior and interior space, where they can feel free to observe others’ activities without being exposed to excessive sunshine or rain, make their own decision to participate or not and easily turn to teachers for help;

(b) Hidden areas such as the lower floor of a climbing facility, where they can have private communication with friends;

(c) Boundaries of different physical surfaces -- especially those with some altitude differences.

Additionally, children in different age groups have different preference of play programs. 1-2 year old children in the ECDL spend much time in individual free play or just staying alone for observation. Comparably, elder children in the CDL are more inclined to play together – inventing games by using movable toys, making up rules, and organizing themselves. Also, they often try to use the play equipment in ways that are possible but not necessarily implied.

4.2 Findings from Interviews

A total of 5 participants were interviewed. The characteristics of participants are summarized as follows:

1) A current administrator of the CDL and the ECDL, who has worked there for seven years;

2) Two teachers: Teacher 1 is a female working in the CDL for twenty years and currently teaching the age group of children from three to five years old, and Teacher 2 is a female working in the ECDL for almost five years and currently teaching the age group of children from two to three years old.

3) Two parents: Parent 1 is a father who has a three and a half-year-old boy studying at the ECDL full-day class, and Parent 2 is a father who has a three-year-old girl studying at the ECDL full-day class and a five-year-old girl studying at the CDL full-day class. Both of them are full-time student parents from an American background.
While the number of participants is limited, the findings from the interviews reveal parental and caregivers’ attitudes, values, and understanding of young children’s outdoor experiences.

4.2.1 Teachers’ Comments

1) General Introduction

Scheduled Time: young children’s outdoor activities in the CDL/ ECDL are arranged by teachers, and fit into their daily life in the way shown below. The schedule would be modified to respond to the changing weather or children’s physical condition.

Typical Playspaces and Activities: young children’s outdoor playspaces are structured in three scales, including (a) within the CDL and the ECDL, (b) on UIUC campus, and (c) in nearby neighborhood. Typical outdoor experiences in the CDL and ECDL are limited in the play yards in the form of free play, including climbing, chasing games, riding bikes, playing balls, playing table toys, balancing around different decks, collecting leaves, and working in tow “Race Gardens”. Meanwhile, as a university-based child care program, teachers in the CDL and the ECDL have tried their best to make use of the campus’s resources for young children when weather permitting, and the current exploration has been mapped in Figure 14. The ability to do this is related to children’s age, teachers’ motivation, and the number of supervisory teachers or aids available.
One of the teachers interviewed explained some of her fieldtrips. Typical activities in this scale include taking yoga classes at the Dance Studio adjacent to the ECDL, visiting greenhouses in the nearby area, visiting the Fire Service Building, flying kites or playing balls on the main quad and the south quad, having picnic in the Staley Illini Grove, playing with water in the Spurlock Museum, visiting the undergraduate library for reading education, and visiting the Arboretum in Orchard Down. Furthermore, fieldtrips are arranged about once a month in city scale. Typical destinations include the indoor playground in Market Place and some nearby neighborhood parks. The process of taking MTD bus to these destinations is highly valued by teachers, as a tool for social education.

2) Key Facilitators and Barriers

Teachers demonstrated a very open idea and positive attitude to children’s daily outdoor play. Even though arranging such kinds of activities requires more careful supervision, they felt happy to support and explore the potential opportunities. The major influences upon children’s outdoor activities mentioned by teachers are summarized in Table below.
Surprisingly, the concern for safety issues, which was regarded by several researchers as the top barrier for children’s outdoor activities, was not emphasized by the teachers interviewed. Teacher 1 expressed a strong belief that young children are safety conscious enough and confident in their judgment about taking risks. She suggested that children enjoyed the provision available, but would gain more from the experience if more challenges were offered to them. Rather than a safe play place, she called for a suitable play space responding to children’s different skill levels, and emphasized the balance between the need for high play value and safety regulations. Teacher 2 suggested that the current play yard in the ECDL is safe enough for children’s free play. She believed that, as long as the availability of appropriate clothing and protection against extreme weather conditions, children could go out almost all year round.

Comparably, teachers mentioned a negative impact of parental overprotective attitude, as exemplified in the comment below:

“Many parents openly discouraged their children from getting dirty or being exposed in a snowy day.” “…they always feel nervous when seeing their children climb or jump from certain play equipment”.

3) Assessment of Current Play Spaces

The desire for improvement was strong among teachers. For Teacher 1, the major limitations of the play yards in the CDL include: lack of enough space for children to run or ride bicycles; lack of multi-dimensional facilities that fulfill the diverse needs of children of different age groups; and lack of elements such as water and sand, which can
inspire free play. For Teacher 2, inadequate bicycles and tricycles, which are the favorite of 2-4 year old children, was the typical limitation in the ECDL.

4) Ideal Outdoor Play spaces

A series of typical elements relevant to ideal outdoor environments have been identified by teachers.

Table 2. Ideal outdoor play spaces_ Teachers’ opinion

<table>
<thead>
<tr>
<th>Source of information</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher of CDL or ECDL</td>
<td>• Elements for free play, such as water and sand;</td>
</tr>
<tr>
<td></td>
<td>• Multi-dimensional play facilities that address the needs of such a wide range of age groups;</td>
</tr>
</tbody>
</table>

4.2.2 Administrator’s Comments

1) General Introduction

Typical play spaces and activities: Although the administrator claimed the ubiquity of children’s outdoor play spaces in their daily life, she agreed with the irreplaceable role of play yards belonging to childcare centers. Statements that typified her description about children’s activities include:

“Pitifully, the play yard is almost the only chance for them to directly contact the natural environment. Certainly we let infants and toddlers walk in the play yards. For 2-year old children, they can walk through the campus. So they get to see, to touch, to feel, and sometimes to taste. The different texture of natural things provides variety that greatly attracts children.”

2) Key Facilitators and Barriers

Table 3. Key facilitators and barriers_ Director’s opinion

<table>
<thead>
<tr>
<th>Source of viewpoint</th>
<th>Influences upon physical activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facilitators</td>
</tr>
<tr>
<td>Director of CDL &amp; ECDL</td>
<td>• Accessibility to play areas and facilities</td>
</tr>
<tr>
<td></td>
<td>• Enough teachers</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3) Assessment of Current Play Spaces

Compared with teachers’ interest in the educational functions, the viewpoint of administrator was more out of consideration of safety issues. Although severe injuries in the CDL/ECDL were very rare, she emphasized the importance of keeping children safe enough by providing appropriate equipment and supervision. Specifically, she mentioned several hidden troubles, such as the chaos of the parking lot in front of the ECDL, the needles leaves of conifers in the ECDL play yard, too much shade or sunshine in the play yards due to the layout of building, and uneven concrete surface in the CDL play yards, etc. To vividly illustrate some expectations for modification, the administrator showed a redesign scheme for the play yards of the CDL, which was provided by a professional design firm.

4) Ideal Outdoor Play Spaces

Table 4. Ideal outdoor play spaces_ Director’s opinion

<table>
<thead>
<tr>
<th>Source of information</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director of CDL or ECDL</td>
<td>• Various surface materials;</td>
</tr>
<tr>
<td></td>
<td>• Overall circulation of play;</td>
</tr>
<tr>
<td></td>
<td>• Suitable micro-climate;</td>
</tr>
<tr>
<td></td>
<td>• Easy maintained;</td>
</tr>
</tbody>
</table>

4.2.3 Parents’ Comments

1) General Introduction

Scheduled Time: Interviewed parents admitted that their tight schedules always make them too busy to play with children during weekdays. At weekends with fair weather, they usually played with their children in the outdoors for one or two hours per day. The detailed schedule is shown in the figure 15.
Typical Play Spaces and Activities: Backyards and neighborhood parks are the top choices for parents. Besides those parks near their home, Parent 1 also took his son to the park in the neighborhood they lived before, because of more playmates as well as diverse play facilities for both children and parents.

2) Key facilitators and Barriers

Parents admitted that free, creative active play was being lost and alternate activities were increasingly sedentary. Parent 1 felt confused to explain the reasons for this pitiful phenomenon, and had no choice but to attribute to “the culture of fear”. To reverse this trend, he hoped that the free play could be restored to the lives of young children as more parents fully understand their value.

Comparably, Parent 2 noted the heavy road traffic near residential areas and the lack of neighborhood supervision significantly increased parental safety concerns. Talking of the panic experienced when his younger daughter left the front porch independently to walk down the street without supervision until a neighbor noticed her, he mentioned that, “compared with the neighborhood we live now, the one we lived when we were child was more protective since everyone knew each other.”

Detailed factors mentioned by parents are summarized in the table below.
Table 5. Key facilitators and barriers_ Parents’ opinion

<table>
<thead>
<tr>
<th>Source of viewpoint</th>
<th>Influences upon physical activity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents</td>
<td>Facilitators</td>
<td>Barriers</td>
</tr>
<tr>
<td></td>
<td>• Adequate supervision</td>
<td>• Weather constraints</td>
</tr>
<tr>
<td></td>
<td>• Accessibility to safe play</td>
<td>• Safety concerns (both</td>
</tr>
<tr>
<td></td>
<td>spaces and facilities</td>
<td>personal and community level)</td>
</tr>
<tr>
<td></td>
<td>• Strong social relationships</td>
<td>• Parental tight schedule</td>
</tr>
<tr>
<td></td>
<td>in the neighborhood</td>
<td>• Distance constraints</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Insects (e.g. bugs)</td>
</tr>
</tbody>
</table>

3) Assessment of Current Play Spaces

Both parents expressed very positive attitudes towards the existing play yards of the CDL and the ECDL. In their opinions, while the building is old and the layout of play yards is traditional, there are enough open space and natural elements for children’s free play. Also, they felt satisfied with current facilities in neighborhood parks.

Specially, Parent 1 recommended more design consideration about the spaces where children and adults can share together, to facilitate parental supervision and deal with safety concerns.

4) Ideal Outdoor Play Spaces

Table 6. Ideal outdoor play spaces_ Parents’ opinion

<table>
<thead>
<tr>
<th>Source of information</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent</td>
<td>• Abstract or concrete boundaries;</td>
</tr>
<tr>
<td></td>
<td>• Large space with trees and flowers;</td>
</tr>
<tr>
<td></td>
<td>• Adjacent to some spaces where parents can have some recreational activities.</td>
</tr>
</tbody>
</table>

4.3Summary and Inspiration

Findings from the on-site observation and interviews are summarized and shown in the Figure 16. In conclusion, time, space, safety concerns and play facilities are identified as the major barriers for contemporary young children’s outdoor experiences.

Correspondingly, several themes of ideal outdoor environments are summarized as follows. They could be used as the design guidelines as well as the assessment criteria.
1) Enhanced accessibility: Establish an interactive relationship between the indoors and the outdoor learning environment. Ensure that every child can easily find and use the play space.

2) Extended play space: Optimize the site by joining unused spaces within or around the play area together.

3) Suitable micro-climate: Create opportunities for year-round use of the site as well as experiences of the seasonal changes. For example, create a logical and functional tree planting design, to provide sun protection.

4) Effective supervision: Maximize opportunities for adult’s observation and supervision.

5) Enriched learning opportunities: Provide multifunctional play facilities, surfaces, site topography and layout, to facilitate various programmed and un-programmed activities of varying scales and types.

6) Cost-effective approach: Employ simple and modest means to reflect innovative ideas and bring significant changes.
Figure 16. Summary of barriers and expectations

EXISTING ACTIVITIES
- Observation
- Talk with others
- Basic Locomotor: Walk, Run, Jump, Crawl, Climb, Slide, Hop...
- Basic Manipulative: Throw, Catch, Kick, Strike, Bounce...
- Basic Balancing: Bend, Stretch, Twist, Beam-walking, ...
- Rough-and-tumble Play: Play with Sand, Water Play, Collect leaves/fruits, Ride Bikes, Play "Maniples" (table toys), Pretend Dramatic Play, Fly Kites, Take MTD buses, Manage Race Gardens

BARRIERS
- Size of playparks: Physical disconnection, Mix used parking lots, Lack of facilities, Weather.
- Distance; Weather.
- Distance; Parental light schedule, Traffic risk, Storms, Weather.

STRATEGIES
- Suitable Micro-climate
- Effective supervision
- Extended play space
- Enhanced accessibility
- Enriched learning opportunities

NEGATIVE
- Poor adaptability to risk situations
- Reduced opportunities to develop skills in solving risks
- Increased injury
- Increase in unsafe risk-taking
- Minimization of Risks

BENEFITS
- Fewer benefits
- More potential risks
- Reduction in opportunities for children-chosen risk
- Reduction in outdoor play

OUTDOOR PLAY & LEARNING
- PLAY & LEARNING
- OUTDOOR ENVIRONMENT

BENEFITS
- FUN
- PHYSICAL
- COGNITIVE
- SOCIAL
- EMOTIONAL

TIME
- WITHIN CAMPUS
- WITHIN NEIGHBOURHOOD

SAFE CONCERN
- FACILITY

SPACE
- GREY SPACE
- MIX-USED SPACE
- MOVABLE SPACE
Chapter 5  Design Strategies: Findings from Precedent Study

Aiming at the barriers and expectations summarized in Chapter 4, a survey of appropriate precedents has been conducted to inspire potential solutions. Based on the findings from this study, three focused design strategies as well as relevant applications are proposed for the following work. Although conceptually distinct, it is important to realize these strategies tend to overlap in practice.

5.1 Grey Space (Intermediary Space)

5.1.1 Concept

Compared with black and white, grey is a neutral and balanced color. Similarly, if enclosure space with definite boundary is defined as black space and public open space is defined as white space, grey space is intermediate, semi-enclosed and semi-public space between them. Its existence is not independent, and is always relative to other spaces with different or opposite characteristics.

Although the practical application of grey space has existed in architecture design for a long time, it was until the 1960s that the concept, named as intermediary space, was firstly proposed by Japanese leading architect Kisho Kurokaya. In Chapter 8

Figure 17. Grey space
of his book *The Philosophy of Symbiosis*, Kisho Kurokay defined intermediary space as “a third type of space, in addition to the interior and exterior space” (Kurokaya 1994). Taking the engawa verandah – which runs around the Japanese house as a projecting platform under the eaves-- as an example, he illustrated how intermediary space blurs the dualistic division between the interior and exterior space, interpenetrates the private and public zone, restores a discontinuous continuum, and stimulates a dialogue between architecture and nature (Kurokaya 1994).

5.1.2 Functions

With its ambivalent and multivalent nature -- neither public nor private, neither interior nor exterior, neither entirely open nor enclosed – grey space is a significant multifunctional zone in our daily life.

1) Physical convenience: Unobstructed spatial interpenetration and discontinuous continuum could increase mobility, especially in bad weather.

2) Environmental benefit: Grey space protects the interior space from wind and rain, and also makes it possible for people to enjoy the natural light and air with the fragrance of flowers without extensive exposure of sunshine.

3) Social role: Used mainly as a transitional space but also as a social space, grey space accommodates various activities, and enriches the communication among people passing by.

4) Psychological impact: As special peripheral element, grey space attributes to less clear demarcation between the opposing elements, and even works as an inviting gesture for each other. Moreover, proved by psychologists, the variety and choice are very important for human beings. People within grey space could sense and observe others’ presence without interruption, and then make their own decision about whether enter into or not. The diverse choices also foster the sense of security and belonging.
5.1.3 Typology

In terms of architectural typology, according to different degree of enclosure as well as location relative to the interior, porch, arcade-passage, portico, and hypostyle hall are distinguished as typical forms of grey space, just shown in Figure 18 below (Sinou and Steemers 2004).

![Figure 18. Typical architectural types of grey space (Source: Sinou and Steemers 2004)](image)

In terms of landscape architectural typology, due to the combination of architecture, vegetation and landform, the forms of grey space are greatly enriched. Typical examples include tree-lined promenade, shady plaza, waterside pavilion, and winding corridor.
5.1.4 Precedents

While it has not been specially proposed in current design practice of children’s outdoor environments, the concept of grey space has been distinctly reflected by several successful precedents.

1) Fuji Kindergarten, Japan

Fuji Kindergarten was designed by Tezuka Architects in Tachikawa, a suburban area of Tokyo in 2007. In this project, the single-storey oval building (with a perimeter of 183m) is a multi-functional intermediary space. Its rooftop serves as a physical boundary as well as an all-day playing space, where there are three preserved large Zelkova trees projecting through and two slides connecting to the courtyard in the center. Under the rooftop, on the premise of keeping safe, continuous French windows visually blur the distinction of the exterior and interior space.
This kindergarten building itself illustrates several benefits of the grey space.

- *Increased actual and perceived safety:* Physically defined by the oval building, the central courtyard is safe enough for children’s free play, without interruption from strangers or heavy traffic. Meanwhile, the continuous French windows of the building make all-dimensional supervision from the interior possible. If a problem occurs somewhere, help could soon come from a nearby room. No dead end or obstructed view exists in this kindergarten.
• **Expanding play and learning space:** By maximally making use of the rooftop space, children could have an all-day long safe playground, where they can feel free to contact blue sky, green trees, and spring breeze.

2) Day-Care Centre for Children “Plappersnut”, Germany

This is an exemplary renovation practice of an old childcare building in Germany. Just shown in the Figure 21 below, the previous entry courtyard was converted into a floor-to-ceiling glassed-in atrium for play (Dudek 2008). It provides a convenient physical linkage between those existing isolated buildings, extends the space and time for children’s play and education with pleasant micro-climate, and realizes the energy-saving goal by inviting natural light. Although physically it is an interior space, this addition exhibits a series of reversals from inside to outside and back again.

![Figure 21. Day-Care Centre for Children “Plappersnut”](Source: Dudek 2008)
5.2 Mixed-use Approach

5.2.1 Concept

Based on the belief that the learning environment is not limited to the boundary of the classrooms, mixed-use approach embeds schools into the fabric of surrounding environment, which can be a win-win situation for all parties (Meacock 2010).

![Figure 22. Mixed-use approach](image)

5.2.2 Functions

Ample benefits exist for childcares to share resources with residents.

1) Increased learning opportunities: Through increased daily interactions with the surrounding communities, children gain invaluable life experience. In turn, this familiarity also fosters a safer learning environment for them.

2) A positive response to adult’s tight schedule: For working families, an edutainment destination for both parents & children is appealing. Children take comfort in knowing their parents are nearby, and parents can engage social activities with others while watching children’s play.

5.2.3 Typology

Success comes in many forms. One typical form is making the resources of educational facilities available to the wider community, yet at the same time safe enough for those children. For example, “gymnasiums can host school or city sports
leagues, classrooms can be used for adult education and school corridors are perfect for early-morning walkers” (Meacock 2010). Another form is diversifying the functions of surrounding area, to attract more people start coming for a greater variety of reasons, such as getting a cup of coffee or attending an outdoor music festival. In addition, other public facilities, such as museum, library, church, marketplace, could expanded their mixed-use services.

5.2.4 Precedents

1) South Bronx Charter School for the Arts, New York, USA

This ambitious building is a combination of a traditional primary school and a new community learning center, by the reuse of an old sausage factory located in the heart of a downtown area. In order to seamlessly integrate the school into the wider community, the idea of a gallery that local artists and students might use together was proposed. Finally, “all arts-related spaces were positioned in the centre of the scheme and along the main street facade, emphasizing their importance and allowing them to be semi-permeable, by way of moveable partitions, to the surrounding halls and communal spaces, and readily accessible to members of the general public entering from the street” (Dudek 2008, 159).

Figure 23. South Bronx Charter School for the Arts
(Source: Dudek 2008, 159)
2) PLAY Boutique, Oregon, USA

The PLAY Boutique is an innovative space aiming at catering to the family as a whole, not just the child. According to the introduction from its web site, the PLAY Boutique provides diverse choices of class, including stay and play, drop and go, learn and grow, camps and special events. It is designed to encourage parents stay and socialize with others in the Parent Lounge area, or do as much as they like to play with their children, or take a break that they deserved while leaving the children with the trained caregivers.

3) Brooklyn Children's Museum, New York, USA

Compared with other museums that perceive latchkey kids who show up in the afternoon as a disturbance, the Brooklyn Children's Museum chooses to support this kind of hanging out as a cool (and safe) activity, and provides a series of mixed-use services. In addition, responding to the spontaneous use of the lit outdoor space in front of the museum entrance as a gathering space at night by people from the neighborhood, the Museum entrance has been redesigned to promote this trend (Simon 2007).

Figure 24. Brooklyn Children's Museum, New York, USA
5.3 Movable Play Facility

5.3.1 Concept

Playground facilities of a movable or portable nature allow each play session to become a new exploring experience, especially when they are combined with certain transportation tools.

![Figure 25. Movable play facility](image)

5.3.2 Functions

1) Increased accessibility: Lack of accessibility to play space and facilities is a major limiting factor for children’s outdoor play. Correspondingly, movable play facilities could provide effortless authority everywhere you go. Therefore the outdoor play space is dramatically extended and play time is increasing as well.

2) Extended free play: Manipulable material and utensils foster children to create their own narratives, activities and environments.

3) Inexpensive intervention: Unlike complete redesign of the play space, this kind of intervention is significantly less expensive, and easy to be changed according to different needs.
5.3.3 Precedents

1) Castle Park, Germany

As a temporary playground to entertain children when their parents was visiting the 2005 State Horticultural Show in Wolfsburg, Castle Park consisted of 24 pink inflatable objects and 15 rubber foam cubes which were laid out on the lawn next to a horse-paddock. These inflatable objects, just like flexible sculptures, allowed for children’s free play. Their exuberant color easily caught the attention and attracted everyone passing by (Rojals 2006). When the exhibition was over, the installation was removed easily, yet remained in the imaginations of the children.

Figure 26. Castle Park
(Source: Rojals 2006)
2) Imagination Playground

“Imagination Playground”, conceived and designed by architect David Rockwell and his firm Rockwell Group, is a breakthrough application inspired by Adventure Playgrounds in Europe in mid-twentieth century. “With a focus on loose parts, complimented by a manipulable environment and Play Associates, it offers a changing array of elements that allow children to constantly reconfigure their environment and to design their own course of play. Giant foam blocks, mats, wagons, fabric and crates overflow with creative potential for children to play, dream, build and explore endless possibilities.”(Imagination playground web site 2010)
Chapter 6  Design Responses

Inspired from three design strategies mentioned in Chapter 5, three design options are proposed, in respond to diverse barriers and potentials within young children’s outdoor environments in three spatial scales.

6.1 Design Option 1: within CDL & ECDL

A key characteristic in this proposal is to overcome existing discontinuity -- between the CDL and the ECDL and between the inside and the outside -- and enrich play and learning opportunities through improved physical communication. A series of grey spaces, such as the main corridor, green houses, and the roof garden, are added to this existing architectural structure.
6.1.1 Main Corridor

Starting from the ECDL parking lot which has been optimized by redesigning the circulation and adding a sidewalk, a main corridor that links the ECDL and the CDL from east to west is proposed. This corridor extension introduces need for further architectural study on security issue, as it might change access or main entry into the buildings. However, this would be a good solution to connect two buildings without interfering the existing Government & Public Affairs Building among them. It brings
great convenience for people who commute between the CDL and the ECDL, and enriches children’s daily experience as well. Moreover, its extension to Goodwin Avenue not only facilitates a ground circulation to central campus, but also stands for the process of growth – from children to youths.
6.1.2 Greenhouse

The greenhouse and glazed cubes could be used as a junction for various functions, such as year-round vegetation-learning space, parents-and-children recreational area and an alternative destination in bad weather. When combined with observation deck, it could be beneficial for researchers to record children’s behavior pattern, which has already occurred in indoor spaces.

Figure 32. Option 1_ Perspective of the greenhouse in the ECDL
6.1.3 Rooftop Playground and Indoor Court

A rooftop playground is added to the flat roofed two-story cubic CDL building, in order to expand safe play area for young children as well as dealing with shady issue in existing play yards. Similarly, the existing underused southern yard of CDL is also transformed to be an indoor court for children’s physical exercise.

Figure 33. Option 1_ Perspective of rooftop playground and indoor court in the CDL
6.1.4 Waiting Boundary

In respond to children’s waiting behavior in front of the CDL, a shelter combined with the existing greenbelt is introduced. This creates a safer and suitable area for young children waiting for the MTD bus as well as observing surrounding world.
6.1.5 Play Yard in the ECDL

According to the interview and on-site observation, the sand pit and bicycles are favorite choices for young children in the ECDL. An enlarged sand pit defined by the modified bicycle track would allow for more unplanned activities, and increase safety when children play on the slide and climbing frame. Tree islands with woody deck in the sand pit provide diverse textures and altitudes for children to experience. Besides, by

Figure 35. Option 1_ Before and after: play yard in the ECDL
redesigning the underutilized east corner, the children’s garden could provide more opportunities for children to learn through play.

6.2 Design Option 2: on UIUC campus

Focusing on the campus area adjacent to the CDL and ECDL, this design option is an illustration of the mix-used approach. Major interventions include school gardens, outdoor classroom and public recreational zone, to attract more people to come and therefore enrich children’s multi-dimensional learning experiences.

Figure 37. Framework of design option 2

Figure 36. Option 2_Aerial perspective
6.2.1 School Garden

Although this garden is proposed to be managed and maintained mainly by undergraduates living in the nearby Lincoln Avenue Residential Hall, it would be a multi-functional vehicle for optimizing young children’s outdoor education: building a connection to natural environment by observing the growth of vegetables, flowers and other plants, augmenting classroom studies with appropriate experiential learning, and stimulating social interaction among children, undergraduates and other people attracted to here. In addition, it could provide healthy food for both undergraduate students and children.

Figure 38. Option 2. Before and after: the school garden
6.2.2 Outdoor Classroom

The outdoor classroom could be reserved and used by all people from the university, to hold outdoor exhibitions on temporary public art installations, music festival, and so on. According to on-site observation, young children are extremely interested in observing their surrounding; even some routine things could inspire their interests. Diverse activities could widen young children’s horizon.

Figure 39. Option 2_ Before and after: the outdoor classroom near the CDL
6.2.3 Visible Neighbors

It is recommended for the adjacent buildings, such as the dance studio, to be equipped with continuous French windows that allow children to observe the indoor activities and learn from them.

Figure 40. Option 2_ Before and after: the “visible neighbors”
6.2.4 Public Resting Area

Several public resting areas are introduced into the surrounding campus to enhance the dialogue between the interior and the exterior. There is a possible conflict – unethical people approaching children -- that would have to be seriously considered. While currently most teachers stay near the porch when children play, it is possible to mitigate the possible conflict by making attractive and useful teachers’ station at fence.

Figure 41. Option 2_ Before and after: public resting area near the CDL
6.3 Design Option 3: in Surrounding Neighborhood

To maximize the daily outdoor environments for young children, this design proposal envisions the third strategy – movable play facilities.

Inspired by the precedent of “Imagination Playground”, a detachable play box made from plastic is designed. Being attached to those wheeled carts used by teachers usually for outdoor field trips, it could be transferred to surrounding neighborhood according to teachers’ arrangement. With teachers’ help, this play box could be easily fixed on site and then provide various educational and recreational options. Moreover, it could be a basic element provided in some public gathering spaces, such as bus shelters, libraries, marketplaces and churches, and effectively fills gaps in play provision in built-up areas.

This option greatly expands the outdoor play space for young children, and dramatically enriches the learning opportunities as well. The changing nature of this option facilitates children and teachers to explore and define their own outdoor environments rather than having everything predetermined for them.
Figure 42. Option 3_ Movable play facilities
In addition, a series of campus resources which have potential to be used by young children for play and learning have been mapped. They include the Bardeen Quad in front of the Engineering Library, the green space surrounding the Alma Mater statue, the shops along the Green Street, the amphitheater of Krannert Center for Performing Arts, the garden outside the Kinkead Pavilion, and the cemetery. The mobile play facilities could be easily transported to these areas by MTD bus service or wheeled carts.

Figure 43. Option 3_ Mapping of potential resources for children in UIUC campus
Chapter 7  Assessment and Conclusion

7.1 Assessment

A general assessment has been conducted to the three design options explained in Chapter 6. The criteria include: whether there is appropriate accessibility, whether the existing play space is physically extended, whether effective supervision is enhanced, whether suitable microclimate is achieved, and whether learning opportunities is enriched. The results are summarized below.

Table 7. Assessment of the three design options

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>• All of the grey spaces added are tightly connected to the existing building and convenient to be reached.</td>
<td>• The school garden and outdoor classroom are adjacent to the ECDL;</td>
<td>• The movable play box could be attached to carts or other public facilities, and therefore used almost everywhere.</td>
</tr>
<tr>
<td>Extensity</td>
<td>• The rooftop playground and greenhouses effectively enlarge the play area within the CDL &amp; the ECDL.</td>
<td>• Functionally, the adjacent area is tightly connected to the ECDL and CDL.</td>
<td></td>
</tr>
<tr>
<td>Supervision</td>
<td>• All of the grey spaces added could be easily supervised by teachers;</td>
<td>• Teachers’ supervision is required, to address the concern of interaction between children and unethical adults outside fence.</td>
<td>• The use of movable play box needs adult’s help.</td>
</tr>
</tbody>
</table>

Table 7 (cont.)

<table>
<thead>
<tr>
<th>Microclimate</th>
<th>Learning opportunity</th>
</tr>
</thead>
</table>
| • The greenhouse provides play area in bad weather;  
• The main corridor makes the circulation between the CDL and the ECDL within “relatively indoor environment”.  
• Sometimes effected by the changing weather. | • Children could review their growth experience by walking along the main corridor from the ECDL to the CDL, and communicate with others as well;  
• Greenhouses provide multiple learning opportunities.  
• The school garden provides multiple learning opportunities for children;  
• The activities happening in the outdoor classroom and public resting area could be observed by children easily.  
• Expanded play area increases more countless opportunities. |

7.2 Limitations of the Study

The most limiting element of this study has been the lack of generalizability. Firstly, while limiting the study to a specific site enabled the study to be completed more expeditiously, the results may not be representative of the cases in other contexts. Secondly, due to the small sample size for interviews as a result of the availability of participants, there is the possibility that the participants’ viewpoints cannot be generalizable to a larger population. For example, both of the parent interviewees are Male American student parents, whose insights maybe slightly different from those of their wives, or parents who have full-time jobs. It’s also feasible that different culture background would affect parents’ educational philosophy and control behavior. Meanwhile, the interview skills of the interviewer may affect the results since all interviews were conducted by the same person.

There are several areas where further work could reinforced. For the CDL and the ECDL at UIUC, the practical optimization of their outdoor environments needs combined efforts from the University, parents, and other parties involved. Some other
form of assessment, such as focus group discussion, could test the reliability and validity of design responses more effectively, and inspire more innovative ideas as well. In addition, more case studies within other daycares could provide comprehensive insights into the challenges and potentials.

7.3 Conclusion

Contemporary young children have very limited outdoor experiences. Literature review suggests that safety has been generally accepted as the primary concern. However, taking the CDL and the ECDL at University of Illinois at Urbana-Champaign as the site of research, the findings of on-site observation and interview have demonstrated that, beside safety concern, the insufficient accessible spaces, tight parental schedules, weather constraints and the popularization of standard play facilities collectively contributed to the diminution of children’s outdoor play. People call for more outdoor experiences for young children, but currently successful models are insufficient.

To reverse this trend, this study tries to bring outdoor experiences back to young children through the redesign of a childcare center. Instead of focusing on the traditional playground, this study explores potentials of increasing high-quality outdoor environments with daily accessibility for young children. Through introducing three strategies -- gray space, mixed-use space and movable play facility, this study proposes a series of design options that make it easier for young children to be outside within a wider context. Although they are explained separately, three design strategies proposed could work together to widely optimize the children’s outdoor environments. For example, with its functional and spatial ambiguity, grey areas, such as corridors and greenhouses, could be easily inserted into public shared spaces, to make them accessible not only for children but also for others and enrich the experience of all groups. Similarly, the popularization of movable play facility could be a catalyst to inspire more mixed-use developments.

As an exploratory attempt, this study clearly indicates the ubiquity of children’s play and learning opportunities within the daily life and how to make use of it through
innovative design. The design options presented here are not intended to predetermine nearly every aspect of children’s interaction with their outdoor environments. Rather, they provide several “platforms”, which allow children the freedom to enrich their own experiences creatively. Moreover, instead of totally replacing the existing system, they provide a range of interventions – some are cost-effective and relatively easy to implement, and others are more elaborate. These temporary or permanent landscape elements could be easily integrated into the city fabric, and make children’s spontaneous outdoor learning and play possible.

This is a productive study about children, for children. Grounded on the findings of this study, we should be more optimistic about the future of the young children, and keep on working to innovatively optimize the outdoor environments for them.
References


Campus Overview, University of Illinois.
http://illinois.edu/about/overview/facts/facts.html (accessed March 01, 2010).


Appendix A: University of Illinois IRB Exemption

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Vice Chancellor for Research
Institutional Review Board
528 East Green Street
Suite 203
Champaign, IL 61820

June 24, 2009

Laura Lawson
Landscape Architecture
101 Temple-Buell Hall
M/C 620

RE: Optimize the Outdoor Environments for Young Children: Re-envisioning the Child Development Laboratories at UIUC
IRB Protocol Number: 09736

Dear Laurn:

I thank you for submitting the completed IRB application form for your project entitled Optimize the Outdoor Environments for Young Children: Re-envisioning the Child Development Laboratories at UIUC. Your project was assigned Institutional Review Board (IRB) Protocol Number 09736 and reviewed. It has been determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b). Category 2 applies because the study involves individual and group interviews as well as observations in public settings (with no interaction between researcher and children/adults being observed). Although there is no data key the interviews are audio recorded with participant permission and photographs of the parking lot/playground observations are taken for research analysis purposes (no identifiable images are disseminated); and group interviews have inherent confidentiality concerns. However, any inadvertent disclosure of responses or participation would not reasonably place the participant at risk of criminal/civil liability nor would it be damaging to their financial status, employability, or reputation.

This determination of exemption only applies to the research study as submitted. Exempt protocols are approved for a maximum of three years. Please note that additional modifications to your project need to be submitted to the IRB for review and exemption determination or approval before the modifications are initiated. To submit modifications to your protocol, please complete the IRB Research Amendment Form (see http://irb.illinois.edu/?q=forms-and-instructions/initial-application.html).

We appreciate your conscientious adherence to the requirements of human subject research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me or the IRB Office, or visit our website at http://www.irb.illinois.edu.

Sincerely,

Sue Kechn, Director, Institutional Review Board

c: Xucan Zhou
Appendix B: Information Sheet about Observation

Dear Parent,

We are from the Department of Landscape Architecture at the University of Illinois and are conducting a research project to study perceptions of safety, play, and education opportunities in the outdoor environments of the Child Development Lab (CDL) and Early Child Development Lab (ECDL) at the University of Illinois.

An important part of this project is through observing human behavior pattern when parents drop off and pick up the children in the parking lots of CDL/ECDL, to explore the potential safety issues and related landscape solutions. Written notes would be taken during the observation. If there is any objection, the information will be destroyed.

This is a great opportunity to identify specific concerns regarding the outdoor environments for young children and explore creative approaches to enrich children's outdoor experiences. There are no risks associated in this research beyond those experienced in everyday, ordinary life.

If you have any questions about this project or plan to let us know not to observe or photograph you or your children, please feel free to contact us using the information below. If you have any questions about your rights as a participant in research involving human subjects, please feel free to contact the University of Illinois Institutional Review Board (IRB) Office at 217-333-2670 or irb@illinois.edu. You are welcome to call these numbers collect if you identify yourself as a research participant.

Sincerely,

Laura Lawson       Xucan Zhou
Associate Professor, Dept. of Landscape Architecture  217-898-9326
217-244-5408       zhou27@illinois.edu
ljlawson@illinois.edu

This research project met the IRB criteria for exemption at 45CFR46.101(B).
Appendix C: Cover Letter and Consent Form to Parents

Dear Parent,

We are from the Department of Landscape Architecture at the University of Illinois and would like to include you in a research project to study perceptions of safety, play, and education opportunities in the outdoor environments of the Child Development Lab (CDL) and Early Child Development Lab (ECDL) at the University of Illinois. Participation will include a 30- to 45-minute interview to occur in August/September and a follow-up 1-hour focus group discussion of design alternatives to occur in November. If you consent to participate, we will contact you by email or phone to arrange the time and place that is most convenient for you.

The intent is to get parents’ perceptions of the outdoor spaces around CDL/ECDL. The interview consists of questions related to the outdoor environments your child experiences through his/her attendance at CDL/ECDL, your perceptions of safety and play opportunities, and your ideals for outdoor experiences for your child. The conversation will be digitally recorded for transcription purposes, and the recording will be immediately erased after transcription is completed. If there is any objection to recording, the digital recorder will not be used and notes will be taken instead.

This is a great opportunity to voice your concerns regarding the outdoor environments for young children and explore creative approaches to enrich children’s outdoor experiences. There are no risks associated in this research beyond those experienced in everyday, ordinary life. For those who participate in a focus group, while all participants will be asked to respect the privacy of the session, it is still difficult to absolutely guarantee confidentiality from other focus group members.

Your participation is completely voluntary. You are free to withdraw your permission at any time and for any reason without penalty. These decisions will have no affect on your future relationship with the CDL/ECDL. The information that is obtained during this research project will be kept strictly confidential. Any sharing or publication of this research will not identify any of the participants by name.

In the space at the bottom of this letter, please indicate whether you are willing to participate in this project and return this to the envelope located in your child’s classroom. If you have any questions about this project, please contact us using the information below. If you have any questions about your rights as a participant in research involving human subjects, please feel free to contact the University of Illinois Institutional Review Board (IRB) Office at 217-333-2670 or irb@illinois.edu. You are welcome to call these numbers collect if you identify yourself as a research participant.

Sincerely,

Laura Lawson
Associate Professor, Dept. of Landscape Architecture
ljlawson@illinois.edu

Xucan Zhou
217-898-9326
zhou27@illinois.edu

I am willing to participate in this research project described above (check) ______________

I give permission for my interview or focus group discussion to be audio recorded (check) ______________

Name: ______________________________                 Signature: ___________________________
Email: _____________________________                                   Date: _______________________________

This research project met the IRB criteria for exemption at 45CFR46.101(B).
Appendix D: Cover Letter and Consent Form to Teachers

Dear Teacher,

We are from the Department of Landscape Architecture at the University of Illinois and would like to include you in a research project to study perceptions of safety, play, and education opportunities in the outdoor environments of the Child Development Lab (CDL) and Early Child Development Lab (ECDL) at the University of Illinois. Participation will include a 30- to 45-minute interview to occur in August/September and a follow-up 1-hour focus group discussion of design alternatives to occur in November. If you consent to participate, we will contact you by email or phone to arrange the time and place that is most convenient for you.

The intent is to get teachers’ perceptions of the outdoor spaces around CDL/ECDL. The interview consists of questions related to the outdoor environments associated with the everyday activities at CDL/ECDL, your perceptions of safety and play opportunities, and your ideals for outdoor experiences for your students. The conversation will be digitally recorded for transcription purposes, and the recording will be immediately erased after transcription is completed. If there is any objection to recording, the digital recorder will not be used and notes will be taken instead.

This is a great opportunity to voice your concerns regarding the outdoor environments for young children and explore creative approaches to enrich children’s outdoor experiences. There are no risks associated in this research beyond those experienced in everyday, ordinary life. For those who participate in a focus group, while all participants will be asked to respect the privacy of the session, it is still difficult to absolutely guarantee confidentiality from other focus group members.

Your participation is completely voluntary. You are free to withdraw your permission at any time and for any reason without penalty. These decisions will not affect your employment at CDL/ECDL. The information that is obtained during this research project will be kept strictly confidential. Any sharing or publication of this research will not identify any of the participants by name.

In the space at the bottom of this letter, please indicate whether you are willing to participate in this project and return this to the envelope located in CDL/ECDL front desk. If you have any questions about this project, please contact us using the information below. If you have any questions about your rights as a participant in research involving human subjects, please feel free to contact the University of Illinois Institutional Review Board (IRB) Office at 217-333-2670 or irb@illinois.edu. You are welcome to call these numbers collect if you identify yourself as a research participant.

Sincerely,

Laura Lawson       Xucan Zhou
Associate Professor, Dept. of Landscape Architecture  217-898-9326
217-244-5408       zhou27@illinois.edu
ljlawson@illinois.edu

I am willing to participate in this research project described above (check) ______________
I give permission for my interview or focus group discussion to be audio recorded (check) _________
Name: ____________________                Signature: ___________________________
Email: ______________________________               Date: _______________________________

This research project met the IRB criteria for exemption at 45CFR46.101(B).
Appendix E: Interview Questions for Parents

1. Age of children?
2. Half-day care or full-day care?
3. How do you and your children get to CDL? And please map the route.
4. What’s your experience in the parking lot of CDL? Is there any potential safety issues?
5. General perception of existing outdoor environment at CDL?
6. What kinds of outdoor activities do you and your children usually participate in during non-school time in a typical week of good weather? How about in winter or rainy days?
7. Time allocated for children’s outdoor play each day/ each week? (accompanied by parents)
8. Are there special issues that prohibit children’s outdoor play? (If yes, key issues that concern you? within CDL, on campus, and in neighborhood)
9. Perceived unsafe activities and actual unsafe activities?
10. Ideal children’s outdoor environments?
Appendix F: Interview Questions for Teachers/ Administrators

1. How long have you taught at CDL/ECDL?
2. What age group do you currently face?
3. What are some of the typical outdoor activities you let your children do? In winter?
4. What campus resources do you take children to use? (Why/Why not?) Is there any other potential that can be made use? And do you know any other possibilities or successful examples for university-based daycare schools to make use of the campus resources for children’s outdoor experiences?
5. Time allocated for children’s outdoor play each day/ each week? (Season?)
6. Do you encourage the interaction among different age groups?
7. Are there special issues that prohibit children’s outdoor play? (if yes, key issues that concern you?)
8. Perceived unsafe activities and actual unsafe activities? / Are there some typical playground (equipment) injuries and risk factors? Playground equipment hazards?
9. Comments about existing outdoor play environments at CDL/ECDL? (if good, please tell strengths; if bad, please tell weakness)
10. Ideal young children’s outdoor environments?